TEXT FLY IN THE BOOK

UNIVERSAL
LIBRARY

OU_164282

UNIVERSAL
LIBRARY

OSMANIA UNIVERSITY LIBRARY

Call No. 330/G550 Accession No. 19693

Author Gleaser, M.G.

Title Outlines. . . . . Economics

This book should be returned on or before the date last marked below.

SOCIAL SCIENCE TEXT-BOOKS

EDITED BY RICHARD T. ELY, PH.D., LL.D.

Director of the Institute for Research in Land Economics and Public Utilities and Research Professor of Economics, in Northwestern University

---

OUTLINES OF ECONOMICS (Fourth Edition)
By RICHARD T. ELY, PH.D., LL.D. Revised and enlarged by the AUTHOR and THOMAS S. ADAMS, PH.D., MAX O. LORENZ, PH.D., ALLYN A. YOUNG, PH.D.

OUTLINES OF SOCIOLOGY (Revised Edition)
By FRANK W. BLACKMAR, PH.D., and JOHN LEWIS GILLIN, PH.D.

HISTORY OF ECONOMIC THOUGHT (Revised Edition)
By LEWIS H. HANEY, PH.D.

BUSINESS ORGANIZATION AND COMBINATION
By LEWIS H. HANEY, PH.D.

PROBLEMS OF CHILD WELFARE (Revised Edition)
By GEORGE B. MANGOLD, PH.D.

SOCIAL PROBLEMS (Revised Edition)
By EZRA T. TOWNE, PH.D.

THE NEW AMERICAN GOVERNMENT (Revised Edition)
By JAMES T. YOUNG, PH.D.

COMPARATIVE FREE GOVERNMENT
By JESSE MACY, LL.D., and JOHN W. GANNAWAY, M.A.

AMERICAN MUNICIPAL PROGRESS
By CHARLES ZUEBLIN

APPLIED EUGENICS
By PAUL POPENOE and ROSWELL S. JOHNSON, M.S.

OUTLINES OF AGRICULTURAL ECONOMICS
By HENRY C. TAYLOR, M.S.AGR., PH.D.

THE LABOR MARKET
By DON D. LESCOHIER, PH.D.

EFFICIENT MARKETING FOR AGRICULTURE
By THEODORE MACKLIN, PH.D.

A HISTORY OF TRADE UNIONISM IN THE UNITED STATES
By SELIG PERLMAN, PH.D.

INTERNATIONAL COMMERCIAL POLICIES
By GEORGE M. FISK, PH.D., and PAUL S. PEIRCE, PH.D

WORKMEN'S COMPENSATION
By E. H. DOWNEY

INTRODUCTION TO AGRICULTURAL ECONOMICS
By LEWIS CECIL GRAY, PH.D.

GENERAL SOCIAL SCIENCE
By ROSS L. FINNEY, PH.D.

OUTLINES OF PUBLIC UTILITY ECONOMICS
By MARTIN G. GLAESER, PH.D.

OUTLINES OF PUBLIC UTILITY ECONOMICS

BY

MARTIN G. GLAESER

PROFESSOR OF ECONOMICS, UNIVERSITY OF WISCONSIN

AND

RESEARCH ASSOCIATE, INSTITUTE FOR RESEARCH IN LAND ECONOMICS AND PUBLIC UTILITIES

New York

THE MACMILLAN COMPANY

1931

COPYRIGHT, 1927,
BY THE MACMILLAN COMPANY.

All rights reserved—no part of this book may be reproduced
in any form without permission in writing
from the publisher.

Set up and electrotyped.
Published September, 1927.

Printed in the United States of America by
J. J. LITTLE AND IVES COMPANY, NEW YORK

TO MY WIFE
THE
SILENT PARTNER
IN
THIS ENTERPRISE

"Most of the things we do, we do for no better reason than that our fathers have done them or that our neighbors do them, and the same is true of a larger part than we suspect of what we think. The reason is a good one, because our short life gives us no time for a better, but it is not the best. It does not follow, because we all are compelled to take on faith at second hand most of the rules on which we base our action and our thought, that each of us may not try to set some corner of his world in the order of reason, or that all of us collectively should not aspire to carry reason as far as it will go throughout the whole domain. In regard to the law, it is true, no doubt, that an evolutionist will hesitate to affirm universal validity for his social ideals, or for the principles which he thinks should be embodied in legislation. He is content if he can prove them best for here and now. He may be ready to admit that he knows nothing about an absolute cosmos, and even that he knows next to nothing about a permanent best for men. Still it is true that a body of law is more rational and more civilized when every rule it contains is referred articulately and definitely to an end which it subserves, and when the grounds for desiring that end are stated or are ready to be stated in words."

JUSTICE OLIVER WENDELL HOLMES, in *The Path of the Law.*

AUTHOR'S PREFACE

This book is the immediate outgrowth of seven years of teaching of the subject of public utilities in university classes. Before the need of a text for teaching purposes appeared, the writer had already planned a treatise upon the general subject of the regulation of our local public utilities. This has several times been done for railway transportation. With this end in view, the work of collecting and organizing material was begun many years ago, but the exigencies of earning a living deferred its completion. The favoring atmosphere of academic work, together with the stimulus and financial assistance of the Institute for Research in Land Economics and Public Utilities, in the end enabled me to bring to a close these *Outlines of Public Utility Economics.*

During the last few years several treatments of public utilities from an economic point of view have appeared, thereby reducing somewhat the urgent need of the present volume for teaching purposes. Nevertheless, the writer has felt that his own point of view, largely historical and economico-legal in character, will fill a niche in the rapidly expanding structure of public utility literature. As here presented, the book was written for the use primarily of students of economics in universities and colleges, who have made more than a beginning in the serious study of their specialty. Yet the needs of the general reader, for whom the book was first intended, have been kept in mind, and particularly the needs of those whose daily contact with the details of public utility administration has made the securing of a more general orientation appear advisable.

To the college instructor who may want to use the *Outlines* for text-book purposes a word of explanation is due. In two respects the treatment of the subject matter departs from the usual mode of presentation. In the first place it aims to present the subject in a way which will introduce the reader to the field in its entirety. With the multiplication of courses in university curricula dealing with the special problems of railroads, the electrical industries, the gas industry, and so forth, certain common material may well serve the purposes of all students regard-

less of later specializations. Moreover, there has been such a great degree of interaction between conditions in the several public service industries that a composite account of their development affords a clearer insight into the historical unfolding of public policy with respect to them. To present this matter within reasonable limits of space, the historical and descriptive portions have necessarily been abridged to the essentials. The aim has been to present a panorama rather than a picture in detail. Each instructor may then supplement in accordance with his own needs. The Select Bibliography in Appendix C may be of some help in this connection, together with the Review Questions and Exercises in Appendix B.

The second respect in which the following treatment differs from others is that it was written from an institutional point of view. Accordingly, the theory of the going concern occupies a central position throughout the book. This theory provides a unifying idea which brings the details into organic connection. Here the writer owes a debt of gratitude to several of his teachers, particularly to Professors Richard T. Ely, John R. Commons and Roscoe Pound, Dean of the Harvard Law School. Directly and indirectly, their teachings and guidance have made possible the application to public utility economics of a social theory which is implied in the activities of social groups.

So far as possible the aim of the writer has been to indicate the sources from which he has drawn in the body of the text. Others are indicated in the Select Bibliography. Acknowledgments for helpful advice and criticism are due many persons who will remain unmentioned. I desire, however, to express special acknowledgment of indebtedness to Dr. Edward W. Morehouse of Northwestern University, Managing Editor of the Journal of Land and Public Utility Economics, and to Dr. Richard T. Ely for help in revising the book; to Mr. Edwin Gruhl and Mr. F. W. Doolittle, both of the North American Company, for helpful criticisms and suggestions; and to Dr. Marcus Whitman and Mrs. Fannie G. Haber, my assistants at the University of Wisconsin, for effective coöperation.

In presenting a subject so replete with controversy as public utility economics it can not be expected that the point of view contained in the following pages will be accorded general acquiescence. No doubt also there are misstatements of fact and errors of detail. Whatever its faults may be in the matter of substance, form of presentation or conclusions reached, the writer has conscientiously aimed to give an interpretation which is based upon

the facts and to treat controversial points in a manner which he believes to be in the public interest and not inconsistent with the larger interests of public service industries.

MARTIN G. GLAESER.

Madison, Wisconsin,
May, 1927.

EDITOR'S INTRODUCTION

The present work on public utility economics has had a long history, if it is traced to its beginnings, and in this respect is like most worthwhile books of a scientific character. It can be traced back to Professor Glaeser's interest in public utility problems as a student in what was, perhaps, the first class in public utilities, conducted by Professor John R. Commons in 1907. Professor Glaeser's long experience with the Wisconsin Railroad Commission as statistician and case investigator afforded an opportunity to make contact with the problems of public utility regulation as they came before that Commission. The ripening process continued while he was serving in consulting and research capacities for public and private corporations. The contract reprinted as Appendix A is the product in no small part of one of these activities. From the beginning of its existence Professor Glaeser has been connected with the Institute for Research in Land Economics and Public Utilities, having worked in both fields, and this book is brought out under the auspices of the Institute.

Since 1920 Professor Glaeser has been teaching public utility economics at the University of Wisconsin and the *Outlines* in mimeographed form has been used in these courses, as well as in various other universities. In its present form the book is the product of careful and repeated revision.

What Professor Glaeser has attempted to do in the *Outlines* is to present the economic problems of all of the public utilities taken as a group. It has been the aim of the author to consider the fundamentals, the aspects that are common to all utilities and the instances where one industry of the group has influenced another. The entire field of public utilities is covered and in this respect the work differs from other books and monographs which have dealt only with a particular industry or a particular phase of public utility problems. In Professor Glaeser's book the railways are included, as they should be. Railways are simply one of the greatest of our public utilities. To treat them as distinct from public utilities is a great mistake involving duplication and needless multiplication of courses.

A book like this has long been needed. We have had engineer-

ing works in great abundance, but this is the first general work written by an economist. Public utilities represent a very considerable proportion of the wealth of the country and perhaps no industries are growing more rapidly. Constantly they are performing new services. At the present moment those engaged in the industry are interested in extending its benefits to the farms, and rural electrification is constantly being discussed. This brings to the fore the economics of the problem, particularly the question of balancing cost and income. This problem of cost and income is one that extends throughout all the inquiries of the Institute, whether they belong in the field of land economics or public utilities.

The aim in this book has been to be as impartial as the physicist or the chemist working in his laboratory. It may not please every one. Neither Professor Glaeser nor his friends would want to say that he has given us the last word. I do venture to say, however, as his editor and his friend, that future writers will refer back to this work as beginning the scientific treatment of public utilities.

RICHARD T. ELY.

May, 1927.

CONTENTS

PAGE

AUTHOR'S PREFACE vii

EDITOR'S INTRODUCTION xi

PART I

THE ECONOMIC BASIS OF PUBLIC UTILITY ENTERPRISES

CHAPTER I—NATURE AND SCOPE OF PUBLIC UTILITY ECONOMICS 1

Sec. 1. The Popular and Scientific Meaning of the Term "Public Utility" Contrasted 2
2. The Social Control of Economic Functions 7
3. Industrial Classification of Public Utilities 8
4. Financial Importance and Magnitude of Public Utility Industries 9
5. Historical Survey of the Development of Public Utilities . 12
6. General Summary 21

CHAPTER II—DEVELOPMENT OF PUBLIC UTILITIES IN THE UNITED STATES—NATIONAL UTILITIES 23

Sec. 1. Transportation Utilities and the Conquest of a Continent . 23
2. The Development of the Railway 28
3. Transportation Utilities Rendering a Supplementary Service 36
4. Utilities of Conservation 41
5. Utilities of National and International Communication . . 44

CHAPTER III—DEVELOPMENT OF PUBLIC UTILITIES IN THE UNITED STATES (CONTINUED)—LOCAL UTILITIES 47

Sec. 1. The Factor of Urbanization 47
2. The Development of Water Supply 49
3. The Development of Gas Supply 52
4. The Development of Electricity Supply 57
5. Urban Transportation 67
6. Local Communication 72
7. General Summary 77

CHAPTER IV—THE LEGAL ORGANIZATION OF PUBLIC UTILITIES . 82

Sec. 1. The Public Service Corporation 82
2. The Trust Form of Public Utility Organization 88

PAGE
3. The Holding Company, its Character and Purpose 89
4. Advantages of Holding Companies 94
5. The Holding Company and Its Critics 97
6. The Question of Stockholders' Responsibility 99

CHAPTER V—PUBLIC UTILITIES AS GOING CONCERNS 102
Sec. 1. The Importance and Scope of Bargaining 102
2. Cost Bargains 105
3. Income Bargains 107
4. The Balance of Expense and Revenue as the Outgrowth of Public Utility Transactions 107
5. The Relative Importance of the Different Categories of Cost 108
6. The Theory of a Going Concern 112
7. Phases in the Life History of Going Concerns 114

CHAPTER VI—ACCOUNTING METHODS 126
Sec. 1. The Development of Control over Accounts and Records . 126
2. Advantages and Extent of the Uniformity Movement . . 129
3. Functional Cost Accounting 131
4. Other Uses of Accounting Systems 132
5. Fundamental Primary Accounts and their Interpretation by Means of Accounting Statements 133
6. Uniform Reports and Statistics 145
7. Financial and Operating Ratios as Aids to Management . 146

PART II

THE DEVELOPMENT OF AGENCIES OF REGULATION IN THE UNITED STATES

CHAPTER VII—THE COMMON LAW BASIS OF PUBLIC UTILITY REGULATION 156
Sec. 1. The Historical Background of Regulation 156
2. Judicial Consideration of the Meaning of Public Utility . 162
3. The Common Law of Public Callings 166
4. Public Utility Origins in Mediaeval Economy 168
5. The Modifications Introduced by "Laissez faire" . . . 170
6. Legal Tests of Classification 172
7. Rights and Duties of Public Utilities 174
8. An Economic Interpretation 175
9. Implications 180

CHAPTER VIII—THE CONSTITUTIONAL BASIS OF PUBLIC UTILITY REGULATION 181
Sec. 1. The Adjustment of Private Rights and Public Interests . 181
2. The Function of the Judiciary in Interpreting Constitutions 182

PAGE
3. Public Utilities in their Relation to Governmental Powers . 184
4. The Police Power 184
5. The Power Which Maintains Peace and Security . . . 187
6. Fiscal Powers 187
7. Eminent Domain 189
8. The Compact Clause 190
9. The Proprietary Power 192
10. The Protection of Private Interests or Rights 192

CHAPTER IX—THE PRE-COMMISSION SYSTEM OF STATE REGULATION 195
Sec. 1. Judicial Regulation 195
2. Earlier Forms of Legislative Regulation 197
3. General Incorporation Acts and Their Effect on Regulation . 202
4. Judicial Interpretation of Charter Regulation 205
5. The Granger Movement 210

CHAPTER X—EARLIER REGULATION OF LOCAL UTILITIES BY SPECIAL FRANCHISES 217
Sec. 1. Underlying Conditions Coloring Franchise Regulation . . 217
2. The Changing Objectives of Regulation under Special Franchises 218
3. The Problem of Tenure 220
4. Regulation of Rates and Service under Term Franchises . . 224
5. The Problem of Compensation for Franchises 229
6. Public Ownership and Operation as an Alternative . . . 230
7. Public Utility Franchises and Municipal Corruption . . . 231

CHAPTER XI—THE REGULATION OF PUBLIC UTILITIES BY STATE COMMISSIONS 233
Sec. 1. Re-establishment of Mandatory Commissions 234
2. Expansion in the Scope of State Regulation 234
3. Legislative Standards of Reasonableness 235
4. The Franchise Problem under State Commission Regulation . 241
5. Administrative Superiority of the Commission System . . 250
6. Peculiarities of Rate Control by Commissions 261
7. Conclusion 262

CHAPTER XII—THE REGULATION OF PUBLIC UTILITIES BY FEDERAL COMMISSIONS 263
Sec. 1. The Origin of the Federal System of Regulation 263
2. The Act to Regulate Commerce and its Emasculation . . 267
3. The Interstate Commerce Commission becomes a Mandatory Commission 271
4. Development of its Powers—The Significance of the "Advanced Rate Cases" 273
5. Government Operation of Railroads during the World War . 278

P
6. The Transportation Act of 1920 2
7. Extension in Scope of Jurisdiction of the Interstate Commerce Commission 2
8. The Regulation of Water Carriers 2
9. The Federal Power Commission 2

CHAPTER XIII—LOCAL REGULATION OF PUBLIC UTILITIES—FLEXIBLE RATE FRANCHISES 2
Sec. 1. Centralization versus Decentralization in Public Utility Regulation 2
2. Local Regulation of Public Utilities 2
3. Sliding Scale Franchises 2
4. Service-at-Cost Franchises 3

PART III

THE ADMINISTRATION OF PUBLIC UTILITIES UNDER REGULATION

CHAPTER XIV—THE MOVEMENT FOR PHYSICAL VALUATION . . 3
Sec. 1. Rate-making as a Governmental Process 3
2. Analysis of the Investment Bargain 3
3. History of the Movement for Physical Valuation 3
4. The Valuation Doctrine and the Theory of the Going Concern 3
5. The Underlying Purpose of the Movement 3
6. The "Rate-making Rule" of Smyth v. Ames 3
7. The Investment Standard of Determining the Rate-base . 3
8. The Capitalization of Income Standard of Determining the Rate-Base 3
9. The Cost of Reproduction Standard of Determining the Rate-Base 3
10. Purpose of the Judicial Rule of Rate-making in Legislative Regulation 3
11. Modification of the Rule by Administrative Commissions . 3

CHAPTER XV—SECURITY OF INVESTMENT AND DEPRECIATION . . 3
Sec. 1. A Classification of Factors Producing Insecurity of Investment 3
2. The Causes of Depreciation 3
3. Maintenance and Depreciation 3
4. Other Causes of Loss of Capital 3
5. The Purpose of Depreciation and Insurance Charges . . . 3
6. Some Misconceptions Analyzed 3
7. The Financing of Depreciation 3
8. The Accounting of Depreciation 3

PAGE

9. The Requirements of Public Policy with Respect to Depreciation 355

CHAPTER XVI—SECURITY OF INVESTMENT AS RELATED TO CONTROL OF THE MARKET 362

Sec. 1. Meaning of Control of the Market 362
2. Competition a Preventable Cause of Insecurity of Investment 365
3. Administrative Aspects of Control of the Market 365
4. The Control of Abandonments of Service 367
5. Economic Limitations upon the Power to Control Abandonments 369

CHAPTER XVII—CORPORATE FINANCIAL POLICIES 371

Sec. 1. Early Conditions of Corporate Financing as Affecting the Security of Investment 371
2. What is a Reasonable Capitalization? 372
3. Classification of Public Utility Securities 374
4. The Financial Plan of Public Utilities 375
5. Methods of Public Utility Financing in the Past 376
6. Present-day Problems in Public Utility Financing . . . 378
7. Stock without Par Value 382
8. Financing by the Sale of Stock 384
9. Yield to Investors and Cost of Capital Distinguished . . . 387

CHAPTER XVIII—PUBLIC CONTROL OF SECURITY ISSUES . . . 389

Sec. 1. Financial Practices leading up to the Regulation of Security Issues 389
2. The Purpose of Security Regulation 391
3. Important Steps in the Movement for Public Control . . 392
4. Typical Provisions of State Statutes 393
5. Federal Regulation of Security Issues 396
6. Judicial and Economic Interpretations 401

CHAPTER XIX—THE RATE OF RETURN 408

Sec. 1. Analysis of the Rate of Return 408
2. General Principle Applicable in Fixing the "Fair Return" 411
3. Determinants of the Necessary Rate of Return 414
4. Quantitative Measures of the Necessary Rate of Return . 423
5. Judicial Standards as Affecting the Rate of Return . . 426
6. Rates of Return as fixed by Administrative Commissions . 428
7. A Flexible Rate-of-Return Formula 429
8. Reward for Efficient Management 432
9. General Summary 434

PAGE

CHAPTER XX—APPRAISALS AND THEIR USES 436

Sec. 1. The Place of Appraisals in Public Utility Valuations . . 436
2. The Purpose and Cost of Appraisals 438
3. The Inventory 440
4. Unit Prices 444
5. General Overhead Charges 445
6. Ascertainment of the Final Appraisal Figures 449
7. The Appraisal of Accrued Depreciation 451
8. The Appraisal of Working Capital 452

CHAPTER XXI—A CRITIQUE OF VALUATION STANDARDS 455

Sec. 1. The Focal Points of Conflict 456
2. Illustrations of the Effect of Price Changes on Appraisals . 462
3. The Doctrine of "Fair Value" Challenged 463
4. Valuation under the Going Concern Theory of Regulation . 468
5. The Present Position of the Supreme Court of the United States 475

CHAPTER XXII—RETROSPECTIVE VALUATION 481

Sec. 1. Necessary Reconciliations in Adopting a Rate-making Rule for the Future 481
2. Franchise Value 482
3. Good Will 485
4. Going Value 487
5. The Measurement of Going Value 491
6. A Definition of Going Value 495
7. Going Value and Confiscation 496
8. An Economic Interpretation of Going Value 499
9. Accrued Depreciation and the Rate-Base 501
10. General Summary 504

CHAPTER XXIII—PUBLIC UTILITY LABOR POLICIES 508

Sec. 1. The Importance of Wages in Operating Cost 509
2. Fundamental Conditions Affecting the Public Utility Labor Bargain 510
3. Methods of Bargaining 513
4. The Collective Bargain or Trade Agreement 521

CHAPTER XXIV—PUBLIC UTILITY LABOR LEGISLATION 531

Sec. 1. The Movement to Assure Continuity of Service 531
2. Special Legislation to Secure Continuity of Operation upon Railroads 535
3. Special Legislation Dealing with Labor Relations of Local Utilities 544
4. Judicial Review of Legislation Providing for Compulsory Conference and Compulsory Arbitration 546
5. General Summary 548

PAGE

CHAPTER XXV—THE PRICE BARGAIN 550

Sec. 1. The Financial Importance of the Price Bargain 550
2. The Basis and Need for Regulatory Control 551
3. Managerial Responsibilities 553
4. The Dynamics of Prices and the Price Bargain 553
5. The Administration of the Purchasing Function 555
6. Standardization 559
7. Vertical Integration and Syndicated Properties 561
8. Commission Control over the Price Bargain 563
9. Some Special Legislation involving the Public Utility Price Bargain 572

CHAPTER XXVI—THE TAXATION OF PUBLIC UTILITIES 574

Sec. 1. The Meaning and Relative Importance of the Tax Bargain . 575
2. Stages in the Development of Public Policy with Respect to Public Utility Taxation 578
3. Taxation of the Franchise 583
4. The Gross Earnings System 584
5. The Ad Valorem System 585
6. Miscellaneous Special Forms of Public Utility Taxation . 588
7. Contributions in the Nature of Taxes 591
8. The Gross-Net System of Earnings Taxation 592
9. Valuation for Purposes of Taxation 594
10. General Summary and Criticism of Public Utility Taxation . 595

CHAPTER XXVII—CONTROL OVER SERVICE—CODIFIED STANDARDS OF SERVICE 600

Sec. 1. The Obligation to Render Reasonably Adequate Service . 600
2. Service Requirements Common to Several Utilities . . . 602
3. Service Standards Peculiar to Gas Utilities 605
4. Service Standards Peculiar to Water Utilities 607
5. Service Standards Peculiar to Electric Utilities 608
6. Service Standards Peculiar to Telephone Utilities . . . 609
7. Grading Public Utility Service 611
8. Characteristics of Street Railway Service 613
9. Steam Railway Service 616

CHAPTER XXVIII—THE ECONOMICS OF REGULATED MONOPOLY PRICE 618

Sec. 1. Economic Characteristics of Public Utility Industries . . 618
2. Some possible Effects of Monopolistic Price Discriminations 626
3. Diagrammatic Presentation of the Theory of Monopoly Price 627
4. The Self-destructive Nature of Competition 630
5. The Bearing of Regulation upon the Theory of Monopoly Price 634
6. The Special Case of Extensions 636
7. Some Misconceptions of Public Utility Rate Theory Analyzed 637

PAGE

CHAPTER XXIX—COST ANALYSIS IN ITS RELATION TO SELLING POLICIES 640

Sec. 1. Cost Analysis as Applying to the Rate Schedule as a Whole 640
2. Cost Analysis and the Adjustment of Class Rates . . . 643
3. The Typical Case of Electricity Supply 645
4. The Concept of "Load Factor" as Indicative of Intensity of Plant Utilization 648
5. Economy in the Utilization of Plant Arising Out of Diversity in the Time of Demand 649
6. Differential Costs of Railway Traffic 652
7. Differential Costs of Electric Service 653

CHAPTER XXX—DIFFERENTIAL RATES AND THE CLASSIFICATION OF CUSTOMERS 660

Sec. 1. Differential Costs as Related to Rate Structure 660
2. Differential Rates Based upon Customer Classifications . . 662
3. Rate Systems 667

PART IV

TRENDS IN PUBLIC POLICIES AFFECTING UTILITIES

CHAPTER XXXI—THE GOVERNMENT AS PUBLIC SERVICE ENTERPRISER 676

Sec. 1. The Need of a Scientific Attitude 677
2. The Various Forms of Governmental Enterprise 678
3. Enabling Legislation 680
4. The Movement for Public Ownership and Operation . . . 685
5. Problems of Public Ownership and Operation 692
6. Sociological Perspective 697

CHAPTER XXXII—SERVICE-AT-COST IN THE REGULATION OF LOCAL UTILITIES 702

Sec. 1. A Public Utility Survey 702
2. Important Provisions of the Milwaukee Operating Agreement 704
3. An Appraisal of the Provisions of the Milwaukee Contract . 714
4. Probable Operating Results 724
5. The Fate of the Contract 730

CHAPTER XXXIII—GENERAL SUMMARY AND FORECAST OF THE DEVELOPMENT OF REGULATION 733

Sec. 1. Public Utility Credit 733
2. Effect of Regulation upon Earning Power 738
3. Some Fundamental Premises of Public Utility Economics . 743
4. Necessary Changes in Regulatory Policy 746
5. The Cost of Regulation 749

PAGE

APPENDIX A. THE MILWAUKEE OPERATING AGREEMENT . . . 755
Art. I. General Conditions 756
II. Cost of the Service 763
III. Control 774
IV. Municipal Acquisition 785
V. Effective Provisions 794

APPENDIX B. REVIEW QUESTIONS AND EXERCISES 799

APPENDIX C. SELECT PUBLIC UTILITY BIBLIOGRAPHY AND SOURCE MATERIALS 831

INDEX 835

CHARTS

CHART		PAGE
I	Population of England and Wales	17
II	Growth of Capital Invested and Gross Revenue—All Steam Railroads of the United States, 1902-1924	35
III	Capital Invested in Selected Public Utilities in the United States, 1902-1923	58
IV	Gross Revenue of Selected Public Utilities of the United States, 1902-1923	59
V	Total Energy Generated and Installed Capacity—All Central Stations, 1913-1926	60
VI	Distribution of Water Power Resources and Extent of Development by Sections, 1925	62
VII	Distribution of Water Power Resources and of Primary Power by Sections, 1925	63
VIII	Electric Transmission Lines in Wisconsin, Map I *facing*	66
IX	" " " " ", Map II *facing*	66
X	Development of Local Transportation	69
XI	Telephone Development in United States and Europe	73
XII	Diagram of Typical Market Situation of a Public Utility	104
XIII	Distribution of Gross Earnings from Operation—T. M. E. R. & L. Co., 1923	110
XIV	Typical Economic and Legal Relations of Going Concerns	114
XV	Phases in the Life History of a Going Concern . *facing*	124
XVI	The Constitutional Basis of Public Utility Regulation . *facing*	184
XVII	Evolutionary Stages in Legislative Regulation	196
XVIII	Zones of Reasonableness and Unreasonablenes as Applied to Rates Fixed for Gas Utilities	334
XIX	Yield Required from Taxable Income to Equal Return from Tax Exempt Bonds of Various Yields Affecting 1919 Income	419
XX	Yield Required from Taxable Income to Equal Return from Tax Exempt Bonds of Various Yields Based on 1924 Federal Rates	420
XXI	Comparative Yield of Municipal and Public Utility Bonds	421
XXII	Comparative Average Rate Paid by the City of Milwaukee and the Milwaukee Electric Railway and Light Co., 1911-1919	422

CHART		PAGE
XXIII	Index of Wholesale Prices—United States, 1791-1925 . .	458
XXIV	Composite Index of Construction Cost for Physical Property of Typical Public Utilities	464
XXV	Comparison of Commodity Price Index with Selected Average Commercial Paper Rates and Bond Yields . . .	506
XXVI	Comparison of Cost of Living, Union Wages, Wholesale Prices and Purchasing Power	534
XXVII	Organization of General Purchasing Department of the Western Electric Co. . . . . *facing*	554
XXVIII	Uniform Monopoly Price	628
XXIX	Discriminatory Monopoly Price	629
XXX	Constant and Variable Costs	644
XXXI	Typical Load Curves for Winter and Summer	646
XXXII	Typical Seasonal Load Curves for an Electric Utility Chiefly Residential Consumption—1925	647
XXXIII	Typical Seasonal Load Curves for an Electric Utility, Chiefly Industrial Consumption—1925	647
XXXIV	System of the Milwaukee Electric Railway and Light Co. *facing*	702
XXXV	Machinery for Management and Control Under the Contract	725
XXXVI	Equalization of Costs and Income Under the Contract . .	731
Annex A	Map of Milwaukee	795

TABLES

TABLE		PAGE
I	Statistics of Public Service Enterprises	11
II	Miles of Railroad Constructed in the United States by Decades	29
III	Miles of Highway Construction in the United States under the Federal Aid Law, 1918-1926	38
IV	Increase in Urbanization in the United States 1890-1920	48
V	Number of Water-works in the United States at end of Decade	50
VI	Total Sales of Manufactured Gas, 1909-1923	55
VII	Growth of Horse-Power Used in Manufacturing in United States	64
VIII	Increase in the Size of the Business Unit for Types of Public Utilities	84, 85
IX	Amount and Relative Importance of Cost Bargains of a Typical Utility, 1922	109
X	Amount and Relative Importance of Cost Bargains for Selected Public Utilities of the United States	*facing* 110
XI	Amount and Relative Importance of Cost Bargains of Gas and Water Utilities of Wisconsin, 1923	112
XII	Extent of Acounting Control by Public Service Commissions, 1925	131
XIII	Annual Ratios of Investment to Operating Revenue for Selected Wisconsin Utilities	150, 151
XIV	The Turnover on Fixed Property Investment by Groups of Representative Companies of Various Industries	153
XV	Proportion of Funded Debt and Capital Stock to Total Nominal Capitalization for Types of Public Utilities	381
XVI	Direct Financing of Securities by Electric Light and Power Companies	386
XVII	Amount of Securities Sold by Electric Light and Power Companies, 1920-1926	386
XVIII	Comparison of Equivalent Income from Tax-Free and Taxable Securities under Federal Income Tax Rates Affecting 1919 Income	418
XIX	Comparison of Annual Cost of Debt Capital, Rate of Return and Differential on Risk Capital of the Milwaukee Electric Railway and Light Company	431

TABLE		PAGE
XX	Composite Index of Construction Cost for Physical Property of Typical Public Utilities	464
XXI	Growth in Membership of Public Utility Trade Unions, 1914-1925	518
XXII	Wage Ratios in Various Public Utilities in the United States	525
XXIII	War-Time Increase in Average Daily Compensation of Railroad Employes	539
XXIV	Taxation of Public Utilities—Ratio of Taxes to Corporate Net Income	577
XXV	Comparative Tax Burdens	577
XXVI	Changes in Rates of Gross Earnings Taxation as Applied in California	586
XXVII	Typical Cost Apportionment of an Electric Utility	656
XXVIII	Comparative Income Accounts, Interborough Rapid Transit Co. of New York	691
XXIX	Municipal and Privately Owned Gas Plants in the United States and Canada	692
XXX	Physical and Financial Statistics of Electric Utilities	693
XXXI	Physical and Financial Statistics of Electric Railway Utilities	694
XXXII	Tentative Apportionment of Property Account	707
XXXIII	Annual Additions to Property and Plant	717
XXXIV	Adjustments in Property Account	719
XXXV	Rate of Return Formula	721
XXXVI	Income Account—T. M. E. R., & L. Co., 1923	*facing* 724
XXXVII	Income Account—T. M. E. R. & L. Co., 1924	*facing* 724
XXXVIII	Summary Statement of Index Interest Rates, 1923	726
XXXIX	Summary Statement of Index Interest Rates, 1924	727
XL	Estimate of Working Capital	728, 729
XLI	Summary of Government and Corporate Financing	734
XLII	Weighted and Simple Average Yield at Offering Price of New Public Utility Security Issues	736, 737
XLIII	Comparative Rates of Interest, Dividends, and Returns	743
XLIV	Expenditures of Administrative Commissions and Gross Revenues of Public Utilities	750

OUTLINES OF PUBLIC UTILITY ECONOMICS

OUTLINES OF PUBLIC UTILITY ECONOMICS

PART I

THE ECONOMIC BASIS OF PUBLIC UTILITY ENTERPRISES

CHAPTER I

NATURE AND SCOPE OF PUBLIC UTILITY ECONOMICS

The tremendous social importance of public utilities in the economic life of our times invites a study of these industries from an economic point of view. Within the period of the generation still living the growth in volume and variety of their services has been little short of marvelous. This growth was accompanied, however, by the development of certain vexing problems which require more satisfactory solutions than have thus far appeared, if this progress is to continue.

A few illustrations will bring out the social significance of public utilities and something as to the nature of the problems involved. The city of Toronto recently purchased the properties of the Toronto Electric Railway Company and began the operation of this urban railway as a municipal enterprise. This event followed a protracted period of conflict over new franchises which ended when the existing franchise expired. During the latter years of this period street railway service in the city had so far degenerated as to leave Toronto the worst served of the larger cities of North America. At the same time the city of Des Moines was engaged in a conflict with the Des Moines Street Railway Company in the course of which that property passed into the hands of a receiver. Transportation service was first interrupted and eventually entirely discontinued on account of a strike of employees for higher wages. Meanwhile, the community attempted to stumble through its daily round of opera-

tions by means of hastily organized motor-bus service and other improvised carriers. In the end street-railway service was resumed under a new franchise embodying revised terms. Chicago and Toledo afford other recent illustrations of urban electric railways, caught between the upper millstone of franchise-controlled rates and the lower millstone of rising costs. In both cases service was temporarily discontinued; but the interval was long enough to bring home to these communities what the lack of an organized system of transportation means in a metropolitan center.[1]

These episodes of recent electric railway history testify to the fact that public service industries are the very stuff and fiber of modern industrial civilization. Instances might be multiplied, using other types of public utilities, to point out the social significance of public service industries as a class. We may hear less of some in the public prints but they are none the less basic. Socially, politically, and economically considered, they are the *sine qua non* of gregarious life.

Sec. 1. The Popular and Scientific Meaning of the Term "Public Utility" Contrasted

The term "public utility" is used in a very loose sense by people in general and in a more strict and defined sense by jurists. One frequently hears it said, for instance, that land as a producer of food is our foremost "public utility."[2] But this is not a

[1] In the course of the Toledo controversy the cars were ordered off the streets by the local council. The company thereupon took its cars across the state line into Michigan. This situation was made the occasion for the following caustic comment by one of the owners: "For twenty years past the street railway has been used as a football by the newspapers and politicians and the last time it was brought into play for political purposes, it was entirely overlooked that it was also needed for transportation purposes, and unfortunately the ball got kicked off the lot."

[2] Recent legislation of Mexico is a case in point. The Constitution of Mexico, adopted in 1917, provides in Article 27:

"Private property shall not be expropriated except for cause of public utility and by means of indemnification.

"The Nation shall have at all times the right to impose on private property such limitations as the public interest may demand as well as the right to regulate the development of natural resources, which are susceptible of appropriation, in order to conserve them and equitably to distribute the public wealth. For this purpose necessary measures shall be taken to divide large landed estates; to develop small land holdings; to establish new centers of rural population with such land and waters as may be indispensable to them; to encourage agriculture and to prevent the destruction of natural resources and to protect property from damage detrimental to society. Settlements, hamlets situated on private property, and communes which lack lands or water or do not possess them in sufficient quantities for

proper use. In its true sense the term public utility is based upon the importance, not of the supply of commodities in general, but of single commodities or services in the economy of man. If, then, one were to ask the man on the street, "What is a public utility?" he would very likely reply: "Why, gas companies, the street-car system, the electric light and power company." His answer is concrete and he is thinking in terms of his environment. If the same question were put to a government official, concerned with the regulation of these companies, he would probably reply: "A public utility is declared to be such by statute." The official's answer is one step removed from the concrete and he makes his definition one of authoritative interpretation. Then, if the reply is made that statutes regulating prices charged by particular types of enterprises have been declared unconstitutional by the courts,[3] he would very likely shift his ground and give the abstract answer: "A public utility is a business affected with a public interest." This reply may appear enigmatical. Even opinions of the courts, where this definition originated, sometimes serve only to deepen the mystery of the words "affected with a public interest." Nevertheless, these replies are indicative of the *procedure* by means of which the legal conception of a public utility becomes concrete.

It is important to have a clear understanding of the meaning and scope of the term "public utility" if public utility economics is to be systematically studied. This special meaning in law and economics is not generally understood. In these sciences it is used as a collective name covering diverse industries that are grouped together because certain common elements involved in their operation give them unity. At the same time they are

their needs shall have the right to be provided with them from the adjoining properties, always having due regard for small landed holdings," etc. Under these provisions agricultural land has practically been declared a public utility. *Cf.* Little, M., *The Land Laws of Mexico*, pp. 4-5, 15-17.

[3] The Lever Act, for instance, passed Aug. 10, 1917, gave the President that the United States might go into the business of producing any of the power to fix maximum prices for necessaries of life and provided further these necessaries. The title explains the scope and purpose of the act, as follows: "To secure an adequate supply and equitable distribution, and to facilitate the movement of foods, feeds, fuel including fuel oil and natural gas, and fertilizer and fertilizer ingredients, tools, utensils, implements, machinery and equipment required for the actual production of foods, feeds, and fuel, hereafter in this act called necessaries; to prevent, locally or generally, injurious speculation, manipulations, and private control, affecting such supply, distribution, and movement; and to establish and maintain governmental control of such necessaries during the war." The act was declared to be unconstitutional in *United States* v. *L. Cohen Grocery Co.*, 255 U.S. 81, Feb. 28, 1921.

classified apart from other industries because there is something distinctive about them which we do not find true of other industries. We propose in this work to subject these *common elements* and these *distinctive elements* to special study.

The law has long recognized this classification, for it has always subjected public utilities to special regulation. Our subject has, therefore, undergone a long development. We will begin, however, with a survey of the situation as it is today. The world-over public utilities are now considered a thing apart from other commercial enterprises.[4] In fact, if these industries are as important a part of civilization—regardless of the time and place considered—as our social concern about them appears to indicate, it is to be expected that our analysis will require us to consider some very general ideas that lie at the root of all social origins. In other words, to gain a complete understanding we must trace the factors in the situation historically. This will be done in a succeeding chapter.[5]

Under the existing economic system wealth is produced by many agencies, working independently and scattered over a wide territory. Economists call this principle of organization the "division of labor", and its derivative the "localization of industry." Due to the division of labor and all that it implies man is best able to proportion economic means to economic ends, to correlate efforts and results so that the latter shall be at a maximum. All institutions, therefore, which aid in giving effect to the division of labor are economic institutions *par excellence.*

A necessary counterpart of the division of labor is the coöperation of those among whom the labor is divided to the end that their separate contributions toward the production of wealth may be combined in a flow of goods and services ready for consumption. Such coöperation may come about voluntarily or under compulsion. Accordingly, mankind has developed institutions that supply a mechanism for the voluntary or compulsory exchange and circulation of economic goods. The pivotal importance of mediums of exchange and of markets and market prices is familiar to every close observer of modern business. Individuals are left free to choose their own course of action; but the means for effective coöperation are provided in our jural institutions whose binding power is maintained and devel-

[4] Where English and French speaking countries, for instance, have coined the term "public utilities", the German equivalent is "public undertakings" (Oeffentliche Unternehmungen).

[5] In chapter VII, entitled, "The Common Law Basis of Public Utility Regulation."

oped, for example, in our law of property, contract, agency, and corporations. The political institution of the state coöperates by providing the social apparatus through which compulsion and persuasion register their results. But where in this scheme, we may ask, does public utility business fit in?

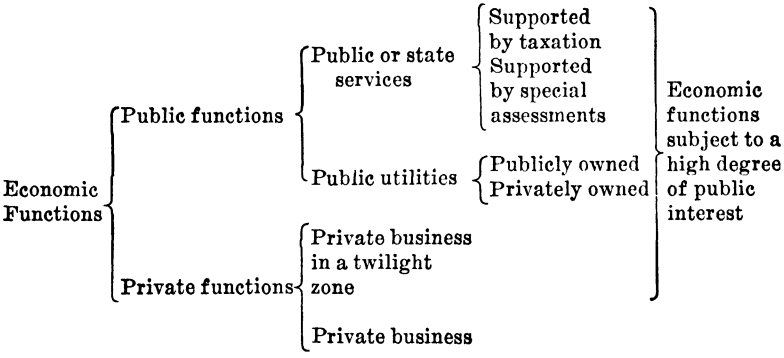
Economic activity in modern society shows a wide range. Some of it is carried on by governments for the common benefit. Most of it, however, is carried on by private business units on their own account. Speaking generally, public activity is carried out under the compulsion of the state while private activity is left to the free will or volition of the individual. Services which are essential to society are therefore owned or regulated by government. For convenience we may call them *"public functions"*. All other economic services are left to private initiative, and may thus be called *"private functions"*. This distinction between public and private functions does not imply that government is not interested in private functions. The fact is that we deal here with a range of economic services, with government so completely solicitious toward some that it either performs them itself or controls the conditions under which private parties are permitted to perform them, while towards others it adopts an attitude, if not of complete indifference, at least of so slight a degree of interest as to leave the supply of these services in private hands without public direction and support.

When essential services are rendered by private enterprises under public regulation they have sometimes been called "quasi-public functions". But since these services are such that they must be performed by someone, either by the public collectively or by private parties under governmental authorization, they are better known as *"public utilities."* In the terminology here suggested the term *"public* or *state services"* is restricted to those functions which government *monopolizes* and which it does *not* hand over to private performance.[6] This classification and use of terms will not be confusing if we bear in mind that the state may sometimes, pursuant to the public interest, engage in activities ordinarily left to private initiative, as when it actively engages in the production of cement for its highways or in the sale of some commodity like gasoline in *competition* with private dealers.

[6] Public utilities are sometimes referred to as public service corporations. This is not in accordance with the distinction we are now making, but should not prove confusing.

It sometimes happens that the community in the course of time becomes so dependent upon certain services, first rendered as private functions, that the state in obedience to this awakened public interest takes a hand in controlling them. They never were public functions, for they owe their origin to the initiative of private persons. Nevertheless, government controls them in certain respects. These are sometimes spoken of as "public utilities in the twilight zone" because they are "affected with a public interest"; but they have not become true public utilities. The state is not willing to admit that they are public functions. When government does undertake to say that the degree of public interest has become such that it is willing to treat them as public functions, they become public utilities in the true sense.

We may present these classifications in diagrammatic form, bearing in mind, of course, that they are designed merely to aid in orienting our field of study.



No hard and fast lines separate these classifications. Modern civilization represents so intimate a network of economic relationships that nowhere do we find a convenient perforation that will enable us readily to separate public functions from private functions and these in turn into the components into which we have analyzed them. As Professor Maitland has said with respect to the analytical study of history, "he who tears the fabric of history tears a seamless web," so he who attempts to analyze social relationships will find that he is dealing with a fabric the threads of which are perplexingly interwoven. This is markedly true in our crowded urban communities where municipal functions have expanded in order to provide the ameliorating conditions of life which alone make these human ant hills possible. A classification such as the above is very much dependent, there-

fore, as to its content upon the civilization of the time and place which is the subject of analysis.

Sec. 2. The Social Control of Economic Functions

Economic functions are safeguarded and maintained by means of the legal institution of property. Property has been defined as a bundle of legal rights which give to designated owners exclusive control of property objects.[7] When these property objects are, by virtue of property rights, in the exclusive control of private persons, we call it private property; when the exclusive control is exercised by public bodies such control is called public property. Exclusive control, however, does not mean that public or private interests may be asserted without limitations.

We will not be concerned with the rules that govern the administration of public property used in rendering public services. From an economic point of view the services of the state are available without a definite price, although the public is compelled to support them through tax payments. The cost of *some* public or state services is defrayed by only that portion of the public which is specially benefited. This is a compulsory payment and hence called a special assessment, although it is levied in proportion to ascertained special benefits.

Nor are we especially interested in the workings of the property system where the services rendered are purely private. We are, however, concerned with the rules of the law of property applying to conomic services "affected with a public interest", and particularly those relating to public utility services rendered by private persons.[8]

Limitations upon exclusive control are brought about by the social process of governmental regulation. Manifestly, both private and public property in public utilities must suffer a degree of limitation in accord with the preponderant public interest. Property rights are not always and everywhere the same. Since public and private interests when attaching to the

[7] *Cf.* Ely, R. T., *Property and Contract in Their Relations to the Distribution of Wealth*, 2 vols., Macmillan, 1914. Vol. 1, Book 1, Part 1. p. 60. See especially chapters III to VII. Also Clark, J. M., *Social Control of Business*. The University of Chicago Press, 1926, especially chapter I.

[8] In common with other business enterprises, public utilities, whether publicly or privately owned, sell their services to consumers at a price. This is, in fact, the characteristic which best distinguishes them from state services. The latter represent, in effect, the economics of communism, while the former are developed and maintained under a system of price economics, which implies the economics of individualism. Fees and special assessments are transitional forms.

same property objects are frequently antagonistic, conflicts appear which under our American constitutional system are decided by the courts. This gives public utility economics a peculiarly legal coloring.

In private economics human choice or volition ordinarily plays the largest rôle. The need of reconciling antagonistic public and private interests brings it about, however, that the economic relations centering in public utilities are to some extent governed by compulsion. This mixture of freedom and compulsion justifies the treatment of the economics of public utility enterprises apart from competitive private economy on the one hand and compulsory political economy on the other hand. These regulated industries are in a sense the meeting ground of two conflicting principles of economic activity—persuasion and coercion—as well as of two points of view concerning property—the sanctity of private rights and the supremacy of public rights.

Sec. 3. **Industrial Classification of Public Utilities**

Public utilities may be classified according to the generalized function which they perform in economic life. At one time or another, the following industries have been treated as public utilities:

1. Services of transportation (common carriers).
   - (a) Provision of highways, turnpikes, ferries and bridges.
   - (b) Vehicular transport over highways by stage-coaches, taxicab companies, motor omnibus and trucking companies.
   - (c) Provision of artificial waterways, canals, canalized rivers, harbors and roadsteads.
   - (d) Water-transport by tow-boat, sailing vessel, tramp steamer and steamship companies having a definite schedule.
   - (e) Steam railway transport of freight, passengers, mail and express.
   - (f) Provision of urban interurban electric railway transit of passengers, freight, mail and express.
   - (g) Provision of transport by airways of passengers, express and mail.
   - (h) Pipe lines for the transport of oils and natural gas.
2. Services incidental to transportation.
   - (a) Supply of specialized equipment,—sleeping, dining, parlor, refrigerator, etc., car service.
   - (b) Stockyards, warehouses and elevators.
   - (c) Docks and terminals, transfer, lighterage and compress services.
3. Services facilitating communication.
   - (a) Postal service.
   - (b) Telegraph service with and without wires including submarine cables.
   - (c) Local and long-distance telephone service, with and without wires.
   - (d) Stock-ticker and radio-broadcasting and signaling services.

4. Facilities providing power, light, heat, and refrigeration.
   (a) Artificial and natural gas works.
   (b) Electricity supply works.
      (1) Using water-power.
      (2) Using steam-power.
   (c) Steam and hot water heating plants.
   (d) Artificial ice plants.
5. Facilities providing water and sanitation in urban communities.
   (a) Sewerage and garbage disposal plants.
   (b) Water-works supplying water for fire protection, domestic, commercial, and industrial purposes.
6. Facilities regulating water supply for agricultural purposes.
   (a) Irrigation works.
   (b) Flood protection works.
   (c) Drainage works.

The difficulty of giving an exhaustive enumeration and classification of public utility services is apparent. Thus such services as the provision of fuel, milk, housing, banking, insurance, credit facilities, slaughter houses and packing plants are closely controlled and often publicly performed. We must recognize, as was said before, a twilight zone in which industries, while not attaining the full status of public utilities, are nevertheless subject to such a balance of private and public interest as to warrant special classification and special regulation by government.

Outside this twilight zone fall the large majority of industries and private economic pursuits toward which government exhibits such a degree of indifference as to justify applying to them our term "private business". Public interest is present but in no sense paramount.

Sec. 4. Financial Importance and Magnitude of Public Utility Industries

The economic importance of this field of study is best indicated by means of a few data which, while far from complete or in all respects authoritative, nevertheless give one some idea of the relative importance of these industries in the social economy.[9] W. I. King, of the National Bureau of Economic Research, in estimating the internal wealth and foreign holdings of the government and people of the United States for 1917, assigned as the value of the holdings of railroads 15,921 millions of dollars and of other public service enterprises 14,524 millions of dol-

[9] The Institute for Research in Land Economics and Public Utilities has attempted to gather the facts in-so-far as they are available, but the statistical, accounting and reporting functions, taking the industries as a whole, are not well enough organized and correlated to provide more than an approximation.

lars.[10] In his estimated total valuation of 246,139 millions of dollars as of 1917 the public utility wealth was more than 12%. There is reason to suspect that this estimate is conservative. It is quite impossible even to estimate the capital which has at various times been put into public undertakings such as public roads and river and harbor improvements. In accounting for public service enterprises some types are generally omitted because of the dearth of statistical material or because we are not accustomed to look upon them as public utilities. The public service industries centering about our water supply have never been properly organized statistically and reported for the country as a whole. The same is true in only a lesser degree of our artificial and natural gas supply industries, particularly the latter. Little is known of central heating utilities, motor-bus companies, cab companies, and motor express companies. The post office and irrigation facilities are usually overlooked in any cataloging of public utilities. Even the figures given by the Census Bureau are illustrative merely of trends because such data are based upon the accounting entries made by the companies themselves, and hence are affected by receiverships, reorganizations, consolidations, and all the complex circumstances surrounding the accounting history of the companies.

Another method of aggregating and roughly approximating the capital invested in these enterprises is that of adding together the par value of outstanding stocks, bonds, and other evidences of long- and short-term indebtedness, including also the corporate surplus. However, this may be taken only as the asserted claim, based upon accounting records, of investors and owners to accounting assets. Where this sort of evidence is not available, as in the case of government undertakings, the data must be supplemented by accounting records of construction costs. Another measure of the relative importance of the different branches of public service enterprise may be obtained from a statement of the gross revenues, as far as available.

A tabulation of the above is given in Table I, p. 11, but the figures are hardly more than "educated guesses." To complete the picture a few other statistics indicating the magnitude of operations, quantity of output and size of market have been included in the table.

[10] *Journal of the American Statistical Association*, Sept., 1922, p. 1.

TABLE I

Pertinent Statistics of Public Service Enterprises

Year ending Dec. 31, 1922, or nearest available date except as otherwise indicated

	Capital Invested In Millions	*Gross Operating Revenues In Millions*	*No. of Employees In Thousands*	*Extent of Facilities In Thousands*	*Magnitude of Traffic In Millions*
I. *Common Carriers and supplementary Facilities*					
Steam Railways [a]	$20,580	$5,674	1,627	262 miles of line	35,811 pass. miles 342,188 ton miles
Electric Railways [b]	5,446 *	1,050	301	31 " " "	12,667 passengers
Express Companies	35	298	...	... " " "	.....
Pipe Lines	365	115	...	55 " " "	.....
Pullman Co.	...	66	...	...	32 passengers
Water Transportation	979 †	564	237	12,250 gross tons	332 " 381 tons of frt.
II. *Utilities of Communication*					
Post Office	...	485	...	561 miles of route	.....
Telegraph [b]	327	152	69	...	191 messages
Telephone [b]	1,600 §	657	290	14,347 telephones	24,648 "
III. *Power, Light and Heat*					
Central Electric Stations [b]	4,465	1,072	151	47,702,861 kw.-hrs.	12,709 customers ††
Manufactured Gas [c]	2,000	438	87	405,200,000 cu. ft.	10,200 " ††
Natural Gas	137 ‡	161	...	762,546,000 " "	2,501 " ††
IV. *Water Supply*					
Water Utilities [d]	1,512	135	...	.....	.....
Irrigation	698 **	...	...	19,192 acres	232 farms ††

* Includes 160 elec. light and power stations operated in conjunction with electric railways.
† Excludes government owned vessels but includes all vessels under American registry in foreign and domestic commerce.
§ Excludes all systems reporting annual income of less than $5,000.
‡ Excludes natural gas production in conjunction with petroleum.
** Only $85,735,470 represents capital invested in commercial enterprises. Balance is governmental or private.
†† Thousands.

Statistical Sources
[a] Commerce Yearbook, 1922.
[b] U. S. Census, 1922.
[c] American Gas Association, 1924.
[d] Financial Statistics of Cities, 1922.

Sec. 5. Historical Survey of the Development of Public Utilities

The discussion thus far has served to bring out two cardinal points: (1) Public utilities are closely associated with our conception of civilization. The public interest is manifested chiefly in connection with those functions which preserve civilized life, and prevent it from becoming, as Hobbes says, "solitary, brutish and nasty". (2) The state in asserting public interest may itself perform a particular function, or may regulate private performance. In the latter event private property is given a legal and economic status which differentiates it from ordinary private property.

It was said above that the special meaning in law and economics of the term "public utility" and its importance in our present system of social control cannot be properly understood without reviewing, however briefly, the development of industries which we now class among our public utilities. We find, for instance, that many of these industries did not exist one hundred years ago. Others are of greater antiquity and their present character is a growth proceeding out of the past. Only by sketching their economic evolution can we gather the full significance of their separate classification.

(a) *Public utilities of ancient times.*

WATER SUPPLY AND SANITATION. We shall pass over rapidly the public utilities of ancient times. The principal concern of primitive man was to eliminate the uncertainties of his food supply. He did this first by the domestication of animals and later by the adoption of a settled life with its resort to agriculture. At this stage in his economic development came the foundation of territorial states, whose chief economic function was the building of certain public works upon which the economic life of these early societies depended. The most ancient and important of these was the provision of a water supply. All are familiar with the public wells of Egypt and Mesopotamia of Biblical history. The aqueduct is less well known. Its first form was merely a ditch which led the water of a stream into the city. Later, it became a ditch lined and covered with stone, and finally a true aqueduct consisting of rude pipes. Some merely supplied water to temples for public worship and to imperial palaces for household use and for watering gardens; others were for the use of the entire community.[11]

[11] The Hebrews between the years 1018 and 978 B.C. built a system of water supply which is still in use today. It gathered the water of natural

Canalization, that is the development of facilities for disposing f sewage, was a necessary corollary of the supply of water. 'he best known of these canal systems was the Cloaca Maxima f Rome, which gathered the sewage and storm water of the entire ity and emptied them into the Tiber. As indicative of the nportance attached to hygienic features of this kind mention ıay be made of the installation of facilities to supply water and :move sewage in even the temporary Roman army camps.[12]

DRAINAGE AND IRRIGATION. The earliest drainage works were ıstalled in connection with the burial mounds of ancient Ur. Extensive drainage facilities were established in Babylon and .ssyria to make large land areas available for agricultural roduction.[13]

The origin of irrigation will always be associated with extenve works, constructed by ancient Egyptians, which carried the ater-borne fertility, the "Gift of the Nile", to what would herwise have been sterile soil. Sir Wm. Willcocks, noted for is work and studies as hydraulic engineer in Egypt and the Ioly Lands, says that "the events recorded in the early chap-:rs of Genesis had their origin in a rainless land where life deended upon irrigation." He concludes that "irrigation is the ldest branch of Applied Science in the world." Out of irrigaon have also come well organized systems of property rights ı water, such we have in the Code of Hammurabi.[14]

>rings, and later the surface water from the hills of Judea, into large :tificial ponds. From these the water was led, in part subterraneously, > the city of Jerusalem. It is significant, however, that these arrangements nplied a knowledge of hydraulic pressure. Alexandria possessed a water stributing plant which first caught the water of the rising Nile and then nveyed it to 360 cisterns, from which, at times of low water, the supply as led to wells scattered throughout the city. In Greece the earliest ıpplying of water was by means of wells dug by individuals. However, :cording to a law of Solon in the sixth century B.C. all those failing to nd water at a given depth might resort to public wells or springs. Perımus in Asia Minor had an extensive system of water supply. The Roman ıueducts, of course, are too well known to require description. As giving >me comparison with modern water supply systems, it is of interest to >te that competent authority estimates that the Catskill Aqueduct in a ngle conduit has nearly ten times the combined capacity of all the aqueducts : Ancient Rome.

[12] It is worthy of remark that the Greeks and Romans had developed public ıths in connection with their water supply and sewerage systems as facilies necessary for public health and amusement.

[13] The drainage works in the Campagna near Rome are other ancient xamples. They transformed a swampy area into a fertile plain, the seat f the villas of wealthy Romans. With the destruction of these improveıents this area is again in its pristine state of decadence.

[14] The irrigation reservoir of Lake Moeris, completed by an Egyptian king ıore than four thousand years ago, is said to be greater than any built

TRANSPORT AND COMMUNICATION. Another type of ancient public works relates to human needs for transport, communication and assemblage.[15] Aside from the earlier caravan routes of the orient, ancient highways may be divided into commercial highways between cities having commercial intercourse, and those devoted primarily to army purposes. Practically nothing is known about highways in Babylon. In Egypt the chief avenue of communication was the Nile, and hence roads were little developed there. The Greeks probably learned the art of highway construction from the Phœnicians, the commercial and maritime people of the Orient, who needed highways for communication inland from their trading posts. One specific need of the Greeks was for wide and well-paved streets, through which expensive festal carriages might pass. Because of the fact that tracks were set into the pavement to provide more even traction, it is said we have here the prototype of the modern street railway.

In the Roman highways we meet for the first time most of the requirements of modern highway systems, since they were built for purposes of commercial intercourse as well as for national solidarity and defense. A class of professional highway engineers arose who, with the help of slaves and the army, constructed and maintained a network of roads estimated to have been 76,000 kilometers in extent. Instead of following the contour of the territory Roman highways led as directly as possible to their goal. In type of paving, drainage provision, breadth and planning, they approach modern designs. In fact, in many instances, modern highways are their lineal descendants.

Waterways always proved serious obstacles to overland transportation. At first shallow places were undoubtedly sought out to ford the streams. Soon ferries came into use, and it has been said that the ferryman operated the first public utility. Finally, bridges were built to overcome this hindrance. The oldest of these was a bridge crossing the Euphrates, inside the city of Babylon. Roman bridges, like Roman roads, were of sub-

since that time. It is reported that the assessment of taxes to defray the cost of the work upon the land benefited was based upon the height of the Nile and that these measurements were made by priests in island temples to which they alone had access. Evidently, the mysterious process of present-day assessment of public utilities for taxation has its ancient parallel.

[15] At first the need for communicating streets was not clearly recognized in cities, in that no regular street layout was provided and streets grew up amid the uncontrolled groupings of private dwellings. Later certain ornamental highways, leading to important public buildings, were constructed. These were wide streets often flanked by a series of massive pillars, comparable to our ornamental "white ways." Paving of different types has been in use from time immemorial.

stantial design and construction, and several are maintained until the present day.

The Phœnicians provided artificial harbors in their cities of Tyre and Sidon. The Greeks built extensive harbors, among others, at Pyræus and Alexandria. The Romans are noted for the harbor at Ostia, built by Trajan. These harbors were equipped with lighthouses, warehouses, cranes and windlasses. Artificial waterways were likewise provided, such as the network of ancient Chinese canals built by the state, the government canals of Rome, and the canals built by the Moors in Spain.

ILLUMINATION. There was no street lighting of importance in ancient cities. Pedestrians, abroad at night, or students, who wanted to reach classes at first dawn, carried their own lanterns or torches. Public illumination was provided only in public places. It was accomplished by means of great torches. Street lighting as such probably dates from the fourth century of our era when Antioch, according to Churchfather Hieronymus (314-393), obtained street illumination from oil lamps hung across streets by means of ropes. Homes were lighted by means of candles, lanterns, and lamps.

It is clear that the civilization of the ancient world made more than a beginning in the development of those economic functions upon which communal life depends. Thus originated the idea of public functions representing collective interests, as set off against private functions representing individual interests. Along with it came the idea that services used collectively should be supplied by the state. In fact, the best progress in the technological sciences was made in connection with these state services.[16]

(b) *Public Utilities in the Medieval Period.*

The public works developed by ancient civilization did not last. Civil war, combined with the migrations of the barbarians of the fourth, fifth, and sixth centuries, undermined political and economic institutions. Under these conditions public improvements declined or disappeared. Reconstruction became necessary, but this awaited the reëstablishment of security.

In this exigency a new social order came forward to provide protection and security. Feudalism was a system in which the person needing protection put himself in a relation of fealty to

[16] Cf. Neuburger, J., *Technik des Alterthums*, 1919; Breasted, J. H., *The Conquest of Civilization*, Harper & Brothers, 1926.

the powerful warrior and leader. In return for protection he promised services and payments in money and kind. Thus the political system of feudalism developed, on its economic and social side, the manorial system and town economies of the tenth and eleventh centuries.

On the materialistic side medieval contributions to the development of public utilities were relatively unimportant. Despite the measure of security given to individuals by the feudal system, the incorporated towns and gilds, and the growing powers of kings, public authority was never very strong, either politically or economically. Except for some advances made in the planning of cities, in castle-building and in architecture, no significant improvements are recorded. Water-supply was predominantly private with the exception of public wells and fountains in public places. The time for public improvements in street lighting and fire protection had not yet come. Streets were generally unpaved, narrow and filthy. Paving did not reappear until the fourteenth and fifteenth centuries, when it began as a private improvement, and did not again become a recognized public function until the sixteenth century. Some attention was given to sanitation, but no noteworthy advances were made. Wharves and terminal facilities, useful to water-borne commerce, were provided by associations of merchants.

But if the materialistic contributions of medievalism were slight, this period was very important from a cultural standpoint in the evolution of public utilities. Economic and legal relationships in this period evolved the concept of a "public calling" which is of great significance to our subject. This and other cultural contributions will be discussed later in a more appropriate connection.[17]

(c) *Public Utilities in Modern Times.*

The transition from self-sufficient manorial and town economies to the nation-state was a slow process which finally accumulated the requisite energy for building new public improvements. The king gradually encroached upon the authority of the manorial lords, while the gilds of the towns declined from inward decay as well as from the competition first of independent market towns and later of the domestic system of manufacture. The coalition of these competing elements of economic society, under the rule of an absolute monarch, was accompanied by the development of a group of national policies known collectively

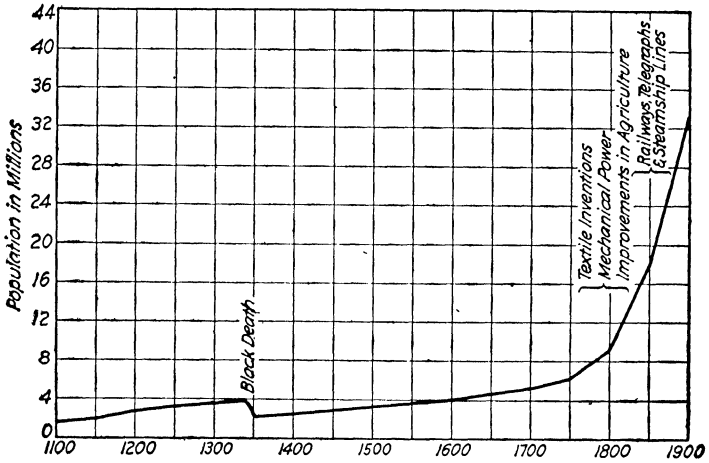
[17] She chapter VII.

as "mercantilism". For our purposes the significant fact in the mercantilist period is the impulse given to the improvement of medieval standards of living. The policies of the mercantilists encouraged manufactures and commerce, particularly foreign trade. But these policies emphasized also the need for more and better systems of foreign transportation and stimulated the growth of cities. The growth of cities in turn set on foot improvements in street sanitation, street illumination, fire prevention, and police protection. Likewise, mercantilist policies broke down local trade restrictions and thereby enlarged markets,

Chart I

POPULATION OF ENGLAND AND WALES FROM 1100-1900*

(For the period prior to 1800 the best estimates have been used)



*Taken from Rorty, M.C. "Some Problems in Current Economics," A.W. Shaw Co. 1922, p. 25

creating a need for better systems of internal transport and communication as well.

The industrial revolution of the late eighteenth and nineteenth centuries was ushered in by certain epoch-making inventions which again completely changed the system of production. The factory system is a method of production which combines the mechanical production of power and its application through machine processes with the regimentation of labor in the tending of these machines. This explains the large importance of capitalism and management along with natural resources in modern production.

The significance of these changes for our present purposes lies primarily in the growing complexity of economic life. The divi-

sion of labor became more minute; work in the home was transferred to the factory; simple power requirements became tremendous demands for power; rural life yielded to city life; local markets became world markets;—while all these tendencies created a demand for ever more improved systems of transport and communication. These developments quickly ended the lingering tradition of self-sufficiency. Mass production and mass transport became industry's watch-words. Increasing urbanization accompanied by increasing population brought on a new stratification of society. The unprecedented increase in population which accompanied the industrial revolution is strikingly illustrated in Chart I. The separation of the work-place from the residence raised an urban transport problem of no mean order. The tremendous increase in the number of employees required by the new industrial system intensified the need of housing the people, who were crowding into the congested cities which had not yet been emancipated from their medieval standards.

Because of its structure the medieval city was not equal to the task of making a home for the new industry. To be sure the first phase of the new order did not sufficiently emphasize this defect. Since the fundamental requirement of the factory system was for power, the early factories were located in the open country, where water power was available. But the growth of cities entered upon a new phase when the invention of the steam engine made possible the localization of industry in urban centers. Thereupon a host of problems pressed for solution. There was, for example, the housing problem in all its aspects; the problem of replanning the city; the problem of reorganizing and extending municipal functions. Solutions for all these problems were necessary to provide an economic location for the developing industry.

But the industrial revolution was accompanied, if not caused, by a revolution in the system of thought of the time. We are accustomed to describe this system of thought as the laissez-faire philosophy, since it exalted the freedom of the individual in practically all forms of thought and action. Such a philosophy was not fertile ground for extending public functions. Hence, although the rapid changes in production and exchange intensified existing needs and created new ones, the tendency was to give greater scope to private enterprise. The result was a clearer separation of public utilities from state services.

It would, however, be a mistake to assume that the prevalence

of laissez-faire principles meant the decay of public functions. This period was indeed something of a test of these functions. The pressure of public opinion was distinctly against extending governmental activities. But even Adam Smith, the premier economist of individualistic persuasion, allowed room for activities such as those already established. However, the narrowing of legitimate governmental action kept governments from expanding their services to meet growing needs, and particularly left many new needs to be met by private enterprise.

The inadequacy of laissez-faire policies was forcibly brought to popular attention during the epidemic of cholera which swept the cities of Europe from 1830-1832. Then it became plain that a policy of governmental non-interference, allowing housing, sanitation and other city problems to pile up, would not do. The evils of a system which left the supply of economic wants entirely to private industry, unaided and unregulated by government, were too flagrant to be overlooked. Beginning about 1840 and with increasing force, the revolt against laissez-faire doctrines showed itself in a concrete way by an enlargement of the scope of governmental functions. This reaction in economic history can best be described as the policy of socialization.

As related to public utilities the policy of socialization is built upon the clearer separation of public from private functions. This meant that, in general, the older services were for the most part public enterprises, while the newer services were supplied by private initiative, sometimes under some form of public supervision or assistance. Thus emerged the modern notion of public utilities, more or less distinct from strictly governmental functions. This separation would not have been possible, however, without the definite evolution of the state and its political subdivisions.

The technique of many of these functions was improved as a result of the inventions of the time. A brief résumé of technological developments will call attention to the blending of ancient, medieval and modern origins. Facilities of transportation and communication, national and international in scope, were developed. The beginnings of the modern postal system date back to the fifteenth century. Similarly, the modern ocean carrying trade developed uninterruptedly from its late medieval origins. During the last quarter of the eighteenth century, England was covered with improved roads built by public authority, or by private turnpike companies. The first canal in a new era of

canal-building was completed in 1761. The first railroad was built in 1825, and the first regular steamboat began operation in 1812.

The steam railway has developed into the backbone of land transportation, yet canals and inland-waterways continue to serve as important arteries of commerce. With the coming of the automobile the United States in particular is reorganizing its highway system and perfecting and extending it upon an unprecedented scale. The motor bus and the motor truck are making use of this development and are rapidly cutting into the short-distance traffic of steam railways.

During the last half of the nineteenth century, systems of world-wide communication had to be perfected. The commercial telegraph had made its appearance in 1844. The post office and the telegraph were thus the first to feel the effect of this stimulus. The telephone, invented in 1876 and beginning with a local exchange service at New Haven, Conn., in 1878, started its march across the American continent as a device for long-distance communication. The first commercially successful ocean cable service was installed in 1865. Since 1900 radio-telegraphy and since 1907 radio-telephony are increasing the varieties of means of communication.

The ancient art of irrigation is undergoing a rebirth as the world is reaching out for a more extensive utilization of its soil resources. The governmental policy of reclamation, begun in this country after 1902, is an outstanding development here.

In the field of municipal public utilities, the need for local transportation was supplied at first by fleets of omnibuses in the twenties of the nineteenth century. The horse-car came in the thirties. Artificial gas for street illumination was introduced commercially in 1812 and was widely in use for domestic lighting by 1840. A new development in water-supply systems appears to have been introduced by the municipality of London in 1283, followed by Plymouth in 1585, and by Oxford in 1610. The first use of modern central water supply systems of the gravity type in America dates back to 1652 when Boston installed one. Central water-supply systems for domestic, industrial, and fire protection purposes became general in the large cities by 1820. Growing out of experiences in the cholera epidemic, British sanitary authorities put forward the trilogy of public hygiene, street paving, canalization and water supply. And as a final crowning achievement in the development of a true municipal sociology came a new city planning movement. It began in Paris about

1850, and has since drawn within its orbit practically all cities that pretend to care at all for the welfare of their citizens.

New public utilities centering in cities have developed out of the industrial applications of a new source of energy, electric power. The electric telegraph and cable were its first offsprings. Next came the telephone, and in 1882 the first central station for electric lighting began operation in the United States. In a few years, that is, by 1885, electric power was applied to street-railways, hitherto propelled chiefly by animal power. Electric interurban railways were built after 1895. The first hydro-electric plant began operation in 1882, the precursor of a new movement in power production which, together with steam-electric plants, will in all probability transmute an age of steam into an age of electricity.

Sec. 6. **General Summary**

In this historical survey it is important to note that public utilities were not definitely segregated from public functions until the laissez-faire philosophy of the eighteenth century restricted the scope of governmental activity and created institutions and processes whereby the supplying of these growing and changing public needs could be left to private initiative. Industrial interdependence, another product of the industrial revolution, now prevails. This has brought it about that public utilities, though privately owned, must be subjected to governmental regulation. The term socialization has been chosen to describe this latest phase of utility development because that term implies that government may actively promote these enterprises through public ownership or arrive at the same result by creating private agencies and controlling them through well-conceived policies of regulation. For this reason the distinction between public utilities and state services on the one hand, and between public utilities and private business on the other, is of increasing importance both in law and economics. A knowledge of the characteristics which distinguish public utilities from other economic pursuits is necessary to make a proper classification. In addition a knowledge of the characteristics which they have in common is necessary in order to devise proper policies of regulation.

Technological history also shows how developments in the engineering arts bring changes in economic organization. For instance, lighting of the home has been transformed first from a self-sufficient household industry (as the making of candles) to a

commercial competitive industry (the supply of candles, lamps, whale-oil and petroleum), and then to monopolistic industry (as in electric lighting and the various forms of gas illumination), where central sources of supply satisfy all demands. The functions of providing transport and communication have divided themselves into several branches, each of which exploits different engineering techniques. An understanding of changes in the basic facts of these several engineering sciences is necessary also in order to understand the changes in operating conditions of the several utilities. And again, no one can appreciate, for instance, the changing policies of electric utility rate-making without being conversant with the development of the art of electricity supply and of its substitutes. Perhaps the most significant economic conclusion, founded upon these changes, is that the social value of public utility services is increased, and that the economic cost of rendering them is reduced, by a consolidation of enterprises. These and other matters arising out of economic and technological developments will be further treated in the two following chapters.

CHAPTER II

DEVELOPMENT OF PUBLIC UTILITIES IN THE UNITED STATES—NATIONAL UTILITIES

Our interest centers in the public service industries of the United States. Each of them constitutes a separate chapter in the industrial history of this country. But, regarding for a moment the economic development of the United States as a whole, we can see that their history—or at least the history of some of them—is intimately bound up also with certain very general economic phenomena. The first of these is the movement of the frontier westward. In this process transportation utilities have been a most active factor. A second phenomenon is the expansion of markets. Here transportation utilities and, secondarily, communication utilities have been the limiting factors. Along with the expansion of markets went the localization of industry. This feature depends upon systems of transportation, communication and power production. A fourth phenomenon has been the growth of population and its increasing urbanization. This was accompanied by a development of those public utilities which owe their existence primarily to the concentration of population. We may speak of these, therefore, as local utilities. Yet urbanization has not been without effect upon our national utilities. Running through our entire history, finally, is a fifth phenomenon, the rapid development of technology, which has been a conditioning factor in the history of all the public utilities. In this and a following chapter the development of national utilities and of local utilities will be briefly reviewed. We shall deal only with outstanding aspects in order to gain perspective.[1]

Sec. 1. **Transportation Utilities and the Conquest of a Continent**

(a) *Colonial conditions and the need for transportation.*

There has never been a period in our history when the need for improved means of transportation has not been pressing.

[1] A more detailed treatment of the successive stages in regulatory policy through which these utilities have passed is reserved for Part II.

During the colonial period the population was concentrated within a narrow strip of coastal plain, and within reach of navigable water. The dense forests and the tribes of hostile Indians intervening between the colonies made the sea and the rivers the safest and best highways. For incursions into the interior the trapper and the trader used river courses, portaging to get over the watersheds. At these sites, once occupied by forts, are now located, in numerous instances, populous cities. For a century communication was almost exclusively by sea with sailing vessels. In New England, however, a demand soon arose for roads whose construction entailed much wearisome labor. Their evolution can usually be traced from Indian trails into widened bridle paths, ending in the wagon road, deep with dust in summer and heavy with mud in the autumn and spring. Although in Massachusetts the General Court had ordered each town to construct a highway to connect with that of the adjoining town, they were, nevertheless, constructed without system. Bridges were few, and fords and ferries were common. Under such conditions intercommunication was practically non-existent. The first stage coach line between New York and Philadelphia was not established until 1756, and between New York and Boston until 1788.

(b) *Turnpikes.*

With the formation of the Union the political necessity of maintaining interstate communication was added to commercial and social requirements. Wagon roads and natural waterways had served the original coastal colonies well enough. But as people began to push across the mountains to settle the West, improvements became necessary to maintain economic connections between the interior and the Atlantic seaboard. Large sums of capital were required to build these improvements. They were invested first in turnpikes, later in canals and steamboats, and finally in railways.

The turnpike period extended roughly from the Revolution to the War of 1812. The first American turnpike was built in 1790. These roads represented a great advance over local roads, for they were constructed with a view to facilitating through traffic. While the cost of transportation was largely reduced from what it had been upon local wagon roads, the tolls were still high. Only goods of high value could be carried over the turnpikes; commodities like grain could not reach markets over them and had to be carried by water, if at all.

Up to 1807 turnpikes were built for the most part by private companies though usually with state aid. New England and the Middle Atlantic States were well supplied with them. Gallatin's Report in 1807 on "Roads, Canals, Harbors and Rivers," however, suggested extensive internal improvements by Congress. The most important of these improvements carried out by the federal government was the "National Pike." It was completed from Washington, D. C., to Vandalia, Illinois, in 1838 at a cost of $4,300,000. Before the federal government could do much more to improve the situation, doubts as to the constitutionality of such action arose, and federal effort toward securing internal improvements took a different direction.

(c) *Canals and inland waterways.*

State governments were the next to enter upon the task. With the application of the steamboat to river navigation in 1807, but beginning particularly after 1816 and extending to 1850, river and lake navigation came to the forefront. At first the navigation of inland waterways by steamboats was restricted by the grant of monopolistic privileges, but in 1824 these were declared to be unconstitutional by the Supreme Court of the United States as an interference with interstate commerce.[2]

Canals were constructed in order to supplement these inland waterways.[3] These were utilized by means of barges and passenger packet boats. The impelling motive for their construction was, of course, the desire to cheapen cost of transport so that the agricultural products of the West and the manufactures of the East might reach markets by way of the Mississippi and its tributaries and by way of the Great Lakes. The real canal era, however, opened with the construction of the Erie Canal from Albany to Buffalo, begun in 1817 and completed in 1825. It was a financial and economic success, entirely paying for itself in ten years. The cost of freight was materially reduced, and the flow of traffic on the Mississippi from the West to the South was in part diverted through the Great Lakes and the canal to the East.

The construction of turnpikes and canals and the improvement

[2] *Gibbons* v. *Ogden*, 9 Wheaton 1 (1824).

[3] The construction of canals was urged at an early date, Virginia granting a charter to the James River Company in 1785. Other early canal projects were the Dismal Swamp Canal, chartered in 1787; the Santee Canal at Charleston, South Carolina, begun in 1792 and completed in 1800; the Middlesex Canal at Boston, begun in 1793 and opened in 1808. New York, Pennsylvania, and Massachusetts were most active.

of lake and river navigation stimulated the growth of terminal cities like New York and New Orleans. At points of transshipment cities arose and grew to importance. The enthusiasm for canal building was further stimulated by the efforts of cities like Philadelphia, Boston, and Baltimore to draw trade to themselves, when they saw that their trade lines were threatened. Canal systems, planned to compete with the Erie Canal, were accordingly constructed by the States. Pennsylvania completed one in 1834 from Philadelphia to Pittsburgh at a cost in excess of $10,000,000 with a portage railway over the Alleghanies. Other important projects sought to connect the Great Lakes with the Ohio and Mississippi. Among these the Ohio Canal from Cleveland to Portsmouth was the most important, its construction being completed by the state of Ohio in 1832.

Although turnpikes were constructed largely with private capital, the states were the principal agencies for constructing canals and improving waterways. It was felt that private capital would not be equal to the task because of the size of the developments, the remoteness of the returns, and the commercial risk of their never proving successful. Moreover, there was some distrust of corporate management because the corporation was still in its infancy as a type of business organization. The perpetual life of states and their good credit made it appear that the work of supplying internal improvements should be undertaken by them. Another important inducement toward state action was the new policy adopted by the federal government of giving assistance to them in land and money. It distributed its surplus revenue to the states in 1837 and donated to them a percentage of the proceeds of all sales of public lands. State constitutions adopted during this period either permitted or directed the legislatures to encourage internal improvements; thus the work went forward with great strides until the financial crisis of 1837.

(d) *Railway beginnings.*

The first attempts at railroad construction and operation worth recording here were made by the Baltimore and Ohio Railroad in Maryland in 1830, by the State of Pennsylvania in connection with its route to Pittsburg in 1834, and by the South Carolina Railroad and by the Charleston and Hamburg at about the same time. The last named road was one hundred and thirty-seven miles long and reputed to be the largest railway under one management in the world at that time. Other railroads were built

from Philadelphia into the central coal regions of Pennsylvania; another series of lines was extended westward from Albany, reaching Buffalo in 1842; a third series extended from New York to Wilmington, North Carolina, by 1840.

The panic of 1837 scarcely affected the progress of railway construction. In fact railways did not begin to *compete* with canals until after this date, and did not completely master the situation until the decade ending in 1860. Railways had the advantage of not being bound to existing or natural routes of trade, whereas canals, besides being more dependent upon climatic conditions, were tied to river and lake routes. In supplying the demand for more and closer connections between the East and the West, canals were made still more ineffective because streams flowed prevailingly north and south. The railroads, therefore, diverted traffic into new channels running east and west. Moreover, they could carry freight cheaply, safely and expeditiously. Although much of the construction was experimental, crude, and disconnected, it soon became clear that the future in transportation belonged to the railroads.

(e) *The failure of state enterprises.*

One important result arising out of this period should be noted in passing. The investment by states [4] in internal improvements increased tremendously after 1820, growing from $12,790,728 to $170,356,187 in 1838. Of this total $6,618,868 was spent for roads, $60,201,551 for canals, $42,421,084 for railroads, $52,640,000 for banks and the balance of $8,474,684 for miscellaneous purposes.[5] These sums were borrowed in part from domestic sources but in larger part from foreign capitalists. Soon, however, it began to appear that many of these enterprises were premature if not entirely unnecessary. They were often extravagantly and corruptly managed. The panic of 1837 ended the speculative mania and soon the debts began to press upon the debtors. At this juncture several of the states repudiated their indebtedness, though later paying in whole or in part. Meanwhile, however, the works were sold and the states withdrew from the field. All state-owned and operated railways were sold by 1857 except those owned by Virginia and Georgia. State constitutions adopted after 1840 showed the changed atti-

[4] No estimate is available of the amount expended by local units. The amount of county and municipal bonds outstanding in 1870 was estimated at $185,000,000. The total amount issued will probably never be known.

[5] Bogart, E. L., *Economic History of the United States*, Longmans, Green & Co., 1912, p. 214.

tude by the inclusion of provisions prohibiting the use of state funds or the loan of its credit for internal improvements. The work of supplying all such improvements in the future was left to private initiative. This represents in large part the historical explanation for the pre-eminence of the private corporation in the supply of public utilities in the United States.

Sec. 2. The Development of the Railway

The period after 1840 is, in all essentials, the great competitive period in the development of public utilities, and more particularly of our transportation utilities. Water routes and railway routes had developed a serious rivalry. The best illustrations were found in the competition between the Reading Railroad and the Schuylkill Canal in the transport of coal, and between the New York Central and the Erie Canal in the carriage of grain and flour. This competition was, however, the beginning of a new development. At that time railways were still regarded as feeders to lake and river transport or as connecting links between inland waterways. By 1860, however, they attained complete independence. In the decade of the fifties the railways carried a greater volume of traffic than did the canals. Yet freight traffic was particularly slow in developing. With the Civil War, however, the period of marvelous railway expansion began.

Canal traffic had practically disappeared by the close of the Civil War. Only the Erie Canal was able to maintain itself against railway competition by virtue largely of grain shipments which continued to move by way of the Great Lakes and the Canal. Drastic reductions in competitive railway rates beginning in 1868 diverted the growing traffic to the railroads and by 1872 traffic on the Erie Canal was on the decline. Its competitive influence was prolonged, however, by the abolition in 1882 of canal tolls, but this was at the expense of taxpayers.

River traffic followed canal traffic in its steady decline. The Mississippi trade was somewhat longer sustained by reason of the grain export trade through New Orleans. It reached its height in 1879 but when the railroads set out actively to compete with river traffic in the eighties, the decline set in here also.

The introduction of the iron rail[6] and its manufacture in this country after 1844, together with the simultaneous introduction of the electric telegraph, did much to help the develop-

[6] The introduction of wrought iron rails was followed by the development of the steel rail, first used in 1863, which rapidly displaced the iron rail.

ment of the railways. Greater speed, safety, and heavier loads were made possible thereby. New England developed her transportation systems in the forties, and the western states entered upon an era of rapid development shortly thereafter. This was facilitated by the policy of land grants. Beginning with the grant by Illinois to the Illinois Central Railroad in 1850, Wisconsin, Minnesota, Michigan, Iowa, Missouri, Arkansas, Alabama, Mississippi, Louisiana, and Florida, all in need of improvements, granted both state and federal lands in aid of railroad construction. Up to the outbreak of the Civil War, 31,600,842 acres of public lands had been given in aid of internal improvements.

(*a*) *Railway expansion since 1860.*

There remains to be sketched the development of the railway system since 1860. Though retarded by the Civil War, construction again became rapid during the years from 1868 to 1872 in the upper Mississippi valley. Interrupted by periods of depression, railway construction proceeded, all too rapidly, in great swings of speculative building, alternately outrunning the growth in population, until at the present time the United States is better supplied with railroad facilities than any other country. The growth in these facilities is shown by the following table:

TABLE II

MILES OF RAILROAD CONSTRUCTED IN THE UNITED STATES BY DECADES
1830 to 1920

Year	*Total Miles of Road*	*Mileage Added during Decade*	*Per Cent Construction to Total at End of Decade*
1830	23	.....	...
1840	2.818	2,795	99.2
1850	9,021	6,203	68.8
1860	30,635	21,614	70.6
1870	52,914	22,279	42.1
1880	92,296	39,382	42.7
1890	163,597	71,301	43.6
1900	193,345	29,748	15.4
1910	240,293	46,948	19.5
1920	252,845	12,552	5.0

At first construction was largely in the Northwest, then increasingly in the South and Southwest. The Civil War stressed the political and military necessity of uniting the Pacific States

with the rest of the country. In 1862 Congress moved to aid in the construction of transcontinental lines. As amended in 1864, a federal charter granted the Union Pacific 12,000,000 acres of public lands for a line from Omaha to Ogden. The Central Pacific was granted 10,000,000 acres as its share for completing the line from Ogden to Sacramento. In addition the two companies were authorized to sell $27,000,000 of government bonds. Grants to the Northern Pacific, the Kansas Pacific, the Southern Pacific, and other corporations brought the total up to 33,000,000 acres. The policy of land grants was discontinued in 1871, when over 159,000,000 acres had been placed at the disposal of the companies by the federal government and 55,000,000 acres through the medium of the state governments. Although most of these grants reverted, the companies failing to fulfill the conditions of the grants, about 43,000,000 acres had been certified to the land-grant roads by 1880.

The year 1869 is a memorable one in railroad annals. In that year the construction of the first transcontinental line was completed, and the process of eliminating the last frontier of American history had begun. But it is also memorable because in the same year two eastern railways succeeded in consolidating lines held in separate ownership into two competing routes. The New York Central, with a line from Albany to Buffalo, consolidated with the Hudson River Railroad running from New York to Albany. By virtue of Commodore Vanderbilt's ownership of the Lake Shore and Michigan Southern, entrance into Chicago was assured. The Pennsylvania Railroad, operating from Philadelphia to Pittsburg, leased the Pittsburg, Ft. Wayne and Chicago, thus completing the second through route to Chicago. To the competition between railways and waterways was now added the fiercer competition between the roads themselves, for other lines—the Erie, the Baltimore and Ohio and the Grand Trunk—were soon to gain entrance to the same city.

After an interval of twelve years, that is in 1881, a second transcontinental line, using a southern route, was opened. It was made possible through the junction of the Southern Pacific and the Atchison, Topeka, and Santa Fé at Deming, New Mexico. In rapid succession, in 1882 and 1883, two more transcontinental routes were opened by joining the Texas and Pacific with the Southern Pacific at El Paso, and by the extension of the Southern Pacific from San Francisco to New Orleans. The latter through its control over steamship lines now has a complete transcontinental route to New York. In 1883 a northern

transcontinental route was opened when the Northern Pacific completed construction of a line from St. Paul, Minn., to Portland, Oregon. About the same time the Union Pacific completed construction of a connection with the Columbia River basin and a through route to Portland, Oregon, by means of the Oregon Short Line Railroad and the Oregon Railway and Navigation Co. In 1888 the Santa Fé entered Chicago; in 1893 the Great Northern opened its line between St. Paul and Seattle. Previously, in 1885, the Canadian Pacific Railway had completed a true transcontinental from Montreal, Quebec, to Vancouver, British Columbia. The decade of the eighties also saw the speculative "paralleling" of lines in the East with the object of forcing the older road to buy out the newcomer at a profitable figure. The outstanding illustrations are the West Shore which paralleled the New York Central and the "Nickel Plate" which duplicated the Lake Shore.

These constructions and completions have made the eighties the banner decade in the history of American railroads. Throughout the seventies and eighties capital seemed to be plentiful. In spite of panics in 1873 and 1884, each yielding a crop of railroad bankruptcies, the expansion continued. When the prolonged depression following the panic of 1893 came, it may be said that the construction of the railway net, so far as its *extensive* development is concerned, was completed. The *intensive* development of the railway net, the double, triple and quadruple tracking had begun and is continuing. This is also true of the building of enlarged terminals, of lateral connections, cut-offs, branches and spurs. Only the following major expansions need to be chronicled: the construction in 1905 from San Pedro, the harbor of Los Angeles, to Salt Lake City of the line of the San Pedro, Los Angeles and Salt Lake; the expansion in 1909 of the Chicago, Milwaukee and St. Paul into a transcontinental line through its Puget Sound extension; the construction of the Western Pacific from Salt Lake City to San Francisco, completed in 1909; the construction of 500 miles of railroad in Alaska by the federal government, completed in 1923. The last named is the only important stretch of railroad, aside from the Panama Canal Railroad, owned and operated by government authority in the United States.

(b) *Improvements in railway service.*

The traffic over these lines has certain characteristics which differentiate it from the traffic over European roads. The

largest tonnage consists of heavy, bulky, and low-grade traffic which must be transported cheaply and steadily over long distances. This has necessitated the reconstruction and improvement of the facilities by providing a standard gauge, heavier steel rails and bridges, larger cars and locomotives, and extensive and specialized terminal facilities. The permanent way was improved by reduction of grades, better alignment of track, improved drainage and ballasting. Passenger traffic was made more comfortable, safe and attractive by the introduction in the sixties of Pullman sleeping, dining, and parlor cars, and later of air brakes and automatic couplers. Fast-freight companies (now largely discontinued) and special-car companies, which catered to particular traffic demands, were organized.

In this same connection we should note the development of the express business which came into existence in 1839 when William Harnden undertook to transmit valuable parcels between New York and Boston. This business developed gradually by taking out of the hands of the railroad companies the duty of transmitting high-class freight with greater speed and security than the railroads had undertaken to do. The five large express companies, which ultimately divided the field among themselves, were already in control of the situation by 1880. Since the World War they have been further consolidated into the American Railway Express Company. Only the Southeastern Express Company operates over the lines of the Southern Railway.

In order to meet their own competition and that of water carriers, the railroads were induced to grant rate reductions. Beginning after the Civil War and continuing more or less uninterruptedly until 1900, the level of railway rates declined. Decreases in the cost of construction and operation, and advances in the technique of construction and operation, made possible the progressive improvement of railway service upon a continuously declining level of charges.

(c) *Railway abuses and the trend toward consolidations.*

Serious abuses arose in the construction and financing of the roads. A device frequently adopted was to place the actual building of the roads in the hands of construction companies which were separately incorporated, although leading stockholders and directors were the same as in the operating companies. By this means unduly profitable construction contracts were often entered into, which reacted to the disadvantage of the government and private investors, who had been induced to

embark capital in the operating companies. The outstanding illustration of this practice was the "Credit Mobilier," functioning as the construction company for the Union Pacific. Irregular methods of financing, such as are illustrated by the operations of Jay Gould and his associates in connection with the Erie Railroad, served further to fasten public attention upon problems which were destined ultimately to lead to the adoption of a thorough-going policy of state control. Another abuse was the common practice of granting rebates and discriminatory rates to favorite shippers. The Standard Oil Company is the classic illustration of a company which benefited by means of these practices and used them to crush its competitors. Although the objection raised during and after the Civil War that rates were too high was soon met by the rate reductions of the seventies, the complaint now was that rate reductions were granted preferentially to large shippers and to shippers located where there was water or rail competition. In this connection should be mentioned the growing evil of the corruption and manipulation of government, particularly of the legislatures, which extended even into the administration of justice.

Such abuses were aided and abetted by the current morality of the times. The country was in a pioneer stage of development; the enterprises were urgently needed; ordinary business morality was low. The country was possessed by an easy optimism, where belief in freedom of competition, unfettered by governmental regulation, was deemed sufficient to protect the public interest. Great achievements were accompanied by national scandals. Public opinion was uninformed. Scientific methods of management and agencies of control were undeveloped.

It is a mistake to assume that the men conducting these enterprises had no thought for better things. When they began to realize that the underlying difficulty was the competitive struggle of the roads for traffic, they sought to escape the evil results of the struggle by *combination*. This method of escape was also dictated by another consideration, namely, the demand for through traffic arrangements. This tendency set in during the fifties, but the larger combinations of connecting roads into great trunk lines did not occur until after the Civil War. The development of the grain traffic and other east-bound business gave impetus to the work of men like Cornelius Vanderbilt under whose ægis the Pennsylvania Railroad, the New York Central, and certain other systems had taken form by 1880.

Curiously enough, as we have seen, the first consolidation movement—frequently called end-to-end or linear consolidation —ended, particularly after 1869 when Chicago connections were assured, in the period of rate wars between the several independent routes. Rivalry for the through traffic between the Central West and the Atlantic seaboard resulted in drastic rate reductions in an attempt to attract traffic from rival lines. This gave rise to a new development, the railway pool, by means of which, after disastrous experiences, the rival lines divided earnings or traffic on a pre-arranged basis. This was the favorite method of eliminating competitive evils in the seventies and eighties. Writings in defense of the pool begin to show a real understanding of the railway problem on the part of management.

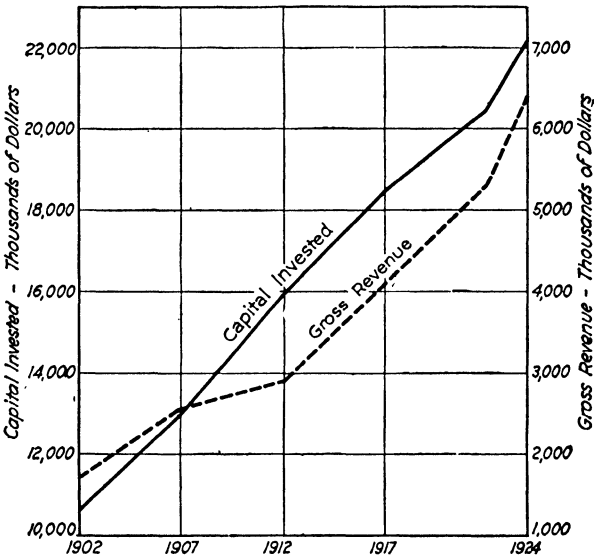
(d) *The rebirth of regulation.*

With public opinion committed to laissez faire, and thus to the policy of maintaining competition at all cost, it is not surprising that railway pooling should have awakened public hostility. Financial scandals, combined with the disillusionment of citizens who had been induced to vote public funds in support of these enterprises, or of farmers who had been induced to mortgage their farms in order to subscribe to worthless railroad stocks, brought on a reaction against the policy of "let alone" and in favor of public control. The Granger Movement in the Middle West, the Windom Report to Congress in 1874, the report of the Hepburn Committee of New York in 1879, were symptoms of this change of front. After a campaign of education, culminating in the report of the Cullom Committee of 1886, had finally borne fruit in the Act to Regulate Commerce passed by Congress in 1887, the new era of socialization of public utilities was definitely under way. But the competitive ideal still prevailed. Although the evils of railway competition were apparent, pooling was declared illegal. When the railroads resorted to rate agreements in order to restrain competition within reasonable bounds, the Sherman Anti-Trust Law of 1890 was invoked, and the act upheld by the federal Supreme Court in cases affecting Traffic Associations in 1897 and 1898. This led to a new combination movement, which consolidated the railroads into great territorial and ownership groupings.

The significance of the period since 1900 rests largely in the attempt of the carriers to collect increased rates and of consumers to resist their collection through the enactment of further regulations restricting the power of the carriers to advance

rates. The recent growth of invested capital and of gross revenues for steam railways is shown in Chart II. At this time an altogether new phenomenon appeared, the periodic congestion of railway traffic. Rate and service problems were thus placed in the foreground. With the outbreak of the European War construction declined still further although the volume of traffic grew tremendously. In fact, between 1916 and 1922

Chart II
GROWTH OF CAPITAL INVESTED AND GROSS REVENUE
ALL STEAM RAILROADS OF THE UNITED STATES
1902-1924



more mileage was abandoned than constructed, the abandoned mileage consisting largely of short-line railroads and of branches and spurs. The competition of new types of short-haul carriers was at the bottom of some of the difficulty. The most important recent event is unquestionably the lease of the railroads by the government from late in 1917 to early in 1920 and their operation as a unified system. This period of governmental operation was terminated by the Transportation Act of 1920 which effected the return of the roads to private operation but under such revised conditions of control as virtually to open a new chapter in the history of railroad regulation.

Sec. 3. Transportation Utilities Rendering a Supplementary Service

The railways have been in the limelight so long that we have come to regard them as comprising the transportation industry in domestic commerce.[7] There are, however, other transportation utilities which have a large measure of economic importance. When we speak of these as rendering a supplementary service, we are thinking in terms of the national volume of transportation. Upon certain favored routes and for the carriage of certain kinds of traffic they may become, indeed they have already become, carriers of primary importance. If transportation is taken to mean the entire journey which persons or commodities must make, all of these agencies form important links in a chain of transportation services.

(a) *Waterways.*

Domestic traffic carried over waterways is of three types: (1) coastwise traffic, (2) lake traffic, and (3) river and canal traffic. It is now appreciated that the development of water transport is dependent upon cooperation with railway transport. In the past railways have regarded waterways as competitors—which in a sense they are—and have proceeded to buy up water transport lines, or they have refrained at least from providing fully the facilities necessary for traffic interchange. Nevertheless, there has been a steady increase in coastwise and lake shipping. The Great Lakes shipping is of particular significance because, with the completion of facilitating canals, this waterway has developed into an immense artery of commerce, in part competing and in part cooperating with the railway system. Coastwise traffic, from which foreign vessels are rigidly excluded, was greatly stimulated by the completion of the Panama Canal in 1913. In 1923 coastwise traffic of the ports on the Atlantic, Gulf and Pacific coasts amounted to 263,659,000 tons and was thus equal to about 11 per cent. of the tonnage—some 2⅓ billions—handled by steam railways. For the same year the tonnage handled by carriers on the Great Lakes equalled 125,518,000 tons, most of which was in domestic commerce. River

[7] We are omitting in this account the romantic history of the American deep-sea Merchant Marine. Its growth was most rapid after 1840. However, a steady decline set in after the outbreak of the Civil War, with a significant and rapid revival during the World War. Its future economic status is somewhat of a problem.

traffic amounted to 52,921,000 tons, over one half of which was carried on the Mississippi and its tributaries.[8] Canal traffic for 1924 amounted to 3,104,165 tons, two-thirds of which was carried on the barge canals of New York state. In 1882 tolls were abandoned on the New York canal system and expensive improvements were further provided in 1918. As a consequence traffic has shown a tendency to increase in recent years on these canals. The system is, however, primarily a carrier of commodities combining low value with great weight like coal, stone, sand and cement. This is also true of other water-borne commerce, particularly of river traffic. Passenger business is important only on the Great Lakes and on certain favored lines of coastwise traffic. Another characteristic of water-borne commerce is that it tends to be highly seasonal.

Two projects affecting the future of water transport are worthy of passing mention. One relates to the development of a Lakes-to-the-Gulf Deep Waterway, for which it is proposed to use the Mississippi and its larger tributaries together with a system of canals and canalized rivers in developing a channel sufficiently wide and deep to permit the passage of ocean and lake vessels. The other project, known as the St. Lawrence Canal or Lakes-to-Ocean Waterway project, has for its object the opening of the Great Lakes to ocean commerce by deepening the Welland Canal and the channel of the St. Lawrence River to twenty-five feet. The proposal is also to construct a dam which, besides deepening the channel, would develop 1,464,000 H. P. of hydro-electric power. The saving in freight and the sale of power, it is claimed, would justify an improvement estimated to cost $252,728,200. The Canadian government is expected to participate in bearing the burden of cost. The aim of both projects is to reduce the cost of transport and to relieve the congestion at terminals and upon the rail-line carriers.

(b) *Highways.*

In addition to railways and waterways which form the principal arteries of domestic transportation there is great need for the maintenance of highway systems that will serve the purposes of local, short-distance transport,—the capillaries, so to speak, of our national transport system. We have already referred to the early development and improvement of highways in the turnpike period. Their continued development has been slow and inconspicuous, but nevertheless steady. The organiza-

[8] *Statistical Abstract of the U. S.*, 1924, p. 389.

tion of highways into a national system, with provision for upkeep comparable to that of European highway systems, has lagged until recently. It is estimated that there are now in the neighborhood of three million miles of highways in the United States, of which only 13.2 per cent. or about 388,000 miles are improved. The development of the automobile after 1900 has induced the federal, state, and local governments to enter upon the work of highway improvement with great energy. Through a system of federal aid to the states a good deal has been accomplished in recent years. The following table summarizes the results by years:

TABLE III

MILES OF HIGHWAY CONSTRUCTION IN THE UNITED STATES UNDER THE FEDERAL AID LAW

1918-1926

Fiscal Year	*Miles of Highway*	*Amount Contributed under Federal Aid Law*	*Total Cost*
1918	30.5	$ 197,939	$ 472,044
1919	271.2	1,084,915	2,823,837
1920	1,229.6	6,063,364	14,037,467
1921	5,943.2	41,238,012	94,991,954
1922	11,324.7	90,643,207	216,033,582
1923	4,448.0	34,817,235	79,345,757
1924	9,155.7	63,807,726	141,950,750
1925	9,445.4	87,801,946	190,485,400
1926	10,628.3	100,524,358	226,552,044
Total	52,576.6	$426,178,702	$966,692,835

Federal legislation, first enacted in 1916, provides for a system of federal aid highways in each state comprising not more than 7 per cent. of its total road mileage. The plan includes a system of trunk line highways, like the Lincoln Highway and the Dixie Highway, which will join together the various sections of the country. States and counties (not to mention continuous street improvements in cities) have likewise undertaken road-building programs, which in 1920 called for bond issues of $331,000,000.

Traffic on highways has increased materially. The Federal Bureau of Public Roads has compiled motor vehicle statistics indicating that 17,126,959 passenger vehicles, 2,409,058 motor trucks, and 161,815 taxis, busses and commercial vehicles used the highways in 1926. While most of such use is in cities, the

amount of "short haul" traffic within a radius of from 200 to 300 miles has been growing. A substantial portion of this hauling has been by common carriers. In 1922 some 1500 motor truck express companies were operating in freight service, with California and Massachusetts heading the list.[9]

(c) *Interurban electric railways.*

The development of electric transit for interurban traffic between nearby cities belongs entirely to the period since 1895 and is most developed in New England and the Central States. The mileage of interurban railways has been estimated by the American Electric Railway Association to be 18,150 for 1922, as compared with 25,800 miles in city service and 3,200 miles in suburban service. Interurban service is an added convenience for business transactions and for social intercourse between nearby cities and between cities and the surrounding rural districts. This makes the interurban and suburban electric railway an active competitor of the steam railway in passenger service. It has succeeded in diverting a considerable share of this traffic to itself, besides creating much traffic of its own. The best service is now rendered by high-speed interurban lines operating between terminal points upon their own private rights of way. They are equipped with cars of a modern design calling for heavy motors, automatic brakes and comfortable seats. Heavy rails laid upon well-ballasted roadways, train operation upon regular schedules with fixed station stops, block signals to insure safe operating conditions, enable these carriers to give a quality of service approaching that of the better equipped steam-railway lines. Mail and express business was solicited from the outset. Recently a package freight service, transport of milk and perishable freight, and even transport of bulk freight, like lumber, coal and sand, has been added.

Efforts were made by some steam railways, particularly in New England, to secure control of electric lines regarded by them as competitors. In recent years the development of the automotive industry and the nation-wide "good roads" movement have placed a third competitor in the field of short-distance transit. Electric and steam railways must now compete with the private automobile, the motor bus, the motor truck express and the private or coöperative motor truck carrier. These new agencies, while not supplanting the electric carrier, have

[9] MacDonald, T. H., "Commercial Vehicles on Free Highways," *Journal of Land and Public Utility Economics*, Oct. 1925.

for several years kept electric railway development at a standstill.[10] It is too early to predict the ultimate effects of motor-vehicle competition; but it is clear that the automobile will at least have a marked influence in determining the field within which electric railway development will proceed and those fields in which it will remain stationary or be supplanted. Abandonments appear to be more significant at the present time.

At first the superiority of interurban electric transit consisted in the more frequent stops, the greater frequency of service by using the single car unit, and the lower fares due to greater economy in construction and operation. The motor bus develops the same advantages of flexibility to an even greater degree although its superiority from the standpoint of cost is vigorously contested. For short-distance freight traffic up to 150 miles the motor truck has definite advantages. It gives direct delivery without additional handling or trans-shipment, thus providing cheaper rates with less likelihood of loss and damage. Not being confined to a track, it is not subject to as many delays and can maintain a high schedule speed. The advantages are best brought out by contrasting it with steam railways in the transportation of merchandise.

These carriers, together with the facilities for communication to be described presently, have done much to break down the isolation of farm life. They have introduced higher standards of living by broadening horizons, and by bringing the advantages of city life such as newspapers, schools, recreational and marketing facilities within reach of the country dweller.

[10] It is estimated that in 1925, 280 electric railway companies operated busses, or 35% of the total number of companies, an increase of 80% over the preceding year. Of these, 20 companies had abandoned railway operation and were operating busses exclusively. The number of busses operated was 5,358 as compared with approximately 82,000 cars. Passengers carried by rail aggregated about 16 billions as compared with 800 million carried by busses. The route mileage of busses was 13,000 as compared with 46,000 miles of single track. Most of the motor busses are used on light traffic lines in outlying sections. The increase in route mileage is chiefly upon new inter-city routes.

Most of the motor busses are, however, operated by some 6,500 independent companies, and number about 31,000. The next largest number, or about 20,000, are used by schools. The balance out of a total of 60,000 are operated by electric railways or are used for sight-seeing. The figures are constantly changing because the motor-bus industry is in a state of flux. There has been considerable abandonment of lines, particularly by independents.

Sec. 4. Utilities of Conservation [11]

With the turn of the nineteenth century a marked diminution took place in the volume of exportable grain. Increasing population was beginning to absorb surplus producing capacity. Not only did this rivet attention upon more intensive farming methods, but the problem arose of securing a more complete utilization of our remaining natural resources. Chief among these were the 842,000,000 acres remaining in the public domain in 1910. Practically all of this is in the arid region. Its development is dependent not only upon transport but also upon the provision of irrigation facilities which alone can bring the fertile lands under cultivation. This is the problem primarily of the states west of the Missouri River.

Irrigation developments in this country go back to the Indians of New Mexico and Arizona, and to the Spaniards of California. Particularly interesting experiments were begun by the Mormons in 1847. These experiments relate as much to the development of property rights in water as to the engineering methods involved. By 1880 about a million acres had been irrigated, largely as a result of the rapid construction of small ditches by individuals and associations of farmers in the previous decades. The "boom" period in the construction of these works was the decade from 1880 to 1890. Great enterprises were projected, organized as corporations, and money obtained from the sale of bonds and by stock subscriptions.

Most of these enterprises failed of financial success. A recent work [12] attributes the failure in large part to the activity of land speculators: "Where before water rights were attached to the land now water rights were attached to the ditch, and the ditch owner had control over the disposition and sale of the water. This caused considerable trouble because certain individuals bought more water than they used for their own farms and could sell to others less fortunate at exorbitant prices. Many private irrigation companies were bankrupted by speculators who acquired public lands under the Homestead Act wherever a new ditch was being built. These speculators had no intention of settling the land; they merely intended to hold it until the irrigation project was finished and then sell at high prices. Meanwhile there was no sale for the water. The com-

[11] Water power will be discussed under the heading of electricity supply.

[12] Ely, R. T., and Morehouse, E. W., *Elements of Land Economics*, The Macmillan Co., 1924, p. 161.

pany's ditches deteriorated, interest charges piled up, and in a short time the company became bankrupt because of the lack of settlers and water users to buy its services."

In the decade from 1890 to 1900, however, better irrigation practices and better regulation of the use of the limited water supply extended the tributary area from about 3,600,000 to 7,500,000 acres without any substantial enlargement of the canal systems. From this time forward the demand has been for the gradual extension of the irrigation works by public authority. Since the more easily irrigated lands had already been supplied, the extension of these facilities required the construction of expensive dams, canals and ditches which could only be provided at public expense or with the aid of public funds.

Congress acceded to this demand by the Reclamation Act of 1902, which made the proceeds of land sales available for this purpose.[13] It is estimated that the United States government has spent a total of $181,000,000 up to June 30, 1923. The Roosevelt Dam of Arizona is the best known of these reclamation projects. It furnishes water to over 200,000 acres. Another, though less important, aspect of reclamation work for which government initiative has been urged is the drainage of the large swampy areas along the South Atlantic Coast, estimated to comprise 80,000,000 acres. In view of the failure of settlers to repay the sums expended upon irrigation works, only $46,000,000 out of $181,000,000 having been repaid, it may be questioned whether the margin of cultivation will continue to be extended as it has been. No economic purpose is served in bringing submarginal lands under cultivation with the expenditure of millions of dollars for irrigation and drainage utilities.

Less than one-tenth of the irrigated land in the United States has been made irrigable under the federal reclamation act. The rest of it has been reclaimed through private activity with some assistance from the states. It has been estimated that 60 per cent. of the irrigated lands other than federal projects have been constructed, operated and financed in a manner which gives them the character of public service enterprises.

The chief problem in the development of irrigation has been the economic problem of promoting and financing these enterprises upon a basis which would make them economically self-supporting. Aside from the more obvious difficulty of eliminat-

[13] *Cf. Reports on the Engineering, Agricultural, and Economic Feasibility of Proposed Reclamation Projects*, Government Printing Office, Washington, 1925.

ing downright misrepresentation and fraud in the promotion of such enterprises, the central difficulty has been that of correctly estimating the cost of such structures together with the cost of developing the land and the probable returns. The increase in land value to be anticipated by bringing water to land could not be attributed to irrigation works alone, for a considerable portion was dependent upon the application of labor, capital and managerial skill in the utilization of the irrigated areas. Closely associated is the task of devising adequate plans for financing. In fact, a good deal of the history of irrigation could be written in terms of a search for a feasible plan of financing improvements which must look for a compensatory return not only to the current receipts for water delivered but also to the prospective values of irrigated lands.

A recent writer suggests that even more than this may be necessary: [14]

"Up to the present time all our schemes for financing irrigation development have been based on the repayment of the cost of providing a water supply by the land actually watered, except for the subsidy represented by relief from interest on deferred payments under the existing Federal reclamation law. Yet the argument for all public participation in reclamation is the claim that a great public benefit arises from the reclamation of arid lands. If such is the case, the question arises whether the water users should be expected to repay the whole cost. Should not the benefits be assessed and all property benefited contribute to the cost in proportion to the benefits?

"The most insistent demands for new reclamation projects come from local chambers of commerce and similar organizations, because of the business that is expected to be created through the construction of works and the development of agriculture in their communities. The demand does not come from farmers who wish to go on the land. If a reclamation project is of so much value to the business interests of a community, it would seem fair that those interests should contribute to the cost.

"Such contributions can be provided for under some modification of the district plan, by including within each district all the property that will be benefited by its activities, including the property in towns and cities in the vicinity. If such property were included in the district bond lien, there would be sufficient value behind the bonds to make them salable.

"Such a scheme should provide for the approval of districts by the counties and states in which they are located and for contributions from the counties and states in proportion to the public benefits.

"This would place reclamation enterprises in much the same class as public utilities generally, and they might be operated in the manner common to community-owned public utilities—by charging rates for the service rendered and meeting payments on indebtedness and operating expenses

[14] Teel, R. P., "The Financing of Non-governmental Irrigation Enterprises," *The Journal of Land & Public Utility Economics*, Vol. 2, p. 427, Oct. 1926.

from general property taxes in case the revenue from rates is not sufficient for this purpose. It would be necessary to base rates on what the traffic can bear rather than on a reasonable return on the investment, but this may be justified on the ground of public benefit. In the opinion of the writer this is the most probable line of development in reclamation finance, aside from government enterprises.''

Sec. 5. Utilities of National and International Communication

Finally we must consider the development of facilities that improve communication, that is, the transmission of intelligence. The most important are the postal service, the telegraph service and the long-distance telephone. More recently, the field of communication has been enlarged by the introduction of wireless telegraphy and telephony, popularly known as the radio; but no definite economic status can as yet be assigned to the new facilities except in the field of trans-oceanic, marine and signalling service.[15]

(a) *Postal service.*

The earliest medium of transportation of the mails was the stage-coach and the sailing vessel. Since speed is the essence of service of this kind it is not surprising that railways and steamships were quickly pressed into service. Railway contracts for the carriage of mail date back to 1834. The annual report of the Postmaster-General for 1921 estimates that 90 per cent. of the weight of mails is carried by the railroads. Other important carriers are interurban electric railways and steamship lines. The stage coach, motor stage and dog train have been relegated to those portions of the country not reached by rail lines. Where the demand is for exceptionally fast service, mail is now delivered by aeroplane.

The development of the postal service has been very rapid. Before the Civil War over 186,000 miles of post roads were in operation. The use of the mails was rapidly extended by reductions in service charges, the most important being the reduction of letter postage to three cents in 1863 and to two cents in 1883. The introduction of carrier delivery in 1863, of the railway mail car in 1879, and of postal money orders in 1884 greatly added to its convenience and extended its popularity. Rural free delivery was authorized in 1890 but actual delivery

[15] *Cf.* Jome, H. L., *Economics of the Radio Industry*, A. W. Shaw Co., 1925, Chap. XII. Legislation has just been passed which will subject the radio industry to federal regulation.

did not begin until 1897. In 1913 a parcel-post service was inaugurated after much opposition from retail merchants and the five express companies. On June 30, 1922, railway post roads in operation totalled 231,981 miles out of a total of 261,984 miles.

(b) *Telegraph and telephone service.*

The telegraph service was also extensively developed before the Civil War. About 50,000 miles of telegraph lines had been built, connecting all the important cities of the country. In 1872 the field of telegraphic communication was considerably enlarged by the invention of duplex telegraphy which greatly reduced the cost of rendering service. By 1880 before the development of the telephone the number of miles of telegraph line operated was 110,727 transmitting 31,703,181 messages at an average cost of 42 cents per message. The present (1922) development of this facility is 252,991 miles of line, transmitting 191,121,333 messages at an average cost of 67 cents.

International communication was greatly facilitated by the introduction in 1865 of the first commercially successful Atlantic cable. An earlier experimental installation was in operation for only a few months in 1858. In 1922 there were 76,711 nautical miles of ocean cable over which 9,602,559 messages were transmitted.

The telegraph lines and ocean cables are largely controlled by two companies, the Western Union Telegraph Company and the Postal Telegraph and Cable Company.

The telegraph was, however, the merest beginning in the development of the field of wire communication. With the invention of the telephone in 1876 there appeared a serious competitor. It rapidly gained favor and by 1880 there were 34,305 miles of wire and over 50,000 receiving telephones in operation. This development was primarily in local exchanges. In 1879 the first commercial attempt at long distance service was made between Boston and Lowell. The next step was the extension of service from Boston to Providence, R. I., a distance of 45 miles, which was made possible by installing a complete metallic circuit. In 1884 service was extended from Providence to New York. After this date development was rapid and carried on primarily by the American Telephone and Telegraph Company. The miles of line operated increased to 140,000 in 1892 when Chicago and New York were connected. In 1911 the talking radius was extended from New York to Denver, and in 1915 to

San Francisco. This development was accompanied by a tremendous increase in the miles of wire in toll service, estimated at 5,632,700 miles in 1925. Communication by word of mouth has now been extended by means of wireless telephony which finds its principal application in trans-oceanic service.

CHAPTER III

DEVELOPMENT OF PUBLIC UTILITIES IN THE UNITED STATES (CONTINUED)—LOCAL UTILITIES

Sec. 1. The Factor of Urbanization[1]

The eighteenth and early nineteenth century village was to all intents and purposes still a self-sufficing community, made up predominantly of self-sufficing households. As the village grew into a town and the town into a city, it ceased to be merely a "supply station for the farming population," and became instead a manufacturing center. Of course, some strategically located cities had always been important trade centers; but it was the industrial impetus that dotted the wide land with cities.

According to the Census the last four decades have witnessed the phenomenon of a declining proportion of our total population residing in rural districts. Localities having a population of 2500 inhabitants or more are usually classed as urban areas. Table IV on page 48 shows the facts as to the increase in urbanization since 1890.

The problems arising out of the urbanization of life are the most important and insistent with which our twentieth century civilization must deal. According to the census of 1920, of the 105,710,620 people in the United States, 9.6 per cent. live in the three great cities of New York, Chicago, and Philadelphia, while 59.9 per cent. live in incorporated villages, towns, and cities. The latter percentage indicates the range within which communal life has created problems of great public interest. These problems concern the securing of housing, water supply, food supply, lighting, heating, transit, communication, power, and recreation. They are not only important in a limited section of the country, such as the New England States, Middle Atlantic and East North Central sections, in which about two-thirds of our urban population resides; but they are increasingly im-

[1] The facts have been conveniently summarized and interpreted by Rosalind Tough in "Growth of Urban Population in the United States," *The Journal of Land & Public Utility Economics*, Vol. 1, p. 226, April 1925.

portant also in the South and on the Pacific Coast where the urban population in nineteen states increased over 50 per cent. in the decade from 1900 to 1910 and again over 38 per cent. from 1910 to 1920.

For many purposes and more particularly in the supply of public utility services the economic area is not the city alone but includes the surrounding "built-up" territory, usually known as a "metropolitan district." The United States Census lists 29 of these districts which include 32 central cities. The

TABLE IV

INCREASE IN URBANIZATION IN THE UNITED STATES 1890-1920 *

Census Year	*Total Population*	*Places of 2,500 or More*		
		Population	*Number of Places*	*Percentage of Total*
1920	105,710,620	54,304,603	2,787	51.4
1910	91,972,266	42,166,120	2,313	45.8
1900	75,994,575	30,380,433	1,801	40.0
1890	62,947,714	22,297,359	1,417	35.4

* United States Census, Vol. 1, 1920.

metropolitan districts show an increase in population from 23,045,544 in 1910 to 29,238,582 in 1920, the greater proportionate increase being recorded outside the central cities. As a consequence of this increased urbanization, the so-called local utilities have gained in importance when compared with national utilities. Their concentration in urban areas is truly remarkable.

But has there developed in these communities, along with the physical concentration of population, a communal spirit, or are they still dominated by the rural point of view? The difficulties met by the city-planning movement, in fact by any movement built upon coöperative social action, seems to indicate that nineteenth century individualism dies hard. Yet the need for socialization, that is to say the adoption of a social point of view, was never more imperative. City growth, if it is to be along right lines, if it is to overcome accumulating difficulties, must be constructively planned. In these urban areas provision must be made for expanding municipal functions and for the growth of public utilities. They must not be dominated by a purely laissez-faire view of government.

Sec. 2. The Development of Water Supply

The first American water works plant was that of Boston, which was established in 1652 and used for both fire protection and domestic supply. This early centralized public system, drawing its supply from springs, appears to have become inadequate; for in 1796, when Boston attained a population in excess of twenty thousand, an "Aqueduct Corporation" organized a private system which drew its water from Jamaica Pond, five miles distant. This development illustrates the two types of water supply systems that have become general. One captures a supply of surface water and impounds it in natural or artificial basins, whence it is conveyed by gravity through aqueducts and mains to customers. A second type secures its supply by means of pumps from underground sources (springs and wells) or from some low-level body of water (lakes and rivers), and forces the water into the mains by pump-maintained pressure. The second water supply system in the United States at Bethlehem, Pennsylvania, constructed by J. C. Christensen in 1762, appears to have been of the second type.[2]

Early projects were both municipal and private enterprises. The earliest water supply system for New York, begun in 1774, was a municipal enterprise; but it was never completed. In 1799, after the Revolution, a private corporation in which the city was interested through stock ownership built a system which by 1823 had grown to 25 miles of main with 2,000 taps. About 1830 the city built its own works for fire protection purposes. Soon this developed into the Croton River System. The first successful municipal enterprise was begun by Philadelphia in 1798 when the city had a population of 80,000. This system secured its water from the Schuylkill River, using for the first time big steam pumps for pumping and cast-iron water mains for distribution. Other early water works were those of Worcester, Mass., and Portsmouth, N. H., completed in 1798, and of Albany, N. Y., in 1799. The need for a central water

[2] "The machinery consisted of three single-acting force pumps, of four-inch calibre and eighteen-inch stroke and worked by a triple crank and geared to the shaft of an undershot water wheel, eighteen feet in diameter, and two feet clear in the buckets. The water was raised by this machinery to the height of 70 ft., and subsequently to 114 ft. The works were in operation as late as 1832. The first rising main was made of gum-wood, as far as it was subject to great pressure, and the rest was of pitch-pine. In 1789 leaded pipes were substituted, and in 1813 they were changed for iron." *Engineering News*, October, 1875.

supply was recognized by different cities at different stages in their development. New Orleans, founded in 1718, had none until 1836; Buffalo, founded in 1801, had none until 1852; Cleveland, founded in 1810, had none until 1853; San Francisco, settled in 1776, had none until 1857. Chicago, on the other hand, incorporated in 1837, already had service in 1840.

(a) *The trend toward public ownership.* The development of this utility appears from the figures in Table V.

TABLE V

NUMBER OF WATER-WORKS IN THE UNITED STATES AT END OF DECADE [a]

Year	*Number of Public Works*	*Number of Private Works*	*Total*	*Per Cent. Public*
1800	1	15	16	6.3
1810	5	21	26	19.2
1820	5	25	30	16.6
1830	9	35	44	20.5
1840	23	41	64	35.9
1850	33	50	83	39.7
1860	57	79	136	41.9
1870	116	127	243	47.7
1880	293	305	598	49.0
1890	806	1072	1878	42.9
1896	1690	1489	3179	53.2

[a] *Manual of American Water Works*, 1897.

In the returns for 1915, summarized in the McGraw Water Works directory, are listed 4,440 communities having water-works, of which 3,045 were publicly owned. But the figures are not comparable with those given above.

Statistical data relating to this industry are scarce, incomplete and not coördinated. It is well established, however, that very early a tendency toward public ownership and operation set in, dictated by economic necessity, the need for fire-protection, and by sanitary and hygienic considerations. Works for impounding a water supply, together with aqueduct systems, required heavy capital investments and large use of the power of eminent domain.

The Census reports that in 1920, of 204 cities with a population in excess of 30,000, there were 155 that owned a water-supply system. The New York System alone represents an estimated investment of $350,004,152 or 32.7 per cent. of the total of $1,071,211,511 for the 155 cities.

Indianapolis is the only large city supplied exclusively by a private system. Other large privately owned systems operated in San Francisco, Denver, and Birmingham.

(b) *Outstanding developments in water supply engineering.*

Since the Civil War, with the advance in standards of living, the supply of water under pressure has become very common. The art of water supply changed rapidly, particularly improvements in pumping. The modern centrifugal pumps driven by steam turbines have displaced all other types. Electric power is now rapidly being substituted for steam power.

At first ordinary river and lake water was the most common source of supply. Because sewerage systems were few and less extensive than they are now, the danger of pollution was not great. As the number of water-works increased and their service expanded, sewer systems were likewise extended so that the danger of water pollution increased. There was added also pollution from industrial sources. The high and increasing death rate, first noticed in the nineties, was traced to water pollution by health authorities as the first practical application of bacteriology in the science of public health. Filtration was adopted as a remedy. First introduced to remove color and turbidity, it was found that filters also removed a large part of the bacterial content. European practice here was distinctly ahead of American. In some cases pollution was so serious that double filtration had to be resorted to in order to make headway against water-borne diseases. Where waters are hard facilities for water-softening have sometimes been added.

Another recent improvement is the water meter. The tardy adoption of water meters is, however, explained by the fact that this development had to wait upon improvement in the quality of water in order to make meters function properly. Where water is scarce as in the Southwest greater pressure has been exerted to secure the installation of meters to bring about greater economy in the use of the available supply.

Mention should also be made of the importance of storage reservoirs. These have served the double purpose of providing additional pressure and of equalizing the demand upon primary sources with the fluctuations in the hourly rate of draft.

Outstanding water utilities are the system in New York City with its Catskill Aqueduct, the largest ever constructed; the Chicago system with its long "intakes" from Lake Michigan and its sewage disposal through the Chicago Drainage Canal

into the Mississippi Basin;[3] the system of Los Angeles which has built an aqueduct 240 miles long, bringing water from the eastern slope of the Sierra Nevada Mountains and generating hydro-electric power as a by-product.

Sec. 3. **The Development of Gas Supply**

If there is any virtue in the Darwinian formula as applied to economic undertakings that the struggle for existence is a pragmatic test of the right of an industry for survival, then surely the gas industry has proven itself. From 1609, when John Baptist Van Helmont[4] discovered that fuels by combustion and fermentation give off a substance to which he gave the colorful name of "Geist," meaning spirit, to 1812, when Frederick Windsor promoted the first commercial gas undertaking by securing from Parliament a charter for the London and Westminster Gas, Light & Coke Company, was a period which may be termed the stage of early experimentation. "Inflammable gas" was then fighting for its right to survive even as a commodity which might be useful to man. Historically speaking, the gas industry should be crowned as king among the public utility family because it was the first to break the shell of the custom-controlled past. Lamps, lanterns and candles had served civilization from time immemorial. The idea of securing better illumination, therefore, required a long period of incubation. It began as a private improvement and fought its way to the front, attaining the full status of a public utility some time during the middle of the nineteenth century.

A second period extending roughly from 1812 to 1850 may be characterized as one of early commercial undertakings.[5] In this period falls the organization and upbuilding of the pioneer companies in this country as in Europe. Baltimore, Boston, New York, Brooklyn, Bristol, New Orleans and finally Phila-

[3] This diversion of lake water for sewage disposal purposes has led to complications arising out of the complaint that the level of the lake is lowered, thus interfering with navigation, and also depriving Canadian and other power users at Niagara Falls of potential power.

[4] Natural gas was first discovered by Thomas Shirley in England in 1659.

[5] The first use of gas, in this instance coal gas, for illuminating purposes is credited to William Murdock, who began his experiments in England in 1792. In 1797 he lighted his home and later a factory in which he was interested. In 1813 Westminster Bridge was gas lighted. The first American gas utility was granted its charter in Baltimore in 1816. Boston followed the example in 1822, New York in 1823, Brooklyn in 1825, New Orleans in 1835, Philadelphia and Pittsburgh in 1836, Louisville in 1838, Cincinnati in 1841, and Albany in 1845.

delphia in the order named, added this facility as a feature of their municipal sociology. At first gas lighting was hardly more than a luxury or at most an expensive convenience. The industry had to "sell" its services to the consuming public and to establish its reputation for profitableness with investors. It had to experiment with production, transmission and utilization problems in order to make service adequate, safe and continuous. In spite of all efforts the cost remained high and hence also the rates. As an illuminant its use continued to be restricted to streets, public buildings, some shops and industrial establishments and a few houses of the well-to-do.

The arguments of those opposed to the new illuminant were as fanciful as those which the steam railway industry was to meet a little later. One argument was that extensive artificial illumination was iniquitous because it constituted a worldly interference with the original divine plan that there be night. Other opposition came from the custodians of public morals who thought that drunkenness and depravity would be increased. Not to be outdone, the medical profession claimed that the emanations of illuminating gas would be injurious to health. The principal obstacle toward an extension of the service, however, was the high rates, ranging from $6.00 to $15.00 per M. cu. ft.

(a) *The contest with electricity.*

After 1850 and extending to the end of the nineteenth century came rapid development. When, in spite of many business failures, the possibilities of acquiring a market in at least the larger cities was sufficiently demonstrated, companies multiplied in numbers. This was also the great competitive period in the gas industry. The popular belief in the regulative power of competition was at the bottom of this shift from the comparative freedom from competition which had characterized the industry in the earlier period.

At this time also the industry had to withstand the competition of such substitutes as improved lamps using kerosene, and, beginning in 1878, of electric lighting. In that year the electric arc for street-lighting appeared, and the central electric station entered the field soon afterward. Within its own ranks the industry had to withstand rate wars and the handicaps of a high cost of production due to the competitive duplication of investment. Management tried to overcome these difficulties by the merger of competing companies. Efforts in this direction

were hampered, however, by the prevailing distrust of large organizations, by the popular belief in competition to beget low prices, and by the courts who held that the consolidation of competitors resulted in monopoly and was thus contrary to public policy as expressed in the Common Law. Under the influence partly of competition and partly of technical cost-reducing improvements a decline in rates set in, which gradually expanded the market for this service. After 1873 the Lowe Process of the manufacture of carburetted water gas was introduced, and this by 1880 won over the coal-gas producers. This cheaper process was more willingly used in order to make headway wherever possible against electricity.

The new illuminant gradually displaced gas in residence lighting and made inroads also in the street-lighting field. A series of inventions by Thomas A. Edison and others raised a great furore of technical and popular discussion of the relative merits of the two competing systems. Gas company stocks fell in value. Slowly but irresistibly the great advantages of electric lighting in safety, steadiness of illumination, and ease of control demonstrated themselves. Meanwhile, gas lamps were improved. The old type of open flame burners were supplanted by the more economical Welsbach type of burners which saved some of this business for a time. It was certain, however, that the industry would, in time, have to adjust itself to a complete change in the utilization of its service.

(b) *The development of new forms of utilization.*

The opening of new markets for gas was accomplished through the introduction of improved processes of gas production which so lowered the cost that utilization was gradually extended from the lighting to the heating field. Gas was first used for cooking about 1859. But gas stoves and heaters did not appear until toward the close of the nineteenth century. With the lowering of rates it was possible to secure the increased use of gas as an industrial fuel, particularly in the larger cities. Extensive campaigns are now being conducted by gas utilities to induce industries to use gas for heating and even for power. The coke-oven process of gas manufacture was developed as a by-product of the manufacture of steel and thus makes gas available for purchase by utilities at low prices in certain favored locations. In natural gas regions, gas is supplied to internal combustion engines for power purposes. In these various ways the evils of a competitive struggle between the gas and electric industries

TABLE VI

Total Sales of Manufactured Gas [a]

1909-1923 [a]

	1909		*1914*		*1919*		*1921*		*1923*	
	M. Cu. Ft.	% of Total	M. Cu. Ft.	% of Total	M. Cu. Ft.	% of Total	M. Cu. Ft.	% of Total	M. Cu. Ft.	% of Total
Total	631,541,967	100.0	795,505,993	100.0	1,054,356,475	100.0	985,895,514	100.0	1,050,513,851	100.0
Straight Coal Gas	19,985,253	3.2	10,509,946	1.3	8,029,749	0.8	9,773,559	1.0	7,541,260	0.7
Coke-oven Gas	*		*		*		43,826,172 [b]	4.4	65,143,515 [b]	6.2
Carburetted Water Gas	79,418,486	12.6	90,017,725	11.2	90,796,299	8.6	94,230,135	9.6	97,382,371	9.3
Mixed Coal or Coke-oven and Water Gas	40,775,283	6.4	86,281,339	10.8	179,871,832	17.0	156,011,274	15.8	193,019,783	18.4
Oil Gas	8,688,860	1.4	16,512,274	2.0	15,421,836	1.5	20,042,374	2.0	19,380,901	1.8
Other Mixed Gas									2,996,021	0.3
Natural Gas [b]	480,706,174	76.1	591,866,733	74.4	745,916,000	70.7	662,052,000	67.2	665,030,000	63.3
Other Gas	1,967,911	0.3	3,179,760	0.3	14,320,759	1.4				

[a] Compiled from reports of the U. S. Census on Manufactures.
[b] U. S. Geological Survey.
[c] From an unpublished monograph by W. G. Maas, *The Economic Development of the Gas Utility.*
* Amount distributed for commercial and domestic uses not ascertainable.

were avoided. They have stabilized themselves to the extent that the major use of gas is found in heating with power and lighting incidental and minor, while the major use of electrical energy is in lighting and power, with heating utilization as a more recent development that gives promise of becoming somewhat more substantial but nevertheless still of minor importance. Since 1900 the consolidation movement has reduced the competition where gas supply and electricity supply have come under the same management. Nevertheless, gas and electric utilities afford a good illustration of the economic principle of substitution.

An important movement is now on foot, inspired by the success of a similar movement in the electric light and power industry, known as interconnection. The basic idea is the same in both cases—large-scale, economical production in centrally situated plants, coupled with long distance distribution.

Substantial revenues are received by this industry from the sale of coke, tar, ammonia, light oils and other by-products of coal gas manufacture. The recovery of by-products, especially in the manufacture of coal gas, has helped to reduce materially the net cost of gas to customers.

The chief processes of gas manufacture comprise first, the making of coal gas, which is the simplest and oldest; next, of carburetted water gas, produced in the largest number of plants and in the largest quantity; third, of coke-oven gas wherever the situation is favorable; and fourth, of oil gas where coal is expensive and oil plentiful as on the Pacific Coast. The increasing price of oil, due to the demand for oil for other uses, is operating in some sections, as in Pennsylvania, to reduce the margin of advantage. In some regions manufactured gas can not be sold in competition with natural gas because the area of the profitable utilization of natural gas has been extended by high-pressure pipe lines. However, natural-gas utilities serve only a restricted area, and their operations are hazardous because they partake of the characteristics of mining ventures. Table VI on page 55 shows the absolute and relative amounts of gas manufactured and produced by different processes for recent census years.

Of the 1,022 manufactured gas utilities comprising the American gas industry only 57 according to the Census of 1919 were municipal utilities. Municipal enterprise has been limited largely to the supply of acetylene gas and of gasoline vapor for street lighting in small communities to which private capital could not be attracted.

Sec. 4. The Development of Electricity Supply

The large-scale application of electricity to the uses of man could not have begun until technology had made practical and cheap the conversion of mechanical into electrical energy. This was made possible by the discovery of electromagnetic induction by Henry and Faraday about 1831. Other important links in the long chain of inventions culminating in the central-station were the development of component parts of the generator by Siemens and Wheatstone in 1867, by Gramme in 1870 and by Hefner-Alteneck in 1873. The development of utilization devices was begun by Davy who built an arc lamp in 1812 and by Starr and King who produced the first crude low-resistance, incandescent electric lamps in 1845.

Not until 1878, however, was it possible to develop a complete lighting system consisting of producing equipment (prime-movers and generators), distributing system and utilization equipment. At that time three systems were designed, one by Jablochkoff in France, another by Brush, and a third by Edison, the two latter having been developed in the United States. The American systems used direct current and the French system alternating current. The Jablochkoff and Brush systems introduced improved arc lamps and the Edison system used the carbon-filament, incandescent lamp. The Edison system was commercially the most successful because it secured greater economy in distribution and utilization. The Brush system was most useful in street lighting and the Edison system in interior lighting. Improvements were soon made in both types of lighting. Only the Edison system has maintained itself to the present day in serving congested districts where direct current is distributed only short distances. In the United States direct current is used exclusively in operating electric railways and also of passenger and freight elevators. Alternating current is now used exclusively in long-distance distribution. The greatest improvement was made in generating devices where the development of the high-speed steam engine, the steam turbine, and the Francis hydraulic turbine[6] have been the corner-stones upon which rests the structure of modern central station electricity supply.

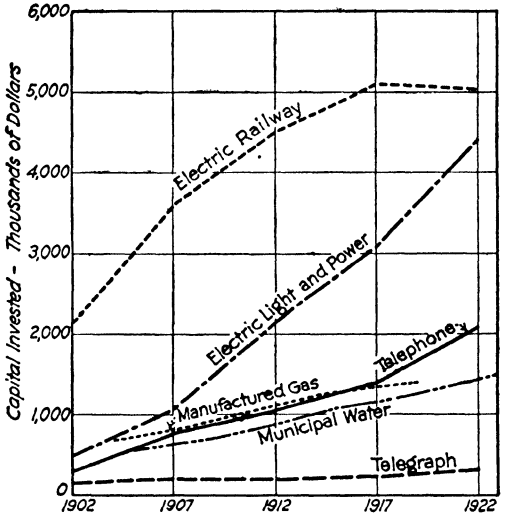
[6] Two classes of hydraulic turbines are now in use. High head, impulse turbines are used extensively in mountainous regions where the quantities of water are small but the falls very high; the other type is designed for large quantities of water and small heads.

(a) *Development and utilization of electricity supply.*

The first central station, the Pearl Street Station in New York, started operation in 1882 with 5,500 lamps. Central stations were constructed soon after in Boston, Brooklyn, and Chicago. In 1886 there were 47 Edison illuminating companies. In 1890 there were more than 1,000 central stations. In fact, the development of electric utilities was phenomenally rapid. The comparative growth of this and other utilities in recent years is shown graphically in Charts III, IV and V.

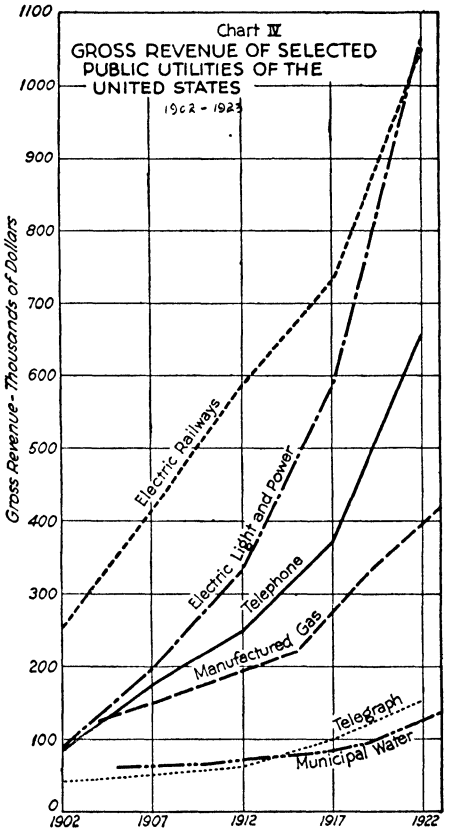
Chart III

CAPITAL INVESTED IN SELECTED PUBLIC UTILITIES IN THE UNITED STATES 1902-1923



The advantages of electric lighting have already been mentioned in our discussion of gas supply. For power purposes the superiority of electrical energy consists in the fact that through the electric motor it can be adapted to units of any required size, that it is adaptable to variations in load, that it is portable over long distances, that electric installations make for cleanliness about the plant and are structurally compact. Accordingly, the main uses for electrical energy are found in street, interior, and display lighting, commercial and industrial power and heating, electric power for urban and interurban transit, and in electro-chemistry. The increasing need of using energy

at high voltages has made safety a primary consideration of service. As more residences, commercial establishments, and industrial plants have made themselves dependent upon central-station supply, *continuity of service* has become another primary requirement. In truth, the central station represents the heart of modern city life.



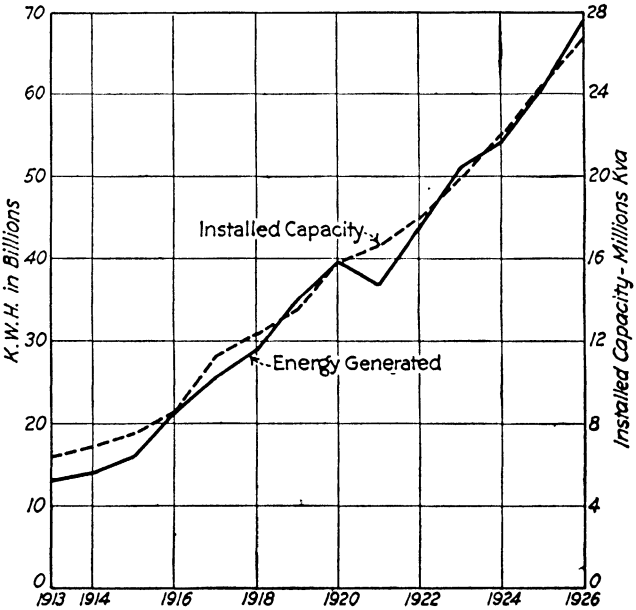
The probable extension of use for electric power is in the electrification of the larger railway terminals and of those divisions on the main line where sufficient cheap power is available. A slow but certain conversion program is here in prospect.[7] Office buildings and commercial establishments are electrically lighted and equipped throughout. In mines and quarries, and,

[7] Murray, W. S., *Superpower, Its Genesis and Future.* McGraw-Hill Book Co., 1925. See especially Chap. VII, Railroad Electrification.

in fact, wherever safe and portable power is required, the use of electricity is being extended. Small establishments requiring intermittent power find electric power cheap and convenient. Electrical devices are being installed in homes and are increasingly in demand since the scarcity of domestic servants began about 1916. The low cost of current, aggressive merchandizing methods, and the desire of every housewife to carry on her work

Chart V

TOTAL ENERGY GENERATED AND INSTALLED CAPACITY
ALL CENTRAL STATIONS*
1913 - 1926



*Electrical World Vol. 89, Jan. 1927, p. 20

more efficiently have had much to do with the increasing sale of appliances.

Electrical energy is also invading the agricultural industry in a movement to which the name of "rural electrification" has been given. Investigation in the state of Wisconsin, where much has been done to secure rural electrification, reveals that less than 4 per cent. of the total number of farmers are connected with the transmission and distribution lines of public utilities. About 6 per cent. more have some form of private installation. The use to which energy is put, in addition to the ordinary

domestic uses, is in the operation of cream separators, milking machines, pumps, hay-hoisters, clipping machines, and grinders. The principal obstacles encountered are the higher rates which must be charged and the absence of properly designed electrical machinery to meet the farmer's needs.

(b) *By-product sale of steam.*

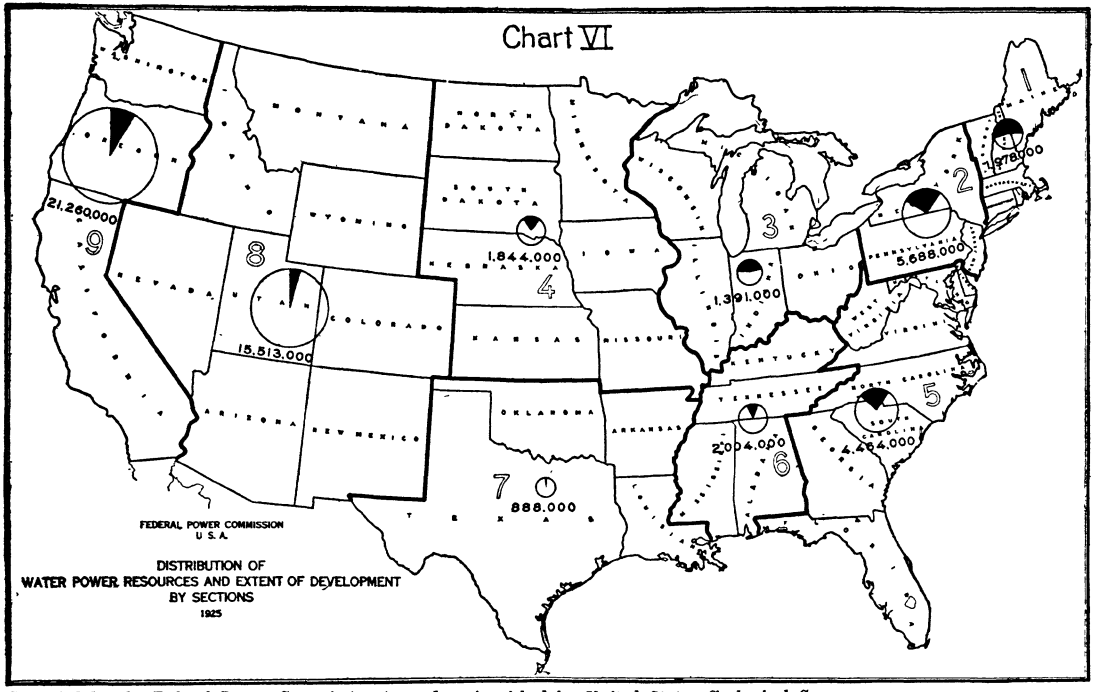
In recent years, incident to the production of steam for transformation into electric energy, the central electric power station has also become a central heating station. The steam is distributed over a restricted area, either without being used for electric generation when it is known as high-pressure steam, or after having been used for electric generation when it is called low-pressure steam. The steam is used to heat residences, apartments, stores, and office buildings, and as incidental to industrial processes. By thus standing ready to supply steam for these uses, the central station has been able to supplant the use of steam power with electric power in industrial establishments and to eliminate the so-called isolated electric plant, designed to supply heat, power, and light to crowded office buildings and to industries using steam.

(c) *The question of power resources.*

The first World Power Conference, held in London during the summer of 1924, is evidence of the importance of power in our industrial civilization. The four main sources of power are coal, water power, petroleum and natural gas. The first three are of extreme importance to electric utilities. No one of these power sources would be adequate by itself to meet requirements and the power problem is primarily that of securing a coordinated economic utilization of all sources. It is estimated that the United States has 3,836,657 millions of metric tons or 51.9 per cent. of the total world coal resources of 7,397,553 millions of metric tons.[8] However, of the world's water power resources of 439,000,000 horsepower the United States has only 26,700,000 or 6.1 per cent. It is estimated that 16.8 per cent. of the potential water power in the United States is now in use.[9] In the utilization of power resources it is generally recognized that conservation means full utilization of water powers because

[8] One metric ton equals 2204 pounds.

[9] Estimates are conflicting. The U. S. Geological Survey estimates the potential water power resources as follows: minimum 27,943,000 H.P. or a maximum of 53,905,000 H.P. The use of water storage facilities would bring this total up considerably.

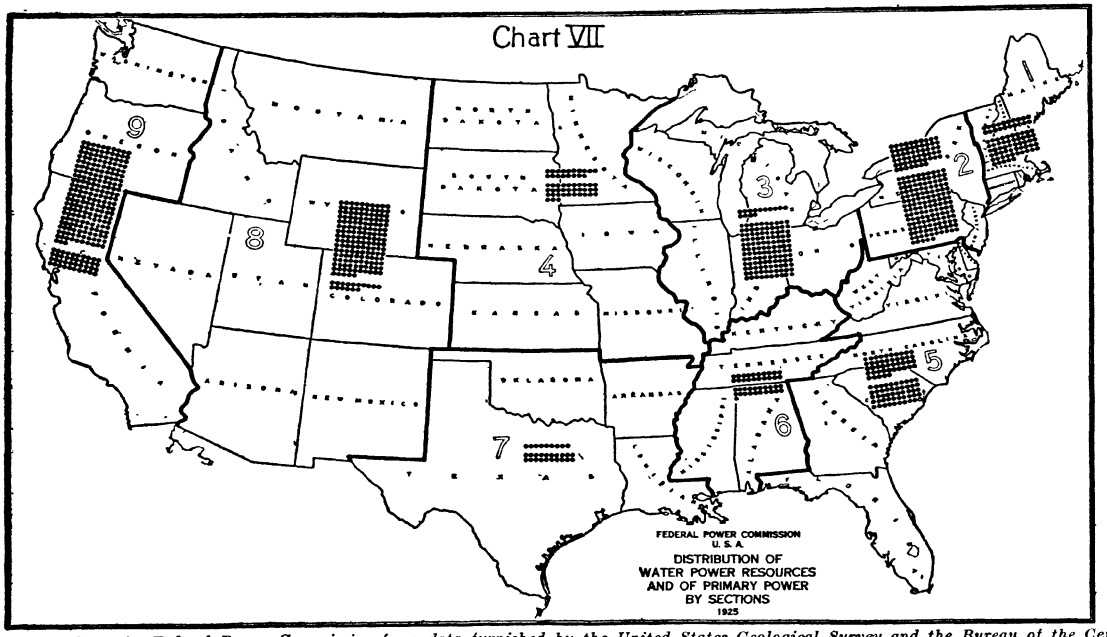


SECTIONS

1. New England
2. Middle Atlantic
3. East North Central
4. West North Central
5. South Atlantic
6. East South Central
7. West South Central
8. Mountain
9. Pacific

Compiled by the Federal Power Commission from data furnished by United States Geological Survey

Total water power resources, 55,030,000 H. P. available for 50 per cent. of the time. Areas of circles are proportionate to water power resources of the section indicated. The blackened areas of the circles indicate the proportion of water power resources in the sections that have been developed.



Each dot represents 100,000 horsepower. Water Power Resources: Upper rows of dots Primary Power: Lower rows of heavier dots

---

Primary power which consists of the installed capacity of water wheels, steam engines, and gas engines in commercial and municipal central stations, street and electric railways, and manufacturing plants, has been estimated for 1925 by projecting the line of growth from the date of the last census at a rate of increase indicated by statistics of previous censuses.

Compiled by the Federal Power Commission from data furnished by the United States Geological Survey and the Bureau of the Census

Section	Water Power *Horsepower*	Primary Power *Horsepower*	Section	Water Power *Horsepower*	Primary Power *Horsepower*
1. New England	1,978,000	5,500,000	6. East South Central	2,004,000	2,100,000
2. Middle Atlantic	5,688,000	14,500,000	7. West South Central	888,000	2,000,000
3. East North Central	1,391,000	12,000,000	8. Mountain	15,513,000	1,600,000
4. West North Central	1,844,000	3,300,000	9. Pacific	21,260,000	4,000,000
5. South Atlantic	4,464,000	5,000,000	Totals (9 Sections)	55,030,000	50,000,000

they are not subject to depletion. They are, however, subject to uneconomic development when the large amounts of capital required remain unproductively idle.

Table VII, below, gives a picture of the growing importance of power in manufacturing industry. (See Charts VI and VII on preceding pages.)

TABLE VII

GROWTH OF HORSE-POWER USED IN MANUFACTURING IN THE UNITED STATES

Year	*Total H. P.*	*Water Power*	*% of Total*	*Electric Power*	*% of Total*	*Other Power*	*% of Total*
1869	2,346,142	1,130,431	48.2			1,215,711	51.8
1879	3,410,837	1,225,379	35.9			2,185,458	64.1
1889	5,938,635	1,255,045	21.1			4,683,590	78.9
1899	10,097,893	1,454,112	14.4	182,562	1.8	8,361,119	83.8
1904	13,487,707	1,647,880	12.2	441,589	3.3	11,398,238	84.5
1909	18,675,376	1,822,888	9.8	1,749,031	9.4	15,103,457	80.8
1914	22,437,072	1,826,443	8.1	3,897,248	17.3	16,713,381	74.6
1919	29,504,792	1,765,263	6.0	9,347,556	31.7	18,391,973	67.3

The total horsepower capacity of stationary prime movers—including all power used in manufacturing, by electric railways and by central stations—was estimated to be 49,000,000 H.P. for 1920. Of this total 9,500,000 H.P. or 19.4 per cent. is water power. Since 1920 applications for the development of 24,000,000 H.P. have been filed with the Federal Power Commission, and 2,782,000 H.P. actually developed. Most of this is hydro-electric development.

Steam-electric power and hydro-electric power thus represent the backbone of American manufacturing industry. But there was and still is room for growth, particularly by central stations, in securing additional power customers. This is shown by the following figures for Wisconsin from the census of manufactures for 1919: 263,714 electric H.P. are generated in private establishments; 213,832 H.P. are generated by public utilities, including some rented mechanical H.P.; 190,620 H.P. are generated by water-wheels and turbines; 16,706 H.P. by internal-combustion engines; 72.814 H.P. by steam turbines; and 394,710 H.P. by steam engines. This makes a total of 878,682 primary horsepower generated.

(d) *Hydro-electric power utilities.*

Electric power is derived primarily from energy stored in coal, yet the amount of electric power derived from the energy

of falling waters has been steadily increasing. Devices for the utilization of water power for industrial purposes have been in use for over three thousand years. Technical development, however, was exceedingly slow. The chief reliance continued to be a modified type of the primitive undershot or overshot water-wheel. Development was remarkably quickened with the introduction of the turbine water-wheel. However, the utilization of this power was limited to the factory located at the source. Of the power used directly in industry in the United States, even as late as 1870, about 48 per cent. was furnished by water power plants. But steam power was in the ascendant. By 1919 the proportion supplied from water power had fallen to 6 per cent.[10]

In 1886 the Westinghouse Electric and Manufacturing Company began the commercial production of alternating current machinery on a large scale.[11] This made possible a great increase in voltage capacity and thus enabled operators to transmit electrical energy over large areas. It also gave a new impetus to the water power industry and may ultimately transform it into hydro-electric industry.

The first hydro-electric plant was installed at Appleton, Wisconsin. It was placed in operation October 5, 1882, with 250 lamps of 16 candlepower. Thus, the pioneer steam power station which was in New York and the pioneer water power station in Wisconsin were placed in operation scarcely a month apart. Another early hydro-electric station was located at Portland, Oregon, in 1884, which obtained its power from the Willamette River, thirteen miles distant. In 1888 it was converted into a plant generating alternating current and here was installed the first alternating current transmission line in the United States. The introduction in 1893 of rotary converters, which convert alternating current into direct current, removed another limiting factor in the development. Inventions and improvements, particularly in the direction of making possible the economical transmission of electrical energy over long distances, have followed in rapid succession. Transmission systems have been perfected which carry the current at high voltages from the point of production to points of consumption in a market area exceeding 100,000 square miles, and between points

[10] Voskuil, W. H., "Water-Power Situation in the United States," *Journal of Land and Public Utility Economics*, Jan. 1925, Vol. 1, p. 89.

[11] The Westinghouse Co. is credited with establishing the first regularly operated alternating current plant in the United States at Greensburg, Pa., in 1886.

approximately 250 miles apart. The electrification of mountain divisions of steam railways (C. M. & Pacific Ry.) has been important in this connection. All estimates indicates a large future for hydro-electric developments, especially in the Rocky Mountain and Pacific Coast States, where in excess of 70 per cent. of the minimum available, potential power is located.[12]

Although far flung transmission lines have made many water power developments economically feasible, there are limiting factors which must be recognized. The fact that for extended periods costly plants may be idle is a primary consideration. Few streams have a fairly constant flow throughout the year. Most of them show a considerable variation in the amount of water available for power from year to year and from season to season. In some cases the flow is so erratic, varying between sudden and short periods of floods and others of little or no water, that these so-called "flashy" streams are generally classed as uneconomical. It is true that pondage facilities and storage reservoirs tend to equalize the flow over the day, month and year, but these improvements are costly and not always possible.[13] In some cases otherwise economical streams can not be developed because the costs incident to the flooding of valuable farm lands, the removal of railroads and industrial and other improvements, are prohibitively high. In other cases the power sites are too far from available markets involving heavy costs for transmission lines and energy losses, or the cost of coal for steam-electric generation is such as to make it uneconomical to bring hydro-electric power into a given market.

(e) *Super-power systems.*

A super-power system consists of two elements: the utilization of highly economical generating stations, steam or hydro, and the interconnection of power stations by transmission lines. Not only is the fuel consumption per unit of output reduced by using only large steam plants but the investment cost per unit of capacity is also lowered. By interconnecting such power systems the reciprocal sale of power from one system to another is made possible and a common reserve is made to serve for a large area. Coöperative action thus insures the utilization

[12] Report of Commissioner of Corporations on Water-power Developments in the U. S., pp. 37-47.

[13] A type of hydro-electric station has been developed recently which uses automatic equipment so that the generators operate only when sufficient water is available. These are particularly adapted for use in conection with super-power systems.

Chart IX

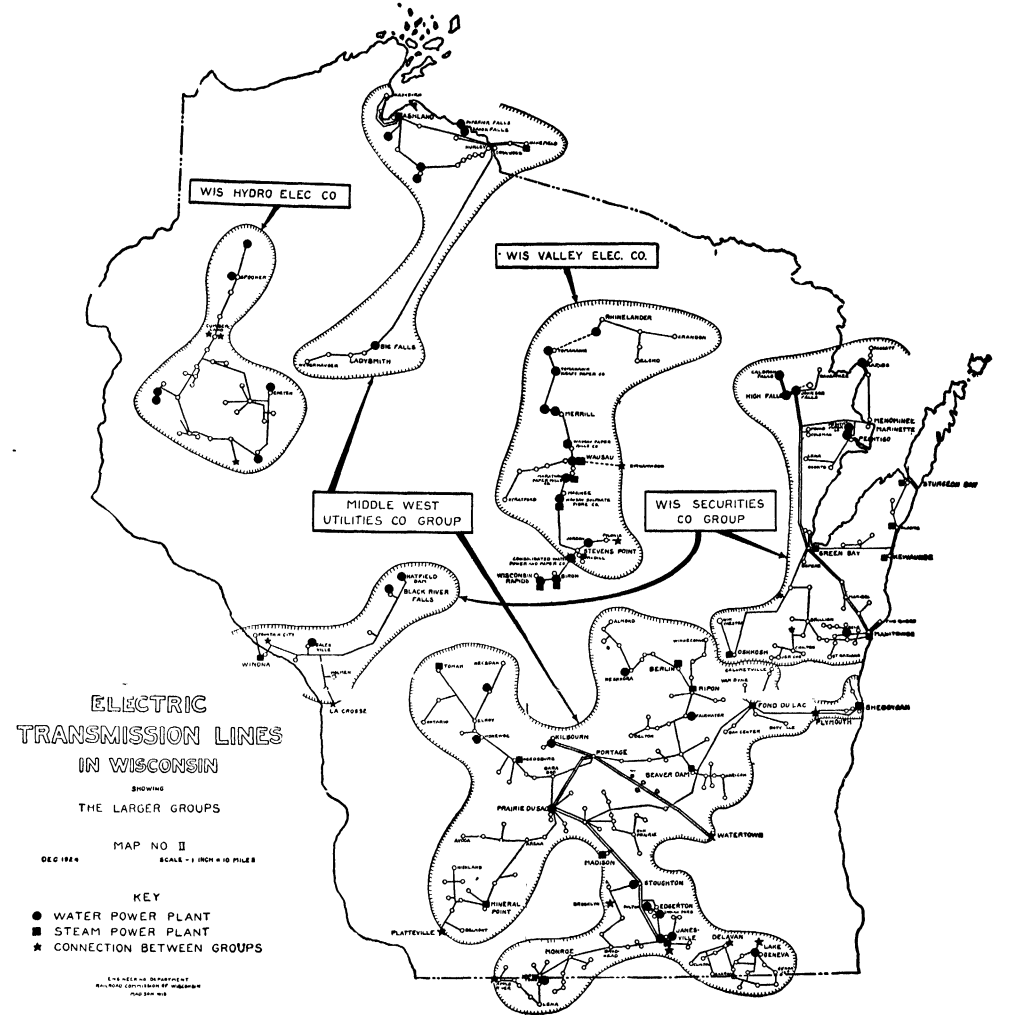
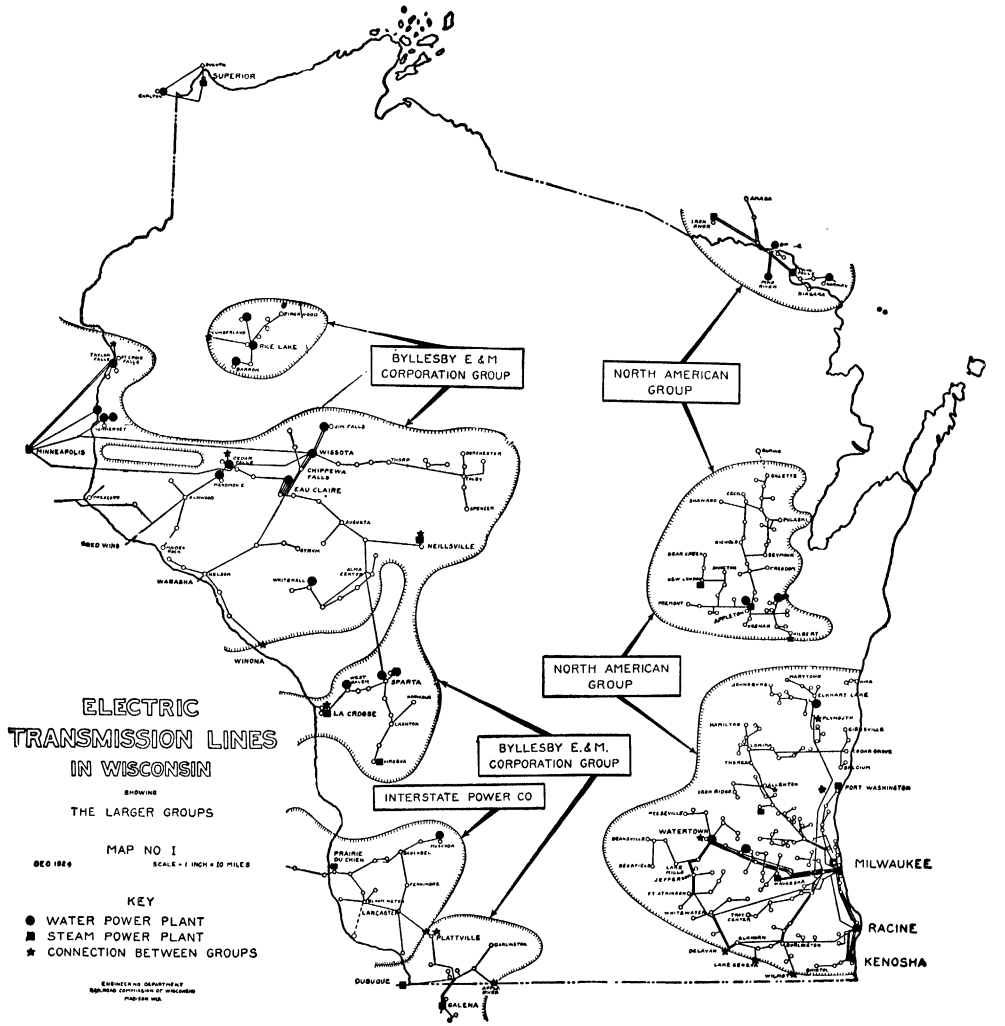

WIS HYDRO ELEC CO
WIS VALLEY ELEC. CO.
MIDDLE WEST UTILITIES CO GROUP
WIS SECURITIES CO GROUP
ELECTRIC TRANSMISSION LINES IN WISCONSIN
SHOWING
THE LARGER GROUPS
MAP NO II
DEC 1924
SCALE - 1 INCH = 10 MILES
KEY
WATER POWER PLANT
STEAM POWER PLANT
CONNECTION BETWEEN GROUPS
RHINELANDER
MERRILL
WAUSAU
STEVENS POINT
WISCONSIN RAPIDS
ASHLAND
LADYSMITH
BIG FALLS
HIGH FALLS
MENOMINEE
MARINETTE
PESHTIGO
STURGEON BAY
GREEN BAY
OSHKOSH
FOND DU LAC
SHEBOYGAN
PLYMOUTH
BERLIN
RIPON
BLACK RIVER FALLS
HATFIELD
WINONA
LA CROSSE
GALESVILLE
ONALASKA
TOMAH
WILTON
CAMP DOUGLAS
KILBOURN
PORTAGE
BEAVER DAM
PRAIRIE DU SAC
WATERTOWN
MADISON
STOUGHTON
EDGERTON
MINERAL POINT
PLATTEVILLE
MONROE
DARLINGTON
JANESVILLE
DELAVAN
LAKE GENEVA
BELOIT

Chart VIII


BYLLESBY E & M CORPORATION GROUP
NORTH AMERICAN GROUP
NORTH AMERICAN GROUP
BYLLESBY E. & M. CORPORATION GROUP
INTERSTATE POWER CO
ELECTRIC TRANSMISSION LINES IN WISCONSIN
SHOWING
THE LARGER GROUPS
MAP NO I
DEC 1924
SCALE - 1 INCH = 20 MILES
KEY
WATER POWER PLANT
STEAM POWER PLANT
CONNECTION BETWEEN GROUPS
SUPERIOR
MINNEAPOLIS
WISSOTA
CHIPPEWA FALLS
EAU CLAIRE
NEILLSVILLE
WINONA
SPARTA
LA CROSSE
PRAIRIE DU CHIEN
LANCASTER
PLATTVILLE
DUBUQUE
GALENA
PORT WASHINGTON
WATERTOWN
MILWAUKEE
RACINE
KENOSHA

of surplus power, safeguards the service from interruptions, and secures the advantages of long hour use of investment by building up the diversity of use. This movement for interconnection is growing, and electric utilities are becoming interstate in character. However, their retail selling will always mark them as local enterprises.[14]

Within the past few years a good deal has been said about locating central stations at or near coal mines and then carrying the energy to markets over transmission lines which are interconnected with transmission lines carrying hydro-electric energy. Such locations are, however, not generally practicable on account of the extremely important part which condensing water plays in economical operation. A carbo-electric generating station requires approximately six hundred times as much water by weight for condensing purposes as it does coal for producing steam. The amount of water needed varies with the temperature of the water—500 tons of water to one ton of coal being the minimum, and in many cases as high as 1000 tons of water being required for each ton of coal burned. For this reason it is proving more economical to locate stations at tide water and on large rivers or inland bodies of water than at the mouths of mines where, ordinarily, little water can be obtained for condensing purposes. Frequently, even where ample water is available at or near the mouth of mines, it is so impregnated with minerals as to make it unfit for use for condensing purposes.

The stimulating effect of interconnection of power stations and of the growth of transmission lines upon the consolidation movement will appear from an inspection of charts VIII and IX showing how the State of Wisconsin has been divided up by a comparatively small number of companies.

Sec. 5. **Urban Transportation**

We have already referred to the interurban electric railway in the preceding chapter dealing with national utilities. Antedating this was the electric *street* railway devoted to urban carriage. Gradually it extended its field of operations into suburban and interurban territory. Yet the electric railway

[14] *Cf.* Murray, W. S., *Ibid.*, Chapters V and VI. Also, *Professional Paper 123*, "A Superpower System for the Region between Boston and Washington," *U. S. Geological Survey*, 1921; also *Report of Giant Power Survey Board to General Assembly of Pennsylvania.* Telegraph Printing Co., Harrisburg, Pa., 1925.

had its predecessors in the elevated street railway, propelled by a steam locomotive, the cable railway, and the horse railway. For all practical purposes this represents the beginning of the development, although an attenuated line could be construed to go back to the omnibus lines of the 1820's and to the horse-drawn vehicle for hire. What distinguishes the true urban carrier is that service is rendered by means of a fleet of vehicles, operated on a more or less fixed schedule, and that the carrier aims to be an agency of mass transportation.

The popular method of urban transportation just prior to the advent of the horse-drawn street car was the horse-drawn omnibus. Omnibus companies were organized in much the same manner as street railway companies are. They owned fleets of omnibuses and offered regular service along definite routes. In those days pavements were rough and there was a widespread demand for smoother riding. Likewise there was a desire on the part of the operators to handle bigger loads. This led to experiments with tracks of various types of construction. The experiments extended over a long period, and the idea met with much opposition from those who thought that the presence of tracks in public thoroughfares would create a danger to other traffic. Finally, the street railway was developed with animals as the motive power.

(a) *Development of the street railway.*

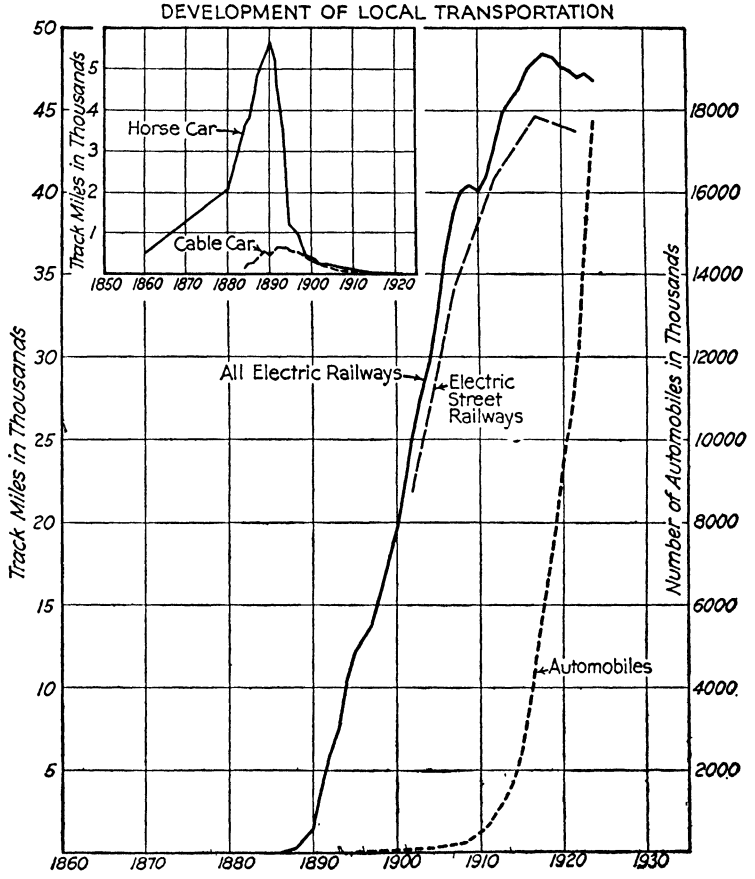
The first street railway of commercial importance began operations in 1831 with the so-called "John Mason Cars" on Fourth Avenue in New York City. By 1870 street railways operated with animal power were found in most of the larger cities. This form of urban transportation reached its peak in 1890. At that time there were 5662 miles of track in operation. However, it was never entirely satisfactory. It was slow; it could not be operated to advantage on heavy grades; it was hard work for the animals. Accordingly, inventors all over the world turned their attention to the development of some form of power suitable to the service. Experiments were made with steam, cable, compressed air, ammonia, hot water, gas, and carbonic acid. The cable railway proved to be the most satisfactory. It was used in New York City in 1869. It was especially useful in cities having heavy grades as Pittsburgh, Seattle, and San Francisco; but it was also used in Chicago where grades are practically absent. The cost of construction of cable railways was high and they could thus be used only where traffic

was heavy. This characteristic militated against a wide adoption of the cable railway. At the height of its popularity there were only 658 miles in operation.

Finally, electric energy, already in use for lighting, was extended to the street railway. The honor of having demonstrated

Chart X

DEVELOPMENT OF LOCAL TRANSPORTATION



to the world for the first time that electricity could drive a car along rails is accorded Thomas Davenport of Brandon, Vt. The experiment was made in 1836. According to investigations of the American Electric Railway Association, the first practicable line in the world was, however, not put into operation until 1874, in Berlin, Germany. It was demonstrated upon a

commercial basis at the Berlin Exposition in 1879. The pioneer electric railways in the United States began operation in 1883 at Saratoga Springs, N. Y., and at Cleveland, Ohio, in 1884. The former used a third rail and the latter a conduit system. These were soon followed by other installations, Appleton, Wisconsin, again figuring among the pioneers. The first electric railway using the modern overhead trolley and other features began operation on May 4, 1888, at Richmond, Va. This date is generally regarded as marking the beginning of the electric railway industry. The stimulating effect of the change was almost instantaneous. Within ten years the horse-car was practically extinct. The street railway plant of the country continued its wonderful expansion until the outbreak of the World War. This development is shown graphically in Chart X, which shows the mileage of track operated by horse, cable, and electric power from 1850 to 1922.

(b) *Motor vehicle competition.*

At the present time the street railway is facing new competition; a new form of power has come to the front and is challenging the old. The internal combustion engine, experimented with on the street railways of Chicago in 1892, has been developed to a high degree of efficiency and is being applied in an experimental way to cars that run on tracks. Similarly the motor bus, equipped with internal combustion engine and not requiring tracks, is competing with electric cars. The Fifth Avenue Coach Co. of New York operates over 500 buses.[15] Where electric railways offer an urban motor bus service they are operated as supplementary carriers, partly to recapture traffic which has left the cars and partly to create new traffic. For it is certain that the heaviest inroads have been made by the private automobile. There is now (1926) one passenger automobile for every 6.84 persons in the United States. (See Chart X, p. 69.) In larger cities, the tendency is, however, to restrict the motor bus to interurban and suburban traffic, to city traffic on boulevard streets where tracks would be objectionable, and to the supplying of a special fare, "de luxe" service. In such cities the electric railway bids fair to continue as the popular agency of mass transport.

Experiments are now taking three distinct directions: (1) the motor bus is finding a limited application on short runs or is

[15] In 1926 the proposal was seriously made to eliminate surface cars in New York City, substituting therefor a fleet of busses.

used exclusively over selected routes; (2) internal combustion engines are being used on cars that run on tracks;[16] (3) buses which are equipped with electric motors that take current from a trolley wire (the so-called "trackless trolley") are being used extensively in Europe. They are used in this country preliminary to the installation of the electric car. The Virginia Railway and Power Company has replaced certain suburban electric lines with the trackless trolley. Whether this will be a permanent solution of the suburban electric-railway problem remains to be seen. It is, however, one of the more notable developments of recent years.

(c) *Rapid transit.*

In the meantime, the increasing traffic congestion upon the streets of our larger cities developed a new need for rapid transit. Since this service can not be obtained from surface lines operating in crowded streets, the elevated railway and, later, the subway were developed to meet this demand. The elevated road appeared in New York in 1878, using steam locomotives, and operated a station to station service. In 1901 the third rail system of electric traction was substituted. The first use of an underground railway came in London in 1853. In this country the construction of subways was long delayed. New York City, for instance, after a long period of agitation, passed laws authorizing construction in 1891. Construction did not begin until 1901, and the first project was completed in 1904. In 1903 the Manhattan Elevated Railways were leased to the Interborough Rapid Transit Co., which had been organized to operate the subways. Other subway construction followed in 1908, but the further history of rapid transit in our largest city becomes too involved for present purposes. We should mention that rapid transit lines, both subway and elevated, have been constructed in Boston and Philadelphia, and elevated lines only in Chicago.[17] The question of securing additional rapid transit is a burning one in Chicago, and has been more or less agitated in Cleveland, Detroit, St. Louis and Los Angeles. The fact, however, that the cost per mile of single track of an elevated railway is at least three times the cost of a surface railway and that of a subway is from two to four times the cost of an elevated railway, is giving all these cities pause.

[16] The gasoline car has been widely introduced on branch lines of steam railways.

[17] Foreign cities having extensive modern rapid transit lines are London (opened in 1890), Paris, Berlin and Budapest.

Only cities having great traffic density can undertake to supply these facilities.[18]

Sec. 6. **Local Communication**

Local communication is carried on mainly by means of local telephone exchanges. For the sake of completeness, mention should be made of the postal service, of municipal police and fire-alarm systems, and of electric signalling in burglar-alarm service, night-watchman's service, carriage call and messenger service.

(a) *The development of local telephone exchanges.*

The development of the telephone industry is especially interesting to Americans because this industry has found its best opportunities in the United States. Speech transmission by electric impulse was first developed to provide local communication. Later long-distance lines appeared so that the industry may now be divided into two departments; the telephone organized as a local exchange system and the telephone as a system of long-distance communication, conducting its service on a message-toll basis. In the long-distance field this service has a state and nation-wide importance. Here also it competes with or is a substitute for the telegraph.

The technical and commercial development of the telephone, once called the "electrical toy," is a most absorbing story. It recounts the struggles of inventors with technical problems, their efforts to overcome the early indifference of capitalists,[19] and the positive hostility of the organized telegraph industry. The history of the telephone goes back to experiments by Page, in 1837, who discovered that an iron bar, if magnetized and demagnetized at short intervals of time, will emit sounds. In 1860, Reis of Germany, building upon earlier experimental foundations, constructed an apparatus for the transmission of sound by electrical means. Hence, he is hailed in that country as the inventor of the telephone and a monument was erected to his memory in 1878. In 1875 Alexander Graham Bell constructed his first pair of magneto telephones, receiving his orig-

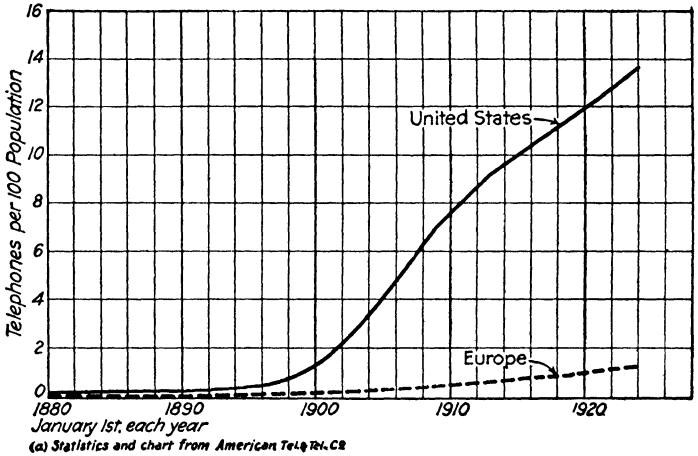
[18] *Cf.* Doolittle, F. W., "Studies in the Cost of Urban Transportation," *Am. Elec. Ry. Assn.*, 1916, p. 334. For a general survey of rapid transit problems throughout the world see *Report on Rapid Transit for St. Louis*, to Board of Aldermen, by Board of Public Service, Sept. 1926.

[19] It has been said that Chauncey Depew was offered one-tenth interest in the Bell patent for $10,000, but rejected the offer on advice of experts.

inal patents the following year. Improvements were soon made to which the versatile Thomas A. Edison, retained by the Western Union Telegraph Co., contributed his share. Emil Berliner, David Hughes, and Francis Blake are other names to be associated with the first patents, and the legal struggles arising over them. It was the Bell Telephone Association, however, which first applied the idea of securing widespread and flexible intercommunication by connecting local telephones with central stations. The first local exchange was the Bell plant established in New Haven in 1878.

Chart XI

TELEPHONE DEVELOPMENT
IN UNITED STATES AND EUROPE(a)



(a) Statistics and chart from American Tel. & Tel. Co.

From that time forward the telephone development in the United States has by far exceeded that of any other country. (See Chart XI.) The City of Paris, more than twice the size of Boston, has only half the number of telephones. On the other hand, it should be stated that Europe has used the telegraph to a greater extent for long-distance messages. Moreover, comparisons between this country and Europe in the use and development of public facilities must take into account the higher average of well-being which the people of the United States enjoy.

It has been said that the telephone was a luxury up to 1894, when the original patents expired. It is undoubtedly true that the major expansion has come since that date. Before this date development was largely in the hands of the American Bell Tele-

phone Company. Since then competition has set in, but the major share of the business is, nevertheless, that of the Bell companies. The dominating company at the present time is the American Telephone and Telegraph Company which was originally organized in 1886 to carry on long-distance operations. In 1898 it absorbed the Bell Company, was reorganized as a holding company of local operating companies, and undertook the task of developing inventions, owning patents, handling legal, financial, and manufacturing problems.

(b) *Conflict between the Bell companies and the independents.*

A new idea, that the telephone industry is naturally monopolistic, was injected into this industry by Theodore N. Vail, who early became the general manager of the parent company. He first secured an agreement in 1880 with the Bell Company's formidable competitor, the Western Union Telegraph Co., whereby the latter abandoned the telephone field, turning over its inventions, apparatus and exchanges. The Bell Company in turn agreed not to enter the telegraph field and to turn over 20 per cent. of its income for seventeen years. Vail left the employ of the Bell company for a time returning again in 1907 as head of the American Telephone & Telegraph Company. At this time he determined to carry into effect his original intention, that is, to secure a single, universal, nation-wide system of communication, using standardized apparatus. All of this was practically accomplished by 1915.

The era of commission regulation beginning in 1907 closed a period of very bitter competition between the Bell company and the independent telephone operators. The Bell company, as already mentioned, propounded the idea that a monopoly was both natural and economically advantageous. But this company had been backward in extending telephone service. Moreover, the public was still quite hostile to the idea of monopoly, preferring competition. Independent operators were therefore looked upon with favor in many cases. The Bell company tried at first to eliminate these competitors by the method of cutting rates; by tying up the railways and the larger establishments, both private and semi-public, by means of special contracts; and by bringing suits against competitors and manufacturers who supplied independents, charging them with infringement of patents. Another practice adopted was to buy out independent companies. The independents and their manufacturers countered by organizing themselves into an association for mutual

protection and for improving their methods of doing business. Thus, for instance, the automatic telephone was adopted by independents while the Bell companies would have nothing to do with it until the recent war period. It is now being installed in many large exchange areas. Beginning about 1913, a series of agreements between the Bell companies and the independents have put the industry upon a plane of coöperation. The change in public opinion which accompanied the development of regulation, and which made monopoly appear less odious, has worked in favor of further consolidations. The taking over by the Bell system of independent telephone companies is now accomplished under prescribed conditions.

There are few places left where there is competition between local telephone exchanges. Independent telephone companies to the number of 8,200 still own and operate 28 per cent. of the telephones of the United States. These independent operators performed a great service in the development of this industry by stimulating the Bell company and by expanding the business through their own efforts. As one of the leaders among them writes,[20] "It seems a fair estimate to say that the Bell and its subsidiaries, during the period of monopoly through patents, relied too much on legal monopoly and not enough on service. The small towns and country districts generally were ignored. Even in the larger cities there was not the intensive development the field required." The present situation seems to be one of comparative peace between the Bell companies on the one hand and the United States Independent Telephone Association upon the other, with tacit understandings as to the division of territory and with a willingness to coöperate with each other to give unified service.

(c) *Growth and present extent of the telephone business.*

The growth of the business may be indicated by a few statistics. In 1880 there were 138 exchanges with about 30,400 stations. By 1889 there were 743 exchanges with 158,700 stations or subscribers. When the patents terminated there was rapid growth in the number of local exchanges and of rural, mutual systems. Although the number of mutual systems exceeds 50,000 most of them consist of only a few miles of wire in rural districts. Rural service is often of a primitive, communistic type. The larger independent systems continue their growth

[20] *Cf.* Theodore Gary, "The Independents and the Industry," *Telephony*, March 13, 1926.

by consolidating companies. The outstanding fact is that this consolidation movement was dictated by the need of insuring communication between all telephone users. Competition resulted in greater cost, less convenience, and poor service. Commercial requirements tend to bring about either consolidation or physical connection with the Bell System.

In 1902 there were fifty-six times as many telephone conversations as telegraph messages, and their number exceeded by 10 per cent. the number of letters sent. Since that time the proportion has become even more favorable to the telephone. The increased use of the telephone by the American people is shown from these figures reported by the Bell system:

1900.....	84	persons	per	Bell	Telephone
1905.....	25	"	"	"	"
1910.....	13	"	"	"	"
1915.....	10	"	"	"	"
1921.....	8	"	"	"	"
1924.....	7	"	"	"	"

The Bell system now consists of three operating units: A parent company, the American Telephone and Telegraph Co., which directly owns and operates the long-distance telephone lines that join together the local telephone systems of the associated companies; twenty-five Associated Companies, controlled through stock ownership, which own local exchanges in extended districts, the telephone instruments being owned by the parent company; and the Western Electric Company, Inc., which is the manufacturing and supply organization of the system.[21] Independent telephone companies to the number of 9,290 and over 26,000 rural lines and associations were physically connected with the Bell system in 1921.

The Bell system at the present time consists of 16,209,000 telephones, of which 11,700,000 are owned and operated by the Bell Companies, and 4,500,000 by connecting companies. It is estimated that 2⅔ millions of telephones are installed on farms. It is also estimated that two-thirds of the telephones are listed as residence and one-third as business telephones. The total number is said to be increasing at the rate of 750,000 per annum. In order to transmit messages 40,000,000 miles of wire are in service. When it is recalled that the Bell system controls

[21] Recently two other units were added, the Bell System Securities Co. and the Bell System Laboratories.

about 90 per cent. of the telephones and 80 per cent. of the total income from telephone service, an idea may be gained of the degree of concentration in this industry.

Recent progress in the art has been considerable. Automatic telephones were perfected; the "nickel phone" was introduced; single-party, two-party, four-party, etc., lines were installed. An automatic trunkage system, the vacuum tube which makes possible the superimposing of four distinct telephone massages, the radio-phone and the vita-phone are important recent improvements. The installation of a long-distance telephone cable between New York and Chicago, completed in 1925, will make long-distance communication freer from interruptions occasioned by storms. Direct telephone communication has just been established between American cities and London.

The telephone is now recognized as the chief instrument for social and business intercourse. It is a great accelerator of commercial and manufacturing processes; it has helped in the widening of economic markets by aiding both buyer and seller; and finally it has aided in both the centralization and decentralization of productive processes.

Sec. 7. **General Summary**

The foregoing discussion has shown that there are certain peculiarities affecting the supply of public utility services. The individual user of water in our urban centers no longer depends for his supply upon his own well, nor does he buy from one of several competing sources. He resorts to a single common source of supply along with other users. This has been found to be more convenient, economical, and, indeed, the only practical solution. But this process of integration of supply has been a long process. In other public service industries it is not even yet completely realized. There are still competing gas, electric, transportation, and telephone utilities. This tendency toward monopoly, whether the result of a competitive struggle or brought about by legislative enactment, is a fundamental characteristic of public utility business.

Every public utility must be in possession of the land or other natural resource upon which that industry is based. A gas or electric company must have possession of sites for the location of its gas works or power houses; a transportation company must have rights of way and terminal sites upon which its structures may be built; a water utility must have water rights, wells,

reservoirs, and pumping-station sites. These lands must usually have strategic locations. The company is therefore severely limited in the choice of this agent of production. This tends to make the cost of acquiring or leasing these facilities greater than it would be if the industry had a wider range of choice. Furthermore, because of the pivotal importance of public utilities to our cities, a tendency exists for other facilities to crowd in upon them. Yet utilities, especially if they have become the sole sources of supply, must take into account probable increases in the required producing capacity, and must make allowances for such an eventuality in advance. This further serves to make difficult the selection and acquisition of these natural resources. For these reasons utilities are provided with the governmental power of eminent domain which makes possible the compulsory sale of private property. Thus the law recognizes that, socially considered, these properties are being put to the *highest uses* of which they are capable.

The character of public utility plants depends upon the technology of the particular industry. Each of these industries has had a distinct history. In the course of constructing these plants we meet all the varying stages of transmutation of capital. The so-called free or liquid capital is changed into durable and specialized forms, emerging often in the most specialized types of buildings, structures, and equipment, capable of use in only one industry, often only in connection with the particular plant of which they are a part. In this form capital is definitely committed to or "sunk" into one kind of enterprise. Many of the permanent improvements erected upon the land possess in a high degree this characteristic of being specialized to one or a few uses. It is not often possible to shift them to other uses, as a store, a factory, or a warehouse may be. The roadway and track of a railway, for instance, is so completely "specialized" that only the rails and rail-fastenings can be salvaged, as many steam and electric railways have recently come to realize. These characteristics of specialization, durability and immobility are included in the definition of "fixed capital." In this connection it is also well to bear in mind the specialized managerial and engineering talent required in constructing and operating these enterprises.

A utility which has assembled its plant and thereby incurred heavy construction costs of a "fixed" character anticipates that the product can be sold at a profit. The immobility and specialization of these forms of capital militate against their being used

for other purposes and in other locations. If expectations are not realized the utility will suffer a pecuniary loss because the government has not undertaken to secure the utility against such risks. The loss is usually estimated by taking the difference between the capitalized value of the net income actually realized and the cost of construction less the salvage recoveries. It is therefore highly important that each enterprise take into account the economic *principle of proportionality* which requires that enterprises be so planned and managed that the maximum of physical output may be secured at the lowest possible money cost and that this maximum supply does not exceed the reasonable, long-run demand for service.

Estimating the future requirements of service is a difficult process. Individual public utility plants now have large producing capacity. With the growth in size of cities and the economic development of the nation the plants have expanded in size. For this reason the enterprises are highly capitalistic and must be capable of commanding a large amount of credit.

But there is another aspect of the matter. Technical improvements involving much fixed investment of capital are also more economical. A double track railway has more than twice the efficiency of a single track railway. Electrical generators of large capacity cost less per kilowatt than do generators of small capacity. The cost of operating large plants thus tends to be less than for small plants. Public utilities are therefore anxious to increase the volume of business.

In addition there are peculiarities arising out of the *time when the demand of customers comes* and these have a special influence upon cost of production. All public utilities must stand ready to supply their services *when and as customers demand them.* From the point of view of this obligation utilities may be divided into two classes according to the ease or difficulty with which they meet this situation.

The first class comprises utilities which must adjust themselves to variations in the amount of service demanded by having constantly ready a productive capacity equal to or exceeding the maximum demand for service which customers may make upon the plant at any one time. This creates a situation where the plant will have *spare* capacity for service at other times in the shape of idle equipment and reserves of employees. This class has been called the "service type" of utility. Concretely, the type is exemplified by electric utilities, telephone and telgraph utilities, the different kinds of transportation utilities, and

the postal service.[22] Here the nature of the service is such as not to permit of delay if it is to be performed efficiently. Technical development has not been successful in making available for instant use surplus service which existing equipment might have produced at times of low demand. Storage batteries, for instance, in the case of electricity supply, are neither practicable nor economical except for unimportant special purposes. Changes in the volume of business can not be met by a policy of meeting peak requirements in part by stored supplies of the past. This has a tendency, therefore, to make cost of operation more expensive.

The second class consists of those utilities where the inequalities in customers' requirements may be met, at least in part, by a policy of production and storage of surplus to meet future deficiencies. This class has been called the "product type." It is exemplified by water and gas utilities which may produce at a uniform rate, impounding the water and storing the gas not required to meet immediate demands in reservoirs, standpipes, and holders against the excess demands of the future. Storage facilities enable this type to supply products under conditions of maximum efficiency, that is to say, of uniform output within the productive limits for which the plant was designed. Utilities of the first class must have a producing capacity sufficient to meet the maximum demand. They render a service which can not be stored. Utilities of the second class need have a producing capacity equated only to meet an average demand but they must provide storage capacity. We must, therefore, compare the operating efficiency of the product-type utility, based upon a constant output with costs enhanced by an added investment in storage facilities, with the operating efficiency of the service-type utility with its lessened efficiency resulting from a variable output with costs enhanced by "standby" losses and the carrying charges for idle equipment.[23]

The services of public utilities are thus conditioned by factors which tend to differentiate them from other business enterprises. They minister to wants which are regarded as basic. The supply of water, light, heat, power, transport, and communication is basic to any one for civilized and comfortable living. But

[22] Storage facilities in receiving freight do not meet the situation. "Embargoes" against receiving shipments or the delays in delivering them, while they may alleviate congestion, constitute an admission that service is inadequate.

[23] Economy in the utilization of plant derived from "interconnection" in the case of super-power systems has already been mentioned.

these services are also essential from a social point of view. They are necessary economic functions because they are the basis for the specialization of occupations and the interdependence which exist in modern economic society. Without, for instance, a transportation system, national and international in scope, our present complex mechanism of production and exchange of products would disintegrate into its primitive, self-sufficient components.

CHAPTER IV

THE LEGAL ORGANIZATION OF PUBLIC UTILITIES

Thus far the development of public utilities has been given in large outlines, first in their world setting and then upon the background of the history of our own country. We will now consider the *agency* which society employs in getting things done in the field of the public utilities.

Sec. 1. The Public Service Corporation

With rare exceptions public utilities are organized as corporations. The basic principles of the American law of corporations are derived chiefly from the seventeenth and eighteenth centuries and were first formulated systematically by Blackstone in 1758. They have since been greatly modified and expanded by legislation and judicial decisions. It is important that the law recognizes the continuous existence of groups and of the social functions that these groups may perform; that it seals this recognition by investing forms of group life with legal personality. In the sonorous language of Chief Justice Marshall in the Dartmouth College Case, "a corporation is an artificial being, invisible, intangible, and existing only in contemplation of law." A corporation has been defined "as an association of persons who have united themselves or their capital for the performance of a definite purpose, and who, as such association, have secured from the sovereign authority in the jurisdiction in which the association is domiciled, a franchise to exercise certain powers beyond those comprehended within their natural rights as individuals."[1]

[1] Ignatius, M. B., *The Financing of Public Service Corporations.* The Ronald Press Co., 1918, p. 1. The definition of a corporation from the functional point of view is as follows: "A corporation is a body of persons upon whom the state has conferred such voluntarily accepted but compulsorily maintained relations to one another and to all others that as an autonomous, self-sufficient, and self-renewing body they may determine and enforce their common will and in the pursuit of their private interest may exercise more efficiently social functions both specifically conducive to public welfare and most appropriately exercised by associated persons." Davis, J. P., *Corporations, their Origin and Development,* G. P. Putnam's Sons, 1905, Vol. 1, p. 34.

What is it that makes the corporation so well adapted to the requirements of the public utility business? The first fact to be noted is that public utilities involve the large scale use of capital. In spite of a public policy hostile to combinations, these enterprises have been changed from scattered, unrelated and competing units into connected, correlated and, in large part, monopolistic units. The Interstate Commerce Commission has adopted a classification of railroads based upon gross operating revenues. In 1924, out of 822 operating companies of all classes, 178 or 22 per cent. had revenues in excess of $1,000,000 but they controlled 91 per cent. (234,976 miles) of the total mileage (257,425 miles); they originated 92 per cent. (1,023,745,007 tons) of the total tonnage (1,111,822,000 tons); and they earned 96 per cent. ($5,559,092,708) of the total operating revenues ($5,766,989,736). There are still numerous small companies, but they are being eliminated or absorbed. The same movement toward concentration is going on elsewhere in the public service field. Taking account only of the statistics for the past two or three decades, after the developmental period had come to a close, a very clear tendency toward larger business units appears. The figures, as derived from the Census or from the Interstate Commerce Commission, are shown in Table VIII, pp. 84 and 85.[2]

Although these figures give some idea of the tendency toward concentration, they fail to show the tremendous control over capital which individual business units have come to represent. In 1924 the Pennsylvania Railroad, for instance, reported an investment in round numbers of $2,123,000,000, with annual operating revenues in excess of $624,000,000. The Commonwealth Edison Company of Chicago reported an investment of $230,500,000, and its annual operating revenues amounted to $53,700,000. The New York Edison Company had an investment account in excess of $282,500,000 and operating revenues of $53,500,000. The American Telephone and Telegraph Company including its Bell System subsidiaries has carried integration farthest. For 1924 it reports an investment in excess of $2,664,000,000 and gross revenues exceeding $657,000,000. The entire iron and steel industry, including iron and steel works, rolling mills and blast furnaces, represents an investment, according to the 1919 Census of Manufacturers, of only $3,600,-

[2] The increase is shown by means of three indices, (a) the average number of employees per company, (b) the average operating revenue per company, and (c) the average investment in fixed capital. The last two columns of the table also show how important the capital factor is in relation to operating revenues and number of employees.

TABLE VIII

INCREASE IN THE SIZE OF THE BUSINESS UNIT FOR TYPES OF PUBLIC UTILITIES

Year	No. of Companies	No. of Wage Earners	Investment in Fixed Capital (thousands)	Operating Revenues (thousands)	Unit Analysis				
					Employees per Company	Operating Revenue per Company	Investment in Fixed Capital per Company	Investment per Dollar of Oper. Rev.	Investment per Employee
Steam Railroads									
1892	1002	821,415	$ 8,690,083	$1,171,407	820	$1,169,069	$ 8,672,734	$ 7.4	$10,579
1897	1158	823,476	9,709,329	1,122,090	711	968,989	8,384,568	8.7	11,790
1902	1219	1,189,315	10,658,321	1,726,380	976	1,416,227	8,743,490	6.2	10,738
1907	1564	1,672,074	13,030,344	2,589,106	1069	1,655,438	8,381,420	5.0	7,792
1912	1298*	1,716,380	16,004,745	2,906,416	1322	1,461,028	12,330,312	5.5	9,325
1917	1168*	1,732,876†	18,574,297	4,115,413	1484	3,523,470	15,046,487	4.5	10,719
1922	1041*	1,626,834†	20,580,168	5,674,483	1562	5,450,992	19,769,614	3.6	12,650
Electric Railway Utilities									
1902	987	140,769	2,167,634	250,505	143	253,804	219,618	8.7	15,399
1907	1286	221,429	3,637,669	429,744	172	334,171	2,828,669	8.5	16,428
1912	1260	282,461	4,596,563	585,931	224	465,024	3,648,066	7.8	16,273
1917	1307	294,826	5,136,442	730,108	225	558,614	3,929,948	7.0	17,422
1922	1200	300,523	5,058,762	1,049,800	250	874,833	4,215,635	4.8	16,833
Manufactured Gas Utilities									
1904	1019	.....	721,035§	125,145	....	122,811	707,591	5.8	.....
1909	1296	51,007	915,537§	166,814	39	128,715	706,433	5.5	17,949
1914	1284	63,993	1,252,422§	220,238	50	171,524	975,406	5.7	19,571
1919	1022	63,328	1,465,656§	329,279	61	322,190	1,434,106	4.5	23,143
1924	984	87,800	.....	438,000	89	445,122	.....	....	.....
Electric Utilities									
1902	3620	30,326	504,740	93,404	8	25,802	139,431	5.4	16,643
1907	4714	47,632	1,096,914	195,736	10	41,522	232,693	5.6	23,029
1912	5221	79,335	2,175,678	338,773	15	64,886	416,717	6.4	27,424
1917	6542	105,541	3,060,392	586,524	16	89,655	467,806	5.2	28,997
1922	6355	150,762	4,465,015	1,072,119	24	168,704	702,598	4.2	29,616

TABLE VIII—(*Continued*)

INCREASE IN THE SIZE OF THE BUSINESS UNIT FOR TYPES OF PUBLIC UTILITIES

Year	*No. of Companies*	*No. of Wage Earners*	*Investment in Fixed Capital (thousands)*	*Operating Revenues (thousands)*	*Unit Analysis*				
					Employees per Company	*Operating Revenue per Company*	*Investment in Fixed Capital per Company*	*Investment per Dollar of Oper. Rev.*	*Investment per Employee*
Telephone Utilities									
1902	4156	78,752	$ 389,228	$ 86,826	19	$ 20,892	$ 93,667	$ 4.5	$ 4,942
1907	1636	131,670	820,417	175,750	80	107,427	501,427	4.7	6,231
1912	1916	183,361	1,081,433	253,894	96	132,512	564,422	4.3	5,898
1917	2200	244,490	1,435,912	372,502	111	169,319	652,687	3.9	5,873
1922	1323	290,333	2,129,774	656,824	219	496,466	1,609,806	3.2	7,336
Telegraph Utilities									
1902	25	27,627	161,680	40,930	1105	1,637,201	6,467,183	4.0	5,852
1907	26	28,034	210,046	51,584	1078	1,983,994	8,078,691	4.1	7,492
1912	27	37,295	222,047	64,763	1381	2,398,624	8,223,213	3.4	5,954
1917	27	51,574	243,358	109,703	1910	4,063,090	9,013,275	2.2	4,719
1922	24	68,632	326,662	151,858	2860	6,327,417	13,610,917	2.2	4,760
Water Utilities ‡									
1905	118	.....	572,172	60,027	....	508,703	4,848,913	9.5	.....
1910	138	.....	783,126	64,502	....	467,409	5,674,826	12.1	.....
1915	155	.....	1,071,202	.....	....	.....	6,910,977	....	.....
1919	175	.....	1,257,832	95,304	....	544,595	7,187,609	13.2	.....
1923	193		1,512,000	135,000	....	699,481	7,834,196	11.2	.....

* Terminal companies excluded since 1912.
† Class I roads only.
§ Net capitalization.
‡Municipally owned enterprises in cities in excess of 30,000 population.

000,000. With this figure heading the list of manufacturing industries, even individual public service enterprises may be brought into a challenging comparison.

Only a state or a corporation, capable of gathering the accumulations of large and small investors, can cope with the magnitude of the financial problem. How wide the distribution of public utility securities may be, can not be ascertained with any degree of exactness. It is estimated that the number of investors in gas utilities exceeds 400,000, in telephone utilities 600,000, in street railways 1,500,000. Accurate figures are available for 156 companies operating local utilities. Between 1914 and 1924 these companies increased the number of their stockholders alone by 426,495, to whom 3,449,189 shares were disposed of in so-called customer-ownership campaigns. The number of shareholders in 20 principal railroads of the country increased from 154,610 in 1904 to 626,969 in 1922. The Commonwealth Edison Company of Chicago increased the number of its shareholders from 11 in 1893 to 7,000 in 1919. In that year it began to sell its stock widely in a customer-ownership campaign, and by August, 1924, it had increased its shareholders to 46,980, including over 4,000 employes.[3] What may be the number of bondholders, it is impossible to say. Undoubtedly there is also much duplication in the figures. Yet ratios obtained in a few cases of 2 stockholders per 100 of tributary population and of 5½ stockholders per 100 of customers indicate that a change has come and that the public utility investment market is no longer as restricted as it once was.

Other large holders of public utility securities are savings institutions such as banks, trust companies, and insurance companies. It is estimated, for instance, that of the six billions of assets of life insurance companies, in excess of two billions are invested in public utility securities. Thus the financial interests of about 35 million policy holders and of about 27 million depositors are focussed in public service corporations.

The corporate form of organization with its limited liability of shareholders was admirably adapted to limiting the risk of investment in public utilities.[4] By restricting the shareholders' risk of loss to the amount of stock subscribed, the corporation rendered a great social service during the developmental pe-

[3] Heilman, R., "Customer Ownership of Public Utilities," *Journal of Land and Public Utility Economics*, Jan. 1925, Vol. 1, p. 7.

[4] In some states, Minnesota and California for instance, the shareholders of public service corporations are subject to double liability.

riod. Herein resides its great superiority over the partnership with unlimited liability.

On account of the permanent service rendered by public utilities the corporation, with continuity of life, is also better adapted to them than are other forms of business organization. An enduring function must be given an enduring organization. The corporation also has a high degree of flexibility in the administration of affairs. By delegating responsibilities of management to directors, executive committees and officers, it is possible to secure the intelligent initiation of policies, their approval by stockholders, and the speedy decision of important questions arising in the day-to-day administration of corporate affairs. This flexibility extends also to financing,[5] for by agreement among the shareholders and when authorized by the state, a corporation may classify its shares into common and preferred.

The voting power of capital stock is a very complex matter. By statute in most states all classes of stock have voting power so far as concerns the sale of a substantial part of the assets of corporations. According to by-laws most preferred stock has voting power when dividends are in arrears by certain specified amounts. In many cases preferred stock has equal voting power with common stock. Nevertheless, under normal conditions, there is a tendency to restrict voting power to common stock alone, and latterly, by a process of classifying common stock, this privilege has been even further restricted.

A corporation has the power to borrow money if this is necessary and appropriate for the transaction of its business. But the state may limit the amount which it may borrow, or prescribe the conditions under which it contracts these debts. This is peculiarly true of public service corporations. In this connection the power of a corporation to pledge or mortgage its property in making loans becomes important. This power was specifically conferred by statute upon public service corporations and surrounded with safeguards, because a mortgage or pledge may result in the sale of the property for the benefit of creditors and might thus prevent the companies from performing their public utility functions. We may note here, parenthetically, that public service corporations have also been limited in their power to sell property needed in the public service.

The debts incurred are usually for long periods. Capital so obtained is used in the construction or acquisition of a plant. The interest obligations assumed constitute for many years the

[5] Explained more fully in Chapter XVII.

fixed charges against the income of the corporation. Financial practice has classified debts maturing after a period greater than one year as funded debt, and those maturing in one year or less as unfunded or floating debt. This distinction is important because in regulating the borrowing power of public service companies the state has restricted itself to the funded or long-term debt.

A corporation has the power to make contracts in the corporate name. It is this power which is important in all relations with creditors, with those from whom it buys, with those whom it hires as officers, agents, and employees, and with those to whom it sells service. Most important of all is the power of a public utility corporation derived from its charter to produce a certain commodity or service and to sell it to customers.

Sec. 2. The Trust Form of Public Utility Organization

Public utilities are sometimes organized as business associations under deeds of trust. This form has been most highly developed in Massachusetts. In that state the law prohibited the organization of corporations for the purpose of holding and dealing in land. Since public utilities use land in varying amounts, utilities in Massachusetts adopted the trust form of business organization.

A trust is created by executing a deed of trust. This is a contract between the owners of property, called beneficiaries, and a trustee or board of trustees. The trustee holds the legal title, but the beneficiaries receive certificates of stock, not unlike the stock of a corporation, upon which they receive dividends. There may be both common and preferred shares. They are assignable and may be sold. In fact, the deed of trust can provide for any desired division of income, risk and control.

Management, however, is in the hands of trustees who carry on operations under a business name, as for example, the Massachusetts Electric Companies. They fix the rate of dividends to be paid upon the shares, appoint and remove executive officers and in all respects carry on the business as would a board of directors. The rights and duties of the trustees and of the certificate holders are fixed in the deed of trust. The trustees are accountable to the beneficiaries, but their right to exercise managerial powers may not be questioned. Instead of being elected annually as is a board of directors, they are permanently in control for the duration of the contract and may fill vacancies.

The legal form of organization may be molded at will at the time the trust is created. A trust may increase its membership by selling stock; it may hold the stock of other corporations; it may provide for the selection of new trustees with continuity of management assured. It provides for reasonable security against mismanagement by holding trustees personally liable for gross negligence or bad faith. Trustees receive compensation for their work, but beyond that may derive no direct or indirect benefit from such management. The trust limits the liability of loss of the beneficiaries to the amount they have invested. Its weaknesses reside in the lack of control stockholders have over trustees and the difficulty encountered in adjusting legal relations. It has also been criticized because it is said to make regulation more complex and difficult. Compared with the corporation, however, the trust remains of minor importance since its use has been confined largely to one state.

Sec. 3. **The Holding Company, its Character and Purpose**

The holding company device was introduced in order to facilitate combination. It does this by building corporations into systems so that all are subject to a single control. Speaking generally, holding companies are not operating companies; as the name indicates, they merely own the common stock and other securities of operating companies so as to control their policies. The advantage of the holding company over other forms of combination is that control may be secured with very much less difficulty and without the use of so much capital. Control is assured by owning only a bare majority of the voting stock of a particular corporation.

American corporations, in their early history, were not permitted to own the shares of other corporations. Beginning with a New Jersey statute of 1896 most states now authorize such ownership and it is customary to confer such power in a corporation's charter. The real purpose lying back of the organization of a holding company usually is the desire to secure an increased profit by placing under common management the affairs of operating companies, without destroying their separate corporate existence. Sometimes state laws provide that no foreign corporation may own real estate or carry on certain businesses, such as pipe lines, railroads or other public utilities. By retaining or organizing a domestic subsidiary corporation, the parent company, though organized in another state, can obey the state

law and still retain control. Subsidiaries are often created in order to carry on special lines of business which are conveniently run as separate enterprises because they are experimental or hazardous.

Historically, the chief purpose of holding companies has been to eliminate competition.[6] Since local public utilities tend toward monopoly anyway the organization of holding companies has not met with as much opposition in this field as has the organization of railroad holding companies. Moreover, by retaining local representation upon the board of directors of each subsidiary, it has all of the appearance and some of the reality of being a local enterprise.

The usual method of purchasing subsidiaries is that a holding company offers its own capital stock in exchange for the capital stock of the companies which it seeks to control. If the exchange can not be effected the stock must be bought outright, but the holding company may in turn deposit this stock as security for collateral trust bonds which it sells to the public. By this means a portion of the capital outlay is recouped. Or it may issue its own securities—preferred or common stock—and purchase control with the cash proceeds. This alternative, however, is open only to well-known holding companies having an established financial reputation.

The capital of a true holding company, therefore, does not consist of fixed property, but of the stocks and bonds of other corporations. It has been said that holding companies own only a stockholder's equity in the operating companies. Their earnings consist of the dividends, and usually also of interest paid upon the securities of the controlled companies, and their financial standing is therefore only as sound as are these securities.

No definite information is available of the extent of holding company control over public utilities. It is known, however, that they are most prevalent in the field of local utilities. They dominate the situation in the telephone, gas, electric light and power, and electric railway fields.

(a) *Examples of public utility holding companies.*

According to Dewing[7] the first corporation analogous to the modern holding companies was the United Gas Improvement Co., a Pennsylvania corporation chartered in 1882. It was or-

[6] Wyman, Bruce, *Control of the Market*, Chap. IX. Moffat, Yard and Co., 1911.

[7] Dewing, A. S., *Financial Policy of Corporations*, The Ronald Press Co., 1920, Vol. 4, p. 111.

ganized to secure wider use for an improvement in the gas industry, the manufacture of water gas. In order to introduce the new process the company first leased the gas plants and later acquired the stock of the companies. The stocks were then segregated in the hands of trustees because the company was not empowered to own them. Eventually, by acquiring the liberal charter of the Union Company, granted by a special act in 1870, and by changing the name of this company to United Gas Improvement Co. in 1888, the way was cleared for the new company to acquire the assets of the old company including the shares of gas companies held by trustees. It has since expanded its control over gas and electric utilities in all parts of the United States.

Another early holding company is the North American Company, organized in 1890 with a broad charter, and with the main purposes of railroad financiering and of promoting electric light and power enterprises. It acquired the assets and business of the Oregon & Transcontinental Company—one of the first railroad holding companies, organized in 1880—but developments in the railroad and financial fields shortly thereafter induced it to confine its operations almost entirely to local utilities. In the very infancy of public utilities it was found that competition was wasteful and the North American Company's most important early step in the utility field was the consolidation of the various competing electric light and power and street railway companies situated in Milwaukee, Wis., into one unified company. Subsequently it carried on like consolidations in Cincinnati, St. Louis, and other cities. In its program of expansion it has since aimed at securing integration and economy of operation by controlling operating subsidiaries in contiguous, heavily populated territories. The company's present utility holdings are grouped around the industrial sections of Wisconsin, centering in Milwaukee; the central Mississippi River valley extending from Keokuk to the lead belt of Missouri and centering in St. Louis; the city of Cleveland, and adjoining area; the California district from Sacramento to Bakersfield, including the cities of San Francisco, Oakland, and Fresno. The company also has substantial but not controlling interests in utilities in Detroit, Mich., and Washington, D. C.

An interesting holding company of local public utilities is the Standard Gas and Electric Co.[8] incorporated in Delaware. This

[8] H. M. Byllesby & Co. own 1,000,000 shares of 6% non-cumulative preferred voting stock of $1.00 par value, which is the entire issue of this

is a holding company of holding companies, where the subholding companies exercise control over operating subsidiaries, each in separate geographical districts. By owning utilities in widely scattered territories the risk of ownership is reduced.

(b) *Holding companies in the field of transport.*

The Atlantic Coast Line Company is an illustration of a holding company in the field of transportation. Professor Ripley [9] describes it as follows: "The peculiar interest of the Atlantic Coast Line Company lies in its relatively small capitalization, as compared with the volume of its possessions. In 1909 its share capital amounted to $12,600,000. In addition it had outstanding $13,000,000 certificates of indebtedness. This enabled it to hold a bare majority of capital stock of the Atlantic Coast Line Railroad Company. This company, in turn, had in the course of events come into possession of 51 per cent. of the stock of the Louisville and Nashville road. Then this road, in order, had large interest in a number of other allied or connecting companies. In 1906, the extent of all these possessions was not less than 11,000 miles of line, with a total capitalization of $725,000,000. Absolute control of this great property was thus vested in a bare majority of the capital stock of the Atlantic Coast Line Company, which stood at the head of the list. No more than $6,500,000 was needed for this purpose. And this much was said to be actually owned by a single individual. It was indeed a financial pyramid balanced on its apex."

The most illustrious example of a railroad holding company was the Northern Securities Company. Owing to the fact that states, following a time-honored policy to promote competition, had prohibited the consolidation of parallel or competing lines, James J. Hill, in 1901, incorporated the Northern Securities Company in New Jersey. It acquired control of the Northern Pacific Railway Company through its ownership of $153,750,640 par value of the capital stock, out of a total of $155,000,000. It also had control of the Great Northern Railway Company by holding $118,124,200 out of $124,109,200 of the par value of its capital stock. In a famous decision in 1904 the United States

voting stock of the Standard Gas & Electric Company. The Standard Company in turn by an ownership of a majority of voting stock controls the Byllesby Engineering and Management Corporation and the operating subsidiaries.

[9] Ripley, W. Z., *Railroads—Finance and Organization*, Longmans, Green & Co., 1915, p. 434.

Supreme Court declared that such control was illegal and directed that the holding company be dissolved.[10]

(c) *Finance and management companies.*

A distinct type of holding company is one created to aid in financing local operating concerns. From the earliest days of the electric industry it was realized that, in order to encourage the establishment of central stations and electric railways, the manufacturers of electrical equipment would have to interest themselves in securing capital for their customers. Accordingly, Edison[11] early organized the Edison Electric Lighting Company to hold the stocks of local lighting utilities. It came into possession of these stocks in return for licenses to operate under Edison patents. Similarly the Thomson-Houston Electric Company of Lynn, Mass., acquired the stock of the United Electric Securities Company, which owned the bonds of local electric and street railway utilities. When these manufacturing interests were merged in 1892 into the General Electric Company the policy of encouraging the sale of equipment through the medium of affiliated finance companies was continued. Until recently the affiliated finance companies were three: the old United Electric Securities Company, the Electric Bond and Share Company, and the Electrical Securities Corporation. These companies buy the bonds and stock of local utilities. The Electric Bond & Share Co. controls the American Gas & Electric Company which is a holding company of local utilities. It has also a substantial stock interest in the American Power & Light Company which in turn controls operating public utilities.[12]

And, finally, some holding companies stress the advantages which a parent company has in managing subsidiaries. These subsidiaries are financially independent, their only bond of

[10] The question raised in that case was whether the holding company device facilitated restraint of trade as prohibited in the Sherman Act of 1890. As the Court observed: "If Congress has not by the words used in the Act described this and like cases, it would, we apprehend, be impossible to find words that would describe them." If the holding company device is not to be outlawed, "then the efforts of the national government to preserve to the people the benefits of free competition among carriers engaged in interstate commerce will be wholly unavailing, and all transcontinental lines, indeed the entire railway systems of the country, may be absorbed, merged and consolidated, thus placing the public at the absolute mercy of the holding corporation." *Northern Securities Co.* vs. *U. S.*, 193 U. S. 197 (1904).

[11] His central manufacturing plant was the Edison General Electric Company of Schenectady.

[12] The General Electric Company has disposed of its holdings of Electric Bond & Share Company stock by distributing them to General Electric Company stockholders.

union being that the same firm of engineers acts as managers for them, and that they market their stocks and bonds through the medium of the same holding company. This is the purpose of the Railway and Light Securities Co. organized in 1905 by Stone and Webster, managing engineers of Boston. The same purpose is served by the Public Service Investment Company organized in 1909, which is another satellite of Stone and Webster. Other corporations which serve as managers for groups of public utilities are J. G. White & Company of New York, and the H. M. Byllesby Company of Chicago.[13]

Sec. 4. Advantages of Holding Companies

The holding company has been defended as a form of the combination movement because it makes available by means of a central organization the specialized skill of experts on construction and operation. Such skill, it is claimed, could not be made available to small local plants at so low a cost. This advantage is the one upon which the management companies are based. The holding company becomes the clearing house for the exchange of information and experiences growing out of operating difficulties and ways of overcoming them. It maintains research organizations for the study of the varied problems.

In the promotion of the earlier local utilities by local capitalists hired managers were depended upon to supply the technical skill. Such technical skill, largely self-acquired in the course of practical operation, was adequate for early beginnings, but was not adequate to meet the diverse technical problems of these growing industries. By combining small local utilities into a public utility system, a larger volume of business was secured and this made possible the organization of a technical staff of managing and construction engineers. The overhead cost of maintaining such services was relatively small for the enlarged management unit. A program of technical improvements could thus be laid down by the holding company for its local subsidiaries and carried out by local managers under expert staff guidance. It is also claimed that the holding company restores some of the vitalizing effect of competition by facilitating comparisons between subsidiaries belonging to the same system. Public service commissioners readily agree that many small

[13] Further examples are the Doherty Operating Co., which operates properties controlled by Cities Service Co., consisting of 65 companies with numerous subsidiaries, and the Middle West Utilities Co. of Chicago, which manages 29 subsidiaries.

local plants have been rescued from the scrap heap after being purchased by a holding company. By supplying additional capital for improvements, by standardizing operating routine under holding company managers, hotbeds of service complaints have developed satisfactory customer relations.

Closely allied with the above advantage is that of combining purchases for greater economy, and for greater care and judgment in the selection of materials and equipment. By standardizing the use of equipment and consolidating the purchases of subsidiaries the manufacturing problem is made easier. On this account manufacturing companies can be induced to offer larger discounts upon purchases when the purchase contract is negotiated by a centralized purchasing department. Economies in the use of equipment can also be realized by shifting equipment from a use in one location where it is rendered inadequate or obsolete to some other location where these conditions do not obtain. The same interchangeability of use applies also to surplus stores of all kinds.

The chief advantage, however, arises out of the financial aid which subsidiaries receive from the parent company. By maintaining its principal office in a leading money center the holding company is in a position to take instant advantage of favorable turns in the money market. It supplies subsidiaries with funds either upon open account or upon demand notes, and is thus able to stave off the need for more permanent financing until a good opportunity arises. However, the benefit does not always go to the subsidiary. The larger subsidiaries often have substantial cash balances which can be turned over for productive use to the parent company which may transfer them to other subsidiaries.

The parent company will also arrange for more permanent financing either by taking charge of the negotiations with investment bankers or by acquiring the subsidiaries' securities direct. It may then hold them as permanent investments or for later sale. In view of the rapid development of local utilities since 1900 the financing of extensions and improvements has become a major problem. By backing up the weaker subsidiaries with its own strong credit the holding company can provide the means requisite for expansion. It is also said that a holding company makes public utility investments more attractive by averaging the risk. Not only does it combine utilities of the same kind that are scattered geographically, but it may also combine utilities of different kinds.

These financial arrangements have sometimes been criticized to this effect, that strong subsidiaries with independent credit would have been able to borrow on more favorable terms without the intervention of holding company financing. This does not apply, however, where holding companies have followed the policy of negotiating the more permanent loans for subsidiaries with strong established credit directly. It is certain that the smaller companies often experienced difficulties in marketing their own securities, but when they were offered for sale by a well-known holding company that owned all or a substantial majority of their common stock, buyers knew that the holding company could be depended upon to protect such securities in order not to jeopardize its own credit standing. By purchasing these securities for its own treasury and later consolidating them with other issues by other subsidiaries as a basis for security issues of its own, a holding company can give securities a wide marketability. Although less frequently done, the holding company may also guarantee the payment of principal and interest on loans made by subsidiaries. Again, holding companies, having established connections with bankers, can exert pressure to induce them to take weaker securities on the plea that established investment channels "should take the little berries along with the big berries."

As an illustration of the services rendered by holding companies we may cite the case of the American Telephone and Telegraph Company which provides the following services to its subsidiaries:

1. Furnishes equipment and repairs.
2. Licenses patents controlled by it to subsidiaries.
3. Gives legal advice and assistance in appearances before state commissions, income tax authorities, the Federal Trade Commission, the Interstate Commerce Commission.
4. Gives engineering advice upon management and construction problems.
5. Studies traffic conditions, compiles statistics, and makes the results of its investigations and experiments available to the associated companies.
6. Furnishes efficiency experts for the study of commercial and operating conditions.
7. Aids in financial operations often with the result of preventing unwise expenditures.
8. Facilitates standardization of equipment and operating practices by establishing uniform service conditions among subsidiaries and otherwise aiding in the development of uniform service standards. Through securing uniformity of plant and practices, it was a great aid in making possible long-distance communication.
9. Provides a system of uniform accounts.

Sec. 5. The Holding Company and its Critics

The holding company is not without its critics. These point to the danger of having managerial responsibility for operation dissociated from financial responsibility, contending that officials of subsidiaries lean too heavily upon the holding company. It is also objected that control is often in the hands of a minority stock interest because, given the general apathy of stockholders, a small capital investment may serve to control large sums invested in the securities of subsidiaries.

Another criticism relates to the way in which holding companies have added to the complexity of intercorporate relations. They are often merely corporations existing on paper. This is particularly true of the so-called sub-holding companies. They may have a board of directors whose personnel is exactly identical with that of the real parent holding company. In this way intercorporate relations are created which tend to make regulation more difficult, besides adding to the complexity of the financial and managerial situation. From the corporate standpoint such complexity is also undesirable, particularly when consolidation would eliminate the multiplicity of reports and taxes required under recent legislation.

Again, it is charged that the holding company device leads to manipulation of the accounts and securities of subsidiaries so as either to hide losses of subsidiaries or to conceal profits until insiders may reap the benefit by purchasing securities from discouraged holders before the true facts appear. More than that, holding companies sometimes conceal the facts in regard to certain expenditures which they do not wish to reveal. They may thus withdraw facts which the legislatures intended should always be available through the publicity of accounts of the operating companies. One company, for instance, is alleged to have spent approximately 10½ per cent. of its total receipts from subsidiaries through a special reserve and an unusual contingency fund, amounting to $2,049,597.46. Sums ranging from $100.00 to $80,621.00 are recorded as having been paid to individuals not regularly in the employ of the company without explanations as to the nature of their services. Whether these expenditures were improper or not, the possibility of impropriety is present, and the procedure, naturally enough, has been severely criticized. This situation gives rise to one of the very difficult problems of regulation.

Another criticism relates to the loose nature of the consolida-

tion brought about through holding companies, especially where the lease has also been utilized to bring about unified operation. This is exemplified in a recent decision by the Pennsylvania Public Service Commission in which the commission says: ". . . The underlying companies have, through the means of stock ownership, leases, etc., been rather loosely drawn together. . . . Proceedings have been instituted by some of these companies in the United States District Court of the Western District of Pennsylvania for leave to foreclose mortgages, and for the purpose of enabling these companies to take possession of the particular part of the Pittsburg Railways System owned by them. Thus another serious situation is presented. Disintegration of the system into its component parts, and these separately operated, present a threatening situation so detrimental and dangerous to the public interests of Pittsburg that every effort ought to be put forth to avoid it. It is, however, but the natural sequence following the gathering together, in loose form, of such a large number of separate but still existing corporations. . . . The outstanding stocks, bonds, and other indebtedness of some of these underlying companies, to the payment of which the Pittsburg Railways Company is obligated, when added to the respondent's own obligations, have imposed a financial burden upon the operating company which has led it to neglect to maintain properly the system which it operates and to keep pace with the increasing demands of a great and growing industrial and business center. The respondent's property and its service to the public have suffered correspondingly." [14]

Finally, it is urged that holding company control retards progress. Combinations, it is claimed, are slow to make use of one great instrument of progress, the junk heap. This is the criticism voiced by independent telephone operators with respect to the American Telephone and Telegraph Company, and they point to the Automatic System which was developed by independents. The existence of a "general staff" and centralized control of patents and processes through the parent company is claimed by Commissioner Johnson of the Indiana Commission to discourage individual initiative.[15]

It is difficult to assess the comparative merits of these conflicting claims. Certainly holding company control has modified

[14] *City of Pittsburg* v. *The Pittsburg Railways Co.*, P.U.R. 1920-C, p. 458.

[15] *Re Central Union Telephone Co.*, P.U.R. 1920-B, p. 813, 855. See also *Re Rates and Charges of Tel. Cos.*, P.U.R. 1920-B, p. 411, 462; *Re Southern Bell Tel. & Teleg. Co.*, P.U.R. 1921-C, p. 833, 842; *Re Pacific Tel. & Teleg. Co.*, P.U.R. 1919-D, p. 345, 363.

to some extent the problem of regulation. As a means of consolidation it has introduced a new era in public utility operation. There is great need for a thoroughgoing study of the consolidation movement. In such a study particular attention should be paid to intercorporate relations and to holding company control.[16] At the present time opinion is divided, some regarding the holding company device as "an instrument of progress and efficiency," others regarding it as "a Buccaneer provided with Letters of Marque by one state to prey upon the citizens of another."

Sec. 6. The Question of Stockholders' Responsibility

In conclusion a word should be added concerning the inherent difficulty of conducting business under the corporate form of organization. Authority or power to act is largely delegated to the executive committee and to executive officers. The board of directors has very largely become a board which validates action already taken. It meets only on stated occasions and is none too well informed upon details. It is often constituted of individuals who are merely "ornamental directors" lending the prestige of their names to corporate actions. Without understanding details they approve acts upon the faith they repose in the principal executive officers. Individuals among them have been criticized for accepting positions upon so many boards that they could not possibly be conversant with all the details.

If this is true of the directors, it is even more true of stockholders. Their control is exercised through the board of directors who act under rules contained in the charter or the by-laws. Only through their power of electing directors and of formulating or modifying the rules under which directors act can stockholders bring their influence to bear. Voting rights are exercised by the stockholder or by someone acting on his behalf. The latter is known as voting by proxy. This power is conferred by statute or specifically conferred in the charter. On account of the indifference of many stockholders, they readily part with their voting power. Looking upon their stock merely as investments, they are willing to leave active management to a small group of men who are the dominant stockholders, but who may own only a minority of the stock and thus need the

[16] The holding company is being studied by Mr. Marcus Whitman in a doctoral dissertation, and it is hoped that the results of this study will soon be available.

additional voting power. The original abuse of the proxy system was that shareholders issued their proxies for a consideration. This has now been generally prohibited by statute. The Hepburn Committee of New York in 1879 reported as follows upon the evil of the proxy system: "The attention of the Committee had been drawn to the evils connected with the proxy system, by which railways were captured by the mere purchase of voting power from persons, mainly bankers, in whose names large amounts of stock were registered, but which had been sold and distributed to their customers, and for prudent reasons were left standing in their names on the stock books of the companies. This situation gave to such persons a large voting power in the railway without a substantial interest or stake in the result of the vote. To persons who desired to capture the road, it was a strong temptation to purchase such voting power; and to persons who had no permanent interest in the road, it was a corresponding temptation to sell the power, the evil effects of the sale of which they were not personally called to bear." [17]

In order to secure responsibility on the part of directors, the Transportation Act of 1920 made it unlawful for the same person to be an officer or director of more than one railroad without authority from the Interstate Commerce Commission. In accordance with this power the Commission has refused permission to persons to serve as directors for competing railroads when their responsibilities might turn out to be conflicting. Those who oppose the system of having members of banking firms, interested in the marketing of the securities of a public utility, serve also as members of its board of directors, have stigmatized the practice as "banker management." It is defended by bankers upon the ground that their responsibility to customers who have purchased securities upon their representations is such as to make continued contact with the affairs of such companies advisable and in the interests of public utility credit.

The passing of stockholders' responsibility in industrial enterprises was recently severely arraigned by Prof. Ripley.[18] His strictures cover the financial pyramiding of holding companies, the proxy system, the dilution of stockholders' voting rights

[17] Quoted from Ignatius, M. B., *Ibid.*, p. 85.

[18] Ripley, W. Z., "From Main Street to Wall Street," *Atlantic Monthly*, May, 1926, p. 94. For further discussion see, by the same author, *Main Street and Wall Street*, Little, Brown & Co. (1927). As to holding companies, see Chapter X.

by the practice of splitting shares, the creation of new corporations with classified common stock, where the voting stock is closely held but represents no substantial capital contribution. He finds in this trend of corporation law and practice toward diminishing responsibility on the part of legal owners "a matter of vital concern to the successful functioning of our capitalistic system." He has no very great misgivings so far as the *operating* companies are concerned. "What concerns the future is the hierarchies of holding companies, superposed one upon another—the piling of Pelion upon Ossa to the seventh heaven. This is provocative of grave concern, for it is in the heights that the real sources of power find place."

CHAPTER V

PUBLIC UTILITIES AS GOING CONCERNS

A description of public utilities from the point of view of their legal organization does not give an adequate picture of their organization as business units. The law merely sets up the *legal* framework for the prospective business unit. In order to get a *complete* picture we must also take account of the *economic* framework by means of which business is carried on. The nature of this economic framework and the functions which it serves are best ascertained by considering typical economic transactions. In negotiating these transactions the legal organization provides merely the nucleus or starting point.

Sec. 1. **The Importance and Scope of Bargaining**

The management of a public utility, in fact of any manufacturing unit, involves first, a financial problem which is one of securing funds and of administering them; second, it involves a manufacturing problem which means that productive factors must be coördinated into an engineering process which will yield an output of service utilities; third, it involves a marketing problem which links up with the two preceding since it involves the expenditure of funds in connection with the manufacturing process and the disposal of service utilities to customers. Bargaining, that is, negotiating transactions, is thus the prime element of both the financial problem and of the marketing problem. The essence of the manufacturing problem is the scientific and economical handling of natural resources and labor power in engineering processes. This problem lies outside the scope and purpose of this work except in so far as labor relations are concerned.

It is important, however, to recognize within what limits this bargaining takes place. While it is true that public utilities tend to integrate and become a single source of supply in a given market area, elements of direct and indirect competition are still present. Even if consolidation, reënforced by regulatory policy, has eliminated direct competition there is always

present the threat of competition from a would-be competitor.[1] Unless a monopolistic producer is able to satisfy all service requirements from the standpoint of quantity, quality and price, public sentiment, when not restrained by law, will favor the reception of a newcomer who promises to correct difficulties. Elements of potential competition reside in consumers themselves, who may go back to their primitive source of supply, or who may, if they are quantity consumers, undertake to supply themselves.[2] Frequently, too, there must be taken into account the competition of substitutes, as gas competing with electricity, steam power with electric power, transport by auto, truck, and motor-bus with electric railway and steam railway transport. This is in accordance with the all-important economic *principle of substitution.* It is effective to the extent that the substitute service approaches in convenience and cost the primary service. At any rate, it provides limits beyond which a monopolist may not go in his power over price or service without driving customers to seek these substitute sources of supply.

In recent years, particularly in the field of local transport, producers have sought to preempt the supply not only of a single transportation medium but also of substitute mediums. When a single producer controls all services which may compete with each other his monopoly is complete. Under these circumstances consumers have left only two alternatives, either to serve themselves or to go without, both of which may be impossible. The dependence of consumers upon the monopoly is complete and this condition constitutes the best economic reason for governmental interference.

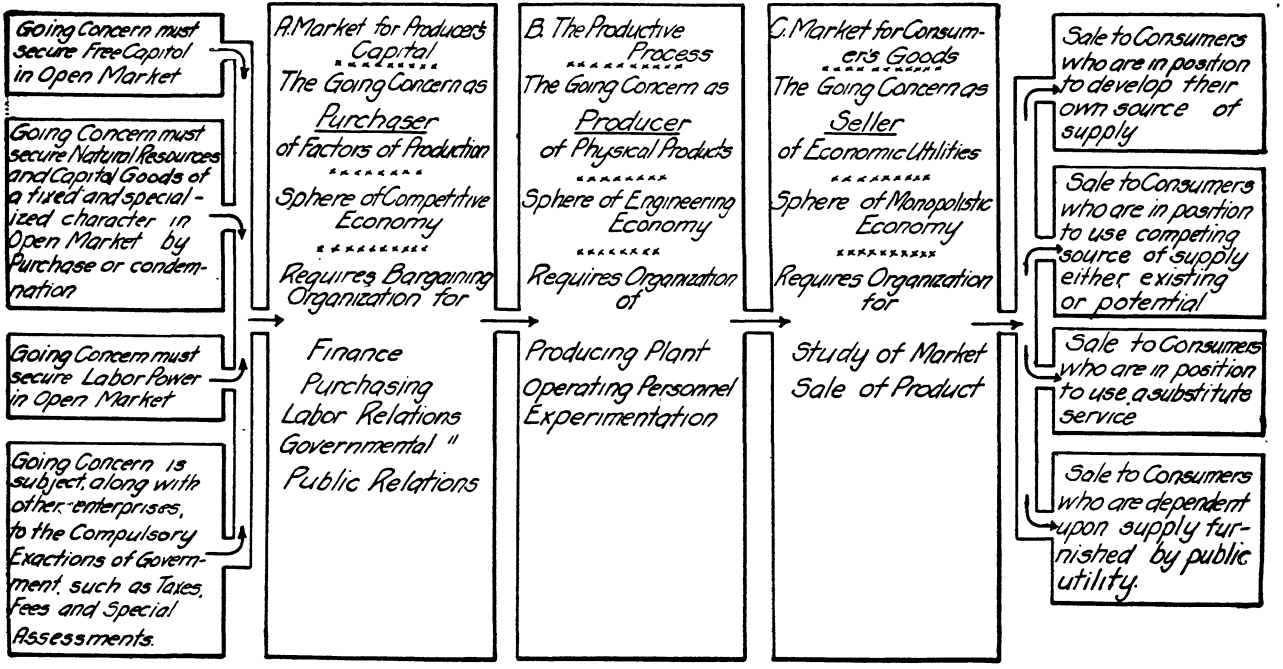
Another avenue through which competitive elements impinge upon public utilities and limit the scope of bargaining is in the market for producers' goods. A public utility usually has a sellers' monopoly, but it seldom has a buyers' monopoly. As purchasers of labor power, of free capital and capital goods of a specialized or non-specialized character, public utilities must not only compete among themselves but also with all other enterprises using these production requisites. The prices which they must

[1] A peculiar form of indirect competition is that between two monopolistic producers for consumers who are free to locate in either of the two monopolistic markets. It must be admitted that such forms of competition are not very effective.

[2] This also is not a very effective form of competition except in those cases where a business unit is large enough to operate the works as a private facility. Illustrations are power plants, pumping plants, terminal railways, motor truck organizations, and so on.

Chart XII

Diagram of Typical Market Situation of a Public Utility



pay for production goods are usually fixed in competitive markets. Except in the rare cases where a utility may have a buyers' monopoly, its power over price is limited to selling transactions. This situation as to the limits of monopoly power is illustrated in Chart XII.

The economic organization of a public utility concern will reflect the typical relations which individual business units have with the market. In its purchasing transactions prices are, on the whole, fixed by competition and the principles applying in competitive industry will there find application. The selling transactions, on the other hand, are dominated by monopoly and prices will be fixed in accordance with the principles that determine monopoly price, modified, however, by considerations of public policy as made effective through governmental control over rates. Finally, as in other manufacturing enterprises, there are transactions which relate to the production of utilities and thus take place within the concern itself. Buying, producing, and selling are the three primary functions of public utility concerns and public utility economics concerns itself with the way in which transactions having these purposes are best made and controlled. From an economic point of view these transactions may be classified into cost bargains and income bargains.

Sec. 2. **Cost Bargains**

Cost bargains are purchasing transactions by means of which public utilities secure for themselves the means of producing output. We may think of these as involving the input of money funds and the transmutation of these money funds into productive fixed plant, employees' services, and working capital, which yields in turn an output of service utilities. This flow of transactions gives us a concept of money cost which must be related quantitatively to output produced and output sold.

The first and second links in the chain of these transactions may be analyzed as follows:

1. Transactions affecting stockholders which involve:
   (a) transactions concerning dividends,
   (b) transactions concerning the disposal of the free surplus in the repayment of debt,
   (c) transactions concerning the repayment of proprietary interests.
2. Transactions with long and short term creditors which involve:
   (a) transactions concerning interest,
   (b) transactions concerning the repayment of debt.

We will call these transactions by a collective name, the *investment bargain.* By means of this bargain owners of free capital in the community are induced to contribute it for certain predetermined purposes. The rights and duties of the concern on the one hand and of the individual contributor of capital on the other hand are the subject matter of the investment bargain. In an economic sense dividend payments, since they are necessary to secure capital contributions from stockholders, are a part of the cost of service.

The other links in the chain consist of the following transactions:

3. Transactions which the concern has with those who provide raw or finished materials and appliances necessary in the construction, maintenance, or operation of the fixed plant. Also there are transactions with those from whom facilities are leased or who, as independent contractors, perform some portion of the work of construction or maintenance. We will include these transactions under the collective term, the *price bargain.*
4. Transactions which the concern has with those who will serve it in the capacity of officers or employes, are here called the *labor bargain.* Cooperation can be secured only by maintaining satisfactory conditions of employment at all times.
5. Transactions which the concern has with governmental units. They involve compulsory payments, made in accordance with a special routine, and must therefore be specially treated. These are:
   (a) transactions which determine the amount of taxes,
   (b) transactions, quasi-compulsory in character, arising out of the enjoyment of some special governmental privilege.

   All economic concerns for whose activities the government provides the institutional setting are involved in these transactions. Perhaps they are not bargains because bargaining implies volition. However, taxation proceeds under the rule of equality and proportionality, so that, while some payment is compulsory, the amount of the payment is subject to adjustment under the rule. We may therefore, with some element of propriety, speak of the *tax bargain.*

The investment, price, labor, and tax bargains provide the voluntary or compulsory basis for the beneficial inflow on the one hand of money, goods, services, and governmental protection, and for the outflow of money cost on the other. They determine also in what proportion the various productive agents share in the total receipts. The science of accounting will record these transactions and will classify the expenditures in such a manner that we get a distinction between expenditures charged to capital and expenditures charged to revenue. In the end, however, they become a part of the cost of producing specific quantities of output.

Sec. 3. **Income Bargains**

The marketing organization of the concern must also attend to the profitable sale of the output. This involves transactions with customers which we may classify under the heading of *rate bargains.* They control the outflow of beneficial services from the concern to customers and the inflow of income from customers. Since customers are not charged a uniform rate but are, for purposes of rate-making, divided into classes with a different rate applying to each class, the rates take the form of a schedule, where the entire schedule determines the total receipts while individual rates determine how much is received from each class. Rate bargains are therefore class-rate bargains.

Sec. 4. **The Balance of Expense and Revenue as the Outgrowth of Public Utility Transactions**

The business unit is thus an organization within which resides the economic nexus of cost and income. If for any appreciable length of time cost or outgo is not balanced by income or receipts, the beneficial inflow of funds, goods, and services will cease, and the beneficial outflow of services to customers must cease also. The economic health of a going concern is thus dependent upon securing a proper balance between expense and revenue. Its marketing organization must effectively cooperate with its manufacturing and its financial organization in order to bring this about, and toward this end accounting methods are a great help. We shall discuss these methods presently.

In a truly competitive industry, bargaining transactions, whether of a buying or a selling nature, depend upon the willingness of both parties to sell or buy as the case may be. Willingness is here defined as the absence of coercion and thus depends upon the existence of alternative opportunities. In public utility industries conditions of production and sale are such that customers are restricted in their choice of alternative opportunities to buy. For this reason government has taken jurisdiction over the selling bargains of public utilities. It fixes the prices and controls the character of the services. Although these selling bargains are controlled by government they do not lose their character as economic transactions; for they must still bring about an economic balance between revenues and expenses. How this is accomplished will be considered next.

(a) *The primary purpose of governmental regulations is to secure the balance of cost and income.*

When government regulates the selling bargains of public utilities, its first concern must be to balance cost with income. This does not imply that the income must be sufficient to cover all costs, no matter what they may be. A public utility is under the legal duty to render reasonably adequate service at reasonable rates. Reasonableness implies reasonable efficiency in production and the exercise of reasonable skill in negotiating cost bargains. Governmental rate-fixing thus involves the investigation of investment, wage, price, and tax bargains. Collectively, these transactions provide the so-called "cost-of-service basis" of regulation, because the government in fixing rates, must pass upon these transactions and also upon the efficiency with which the engineering organization of the concern performs its work. Only reasonable costs may be assessed upon the consumers in the rates they pay.

Rates are designed to apportion the total reasonable cost according to service classifications. Public utility rates, in effect class-rates, are sometimes spoken of as the rate-structure, and what concerns us at this point is that the earnings under the rate structure must be sufficient to provide a balance between reasonable cost and income. This earning power is usually referred to as "the general level of rates," while earnings under specific rates are referred to as "relative rates."

The legal basis of regulation and its development in the United States will be discussed in Part II. The administration of public utilities under a developed system of governmental regulation will be discussed in Part III, and the subject matter will be organized around the foregoing classifications of bargains.[3]

Sec. 5. The Relative Importance of the Different Categories of Cost

Although cost is not the only measure of the relative importance of the different classes of bargains, it does measure the importance of a particular bargain in the composition of rates.

[3] This treatment will necessarily leave out of account many problems and aspects of problems concerning the management and regulation of these enterprises. They are best discussed separately and for single industries. Many aspects of public utility economics, indeed, require even more intensive treatment. The aim here is to afford a general orientation, and we must therefore limit the discussion to those subject matters which are of common concern.

For this purpose the *operating* outlay, as distinct from the *construction* outlay, of one public utility [4] has been analyzed into its components for a normal year. Table IX below gives the results expressed in absolute amounts and in percentages.

TABLE IX

AMOUNT AND RELATIVE IMPORTANCE OF COST BARGAINS OF A TYPICAL UTILITY

Year 1922

Item	*Amount*	*Ratio*
I. *Investment Bargain*		
Interest on Indebtedness	$ 2,726,400.02	12.27%
Dividends on Preferred Stock	674,581.00	3.03
Dividends on Common Stock	1,293,750.00	5.85
Surplus	162,833.49	.73
Reserves*	2,502,654.93	11.27
Total	$ 7,360,219.44	33.15
II. *Wage Bargain*		
Labor, including wages and salaries †	7,223,426.00	32.52
III. *Price Bargain*		
Fuel	3,189,031.50	14.36
Purchased Current	245,111.07	1.10
Materials and Sundries	2,621,880.87	11.81
Total	$ 6,056,023.44	27.27
IV. *Tax Bargain*		
Taxes	1,567,091.81	7.05
GRAND TOTAL	$22,206,760.69	100.00%

* Reserves have been included in the investment bargain because they relate primarily to the security of the investment.

† Approximate only, total salaries and wages in operating accounts not entirely separable from materials and sundries in some accounts.

A glance at Chart XIII will show the same facts in diagrammatic form. The relative size of the segments illustrates how the dollar of revenue paid by customers was divided up by management in meeting its various obligations under the different bargains. It should be noted that the wage and investment bargains are about equal in importance and that the tax bargain is quantitatively the least important. The total outlay of the corporation for the year 1922 was greater, of course, than that shown in the table because construction expenditures are not

[4] The Milwaukee Electric Railway & Light Co. operates an electric railway and a motor-bus utility, each rendering urban, suburban, and interurban service, a steam-heating utility, and an electric light and power utility.

TABLE X

AMOUNT AND RELATIVE IMPORTANCE OF COST BARGAINS FOR SELECTED PUBLIC UTILITIES OF THE UNITED STATES

Apportionment of Operating Receipts

Based upon Census Returns for the Year 1922

	Electric Railways			*Commercial Lt & Pr*			*Steam Railways*			*Telephone*			*Telegraph*		
	Amount	Ratios		Amount	Ratios		Amount	Ratios		Amount	Ratios		Amount	Ratios	
		1922	Average §		1922	Average §		1922	Average §		1922	Average §		1922	Average §
I *Investment bargain*															
Interest on indebtedness	$139,126,390	13 7	15.7	$125,595,990	13 4	13 9	$538,594,041	9 5	13 0	$43,297,307	6 8	7 6	$3,301,042	2 2	4 9
Dividends on preferred stock	16,003,671	1 6	1.9	33,557,157	3 6	2 2	3,694,883	6	6						
Dividends on common stock	37,659,323	3 7	9.0	95,687,421	10 2	10 0	388,805,695	6 9	10 5	62,340,368	9 8	13 0	10,715,577	7 1	11 1
Surplus or deficit	28,804,611 def	2 8	4 0	36,365,565	3 9	5 6	237,091,830	4 2	6 0	16,037,651	2 5	3 1	13,151,894	8 7	4 8
Reserves, rentals, misc deductions	60,150,836	5 9	9 3	59,272,906	6 3	6 6				104,116,075	16 3	17.4	4,055,754	3 1	8 3
Total	$224,135,609	22 1		$350,470,322	37 4		$1,164,491,566	20 6		$229,486,284	36.0		$31,824,267	21.1	
II. *Wage bargain*															
Labor, including wages and salaries	445,680,135	43 8	37 7	194,148,121	20.7	21 0	2,640,817,005	46 5	42 5	341,537,822	53 6	44.6	76,161,926	50 1	39 2
III *Price bargain*															
Fuel	31,894,241 *	3 1	4.2	146,323,772	15 7	14 0									
Purchased current				70,037,173	8 5	5 8	1,561,028,720	27 5 †	23 9	19,645,644 †	3 1	7 6	36,977,899 †	24 3	28 9
Materials and sundries	250,220,786	24 6	20 4	92,569,887	9 9	13 5									
Total	$282,115,033	27 7		$318,530,392	34 1										
IV *Tax bargain*															
Taxes	64,788,315	6 4	5 8	73,128,410	7 8	5 4	308,145,247	5 4	4 1	$46,798,880	7 3	5 2	6,893,994	4 5	2.8
TOTAL	$1,016,719,092	100 0		$936,286,275	100 0		$5,674,482,538	100 0		$637,468,630	100.0		$151,858,086	100.0	

* Includes purchased current

† Includes other operating expenses

§ Average ratio is based upon a parallel analysis for the five census years, 1902, 1907, 1912, 1917 and 1922

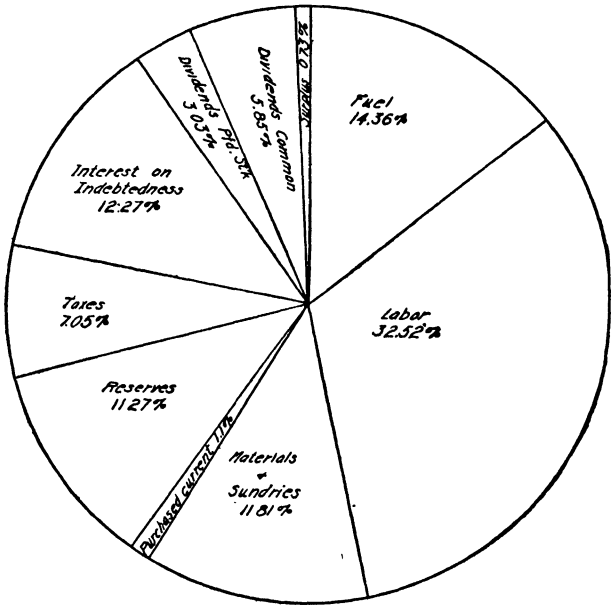
included. These expenditures were charged against the asset account to which they belonged. If they had been similarly analyzed it is certain that the price bargain and wage bargain would have proved relatively more important than the investment bargain. The tax bargain would have kept its position at the foot of the list.

Chart XIII

Distribution of Gross Earnings from Operation

T M E R & L Co 1923

How the Consumers' Dollar is spent



The significance of marshalling expenditures at this point is to make clear how important from a pecuniary standpoint the work of management and regulation is in these different directions. Taxes are assessed by government and management has little control over their amount except in so far as it may seek a reduction, relative to other tax subjects, in a utility's share of the total tax burden. In the adjustment of the remaining bargains management and regulating agencies may coöperate more effectively with the view of achieving economies. These relate to economy in fixed charges; economy in the design, construction, maintenance, and use of fixed properties; economy in

the purchase and handling of materials and supplies; and economy in the hiring and management of labor. If the problems of regulation and management growing out of the adjustment of the investment bargain have claimed an inordinate share of attention, it is not because economies were most needed in this direction but because investors, and particularly stockholders, are in an exposed position when profits decrease; for the return to investors constitutes the last claim upon earnings, obligations arising out of the other bargains having been met. It is, therefore, a fair assumption that a concentration of attention upon other bargains will achieve greater economies in the future.

In attempting to show the importance of the different cost bargains for each of the more important public service industries we are on somewhat uncertain ground. The statistical material, although on the whole well organized from the standpoint of the individual business unit, is not, as has been said already, well coördinated as a national aggregate.[5] Nevertheless, the relative importance of the different elements of cost of operation is shown in Table X for steam and electric railways, electric light and power, telephone and telegraph utilities. Only the year 1922 is summarized. The figures show how total receipts are disposed of again under the different bargains.

As approximations of the importance of different elements of cost the figures are suggestive. The electric railway industry, for instance, shows a deficit. No hasty inference should be drawn from this fact. It merely means that some electric railway companies drew upon past surplus or capital, or upon receivership obligations in order to meet current outlay. The total for the industry thus drawn upon amounts to $28,804,611. The columns showing ratios indicate the importance of each item in percentages of the total. The average ratio gives some notion of the importance of the items in previous years.

An examination of these details for previous census years indicates that, speaking generally, the tax, wage, and price bargains have been increasing in magnitude, while the investment bargain has been declining. This, of course, is due in large

[5] The Census supplies some comparable information every fifth year for public utilities, not including, however, steam railways, natural and artificial gas companies, and water supply companies. In the case of steam railways we may look to the annual statistical reports of the Interstate Commerce Commission. In the case of gas and water utilities the Census information is fragmentary. The need for a complete and comparable census of the gas and water supply industries has long been felt.

part to the rising costs of labor and material and to the increasing expenditures of government; while the return to stockholders has been kept down by rate regulation and the return to investors has been fixed for long periods of time by contract.

In Table XI, below, the same facts are shown for privately owned water and gas utilities in Wisconsin.

TABLE XI

AMOUNT AND RELATIVE IMPORTANCE OF COST BARGAINS OF GAS AND WATER UTILITIES OF WISCONSIN

Year 1923

	Gas Utilities		*Water Utilities*	
	Amount	*Ratio*	*Amount*	*Ratio*
I. *Investment Bargain*				
Interest on Indebtedness	$ 472,530.19	4.34	$ 52,171.86	8.54
Dividends on pref. stock / Dividends on com. stock	848,508.47	7.79	7,500.00	1.23
Surplus or deficit	1,741,993.66	16.02	130,587.54	21.39
Reserves, rentals	459,185.72	4.21	36,557.06	5.99
Total	$ 3,522,218.04	32.36	$226,816.46	37.15
II. *Wage Bargain*				
Labor	1,163,879.76	10.66	72,801.95	11.93
III. *Price Bargain*				
Fuel	2,306,389.82	21.20		
	830,696.80	7.63	201,113.85	32.95
	1,975,305.17	18.14		
Total	$ 5,112,391.79	46.97	$201,113.85	32.95
IV. *Tax Bargain*				
Taxes	1,089,215.72	10.01	109,666.01	17.97
GRAND TOTAL	$10,887,705.31	100.00	$610,398.27	100.00

Sec. 6. **The Theory of a Going Concern**

If the foregoing analysis correctly represents the typical transactions of a representative business unit, it is clear that this business unit does not consist of the collectivity of shareholders alone as might be implied from its purely legal organization. From an economic point of view the going concern comprises all of its economic relations as evidenced by the transactions which it makes. The parties to such transactions are always the legal concern on the one hand and the stockholders, bondholders,

directors, officers, employes, customers, and sellers, taken in their individual capacities, on the other hand. At the same time that the interests of these second parties conflict, they are aware that, so far as the continued security of their property, loans, offices, jobs, services, and markets is concerned, they must cooperate to a certain extent. They are members of an economic organization, dominated by a common purpose which is the profitable, continuous and efficient rendition of service. In this sense they are all partakers in a common economic enterprise, because their coöperation is necessary in order to enable the concern to do its work in production, and they must, therefore, be treated, in a functional sense, if not legally, as members of the concern.

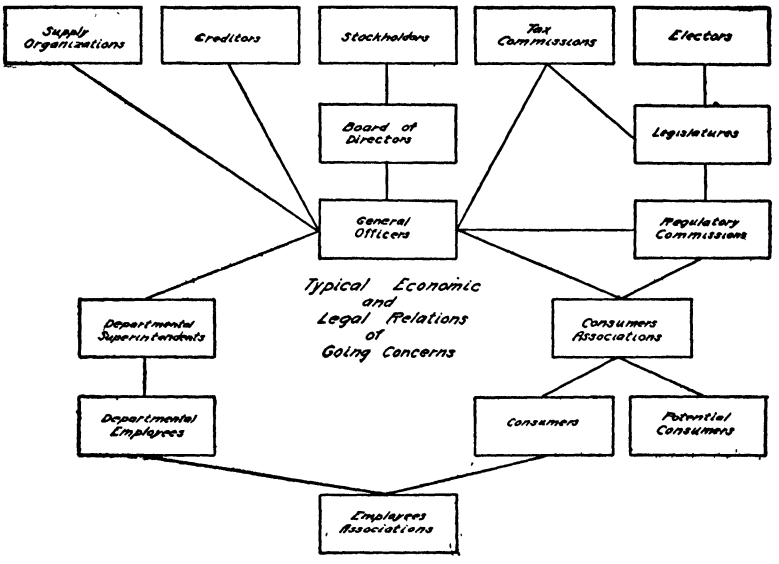
If the going concern is not alone the bare legal organization, is not in other words the "fiction of law" as Chief Justice Marshall defined it, what then does it embody? From an economic point of view the going concern is the collective behavior in terms of willingness to coöperate in an economic enterprise as evidenced by its economic transactions. To quote one of the pioneers in the analysis of industrial government:[6] "The going concern is animated by a common purpose, governed by common rules of its own making, and the collective behavior in attaining that purpose, we distinguish as a 'going business'. It is this collective behavior of this collective will, *this flow of transactions along lines indicated by its own working rules*, this going business of a going concern, that constitutes the invisible, intangible being of Marshall's definition. It is not an artificial 'creature of law'—it exists prior to the law in the intentions and transactions of its members, and thus exists in the very nature of the human will as well as 'in contemplation of law'."

Detailed consideration of public utility management belongs elsewhere than in a general work. A word should be added, however, upon the bearing of the idea of a going concern upon managerial policies. Coöperation or the lack of it may make or mar any business. From this point of view a going concern is an administrative scheme whereby rules of practice are applied in a manner which will correlate the different economic activities, compose and control nascent conflicts of interest and keep these elements in a state of coöperation. This applies also to the so-called "public relations." The important relations

[6] Commons, J. R., *Legal Foundations of Capitalism*, The Macmillan Co., 1924, p. 145.

here are with consumers, actual and potential, and with public authorities. A public utility executive is in a sense a quasi-public official. In his dealings with customers and others, where there may be conflicts of interests, there is need for a judicial temper, and a disposition to hold the balance even. Moreover, the needs of regulation tend to throw upon the business a burden of routine in reports, hearings, inspections and litigations.

Chart XIV



These restraints upon managerial initiative may be chafing, yet it is a mode of procedure arising out of the aspects of publicity which surround these businesses, and requiring special talents and a broadened point of view.

Some idea of the apparatus of management and of the typical economico-legal relations of going concerns within their regulatory setting may be gained from an inspection of Chart XIV. It enables the eye to take in at a glance the principal *foci* of legal and economic relations upon which going concerns rest.

Sec. 7. **Phases in the Life History of Going Concerns**

The operating subsidiaries of holding companies are the true "going concerns" with which we must deal. By taking a typical public utility organization and observing the various stages through which such an enterprise passes, the nature of a going

concern will become clearer. It will also serve to lay the groundwork for an understanding of the valuation of public service companies, particularly of the so-called intangible elements in such a valuation. For, as we shall see later, a public utility valuation recapitulates under the cost of service theory, the stages in the life history of these concerns.

(a) *The period of preliminary organization.*

The first phase involves the promotion of the enterprise which usually consists of three distinct steps: (1) the discovery of a business opportunity, (2) the assembling of the elements of a business, and (3) the securing of funds to put these elements to work producing the commodity or service. The promoter may perform all these functions himself or he may and usually does call in others to assist him. The ideal promoter is an economist with an eye for exchange values, since a business opportunity is premised upon the demand for a particular service or commodity at a price which covers the cost of production plus a profit. But the utilization of a business opportunity involves the marshalling of funds, the assembling of a physical plant for production, and the formulation of a plan of organizing the human relations out of which productive work proceeds. He may thus have to call upon the services of bankers, industrial engineers, and lawyers, having various aptitudes and specializations. Except in the field of motor transport, the work of promoting new concerns in public service industries has very largely been done. Promoters' activities are now chiefly in the direction of reorganization and consolidation, made necessary by the super-power movement and the rearrangement of our transport facilities. Nevertheless the promotion stage was an important phase in the upbuilding of these industries, the necessity and importance of which must be understood.

On account of the promoter's needs for capital he may have to call in investment bankers whose responsibility it is to look into the promoter's plans and to satisfy themselves that the demand for services is such as to justify investment.

All these activities take place during an interval of time which we may call the *period of preliminary organization.* The significant parts into which this organization work divides itself may be presented as the drawing up of—

1. the economic and financial plan of promotion,
2. the industrial plan of construction and operation,
3. the legal plan of organization.

THE ECONOMIC AND FINANCIAL PLAN OF PROMOTION. The drawing up of this plan usually involves the estimation of probable revenues and expenses, and the casting up of the balance of prospective profits. These estimates, originally made by the promoter, the investment bankers must check and verify. In order that the probabilities be estimated accurately and in order to do justice to the opportunity, promoters and bankers must possess experience and imagination. If the new utility, for instance, be a street railway, the tributary population must be determined and the number of car riders estimated on the basis perhaps of rides per capita. The probable fare that may be charged must be ascertained. Together, these factors will yield an estimate of the probable revenues. Account must be taken of the probable growth in population and the possibility of developing traffic. Allowance may also have to be made for competition and substitute services, as well as for seasonal variations in traffic. If the enterprise is an interurban railway the situation is complicated by the traffic flow between important centers, so that account must be taken of the relative amounts of through traffic and of local traffic. In all these calculations comparisons with already established enterprises, similarly situated, prove helpful. And, so far as possible, the calculation is made upon a unit basis; that is, the revenues and expenses are estimated per car mile or other convenient traffic unit. Meticulous accuracy is not necessary for a promoters' calculations.

Incidental to the determination of cost and as a basis for the investment bargain a financial plan of promotion must be drawn up. This will determine the amount and character of the capital contributions and will give a clue to the probable cost in fixed charges. Of course, the amounts involved are determined by the size and character of the plant required. The estimates of cost are again based roughly upon some convenient unit, such as costs per car, per mile of single or double track, per kilowatt of capacity of power plants, etc. At this point the financial plan is dependent upon the industrial plan. Investment bankers will be helpful in determining the proportions of fixed and floating capital required and the form that security issues should take. They can provide estimates of the probable money rates in leading money centers, and thus determine provisionally the burden of fixed interest charges. The composition of the financial plan will ultimately determine such important relations as the amount of bonds to be authorized and sold as compared to stock authorizations and their subscription. Per-

haps enough has been said to indicate the extreme delicacy and importance of these determinations.

THE INDUSTRIAL PLAN OF CONSTRUCTION AND OPERATION. The drawing up of the industrial plan involves characteristically three important decisions. The first relates to a preliminary location of the plant. The site eventually chosen should be such as to meet the convenience of the patrons and should draw out the revenue possibilities of the territory. Safety and economy of service are other desiderata. Topographical, social and legal considerations often limit or determine the choice of location. Recently the city plan, in its present and future aspects, has been a limiting factor.

The second decision has to do with the choice and design of instruments. Equipment must suit the requirements of operation, must be safe and economical in operation and not subject to early retirement because obsolete or inadequate. Often experimental construction is necessary which introduces a new element of uncertainty into these calculations.

The third determination, namely, the estimates of costs of construction and operation, flows from its two predecessors. Consulting engineers of large construction experience usually coöperate with practical operating engineers in this part of the work. With all due allowances and safeguards, the result has frequently been an underestimate of the costs.

THE LEGAL PLAN OF ORGANIZATION. The last step will be the drafting of a legal plan of organization. This part of the preliminary work is not usually undertaken unless it is believed that financial success is reasonably assured, and the investment bankers have shown their faith in the economic future of the enterprise by agreeing to underwrite the sale of securities. While important and vital, the legal plan is of a more formal and standard character, inasmuch as the law generally prescribes the form organizations may take. The work involves the securing of a charter of incorporation, the negotiation of franchises, obtaining indeterminate permits, certificates of convenience and necessity, permits to issue securities, purchase options and rights of way. Dealings are had with private parties and public authorities. Definitive work consists of the examination and drafting of contracts, franchises, consents, mortgages and deeds of trust and other important legal documents. Much time is usually spent in the examination of titles, statutes, ordi-

nances, and the decisions of the courts and in other research activities.

The final product, often a resultant of much experimenting and discarding of tentative plans, may be called the *going plan of organization,* because upon it as a basis the actual steps are taken which translate the theoretical conception into a practical, working reality.

(b) *The period of construction.*

Having developed the conspectus of our economic enterprise, the next step is the construction of the plant, plans for which have already been worked out. When the work is completed we have what may be called a "going plant" capable of turning out product. We will call this the period of construction. The "going plant" refers only to the technical process of production, and not to the sale of the product. Usually, when properties of substantial size are to be assembled, the work will be performed in sections so as to permit production to begin with the earliest section before all the construction work on the remaining sections has been completed.

THE DURABLE PORTION OF THE GOING PLANT. The physical plant consists of two elements: the durable element and the non-durable, depreciable element. The durable element, as the name implies, consists of the land, rights-of-way, or easements upon which the structures are erected. Two peculiarities should be noted here. Because of the necessity of obtaining land in strategic locations, or because the land must provide a continuous right-of-way, as in the case of railroad construction, the public utility is under the necessity of procuring the land considerably in advance of actual construction. The need for careful selection of land will be appreciated when one reflects upon the great importance to these enterprises of dock and transportation facilities on account of the quantities of raw materials that will be used. Similarly, the need of carbo-electric power plants for an abundant supply of good water limits the choice of sites. The second peculiarity is that private rights-of-way, once dedicated to a particular use, cannot usually be reconverted to other uses.

It may not always be necessary to acquire land outright. It may be leased for long periods, or easements, representing a limited property right, may be secured. Easements are rights to build tracks, to erect poles, and to string wires or lay underground conduits. Much of the land, however, is purchased in

the open market, often without disclosing the use to which it will be put, in order to secure it at the lowest possible price. When the price is believed excessive or the owner of the most appropriate site will not sell, the utility may proceed to condemn the property, in which case the utility must prove that the particular property best meets its needs. The price will then be fixed by a jury. To this must be added the costs of condemnation. The real estate departments of public utilities contend that the prices fixed by condemnation juries are in excess of market values (they call them hold-up values) which, when added to the costs of condemnation suits, make it advisable to purchase rather than to use the power of eminent domain.

Incidental revenues may make their appearance at this point. Rents may accrue from facilities bought in advance of immediate requirements or they may accrue because the utility has purchased an entire holding—more than it requires for its public utility uses—in order to avoid the costs of severance when it buys less. In the past, too, there has often been an element of speculation entering into these purchases in that utilities may, by forehanded purchase of contiguous lands, realize upon resale the rise in market value often accompanying the construction of new utilities.

Not all the land used by public utilities is necessarily bought or leased. The land may be donated by private persons or by public authorities. The former may be impelled by considerations of civic spirit or because they expect advantages to accrue to them indirectly, as is often the case in new real estate subdivisions. The land grants to railroads are the classic illustrations of land obtained from governments. The right-of-way may be the public highway, permission having been obtained by franchise. But it must not be lightly assumed that these grants are entirely without cost, as expensive street and paving improvements may be coupled with them.

THE NON-DURABLE PORTION OF THE GOING PLANT. The non-durable element of the plant involves buildings and structures, equipment and facilities. This branch of the work is usually the task of a separate construction organization. The work may be done by the company's own organization or by an affiliated but separately organized construction company. Again, all or some of the work may be performed by general contractors who will sublet portions of the work to subcontractors. In the latter case, the work of the utilities consists merely of general super-

vision and inspection. Many ingenious bonus and premium plans have been worked out to secure rapid and economical completion of the project. The highly seasonal and temporary nature of the work is an added reason for the separate organization of construction work. The cost of the work accrues through pay rolls, purchases of materials, and payments upon contracts.

At this point account should be taken of indirect construction costs, usually called "overhead." These costs arise from emergency surveys, relocations, and the preparation of special designs; from the administrative control of construction, involving such items as superintendence, inspection, accounting, payment of insurance premiums, taxes and interest during construction. Costs for work not covered by contracts may be enhanced by unforeseen contingencies such as strikes, cyclones, earthslides, fires, accidents, stream diversions, and delays in the delivery of material.

No very definite ratios can be set up in which these elements are combined. The land element may run from 5 to 30 per cent. of total construction cost, depending upon the type of utility. Indirect construction costs have likewise varied between 8 and 30 per cent.

We have mentioned above that the work will, when possible, be constructed in sections so that a part of the plant may begin operations while the balance of the project is being finished. This divides the construction period into an earlier period of pure construction and a later period of mixed construction and operation. The construction work will continue until the plant, as originally designed, comes into being.

At this point a new need arises: the development of an operating organization to carry on the work of turning out the physical product or of rendering the service for which the plant is designed. This involves first of all the assembling of an executive and supervisory personnel with its full complement of an operating labor force. Training, reliability, and efficiency are the qualities which must distinguish the operating organization. Some untrained or "green hands" may be employed in any public service undertaking, but there must always be present a substantial nucleus of "key men" of various grades upon whom the responsibility for continuity and efficiency in operation will fall. The "esprit de corps" which motivates an organization depends upon the loyalty, standards of performance, and devotion to duty exemplified by this nucleus.

On this account seniority is given large weight in the preferments and assignments of responsibility within the operating organization.

A second requirement relates to the provision of *operating* materials and supplies as distinguished from those required for construction. While the latter must be obtained enough in advance to insure steady progress in construction work, a larger store of *operating* materials and supplies are required in order to insure not only steadiness of output, but also to provide for unexpected increases in demand and for prospective growth. Moreover, money funds to serve as working capital are required to meet cash expenditures before receipts from customers come in. After the enterprise is well established, cash working funds may be relatively decreased in proportion as the credit of the enterprise enables it to borrow for short periods upon open account or by negotiating its notes payable.

At this point, accordingly, a distinction must be made between costs arising from the continuance of construction operations, and therefore chargeable to "capital," and costs arising from the new phase of operation, and hence chargeable against the expected revenues from operation.

In any newly constructed plant it will be found necessary to incur certain expenditures arising out of what has been called the element of "adaptation and solidification." This is a term borrowed from steam railway parlance that has since been given a wider meaning. It covers not only expenditures arising out of the realignment and adaptation of the roadway to practical operating conditions but also all other expenditures having to do with the extra ballasting of track, the rearrangement and adaptation of buildings, structures, and equipment to operating demands. The practical outcome is that operating and maintenance costs will be rather heavy at the outset until the plant has been "seasoned" to operating conditions. These costs are usually treated as operating costs.

Our term "going plant" should accordingly be understood to refer to a plant, constructed in accordance with the going plan, adapted to actual operating conditions by an experimental period occasioning additional costs, and manned by an operating personnel, trained to various assigned jobs.

(c) *The period of acquisition of a going business.*

A "going plant" which has the capacity to turn out units of physical product may be a "going plant" in a restricted engi-

neering sense; but it does not become a true operating unit in an economic sense until it finds a market for its product, at rates that provide for all forms of operating cost and provide, in addition, a satisfactory profit to its owners. A plant which has acquired such a market is said to have attached to it a "going business" where business means the satisfactory seller-buyer relationships usually comprehended under the term "good-will." But these business connections, in the case of public service enterprises, may be based upon the governmental privilege of an exclusive franchise. It is upon the hypothesis first, that the service is needed, and second, that the public concession to render the service within a defined area has opened up a market sufficiently large to absorb in time the maximum potential output of the plant, that promoter, financier, and investor have cooperated in the investment bargain. And yet government in its organized capacity has not guaranteed sufficient revenues. On this account all energies of the new enterprise will be set to work to develop the marketing possibilities.

Some peculiarities inherent in the operating and the marketing situation should be recalled. The enterprise is one which has involved large investments in fixed and specialized capital representing often a producing capacity in excess of the immediate demand. There is present unutilized capacity which awaits the development of a demand. Incomplete utilization of producing capacity therefore results in high costs per unit of output sold. The unused capacity offers a great incentive to securing additional business. In other words, the "going business," within the limits of the producing capacity afforded by the "going plant," can be developed upon the basis of the law of decreasing cost or its correlative, the law of increasing returns.

We may therefore expect that the management will spare no reasonable costs in securing increases in patronage. Expenditures will be incurred to advertise for and solicit new business. Experimental and trial installations will be made. If the service is of a type which must be introduced by demonstration of its usefulness, everything will be done to acquaint potential customers with its virtues. Its superiority over substitutes or sources of private supply must be demonstrated. The doubts of the timid must be allayed, and the arguments of detractors met. All this means heavier initial costs chargeable against the expected growth in business, which must nevertheless be met only out of existing revenues. Under such conditions one would not be surprised if the enterprise should fail during the initial

period to meet its total outlays for operation. It will be a cause for congratulation if the business should happen to "break even." It has been the fortunate circumstance of but few enterprises in their early days to have current income exceed current outgo, thus leaving some element of profit. The normal circumstances of an enterprise in this period—which we have called the period of acquisition of a going business—is that operating cost exceeds operating revenues, and that these annual deficits measure the costs of acquiring a going business.

At this point it is convenient to draw the distinction between operating cost in the sense of "operating outlay" which is a direct consequence of the expected and immediate sale of product, and the operating cost which continues whether product is being sold or not. The former consists principally of the wages paid, and the materials consumed in operating the property and maintaining it in a fit condition for operation. The latter consists primarily of the outlays required to meet fixed interest obligations upon security issues, and to meet taxes. Good business policy will therefore dictate that charges be so fixed as to compensate all outlays of the former class and as much of the latter class as will not restrict the enterprise in the sale of additional product. Outlays not recouped from customers will have to be met out of working capital or, eventually, out of assessments upon stockholders.

As the business grows in volume the revenues may prove adequate to meet not only the variable operating costs but all the "fixed charges." It then becomes necessary to take account of certain expenditures which, while not immediately necessary, will shortly be required in order to offset the disintegrating effect of operation and of the elements upon the "going plant." Thus hidden costs like depreciation, reserve charges to cover losses from unforeseen contingencies, begin to appear and imperatively to demand attention. Revenues will be devoted to these purposes. Only after adequate provision has been made for these can surplus revenues be retained and ultimately devoted to dividend purposes.

This line of thought tends therefore to develop in the owners of the enterprise a conception of deficiency in income not only below actual outlays but below outlays necessary to insure their willingness to continue in the business. The necessary income (the long-run necessary supply price), with which actual income is compared, must be sufficient to meet, under normal conditions, all operating costs including therein a reasonable profit for the

entire time that the enterprise has been acquiring its going business. When this point is reached the enterprise has obtained, in the minds of its owners, a going business, and it will be regarded by them *in its entirety* as "a going concern." Looking backward, the owners have mentally *capitalized* the deficits below the expected reasonable return. The capitalization process has been one of cumulating the yearly deficits occasioned by the non-coincidence in the accrual of what they regard as operating cost and the compensatory revenues.

(d) *The enterprise as a "going concern."*

Now the period of normal operation, the ultimate objective of past effort, begins. The utilization of the capacity of the "going plant" is such as to insure that, with efficient management, earnings and expenses have reached normal proportions and are mutually compensatory. But, like Alexander, the owners may look about them for new worlds to conquer. They may seek an extension of their franchise into new markets, or they may seek to cater to new demands in the old markets. It will become necessary to make extensions of the "going plant." Additional capital investments will become necessary, thus repeating upon a smaller scale the cycle of activities upon which the theory of the going concern rests. The process of successive enlargements of the physical plant goes by the term of "piecemeal construction."

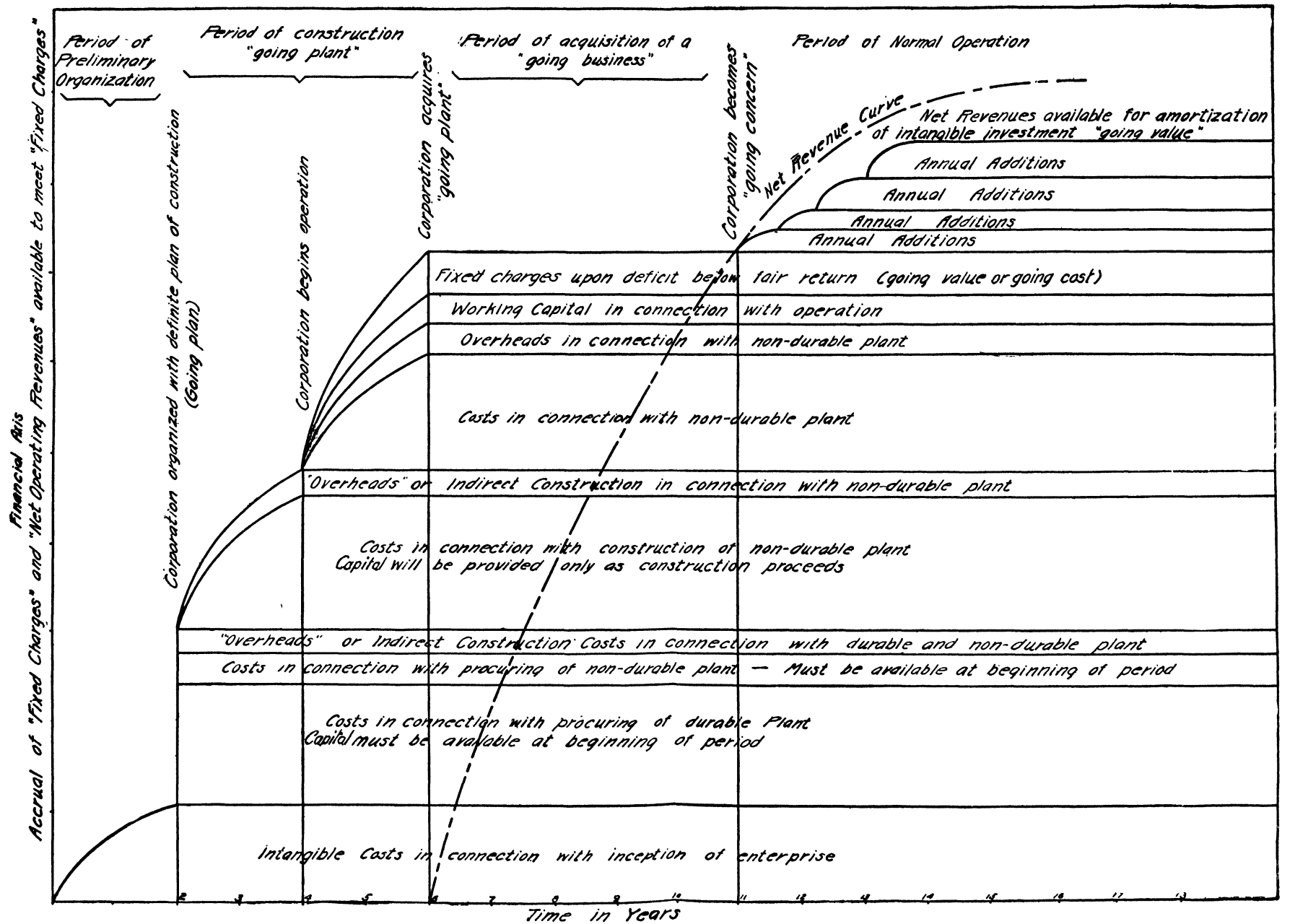
The ebb and flow of demand for the product with daily and seasonal variations, together with variations due to the business cycle, will have developed the need for a permanent reserve capacity in the going plant, so that customers' wants may not go unsatisfied. Transient new business, and temporarily increased demands by old customers, represent a service obligation which wise public utility management will seek to satisfy. In this way alone will public utilities be able to make themselves secure in their monopolistic position.

The enterprise may also begin to take thought of the possibility of amortizing out of the steady flow of revenues such of its capital losses as are traceable to the earlier accumulation of actual or construction deficits. By this process a business protects itself against the inroads of a potential decrease in future demand.

A picture of the economic process involved in bringing an enterprise through the various phases of its life history is given in Chart XV. No particular significance should be at-

Chart XV

Phases in the Life History of a Going Concern



tached to the number of years comprising each period, nor to the relative levels at which fixed charges are assumed to be accumulating. Attention should be called, however, to the extended sense in which, for illustrative purposes only, the term "fixed charges" is used in the diagram. As here used, it includes interest accruals, depreciation accruals and a "constructive" reasonable profit to the owners. Strictly speaking, all costs up to the end of the construction period are capitalized, whether they represent direct outlays or whether they are indirect outlays, representing "carrying charges." After operation begins, their true nature as annual fixed charges appears. They must then be met by the accrual of net revenue available to meet fixed charges. The area above the "net revenue curve," therefore, represents uncompensated fixed charges or losses which are "constructively" capitalized and thus serve as the basis for a "constructive" intangible investment, sometimes called the "going value," but better regarded as "going cost."

CHAPTER VI

ACCOUNTING METHODS

Sec. 1. **The Development of Control over Accounts and Records**

The purpose of accounting systems is to set forth the sources, utilization, and disposition of pecuniary values. Every business unit which becomes a going concern has an accounting and record-keeping organization which can supply, more or less adequately, the current facts in regard to income and expenditure and, more or less inadequately, the historical record of these dealings. Accounting as a practical art is, of course, as old as business, but as a science it dates from the attempts of Italian merchants in the sixteenth century to apply certain mathematical principles to their bookkeeping. From these beginnings accountancy has developed into a separate discipline which is being systematized and elaborated by specialists. In the nineteenth century, the science of statistics was developed as an aid in the interpretation of mass phenomena and the two are now generally combined in business enterprises in order to aid management in solving business problems. With the coming of regulation, governments have seen the need of further expanding these accounting and record-keeping activities and of making them serve also the needs of governmental agencies in their work of exercising control.

(a) *Early opposition to publicity and regulation of accounts.* In private businesses the accounting and statistical organization exists for the primary purpose of providing information to owners. Complete information is usually available only to those directly concerned with management. Future plans and the results of past operations must not be revealed to competitors. Out of this atmosphere have sprung certain accounting practices and certain mental attitudes that have made difficult the development of accounting systems in a way which would aid government in its task of regulation. While public service enterprises always showed traits that distinguished them from pri-

vate businesses, they were not entirely free from competition and hence from the desire to keep their operations secret. The first breaches in the wall of secrecy were made when charters or special legislation required them to submit certain reports to legislatures or to administrative bodies. The breach was widened when it became necessary that utilities reveal their profits, present and prospective, in order to secure stock subscriptions or to induce owners of capital to become creditors. We have now arrived at the point where publicity of accounts is more and more required of all enterprises that solicit funds through the sale of securities, whether their rates and service are subject to regulation or not.[1]

(b) *The first steps in the regulation of public utility accounting.*

As stated, the earliest charters of railroad companies contained provisions requiring them to file annual reports. The next step was the requirement by legislatures, such as the New York act of 1843, providing for publication of accounting facts. There followed legislation specifying in great detail what these annual reports should contain. The general railroad law of New York of 1850, for instance, specified 102 separate items. The criticism made of these early forms of publicity was that the reports were inaccurate, misleading, and not uniform so as to permit comparisons. Finally, it was seen that only by going back of the reports and into the accounting systems themselves could the real facts be brought to light. This step was first taken by Massachusetts which in 1876 directed its board of railroad commissioners to "prescribe a system on which the books and accounts of corporations operating railroads or street railways should be kept in a uniform manner." It also gave the commission power to inspect books of account, to make sure that the regulations were being obeyed. The work was extended to gas companies in 1885 and electric companies in 1887.

When the act to regulate interstate commerce was passed by Congress in 1887, it ought to have been appreciated that the enforcement of the entire system of federal control was dependent upon the degree of power given the Interstate Commerce Commission to supervise the accounting practices of the carriers. That act did give the commission some power to prescribe a uniform system of railway accounts. Yet the ineffectiveness of accounting control under this legislation compares with that secured under earlier state legislation. "In the original Act

[1] *Cf.* Ripley, W. Z., *Ibid.*, Chap. VII and Chap. X.

of 1887 carriers were required to file annual reports with the Commission, and the items were specified. Blanks were provided and classifications of certain general accounts were issued in cooperation with the roads, in the hope that this might aid in the promotion of uniformity. But these classifications could not be ordered into force. The carriers were merely requested to adopt them. Accordingly, while the statistical compilations made from these reports steadily improved in content and quality, they did not inspire confidence with respect to significant items, since the carriers were free to report or not as they saw fit. An attempt on the part of the Commission to compel answers to certain questions led to a ruling by the Supreme Court that in view of the lack of penalties and of enforcement provisions no suit could be maintained to compel the furnishing of information refused in the annual reports."[2]

(c) *The attainment of uniform accounting under commission regulation.*

The commission's authority was accordingly supplemented in 1906 by giving it power to prescribe the forms of all accounts, records, and memoranda kept by the railroads, not only in connection with their financial transactions, but in all other respects. It was made unlawful to keep any other accounts or records than those prescribed or approved, to alter, mutilate, or destroy them, or to make false entries. The commission and its agents were given access to the accounts and records for purposes of supervision. Heavy penalties were imposed for violations.

Meanwhile, in 1905, New York had established a commission of gas and electricity with power over accounts. When Wisconsin, in 1905 and 1907, initiated a new movement for the establishment of mandatory commissions, inquisitorial powers embodying control over accounts were given and these became an integral part of the new regulatory program in other states. Practically all states now require annual reports to be filed and published. They become public records available to all. Only those who have worked in the earlier atmosphere when facts were obtainable with difficulty can appreciate what improvements in regulatory processes were made possible by the new legislation. Many of the state commissions have adopted uniform accounting classifications under legislation requiring them to do so.

[2] Dixon, F. H., *Railroads and Government*, Charles Scribner's Sons, 1922, p. 62.

Generally speaking, these classifications were modeled upon those adopted in New York or Wisconsin for the local utilities. For steam railways, telegraph and express lines, the Interstate Commerce Commission classification has been adopted. This has been true, also, to some extent of telephone and electric railway accounting classifications. There is thus some conflict where states have adopted their own electric railway and telephone classifications.

Sec. 2. **Advantages and Extent of the Uniformity Movement**

It must not be inferred that the public utilities have remained altogether passive in the matter. The increasing size of the ownership unit, particularly after 1900 with the development of holding company control, has induced considerable activity on their part. The advantages of complete systems of accounts and of accounting and statistical records in the management of the properties were generally perceived. The most essential characteristic of accounts should be their comparability from year to year. Standardization was therefore effected and applied not only to single companies but to groups of companies, the so-called syndicated properties. Associations of accounting officers did much useful work here and their results and cooperation have been enlisted in building up the standard classifications of commissions. Much of this work had been done previous to 1906 when accounting control began in earnest. The adoption of official classifications has made possible periodic comparisons of results of operation not only for the same company but also for different companies, and for the industries as a whole. It was now possible to arrive at the financial history of individual properties or of an entire industry, and on the whole to vouch for the honesty with which the transactions had been recorded. Geographically considered, the Southern States are least advanced; and industrially considered, the greatest amount of work remains to be done in the fields of water supply, motor transport, and heating utilities. As in other administrative matters, legislation had to be supplemented by detailed regulation concerning even practices and procedure, and the whole program had to be enforced through a system of inspection by accounting examiners.

The largest measure of benefit has accrued to the smaller companies whose standards of practice in accounting matters were markedly improved. It is doubtful if anything but com-

pulsion and assistance from the state would have brought the desired result. In order that the work of record-keeping should not become unduly expensive for the smaller utilities, the practice has been introduced of building the classifications around certain standard accounts which are required of all utilities, large as well as small. For utilities with greater operating revenue, the standard accounts are again subdivided into accounts giving further details. This policy has made the system sufficiently flexible to meet a variety of operating conditions. The use and effectiveness of the classifications was further extended among the smaller companies, and particularly among the small public-owned enterprises, by advice and assistance in the installation of accounting systems through commission examiners.

In spite of the disposition of states to adopt the classifications of the leading commissions, considerable diversity was introduced by local variations. The rapid growth of large holding companies, which operated properties in adjoining as well as widely scattered states, called attention to the convenience of having standard classifications for the country as a whole. The National Electric Light Association, as early as 1900, had appointed a Classification of Accounts Committee whose duty it was to devise a system of accounts covering the requirements of electric utilities. By embodying the actual experience of member companies, and after much research work of its own, the association was in a position to publish a standard classification in 1914. This was adopted by a few of the state commissions. The American Electric Railway Association coöperated with the Interstate Commerce Commission in drawing up its classification of accounts for electric railways doing an interstate business. The final step in reaching national uniformity was taken by the National Association of Railway and Utilities Commissioners in 1919, when a resolution was passed at their annual convention instructing its Committee on Statistics and Accounts of Public Utilities to formulate and present to the association a uniform system of accounts for all public utilities other than railroads. With the coöperation of the National Electric Light Association and the American Gas Association a tentative classification for gas and electric utilities was presented to the National Association in 1920. After some revision the classification was approved and adopted by the National Association in 1922, which recommended its adoption by the individual states. Table XII, p. 131, gives some idea of the progress of the move-

ment for state control of accounts and records and for nation-wide uniformity.

TABLE XII

EXTENT OF ACCOUNTING CONTROL BY PUBLIC SERVICE COMMISSIONS
1925

Public Utilities	*Number of States*			
	Requiring Reports	*Authorizing Accounting Classifications*	*Having Adopted Classification*	*Having Adopted National Uniform Classifications*
Street railway	38	32	26	
Bus companies	5	5	0	
Express companies (local)	7	6	0	
Telephone companies..	41	30	22	
Gas companies	30	26	20	16
Electric companies ...	31	27	22	23
Water companies	27	23	17	
Heating companies ...	20	15	4	

Sec. 3. **Functional Cost Accounting**

The need of disclosing the cost at which different operations are being carried on is an extremely important objective of accounting control. Management and regulatory authorities are alike interested in this aspect. This means that the accounts must be organized in such a way as to show the cost of major operations. It is then possible to judge the efficiency with which the different operations have been carried on and to start measures for economy. Securing comparability in accounting and statistical data is the essence of the problem. With such information as a basis, cost may be made a factor in fixing relative rates.

This objective has been only partially attained. The Interstate Commerce Commission failed at first to take into account the needs of cost finding. In its recent attempts to secure a separation of operating expenses of steam railways into those chargeable exclusively either to passenger train service or to freight train service, and those which are essentially joint expenses, it is also recognizing cost accounting as one of the pur-

poses which accounting classifications should serve. We shall treat this aspect of the rate problem in detail later.

Greater progress has been made in the direction of having the accounts show the true earning capacity for the business as a whole. This is necessary in order to enable management and public authorities to determine when rates yield a reasonable rate of return upon the fair value of the property. It is certain that the accounts of public utilities will be more important in the future than in the past.

Sec. 4. **Other Uses of Accounting Systems**

Other uses of accounting systems, not associated with regulation, may be briefly touched upon. The first is that accounting facts serve as a basis for budgetary control. Under a budget each department of a business is allotted a certain expenditure for a future period, the amount of which is determined by its past requirements modified by such factors as future plans call for. Budgetary control is exercised by checking actual expenditures in the future against past allotments. In this way economy in expenditures is emphasized and reasons for over-running allotments are definitely established.

Another use is associated with the administration of tax laws. Wherever the base of taxation is some financial fact such as gross revenues, net revenues, capital stock outstanding, etc., an adequate accounting system is a prerequisite for proper tax assessment.

We may best summarize the objects of accounting control in the words of Mr. Charles G. DuBois, Comptroller of The American Telephone and Telegraph Company. Having in mind telephone accounts, he writes:[3]

"A suitable scheme of accounting must attain these objects.

First. It must be uniform in its essential and fundamental features so that the results of the business can be compared and combined.

Second. It must be elastic in details so as to furnish at the one extreme the simple information needed with respect to the numerous small exchanges, and at the other extreme, the great and complicated variety of information needed with respect to a large city system with every degree of greater or less detail for the conditions between these extremes.

Third. It must be sound in principle so as to meet the most rigid scrutiny of investors and public authorities.

Fourth. It must conform to organization so as to associate the strong and weak spots with the individuals responsible for them.

Fifth. It must be practicable in application, speedy in operation and dependable in results."

[3] Company Bulletin, *Uniform System of Telephone Accounts.*

Sec. 5. Fundamental Primary Accounts and their Interpretation by Means of Accounting Statements

The history of a business enterprise is best revealed in its accounts. All the phases in its life history—as we have outlined them above—leave their impress upon the accounting record.

We have distinguished the period of time during which the prospective business matures its going plan from the ensuing period during which the business obtains its going plant. Expenditures made during these periods need in turn to be distinguished from those made during the following period, when the concern obtains its going business. Indeed, the same necessity of separating expenditures on behalf of plan and plant, and all other items involving the future from expenditures arising out of the rendition of service, obtains throughout the last period of operations as a going concern, during which the business is either maintained or extended. Always there are expenditures which are premised upon the continued existence of the business. They represent the hostages to fortune which every concern must give if it looks for a future return.

Accountants have attempted to give precision and descriptive classification to these expenditures by dividing accounts under two general headings: the Balance Sheet Accounts, and Income Accounts. What might be termed a sub-classification of income accounts is called Profit and Loss Accounts.

This is not the place to enter upon a lengthy treatment of public utility accounting principles. Yet a brief explanation of the most fundamental conceptions in their relations to economics and to regulatory policy is necessary in order to secure real insight into the public utility problem.[4]

(a) *General character of balance sheet accounts.*

A balance sheet records the economic status of an enterprise and reflects the cumulative net results of investment and operation on a certain date. The accounts in a balance sheet record in detail the investment which the concern has made in getting ready to serve and in keeping itself in readiness to serve.[5] Accounts showing how the investment funds were used are called asset accounts. They represent expenditures made to secure the physical things which the concern needs and which it owns as

[4] *Cf.* Bailey, W. G., and Knowles, D. E., *Accounting Procedures for Public Utilities*, A. W. Shaw Co. (1926).

[5] See Schedule V on page 144.

property. Expenditures are also made on account of non-physical items of property such as securities held as investments in other companies or notes and accounts receivable representing the obligations of others which the concern owns. Under the theory of double-entry bookkeeping, balance sheet accounts also include liability accounts showing the sources of the funds with which the concern acquired its assets.

The most important asset account is variously called "Property and Plant" or "Fixed Capital." Here are charged expenditures which represent the money cost to the enterprise of the various forms which fixed capital may take. It is divided into intangible fixed capital and tangible fixed capital. The intangible fixed capital consists of such items as organization expense, franchises and patents. These are, as we have seen, important expenditures in working out the "going plan" of the concern. The tangible fixed capital consists of investments in assets—land, structures, equipment, and the so-called overhead costs during construction such as engineering and superintendence, law expenses, taxes, interest, and so forth. It should be clear, of course, that the nature of the structures and equipment will vary with the industry whose fixed capital is being classified.

Much difficulty has been met in securing a satisfactory definition of fixed capital. The classification above referred to defines fixed capital as "the property both tangible and intangible which is devoted to the accomplishment of the principal purposes of its business, and which has an expectation of life in service of more than one year from date of installation in service."

This definition calls attention to two kinds of considerations: First, these properties are held for operation; they are the very essence of the enterprise, and their destruction or withdrawal from service results in the abandonment of operation unless replaced by equivalent property. The accounts show how much these properties have cost. They can, of course, be sold, and the amount realized may be either more or less than the cost. But, so long as they are used for operating purposes by a going concern, this market value is of no particular significance. The second consideration is that these properties wear out in the course of time. Only those estimated to be capable of use for more than a year are called fixed capital. The definition of the category "fixed capital" is, therefore, entirely a matter of convenience.

Properties which do not last longer than a year, or, indeed,

are consumed in the very process of production of service like fuel—described as circulating capital by economists—are called current assets. Yet even fuel *may* be stored for more than a year, though this would be abnormal. Hence, all properties, like materials and supplies, which are not expected to remain on hand for more than the convenient accounting period of one year, or assets which are currently liquidated, are classed as current assets. When they are used up in the productive process, their cost is charged as an operating expense of the accounting year and set off against the revenue produced during that year. We thus get the distinction, already referred to above, between expenditures made for capital and expenditures made for revenue. In the end, however, fixed capital expenditures for non-durable properties become chargeable against the revenues they have helped to produce, with this difference, that the charge is divided up into accounting periods and assessed against each period in the form of an *estimated* depreciation or retirement charge.

Kester, in a recent work on Accounting, brings this point out very nicely.[6] "The distinction made . . . between capital and revenue draws attention to the fact that the depreciation factor arises only because the fiscal or other period, when information concerning values and costs, i.e., financial condition, is desired, does not coincide with the expiration of service life of the properties used in production. If the information just referred to were not desired at intermediate periods between the date of acquisition of the asset and the date of its discard or obsolescence, its cost could be treated solely as an expense of operation to be charged to the whole period in the same way that the fuel consumed, the raw materials used, etc., are regarded as revenue charges, or costs of manufacture."

While certain primary asset accounts thus set forth the facts as to the growth of the property of a public utility, showing as of succeeding definite dates the pecuniary investment in the properties which the concern owns, we must look to other primary accounts, called liability accounts, for an estimate of what the concern owes, either to its legal owners, or to those associated with its economic fortune as creditors. This, too, can be shown historically by setting up a balance sheet at different times. Here again we meet the parallel distinction, drawn by accountants as a matter of convenience, between capital liabili-

[6] Kester, R. B., *Accounting Theory and Practice*, Ronald Press, N. Y., 1918, Vol. II, p. 103.

ties representing fixed obligations, with a long term date of maturity or without any definite date of maturity, and current liabilities representing obligations that mature frequently, usually within a year. The account "capital stock," in its various classifications of preferred and common, for instance, usually represents the "permanent full paid interests in the accounting company, or interests which, if terminable, are so only at the option of the company." The par value of the stock represents the subscriptions to corporate capital by its legal owners and has thus been irretrievably committed to this enterprise. The account "long-term debt" in its various classifications represents the total par value of all debt "which, by the terms of its creation, does not mature until more than one year after date of creation. This covers bonds, notes, mortgage certificates, and all other forms of acknowledgment of indebtedness." As distinguished from the above, other primary accounts, such as Notes Payable and Accounts Payable, represent outstanding obligations payable either on demand or after some interval of time, usually less than one year. Thus the concern can establish a financial plan which will enable it to secure working capital largely on the basis of its current credit while it secures its fixed capital by a joint contribution of owners and long-term creditors.

There are other types of primary asset and liability accounts, but since these grow out of technical accounting requirements they will not be discussed here. We must, however, say a word about one of these types. In the development and upbuilding of a business funds may come from four sources: (1) they are contributed by the joint owners; (2) they are borrowed from long and short term creditors; (3) they are secured from public or private sources as contributions and gifts; (4) they are derived from earnings. Funds derived from the fourth source give rise to at least one peculiar type of balance sheet account. Ordinarily, sums not required to pay obligations, are considered as net income, available for distribution to owners. When they are not distributed to owners, but are retained in the business, they are credited to the surplus or profit and loss account. So long as these earnings remain in the business, they are analogous to the capital funds originally contributed by owners. They may be used for corporate purposes like other cash, as for the extension or improvement of the fixed property. Often they are used for the creation of casualty and insurance reserves or sinking fund reserves to pay a specific long-term debt.

They are then taken out of the surplus account and credited to these special reserve accounts. Simultaneously, the actual cash will be transferred from the cash account to appropriate special funds carried as asset accounts. Funds may also arise out of earnings, but instead of being classed as *net income* they may be treated as an expense or cost of operation, although the actual expenditure may be a contingent one or one deferred to some future time. Meanwhile these funds will be held in appropriate reserves such as a reserve for bad debts or a reserve variously called depreciation or retirement reserve. Legislation or administrative orders will determine whether such reservations of earnings should be treated as expenses or as appropriations of net income. These funds also will be available for corporate purposes and may be invested in fixed property or held in special funds. But in these cases a peculiar claim attaches to the funds in that the priority of use for the original purpose ought always to be safeguarded.

By way of summary we may say, therefore, that balance sheet accounts and their marshalling in the form of a statement are designed to afford a picture of the financial condition of the concern at any given time, let us say at the end of a calendar year. Another parallel statement may be prepared showing the financial condition at another given time, say at the end of the next calendar year. In this way balance sheet accounts show, historically, the important economic facts in regard to a concern in so far as they have become a matter of accounting record. Changes, both favorable and unfavorable, can be noted by an examination and comparison of these parallel statements, taken either as a whole or account by account. The surplus or profit and loss account is the critical account in such an analysis and comparison, because in it are supposed to be reflected the net changes in financial condition. If these changes show favorable tendencies, the surplus will be growing or the deficit diminishing. Such a concern is what we have called here a "going concern" or it is on the way to become one. On the other hand, a declining surplus or, worse still, an accumulating deficit is indicative of a concern whose economic future is not assured. It may develop into a "going concern" if the losses or recessions in surplus are but temporary. On the other hand it may be definitely on the way to receivership and eventual dissolution or reorganization. To determine, therefore, what is and what is not a going concern is a complex task not to be lightly inferred from any one balance sheet or even a series of them,

because after all, accounting facts must be translated into economic causation by an analysis of detailed operations to which balance sheets give but a clue. Yet they are the starting point in the process of diagnosis.

(b) *General character of income accounts.*

We have said that a comparison of the facts disclosed by two successive balance sheets will show the extent and character of financial changes that have occurred in the interval between these two definite points of time. Such cross-sectional views of a particular business are supplemented by an income statement which summarizes the results of operation as disclosed by income accounts. These accounts record changes during a period of time such as a year or a month.[7]

The classification of income accounts begins with a primary account called Operating Revenues. Like the fixed capital account, this is a control account in which the several classes of revenues are summarized. The detailed revenue accounts are classified in accordance with the types of service rendered. Revenue classifications vary primarily with the character of the utility (electric, street railway, steam railway, gas, water, telephone, etc.) and secondarily with the classes of service rendered by each utility. So far as possible each single revenue source is related to one or more similar schedules of rates, in order that the yield in earnings under each rate schedule may be readily ascertained. Miscellaneous revenues incidental to operation, as well as revenues arising from operations outside the primary purpose for establishing the utility, are likewise shown.

From operating revenues are deducted operating expenses. The general accounting classifications provide for detailed operating expense accounts of which the general account is a summary. Operating expenses are necessary in providing the concern with revenues and include the estimated fixed capital consumed in operation in addition to the direct outlay for labor and material directly consumed in operation. But the fixed plant must be kept up and repaired. Minor renewals of small tools or of parts of larger units of equipment become necessary in order to maintain operating efficiency. Since these repair and renewal costs occur on the whole with regularity and are tolerably proportional in amount from one accounting period to the next, they are considered as a maintenance expense and charged against the revenues of the period when they occur.

[7] See Schedule III on page 143.

When, in order to maintain efficiency of operation, it becomes necessary to replace equipment, the retirements of old capital become more significant. The question then is whether the change in degree does not constitute one in kind, which should be called depreciation. Depreciation is merely a technical term for the wastage or consumption of fixed capital assets. The wastage cannot be denied; it has become an objective fact. The only question which can properly be raised is whether the cost of a particular major renewal or remodeling is so important that the cost should be distributed over more than the current accounting period. Not to prorate the cost may make the maintenance expense for that period higher than for the preceding or the following period, thus resulting in an uneven flow of net earnings. This circumstance, together with the fact that many of the physical causes of depreciation have been operative over long periods, have led to the practice of estimating the probable wastage of capital in advance and recording it by means of a proportional depreciation charge. So far as the official classifications of accounts are concerned the matter is one which should be recognized in principle, leaving the working out of details to administrative regulation.

Taxes are a definite charge levied by governments against public utilities. The tax account is debited with the annual amount of these contributions which constitute another deduction from gross revenues. Similarly, a deduction is made annually for uncollectible accounts upon some estimated basis.

It is often convenient for a particular utility to lease a portion of its physical plant or to divide with some other utility the cost of owning and operating a facility jointly used. Such lease rentals and joint facility rents are also provided for in the accounts and constitute a deduction from revenues. They are set off from other expenses because the rental is in the nature of a fixed charge for the use of capital provided by some other business unit.

Frequently, a concern may engage in operations outside of its purely public utility service. Or, again, it may operate several types of public utilities as a joint enterprise. It is then important that accounts and income statements be so arranged as to show separately the operating revenues and operating expenses attributable to each of these separate enterprises. The income statement of such a consolidated enterprise should therefore show, (1) the net income derived from the several types of public utility services, and (2) separately therefrom, the net income

from non-utility operations. The latter usually takes the form of revenues derived from investments made by the corporation in the securities of other companies. These investments may be made solely for financial purposes or they may be made in order to secure the control of another company.

These two streams of net income are now combined into a gross corporate income. The corporation then proceeds to take care of its fixed obligations for which the enterprise as a whole is liable.

The deductions from gross corporate income give rise to another class of income accounts of which the "interest on long-term debt" is the most important. Other interest payments, on notes payable for instance, are shown in an account called miscellaneous interest. Discounts and expenses incurred in floating long-term debts are prorated as an annual charge over the life of the security. They are thus in the nature of a prepaid interest charge, which is carried in an account called amortization of debt discount and expense. Other similar items, compulsory in character, are likewise accounted for and added to the other deductions. These deductions having been made, the result is the true corporate net income available to the corporation and subject to voluntary appropriation for corporate purposes by vote of its board of directors. The chief items here are appropriations of income to sinking funds (sometimes required by mortgage provisions) and appropriations for dividends upon the preferred and the common capital stock. Only the fixed dividends upon preferred stock and the customary regular dividends upon the common stock are usually included in the income statement. These appropriations are at least semi-compulsory in that they are necessary to maintain corporate credit. The balance of unappropriated net income is transferred to the profit and loss account.[8]

(c) *General character of profit and loss accounts.*

We return once more to the profit and loss or surplus account on the liability side of the balance sheet. When arranged as a statement it is sometimes treated as a collective title for a small group of accounts or accounting transactions that form the connecting link between the income account and the balance sheet. These are designed to give a summary explanation of the changes in financial condition that have come about since the date of the last balance sheet. In order to do so, the profit and loss

[8] Consult Schedules I, II and III on pages 142 and 143.

statement carries the balance of profit or loss in the last balance sheet to the beginning of the fiscal period. To this is added the net change as indicated by the current income statement. Out of this total come additional appropriations of dividends, or, if the current net income was inadequate, the regular dividends. Other items might be sundry appropriations of reserves not provided for as a matter of accounting routine. There might be other abnormal items of profit or loss, such as property sales, which would seriously distort the income statement if they were there included in whole or in part. They are therefore taken care of through the profit and loss account.[9]

The cursory analysis and explanation set forth above will have served its purpose if it has given some idea of the nature of the classifications of primary accounts which public utility enterprises use under legislative sanction. They are exemplified in a series of schedules applying to a typical electric light and power utility. Schedule I shows detailed operating revenues of $11,400,000 earned by this electric utility during the year 1924. Schedule II shows the general operating expense accounts for the same business, which reveal an expenditure of $5,910,000. These amounts are carried over into an Income Account which is Schedule III. Here are shown other items of cost and of income resulting in a net income of $894,000. After making certain dividend appropriations, the balance of net income of $174,000 is transferred to the Profit and Loss Account which is Schedule IV. This shows a special dividend appropriation of $360,000 along with other items. The final balance of profit of $514,000 reappears as the corporate surplus on the liability side of the Balance Sheet, which is Schedule V.

Accounting control has thus been instituted in order to aid both management and regulation. By way of summary, we may say once more that it is designed first to account for the inflow of pecuniary values from all sources; second, to record the outflow of pecuniary values, *i.e.*, the disposition which is made of these funds by management either (a) in the acquisition of fixed or circulating capital, or (b) in the administration of these properties, so as to earn an income.

While the accounting treatment has been in accordance with the requirements of enterprises privately owned and managed (the type of ownership dominant in the United States), the accounting process would be the same in all essentials for enterprises publicly owned and managed. Only the accounts signi-

[9] Consult Schedule IV on page 144.

SCHEDULE I

ELECTRIC UTILITY

DETAILED OPERATING REVENUE ACCOUNTS

Year Ending Dec. 31, 1924

Acct. No.	*Item*	*Amount*
	Sales of Current	
601a.	Metered sales to lighting consumers	$ 5,500,000
b.	Metered sales to cooking consumers	140,000
c.	Metered sales to power consumers	4,340,000
602a.	Flat-rate sales to lighting consumers	65,000
603	Railroad corporations	130,000
604	Other electrical corporations	1,040,000
605	Municipal street-lighting	140,000
606	Miscellaneous municipal sales	
	Total	$11,355,000
	Miscellaneous Revenue	
611	Commissions on others' electric energy	
612	Rent from electric appliances	
613	Rent from property used in operation	1,000
614	Merchandise and jobbing	40,000
615	Miscellaneous operating revenues	4,000
	Total	$ 45,000
	GRAND TOTAL (See acct. 401 Income Account)	$11,400,000

SCHEDULE II

ELECTRIC UTILITY

GENERAL OPERATING EXPENSE ACCOUNTS

Year Ending Dec. 31, 1924

Acct. No.	*Item*	*Amount*
700	Production expenses	$3,960,000
720	Conversion and storage expenses	180,000
730	Transmission expenses	60,000
740	Distribution expenses	520,000
750	Utilization expenses	300,000
760	Commercial expenses	320,000
770	New-Business expenses	140,000
780	General and miscellaneous expenses	430,000
Total	General operating expenses (See acct. 402 Income Account)	$5,910,000

SCHEDULE III

ELECTRIC UTILITY—INCOME ACCOUNT

Year Ending Dec. 31, 1924

Acct. No.	*Item*		*Amount*
	Income from Operating Properties		
401	Operating revenues (Schedule I)		$11,400,000
402	Operating expenses (before Retirement expense) (Schedule II)	$5,910,000	
403	Retirement expense	900,000	
404	Uncollectible bills	15,000	
405	Taxes assignable to electric operations	1,050,000	
	Total revenue deductions		$7,875,000
	Net operating revenue		3,525,000
	Income from Non-operating Properties		
	Miscellaneous rent revenues	$ 20,000	
	Interest on long-term debt owned	5,000	
	Miscellaneous interest revenues	500	
	Dividend revenues	40,000	
	Income from special funds	16,500	
	Miscellaneous non-operating revenues	21,000	
	Total income		103,000
	Gross Corporate Income		3,628,000
	Deductions from Gross Corporate Income		
	Interest on long-term debt	2,600,000	
	Miscellaneous interest deductions	9,000	
	Amortization of debt discount and expense	125,000	
	Amortization of premium on debt—cr.		
	Miscellaneous amortization		
	Miscellaneous deductions		
	Total deductions from gross corporate income		2,734,000
	Net Income		894,000
	Disposition of Net Income		
	Sinking fund appropriations		
	Dividend appropriations	720,000	
	Miscellaneous appropriations		
	Total appropriation of net income		720,000
	Balance transferred to surplus (See Schedule IV)		174,000

SCHEDULE IV

ELECTRIC UTILITY—PROFIT AND LOSS ACCOUNT

Year Ending Dec. 31, 1924

	Debit	*Credit*
Balance at beginning of fiscal period		$750,000
Balance transferred from income account		174,000
Dividend appropriations from surplus	$360,000	
Appropriations to reserves		
Miscellaneous credits to Profit and Loss		50,000*
Miscellaneous debits to Profit and Loss	100,000†	
Balance at end of fiscal period (See Profit & Loss—Surplus, Schedule V)		514,000

* Profit on the sale of fixed property.
† Losses on sale of property and donations for charitable purposes.

SCHEDULE V

ELECTRIC UTILITY—BALANCE SHEET

December 31, 1924

Assets		*Liabilities*	
Fixed capital	$35,000,000	Capital stock	$12,000,000
		Premium on capital stock	
Current Assets			
Cash	400,000	Long-term debt	24,000,000
Notes receivable	40,000	Receiver's certificates	
Accounts receivable	700,000		
Interest and dividends receivable		*Current Liabilities*	
		Notes payable	150,000
Materials and supplies	1,900,000		
Prepayments	10,000	Accounts payable	400,000
Miscellaneous current assets	15,000	Consumers' deposits	90,000
		Matured interest unpaid	5,000
		Dividends declared	2,000
Miscellaneous Assets		Matured long-term debt unpaid	45,000
Investment in affiliated companies	2,500,000	Misc. current liabilities	24,000
Miscellaneous investments	100,000	*Accrued Liabilities*	
Sinking funds		Taxes accrued	225,000
Replacement fund		Interest accrued	300,000
Miscellaneous special funds	400,000	Misc. accrued liabilities	
Special deposits	70,000		
		Advances from affiliated companies	

Assets		*Liabilities*	
Suspense		*Reserves*	
Unamortized debt discount and expense..	1,800,000	Retirement reserve ...	5,250,000
Property abandoned .	100,000	Casualty and insurance reserve	400,000
Jobbing accounts	5,000	Unamortized premium on debt	
Clearing and apportionment accounts .		Sinking fund reserves.	
Work in progress	700,000	Advances and contributions for extensions	75,000
Miscellaneous suspense	25,000		
Adjustment Accounts		Contingency reserve..	
Reacquired securities.	10,000	Miscellaneous reserves	320,000
Treasury securities ..	25,000	Miscellaneous unadjusted credits	
Profit and loss—Deficit		Profit and Loss—Surplus	514,000
Total Assets	$43,800,000	Total Liabilities	$43,800,000

fying ownership would be differently named and, perchance, differently treated.[10]

Sec. 6. **Uniform Reports and Statistics**

As we have seen, the regulation of accounting began by making reports compulsory. At first these reports were neither uniform nor standardized. In fact, standardization and uniformity had to wait upon the perfection of accounting control. At the present time, practically all public service commissions require annual reports upon prescribed forms. These reports contain schedules which call for an annual balance sheet, an income account, and a profit and loss statement. They are supplemented by other schedules calling for further details with respect to particular items. Among these should be mentioned details concerning capital stock and dividends, long- and short-term debt and interest payments, appropriations of revenues to reserves and charges against these reserves. Without such reports customers and public authorities would have difficulty in keeping currently informed. It is anticipated that even more frequent reports, perhaps upon a monthly basis, will be required if the regulation of income is to become more flexible. This

[10] The city's proprietary interest, for instance, might be called "City Equity."

is already being done in the case of some of the larger companies, and the practice is growing.

In the event of actual litigation and for certain special purposes not arising directly out of litigation, special reports upon designated or optional forms may be called for. Accounting control reaches its ultimate end, however, in the periodic audits of accounts and records which are undertaken on behalf of public authorities by their own or by designated staffs of accounting and engineering examiners. Upon such occasions the examination extends into such refinement of detail as the specific purpose of the investigation requires. Particular attention is then bestowed upon the way in which the accounts have been kept and upon the fidelity, accuracy, and technical perfection with which the prescribed accounting regulations have been carried into effect by the operating companies.

A distinctive feature of annual reports is the schedules calling for statistics of ownership and operation. These statistics are of a miscellaneous character, not readily classified or described. In general terms they relate (a) to units of service, (b) to units of performance, (c) to units of fixed capital investment. It is clear, therefore, that they are not necessarily fiscal in character, but may relate to purely physical items, or may be of a mixed physical and financial character. By means of such statistical units efficiency in construction, operation and financing is best judged. Statistical units of cost of service or of revenue receipts are the best means of relating rates paid to service consumed and hence of finding a basis for rate adjustment in economic facts.

We must also mention in passing that the regular reports give information regarding the legal history and corporate organization of the utility, its official and operating personnel, the territory served, the number and classification of customers, and the character of the service. The reports are used for a variety of purposes. All these miscellaneous matters have become important because they aid in making effective a system of regulation which has varied objects, a far-flung frontier, and does a good deal of its work at long range.

Sec. 7. Financial and Operating Ratios as Aids to Management

The elements of cost and income may also be scrutinized from a management standpoint. For this purpose statisticians have worked out certain important financial and operating ratios.

Only the most important of these will be discussed here and in the following order:

1. Ratios indicating return earned on the stockholders' equity or investment.
2. Ratios of net operating revenue to total capital employed.
3. Ratios of the cost of borrowed capital.
4. Ratios of turnover of investment in fixed property and plant.
5. Ratios of operating expenses and fixed charges to operating revenues.
6. Ratios of fixed expenses to property investment.

(a) *Ratios indicating return earned on the stockholders' equity or investment.*

In arriving at this ratio of earnings the year is the customary unit of time. The stockholders' equity, where all the capital stock of a company is common stock, is shown by the capital stock and the surplus accounts.[11] The return in this case is the *net income* available for dividends, as shown in the income account. Dividing the annual net income by the average stockholders' equity for the year yields a ratio or percentage which expresses the earning power of the aggregate investment made by stockholders alone. Sometimes the ratio is expressed as the number of dollars earned per share outstanding but this is misleading because it does not include surplus earnings which may have been left in the business either as free surplus or as appropriated surplus in the shape of reserves. This ratio expresses the point of view of the legal owners of the business.

(b) *Ratios of net operating revenue to total capital employed.*

Under regulation it is also important to know what is the financial return of the business taken as a unit, without distinguishing between capital which has been contributed by owners and capital obtained from creditors. This financial return is shown by bringing into relation with each other the net operating revenue and the *total* capital used in operation. This is the true measure of earning power of the business considered as an *economic* unit. If the business carries on different kinds of operations—as for example a joint utility operating an electric railway, an electric light and power utility, and a gas utility—it then becomes necessary to determine the net operating revenue for each utility and the total capital employed in operating each. It is essential for both management and the regulating

[11] To the surplus account should be added reserves created out of surplus the purpose of which is to increase stockholders' equity, such as sinking fund reserves created to retire indebtedness.

commission to know the earning power, separately, by departments because the sources of gain or loss should be disclosed.

The year is again the unit of time for which this ratio is commonly determined. Net operating revenue is the amount of operating revenue remaining after paying all operating expenses.[12] The total capital employed in operation consists of the total assets of the business less such assets as are not used by the company in its ordinary public utility operations. For instance, investments in securities yielding an income of their own should be deducted from the total assets. This means that the corresponding revenues and expenses arising out of such non-operating investments should likewise be eliminated in computing the net operating revenues. The total operating capital will thus include only the *average* investment in fixed assets, in current assets, in prepaid expenses and in deferred charges. For practical purposes, and to make computation easy, the total operating capital is usually taken as the fixed assets alone or as fixed assets plus some allowance for working capital. This allowance may be somewhat arbitrarily determined by taking total current assets or total current assets diminished by current liabilities. This ratio has come to be known in the parlance of regulation as "the rate of return" and will be dealt with further in a later chapter. We only mention it here because, together with the preceding ratio of return upon the stockholders' equity, it is a measure of the economy and efficiency with which management carries out its operating, merchandising and financing functions.

(c) *Ratios of the cost of borrowed capital.*

The cost of borrowed capital constitutes a large portion of the entire difference between the net operating revenue and the net income. The interest rate paid on borrowed capital does not alone make up the cost. To the nominal interest should be added the cost of bond and note discounts applicable to the period under consideration, as well as expenditures in connection with bond and note issues. By adding together for the year the nominal interest paid, the expenses of issuance and discounts (deducting any premiums that may have been received) the true cost of borrowed capital is ascertained. This cost is then divided by the *average* amount of capital borrowed during the

[12] According to a recent decision of the United States Supreme Court federal income taxes should not be included among operating expenses. *Galveston Electric Co.* v. *Galveston*, 258 U. S. 388, 395.

year, as shown by the funded and floating debt accounts, and the resulting ratio expresses the true cost of borrowed funds.

(d) *Ratios of turnover of investment in fixed property and plant.*

We have often referred to the fact that public utilities are large-scale businesses. However, their operations are on a large scale in a sense which differs from the sense in which large mail-order houses do a large-scale business. In the case of the latter enterprises the *volume of business* done as shown by sales is large compared to the capital employed, while in the case of public utilities this relationship is small. The ratio of gross operating revenues to total capital employed has been called the "turnover." It is one of the most important financial facts to be known about any business. It provides a measure of the revenue producing efficiency with which the capital is employed. It also tells the extent to which the capital factor dominates the business.

When the term capital is used in this connection it should again be taken to mean fixed plus current assets—(because the capital of public utilities is invested not only in fixed properties for manufacturing and distributing purposes but also in raw materials for production and in cash and accounts receivable). Investments of capital in the securities of other companies should again be excluded from capital for this purpose. In order to be strictly correct operating capital ought to include also prepaid assets and deferred assets. On account of their miscellaneous character, however, and the difficulty of properly segregating those arising out of operation from those incident to other transactions, it appears advisable to restrict this ratio of turnover to fixed capital alone. Assets held for investment or control are outside of the immediate purpose for which "turnover" is computed. It is true that there is a turnover also with respect to accounts receivable and with respect to materials and supplies. These items are, however, relatively unimportant for public utilities. Moreover, the law and the economic indispensability of the service to customers have placed public utilities in a position where the turnover of accounts receivable represents no serious management problem. Materials and supplies are needed for both construction and operating purposes. When that portion held for construction is deducted, the balance will be found to consist in large part of fuel, and of material required for maintenance purposes. Since public utilities

TABLE XIII

ANNUAL RATIOS OF INVESTMENT TO OPERATING REVENUE *

FOR SELECTED WISCONSIN UTILITIES

	1909	*1910*	*1911*	*1912*	*1913*	*1914*	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*
Street Railway Utilities												
Wis. Public Service	5.8†	5.6	5.5	10.4	10.7	10.3	11.3	12.2	11.7	11.4	9.4	7.3
Wis. Traction Lt. & Ht.	5.1†	5.1	5.4	5.9	5.8	5.7	5.9	6.3	5.4	5.4	4.4	3.8
Eastern Wis. Ry. & Lt.	5.9†	5.6	5.5	5.5	5.6	5.6	6.0	6.1	6.2	7.7	6.8	7.9
La Crosse Ry.	3.0†	2.8	2.6	2.5	2.4	2.2	2.2	2.2	2.2	2.1	2.0	1.5
Janesville St. Ry.	4.9†	5.5	7.3	4.5	4.0	4.2	3.7	4.4	4.3	5.9	5.4	5.4
Milwaukee Northern Ry.	8.4	7.1	7.0†	6.7	6.2	6.3	6.9	7.0	6.6	6.2	5.2	3.9
Wis.-Minn. Lt. & Pr.	4.8†	4.3	3.8	3.9	3.9	4.2	4.1	4.0	5.6	6.0	5.4	4.5
Milw. El. Ry. & Lt.	3.1†	3.0	3.0	3.2	3.6	3.9	4.5	4.0	3.7	3.7	4.1	2.9
Madison St. Ry.	2.3†	2.2	2.1	1.5	1.5	1.6	1.6	1.7	1.6	2.2	2.3	1.9
Manitowoc & Northern Ry.	4.9†	5.0	4.7	4.5	4.4	4.4	4.6	4.6	5.2	5.2	4.2	3.3
Menominee & Marinette Lt. & Pr.	7.1†	7.2	8.4	8.2	8.0	7.2	8.2	8.8	8.7	9.2	7.4	6.4
Waupaca El. Lt. & Pr.	5.7†	5.9	6.1	5.7	5.7	5.9	6.6	7.4	7.1	8.6	8.2	8.5
Ashland Lt. Pr. & Ry.	7.2†	9.7	11.0	13.3	13.3	13.2	16.9	18.9	13.3	13.2	9.8	9.3
Beloit Traction	1.7†	1.4	1.7	1.7	1.6	1.7	1.9	2.0	2.1	1.8	1.6	1.1
Water Utilities												
Fond du Lac Water	7.5	7.7	7.4†	7.3	6.5	6.6	7.1	6.9	7.1	7.0	7.1	6.6
Appleton Water Works	8.6	8.4†	9.5	10.5	13.0	10.3	9.6	11.0	10.0	9.8	10.2	8.9
La Crosse Water Co.	11.3	11.4	10.8	13.7	12.8	17.3	20.2†	20.9	16.5	17.9	16.2	12.8
Madison City Water	15.0	11.0	12.7	12.8	9.8	9.3	9.8	9.9	11.6	12.8	8.9	8.8
Oconto City Water	14.3	14.8	14.1†	14.4	13.9	13.5	12.9	13.3	12.6	12.2	12.2	12.6
Green Bay Water Co.	11.9	10.6	11.6	9.7†	9.6	9.3	11.6	11.0	11.2	11.0	12.5	12.3
Milwaukee Water Works	8.0	8.9	8.6†	10.3	8.7	9.0	8.3	8.3	9.0	8.9	8.9	9.9
Watertown Water Works	8.1	9.4	9.3	10.1†	9.4	9.7	9.5	9.3	9.2	9.7	9.0	11.0
Waukesha Water Works	9.7	12.3	12.7	11.2	11.9	11.3†	12.7	12.8	13.3	12.8	12.7	14.0
Baraboo Water Works	10.5	10.6†	11.2	13.0	11.1	10.3	10.7	11.1	11.9	12.7	13.4	11.8

TABLE XIII—(*Continued*)

ANNUAL RATIOS OF INVESTMENT TO OPERATING REVENUE *

FOR SELECTED WISCONSIN UTILITIES

	1909	*1910*	*1911*	*1912*	*1913*	*1914*	*1915*	*1916*	*1917*	*1918*	*1919*	*1920*
Electric Utilities												
Beloit Water Gas & Electric	3.8†	4.0	3.7	3.3	3.3	3.1	3.2	3.2	2.8	3.3	3.4	2.8
Willow River Pr.	5.3†	4.7	4.2	4.0	3.9	4.7	4.7	3.9	6.8	6.8	6.3	5.4
Madison Gas & Electric	2.9	2.6	2.5	2.8	2.7	3.0†	2.8	2.6	2.4	2.3	2.2	2.0
Monroe Lt. & Pr.			2.9	2.8	2.7	2.5	2.7	2.5	2.3	2.3	2.4	1.9
Peoples Water Lt. & Pr.	6.3	7.4	6.0	6.4	6.1	5.8	5.8	5.5†	5.1	5.7	5.4	3.9
New Richmond Power	1.7	1.5	1.3	1.3†	1.2	1.6	2.2	2.0	2.0	1.7	2.0	1.4
Ripon Lt. & Water	4.1	4.1†	4.2	4.0	3.1	2.8	2.6	2.8	2.8	2.6	1.8	1.5
Superior Water Lt. & Pr.	3.5	3.2	2.9†	2.8	2.7	2.7	2.8	2.7	2.8	2.4	2.2	1.8
Tomahawk Lt. Teleph. & Imp.	2.8	2.8	2.8	2.9	2.7†	2.7	2.6	3.2	3.2	3.2	3.8	2.8
Waukesha Gas & Electric	1.9	1.8	4.5	4.2†	3.9	3.3	3.5	3.0	3.0	2.1	1.4	1.2
Gas Utilities												
Antigo Gas			19.0†	15.3	8.6	8.4	6.2	6.7	5.5	4.2	3.7	2.8
Beaver Dam Fuel & Lt.		10.5	7.0	6.0	5.0	4.4	4.6	4.1	4.0†	3.4	3.0	2.3
Beloit Water Gas & Elect.	4.0†	4.0	4.1	4.1	4.7	5.0	5.1	4.5	4.3	3.8	3.3	2.1
New Gas Lt.	3.4	3.4†	3.4	3.2	3.1	3.0	3.0	3.0	3.1	2.8	2.7	1.6
Madison Gas & Electric	3.0	2.9	2.9	2.8	2.8	2.8†	3.2	3.1	3.0	2.9	2.8	2.4
Menominee & Marinette Lt. & Pr.	12.5	11.1	11.4	11.3	10.8†	10.7	9.7	10.5	9.6	8.9	7.5	5.0
Milwaukee Gas Lt.	4.5	4.2	4.2	4.3†	4.0	4.0	3.9	3.6	3.0	2.9	2.8	2.2
Monroe Lt. & Pr.			6.7	6.0	5.2	4.8	4.6	4.7	4.4†	4.0	3.4	2.5
Portage American Gas	3.2	3.3	3.2	3.3†	3.3	3.3	3.3	3.2	3.2	2.9	2.8	1.9
Oneida Gas	12.9	8.5	9.4	7.1	5.7	5.8	5.6†	5.8	5.1	4.6	4.3	3.2

* Investment consists of valuation plus additions to capital for the year.
† Indicates year of valuation.

supply service as it is needed, there is no inventory problem similar to that of a manufacturing or merchandising business. The only exceptions, as we have seen, are public utilities of the "product type"; but the amount of supply on hand is rarely more than one day's sales.[13] Altogether, therefore, these items of current assets are both unimportant and difficult of exact ascertainment, and it is best to omit them. The ratio is thus computed upon the basis of investment in fixed property and plant.

These computations are illustrated in a series of tables for the different classes of public utility industries. Table VIII on page 84 shows this ratio for all classes of public utilities. The figures are subject to the criticism that the property and plant accounts are inaccurate, yet they are the only data available at the present time. In order to test the accuracy of these ratios a similar computation has been made for those local utilities in the state of Wisconsin for which *valuations* of fixed capital are available. The results are shown in Table XIII on page 150. The ratios have not been averaged but are shown annually and separately for each company. These facts serve to indicate the diversity of conditions under which investment is made and how conditions change from year to year.

A wide variation in turnover of fixed property investment exists also as between different industries. What these differences are in the various branches of public utility industry can be seen from the above tables. For industries other than public utilities an even greater variation exists. Table XIV shows these ratios as ascertained by Bliss in a recent study [14] and somewhat revised in order to make them comparable with the results shown in the other tables. The difference in the volume of business done as shown by sales varies with the coal industry at one end of the scale and tobacco products at the other. None, however, approach public utility industries in the amount of fixed investment necessary to handle a given volume of business.

(e) *Ratios of operating expenses to operating revenues.*

The ratio of operating expenses to operating revenues is known as the "operating ratio." It expresses a fundamental relationship of the cost of doing business. For this purpose operating

[13] The articulation of service supplied with service demanded is a serious management problem of the "service type" of utility.

[14] Bliss, J. H., *Financial and Operating Ratios in Management*, The Ronald Press Co., 1923, p. 152.

TABLE XIV

THE TURNOVER ON FIXED PROPERTY INVESTMENT BY GROUPS OF REPRESENTATIVE COMPANIES OF VARIOUS INDUSTRIES *

	No. of Years in Period	*No. of Companies in Group*	*Dollars of Fixed Property Investment per Dollar of Sales*
Auto & Truck Mfg.	6	5	$ .34
Auto Accessory Mfg.	5	6	.21
Chemical Products Mfg.	6	4	.81
Coal—Anthracite	8	2	1.75
Coal—Bituminous	7	4	2.94
Copper Mining & Mfg.	9	12	.83
Cotton Goods Mfg.	7	4	.37
Drug Mfg. & Distributors	6	2	.21
Electrical Machinery Mfg.	8	3	.22
Explosives Mfg.	9	2	.56
General Merchandising	7	3	.10
Iron & Steel Mfg.	8	6	1.43
Lead Production & Mfg.	7	2	1.33
Leather Mfg.	9	2	.70
Machinery Mfg.	6	4	.43
Mail-order Merchandising	9	2	.10
Petroleum Oil Companies	7	6	1.33
Paper Manufacturing	5	2	.99
Railway Equipment Mfg.	8	4	.71
Retail Chain Stores	6	5	.11
Rubber & Tire Mfg.	9	4	.52
Slaughtering & Meat Pkg.	9	4	.10
Sugar Prod. & Refining	8	4	.90
Tobacco Products	9	2	.08
Averages:			
94 Companies, 1916-1921	6	94	.55
56 Companies, 1914-1921	8	56	.58

* Statistics based on published reports.

expenses are usually defined as all costs occasioned by the earning of revenues excluding, however, all fixed charges. Fixed charges, in an accounting sense, include interest, amortization of discount and expense, and contractual sinking fund requirements. The operating ratio may be shown for the business as a whole or for some department of the business. When ascertained over a period of years it gives information of the trend of costs and particularly of their relation to gross revenues.

Operating expenses, although variously defined for this purpose, ordinarily include depreciation, taxes, and rentals. Because operating expenses so defined comprise all the variable expenses, and some proportion of the fixed expenses, their relation to gross revenues must be closely watched.

Operating ratios show the margin available for meeting fixed charges and for profits. An increasing operating ratio reflects either upon the efficiency of operation or upon the sales policy of the concern. However, operating ratios fail to distinguish between fixed and variable expenses and are therefore open to misinterpretation. Maintenance expenses, for instance, may be deferred for a time and expenses may thus be understated. Nevertheless, operating ratios tend to become characteristic for industries or long-established business units and much can be learned from them in a general way.

Ratios of fixed charges to operating revenues are important because together with the operating ratio they give an idea of the width of the margin of net income or true profit.

(f) *Ratios of fixed expenses to property investment.*

Economy of operation is also disclosed by the relation of fixed expenses to the investment in fixed property. Fixed expenses for this purpose should be distinguished from fixed charges. They include, in addition to fixed charges, taxes, insurance, and depreciation. For some purposes a reasonable estimated profit may also be included. Such costs are likely to remain constant from year to year. They will vary in amount with the character of the fixed properties and circumstances surrounding the particular plant. For any one plant they should, however, bear a tolerably constant relationship to the capital tied up in fixed properties. These properties were designed to afford a certain capacity for carrying on business and this potential capacity controls the amount of investment and consequently such items of fixed cost as interest, depreciation, insurance, etc.

The ratio of fixed expenses to property investment together with the ratio of fixed charges to operating revenues (the complement of the operating ratio) affords some idea of the burden which a subnormal volume of earnings throws upon the finances of a business. It also points out the advantages of securing an additional volume of business without increasing the fixed investment, and it aids in deciding the question whether or not a business should expand investment in fixed property. Fixed property investment is increased in order to save operating cost

or to provide additional producing capacity. But such increases also mean added fixed expenses. It must, therefore, be determined that these added fixed expenses will either be carried by an increased volume of business that bids fair to be permanent or by permanent savings in operating cost.

These preliminary chapters have dealt in a general way with the reasons why public utilities have been classified apart from other economic pursuits. The essential facts as to their history have been traced, taking first the development as a whole and then the development in the United States. A survey was made of the kinds of transactions which going concerns involve; their nature and relative importance was explained; and something was said as to the way in which, through accounting and statistical records and devices, one can learn how well an individual business unit is performing its economic functions. We are now ready to review in Part II the various policies of regulation to which going concerns have been from time to time subjected.

PART II

THE DEVELOPMENT OF AGENCIES OF REGULATION IN THE UNITED STATES

CHAPTER VII

THE COMMON LAW BASIS OF PUBLIC UTILITY REGULATION[1]

Public service enterprises are regulated by governments throughout the civilized world. We must not think of public utility regulation as a new device invented by disgruntled American farmers about 1870. It is, in fact, only one aspect of the social control of all economic activity, and depends, in the last analysis, upon the social philosophy which people generally have come to profess as a result of their experience.

Sec. 1. **The Historical Background of Regulation**

Regulation of private industry has been attempted by government from the earliest times. However, the character of that regulation has changed, having been at times less intensive and at other times more intensive depending upon the oscillation of public policy between two poles of thought. As the pendulum swung from the extreme forms of collectivism that characterized early social structures to the liberal individualism of the eighteenth century, the idea was discarded that private economic activity required a high degree of governmental interference and in its place came the idea that the regulatory power of the State should be restricted. The economic life of the Greek city states, of the Roman Empire, of medieval Europe and of the early modern states afford abundant illustrations of the operation of policies according to which economic life is essentially state controlled. Paternalism, feudalism and mercantilism are three terms which epitomize a view of economic life in which individual initiative is greatly limited. Out of a great mass of

[1] The larger part of this chapter is reprinted from an article by the writer in the *Journal of Land and Public Utility Economics*, Vol. 1, No. 2, p. 176, 1925.

illustrations showing how control was exercised we will give only two.

During the period of the decline of the Roman Empire, when Christian theology was beginning to exercise some influence, the Emperor Diocletian in two price edicts of the years 285 and 301 fixed maximum prices for from seven hundred to eight hundred different articles upon the basis of their estimated cost of production. The reason for such legislation was fear of revolution. Prices were high and unsteady due to the debasement of the currency, taxes were heavy under conditions of declining trade, and the cost of living for the poorer classes was rising. Another illustration is derived from the regulation of trade by medieval gild societies. The historian Cheyney [2] has well summarized certain of these regulations. "In those occupations that involved buying and selling the necessities of life, such as those of the fishmongers and the bakers, the officers of the fraternity, like the town authorities, were engaged in a continual struggle with regraters, forestallers, and engrossers which were appellations as odious as they were common in the medieval town. Regrating meant buying to sell again at a higher price without having made any addition to the value of the goods; forestalling was going to the place of production to buy or in any other way trying to outwit fellow-dealers, by purchasing things before they came into the open market where all had the same opportunity; engrossing was buying up the whole supply, or so much of it as not to allow other dealers to get what they needed, the modern 'cornering of the market'. These practices which were so objectionable in the eyes of medieval traders were frequently nothing more than what would be considered commendable enterprise in a more competitive age." Thus governmental regulation is not a new phenomenon.

(a) *The doctrine of just price.*

All attempts to regulate economic life owed much to the prevalence of an economic idea which may be traced to the Church Fathers, namely, the doctrine of "just price". Only that trade was legitimate, according to St. Augustine, in which the trader paid a just price to the producer and in selling added only so much to the price as was sufficient for his support. This doctrine was adopted by the scholastic philosophy of the middle ages and given a somewhat revised interpretation. St. Thomas

[2] Cheyney, E. P., *An Introduction to the Industrial and Social History of England*, The Macmillan Co. (1919), p. 57.

Aquinas, its greatest exponent, said in substance that buying and selling were established for the *common advantage* of both parties, each requiring that which belonged to the other. But the exchange must take place at a just price, not at a competitive price. This interpretation puts the price problem on an ethical basis.

But what is a just price? It is, according to the Schoolmen, a price which will repay the expenses of production. These expenses include, of course, labor costs, costs of transport, including compensation for its dangers and risks, and costs of storage. Even interest, in spite of the general condemnation of usury, was included as a cost because the loan of money might involve the possibility of loss to the lender or the foregoing of an advantageous use of the money on his part. This interpretation, only slightly modified, continued effective to the time of Luther.

(b) *The regulation of industry under mercantilism.*

With the development of feudal society into modern state structures a change came in the origin of regulatory policies. In England this development is shown best on its legal side, where the gild, town and manor authority was being displaced by the authority of the common law courts. The existence of a national parliament, enacting laws for the commonwealth as a whole, did much to break up the sense of local control. More and more appeals were being taken in trade disputes from the local courts to the king's court. As Prof. Ashley has said:[3] "The royal authority secured for society trustworthy instruments of exchange; and by helping to break down the privileges of isolated town communities, prepared the way for the idea of a *national economy* to make its appearance in the sixteenth century."

This brings us to a discussion of the system of mercantilism, a policy associated with Colbert, the famous finance minister of Louis XIV. To him money appeared as the index of national wealth and its acquisition as the loadstone of national policy. To this end, he contended, all agencies of national control should be shaped. Where the medieval ideal of control had been one of self-conscious *local economy*, mercantilism was one of self-conscious *state economy*. Economic wants began to be viewed from the national instead of the local standpoint. Markets had

[3] Ashley, W., *Introduction to English Economic History*, Longmans, Green & Co. (1913), Vol. 1, chap. 3, p. 49.

again widened. Accordingly Colbert advocated, not the *trade restrictions* of the gilds and towns, but the *tariff restrictions* of states. Industry should be regulated, but it should be the regulation of the state, in order that industry might promote the strength and power of the state. He advocated tariff and manufacturing restrictions so imposed that a favorable balance of trade (excess of exports over imports) might be obtained. The favorable balance would tend to bring precious metals into the country, and thus eventually provide the national treasury with sinews of war. The export of gold was forbidden. National regulations, such as the navigation acts, were devised to build up a merchant marine.

The element of mercantilist policy which is of the largest importance in the history of public utility regulation is the practice of granting royal charters to trading and plantation companies which carried on their functions under a system of national regulation.[4] It was the old idea of the grant of exclusive privileges to perform functions of social importance, formerly applied in a town economy, but now applied in the wider field of national economy. These private enterprises, organized in a modern corporate form instead of a medieval gild society, were conceived to be performing an extra-governmental function and hence were clothed with responsibilities of government. Thus the grant of a monopoly was regarded as a method of accomplishing social results. Being a royal grant it was regarded as a franchise conferring the special privilege to perform functions which the state itself did not care to undertake but which the mercantilist authorities conceived to be governmental in character. These grants of monopoly provided an incentive for the investment of capital and the assumption of risks. That they turned out, in many cases, to be extremely profitable to their grantees and would in turn need curbing should not conceal the fact that they were originated by the state as a means of attaining public objects. No distinct line can be drawn between the gilds, the regulated commercial companies of the fourteenth and fifteenth centuries and the new, joint stock companies that sprang into being in the sixteenth century with the discoveries and colonizations. In this development, however, is to be found the origin of our modern notion of a public service corporation. Historical continuity is important in all economic institutions.

[4] The more important of these companies were the Russia Company, organized in 1554; the Merchant Adventures, 1564; the Turkish Company, 1581; the Guinea Company, 1588; and the East India Company, 1600.

(c) *Opposition to domestic monopolies as special privileges.*

Another social movement of this period is important because to it may be traced the antagonism of the law to monopolistic privileges. It finds its best exemplification in the policy of Queen Elizabeth of granting to her favorites patents of monopoly that gave exclusive rights to deal in certain articles of common use *within* the country. Exorbitant prices were charged for salt, iron, vinegar, lead and paper—to mention only a few articles thus monopolized. This policy aroused widespread public condemnation. It ran counter to the tendency of the times which was away from medieval industrial restrictions. Finally, by act of Parliament in 1624, all monopolies were declared to be null and void which controlled the buying, selling, and manufacturing of goods. It is appropriate to mention the date 1624 as one important in the development of laissez faire for "this act, in the opinion of excellent authorities, has done more to excite the spirit of invention and industry and to accelerate the progress of riches in that country than any other in the statute book."

(d) *The modern theory and system of laissez faire.*

The philosophical presuppositions of laissez faire need now to be examined. Compared with the predominant thought of the preceding period they represent a revolution in ideas. The desire which came to the forefront particularly in the latter part of the 18th century was for liberty, for freedom from governmental and authoritarian restraints in economic and social life. Within the realm of economic interests this meant freedom for individuals to make a living in any way they saw fit.

This theory and the system of social control which it explains found its chief exposition in Adam Smith's book, *The Wealth of Nations,* published in 1776. Historically, the theory represents a recrudescence of Stoic belief in the existence of natural laws. The evils existing in the world, it was believed, arose from artificial interference by human agencies, primarily governments, with natural developments. A return to a "state of nature" would again set things right. As Adam Smith wrote: "The patrimony of a poor man lies in the strength and dexterity of his hands; and to hinder him from employing this strength and dexterity in what manner he thinks proper, *without injury to his neighbors,* is a plain violation of this most sacred property. It is a manifest encroachment upon the *just liberty,* both

of the workman and of those who might be disposed to employ him. As it hinders the one from working at what he thinks proper, so it hinders the other from employing whom they think proper."

It is perhaps somewhat difficult for us, accustomed as we have become to the beneficent interference, on the whole, of government in private affairs, to realize that an ideal of the general welfare underlay this seeming insistence upon private benefit. The thought was of an *unconscious* realization of the general welfare through the *conscious* striving of individuals for individual welfare.[5] The functions of government in this system were limited to those of umpire in the struggle. State regulation was to prevent merely force and fraud.

In contrast with mercantilism, this theory viewed economic wants from a cosmopolitan instead of a national standpoint. Its typical institution was the *open market* as distinguished from the *controlled market*. Competition was not to be artificially limited to the members of a gild subsisting under common rules, or to international rivalry for foreign commerce, but was to be given the utmost scope. On its legal side the system called for a development of the institutions of private property and contract and for a release of the individual from legal restraints affecting his person. Hence it was that Sir Henry Maine, the noted student of the history of law, epitomized social progress as the evolution of man from status to contract.

Although price regulation by public authority continued to some extent, industry, taken as a whole, was placed in a position where it fixed its own prices. The old conception of "just price" was displaced and a new conception of "natural price" substituted. The new explanation of natural prices was based, not upon cost of production, but upon the existing state of the demand for, and supply of, commodities in a particular market. It is clear that such a theory of price is premised upon competition.

(e) *American colonial legislation.*

Within the period of mercantilism fall the voyages of discovery of North America which resulted in the colonization of

[5] "By preferring the support of domestic to that of foreign industry, he intends only his own security, and by directing that industry in such a manner as its produce may be of the greatest value, he intends only his own gain, and he is in this, as in many other cases, *led by an invisible hand to promote an end which was no part of his intention.*" Adam Smith, *Wealth of Nations*, Thorold Rogers ed. (1880), Vol. II, p. 28.

these territories and and their incorporation into European state systems. European control over domestic policies lasted long enough to transplant not only the English system of common law jurisprudence but also the idea of legislative control of price. The scarcity of food, the isolation of the settlements, the difficulties of colonial trade, provided the requisite conditions for cornering the market. Enough of the gild spirit survived to transplant also some of its conceptions of local and trade autonomy. And so we find the colonies attempting to control prices. Massachusetts in 1635 and Plymouth in 1668, to mention only two instances, forbade the charging of excessive prices by shop keepers for corn, tobacco, beer, bread, beef, etc. The Revolution tore the political fetters that tied America to Europe, but it did not place us outside the influence of the sweep of ideas and wants that characterized an industrialized Europe and that brought forward a liberalized economic policy.

With this brief sketch of the general historical background of regulation, we may turn to a consideration of certain legal opinions by the United States Supreme Court which give us the common law basis of public utility regulation.

Sec. 2. **Judicial Consideration of the Meaning of Public Utility**

(a) *The Munn case.*

In the United States judicial consideration of public utility regulation usually begins with the famous decision in Munn v. Illinois in 1876 which has, by common consent, been placed at the threshold of our modern treatment of the public utility problem. Munn v. Illinois involved the validity of an Illinois statute fixing maximum rates for storing grain in elevators at Chicago. Munn and his partner Scott had been engaged in the elevator business since 1862, long before the enactment of the statute. They had been in the habit of charging rates fixed by agreement among the elevator owners in Chicago and had continued to charge these rates although they were in excess of those fixed by the act. They were convicted and fined in the state courts and appealed to the United States Supreme Court upon the ground that the act violated the Fourteenth Amendment in that it deprived them of their property without due process of law.

Chief Justice Waite, in upholding the validity of the statute, said in substance that under the circumstances in which the elevators were being operated in Chicago, that is, standing "in

the very gateway of commerce and taking toll from all who pass," they had become a business "affected with a public interest and had ceased to be *juris privati* only". The mystic formula was not his own language but was quoted from Lord Chief Justice Hale who had penned it some two hundred years ago in England. This legal doctrine, Justice Waite said, had been a rule of the law of property ever since; that under this rule and in the exercise of the police power of the state, "it had been customary in England from time immemorial and in this country from its first colonization to regulate ferries, common carriers, hackmen, bakers, millers, wharfingers, innkeepers, and so forth," and to fix maximum charges.

Justice Field, in his dissenting opinion, objected that the rule applied only in those cases where the business was based upon a governmental franchise or license, or upon an implied franchise claimed by prescription through long usage and consent. The warehouses here in question had always been a private business and had not been operated under governmental franchise nor had they received governmental privileges. He ridiculed the idea of calling them public warehouses. "There is no magic," he said, "in the language, though used by a constitutional convention, which can change a private business into a public one. . . . A tailor's or a shoemaker's shop would still retain its private character, even though the assembled wisdom of the state should declare, by organic act or legislative ordinance, that such a place was a public workshop, and that the workmen were public tailors or public shoemakers."

Justice Field was undoubtedly right if the expression is to be given the narrow interpretation for which he contends. But, as Professor Commons has so clearly pointed out,[6] the right of government to regulate prices is made by the majority opinion to depend not alone upon "a special grant of sovereignty," but also upon a recognition of the fact that private property rights bear within themselves the germ of coercion which becomes apparent when *economic conditions* create a state of facts which the majority felt was virtual monopoly.

But what is the meaning of the phrase "affected with a public interest"? It means in the none too clear language of Chief Justice Waite that private property is being used "in a manner to make it of public consequence, and affecting the community at large. When, therefore, one devotes his property to a *use* in which the public has an interest, he, in effect, grants to the

[6] Commons, John R., *Ibid.*, p. 33.

public an interest in that use, and must submit to be controlled by the public for the common good, to the extent of the interest he has thus created. He may withdraw his grant by discontinuing the use; but, so long as he maintains the use, he must submit to the control." What, then, are the uses of property in which the public has an interest?

(b) *The Wolff Packing Company case.*

A recent judicial exposition of the doctrine is contained in an opinion by Chief Justice Taft in the Wolff Packing Company case which came to the United States Supreme Court from Kansas.[7] The Court of Industrial Relations Act of 1920 had declared the following businesses to be affected with a public interest: the manufacture and preparation of food for human consumption, the manufacture of clothing; the production of any substance in common use for fuel; the transport of the foregoing; common carriers and other public utilities. It is certain that this is the most far-reaching application by modern legislative act of the doctrine of public interest in the United States. Under the act the Industrial Court was empowered, among other things, to fix wages and other terms of employment in the event of labor controversies imperilling the peace and health of the public. The act was challenged on the ground of conflict with the provisions of the Fourteenth Amendment.

Chief Justice Taft, in considering the question, divides businesses affected with a public interest, and thus justifying some public regulation, into three classes:

(1) Railways, other common carriers, and what he terms public utilities. These he characterizes as businesses carried on under authority of a public grant either expressly or impliedly imposing the affirmative duty of rendering a public service demanded by any member of the public.

(2) Certain exceptional occupations, so recognized and surviving from the earliest times when arbitrary laws by Parliament or colonial legislation regulated *all* trades and callings. Examples are innkeepers, cabs, and grist mills.

(3) Other enterprises which, though not public at their inception, may have become such and thus subject in consequence to some government regulations. "They have come to hold such a peculiar relation to the public that this (regulation) is super-

[7] *Charles Wolff Packing Co.* v. *Court of Industrial Relations of the State of Kansas*, 262 U. S. 522 (1923).

imposed upon them. In the language of the cases, the owner, by devoting his business to the public use, in effect grants the public an interest in that use and subjects himself to public regulation to the extent of that interest." No illustrations of business falling within this class are cited, but the grain elevators of the Munn case are implied.

It is apparent that this classification is an inductive generalization from legal history. It accepts without question as one class industries based upon the franchise, in regard to which both the majority and minority in the Munn case were in agreement. It distinguishes, as a second class, callings that now fit with difficulty into the rubric of public utilities. Even the minority accepted these as survivals of the restrictive economy of feudalism and mercantilism. The third classification represents the element of growth as evidenced in the Munn case,[8] the Budd case,[9] the Insurance case,[10] the Pipe Line Cases,[11] and the Rent cases.[12] By way of warning that the conception of public interest be not taken too literally the justice adds: "In a sense, the public is concerned about all lawful business because it contributes to the prosperity and well-being of the people. The public may suffer from high prices or strikes in many trades, but the expression 'clothed with a public interest' as applied to a business, means more than that the public welfare is affected by continuity or by the price at which a commodity is sold or a service rendered. The circumstances which clothe a particular kind of business with a public interest, in the sense of *Munn* v. *Illinois* and other cases, must be such as to create a peculiarly close relation between the public and those engaged in it, and raise implications of an affirmative obligation on their part to be reasonable in dealing with the public." He might have added, as legal writers frequently do when dealing with problems of this character, that the distinction is one of *degree* which is raised to one of *kind*.

Although giving us a classification of the businesses treated by courts as affected with a public interest, the court rather leaves us in the dark in the Wolff Packing Company case

[8] *Munn* v. *Illinois*, 94 U. S. 113 (1876).
[9] *Budd* v. *State of N. Y.*, 117 N. Y. 1 (1889).
[10] *German Alliance Insurance Co.* v. *Kansas*, 233 U. S. 389 (1914).
[11] *United States* v. *Various Oil Companies*, 234 U. S. 548 (1914).
[12] *Block* v. *Hirsh*, 256 U. S. 135 (1921); see also *Holding Co.* v. *Feldman*, 256 U. S. 170 (1921); *Chestleton Corporation* v. *Sinclair*, 264 U. S. 543 (1923); *Summons* v. *Winters*, 21 Oregon 35 (1891) (water utility); *Cummings* v. *Hyatt*, 54 Nebraska 35 (1898) (irrigation utility).

as to its conception of a public utility. It does make the helpful suggestion that, in the case of industries in the dynamic group, "the thing which gave the public interest was the indispensable nature of the service and the exhorbitant charges and arbitrary control to which the public might be subjected without regulation." It also explains that the classification of a business as a public utility "is not a matter of legislative discretion solely"; that the need of regulation depends upon "abuses reasonably to be feared"; that the intensity or the degree of regulation may reasonably vary with different kinds of business. Indeed, Chief Justice Taft senses the delicacy of the problem when he says: "It is very difficult under the cases to lay down a working rule by which readily to determine when a business has become 'clothed with a public interest'. All business is subject to some kind of public regulation; but when the public becomes so *peculiarly dependent* upon a particular business that one engaging therein subjects himself to a more intimate public regulation is only to be determined by the process of exclusion and inclusion and the gradual establishment of a line of distinction."

The opinion also throws some light upon the problem indirectly, because it tells us what a public utility is *not*. The constitutionality of the Kansas Act had been urged upon the analogy of the doctrine of *public use* as exemplified in condemnation cases and tax suits. But the court did not regard these as "especially helpful". That doctrine was conceived to have a wider application inasmuch as *public use* may "cover almost any private business if the legislature thinks the state's engagement in it will help the general public and is willing to pay the cost of the plant and incur the expense of operation." The court probably had in mind the North Dakota legislation involved in *Green* v. *Frazier*,[13] under which the state had engaged in certain forms of competitive business. In order to clear up the conception, it seems to be necessary, therefore, to trace the connection between these decisions and the English common law.

Sec. 13. **The Common Law of Public Callings**

De Quincey once wrote: "It is a natural resource that whatsoever we find it difficult to investigate as a result, we endeavor to follow as a growth. Failing analytically to probe its nature, historically, we seek relief for our perplexities by tracing its

[13] 253 U. S. 233 (1920).

origin. Thus, for instance, when any feudal institution eludes our deciphering faculty from the imperfect records of its use and operation then we endeavor conjecturally to amend our knowledge by watching the circumstances in which that institution arose." Does not this apply with special force to our problem here? It is certain that the legal conception of a "public utility" is a matter of long growth. The Middle Ages, out of which the American development proceeded, termed the then correlative a "public employment" as distinguished from a "private employment". This was a distinction recognized by the common law. Indeed, as we followed the development of these industries, or such of them as showed a continuity in development, into ancient times, we found that most of them were government functions.

No one has done more to explain *in detail* the nature of the law governing public employments than has Professor Bruce Wyman.[14] But it was the genius of Dean Roscoe Pound that first saw the central principle running through this long historical development, preserved by the peculiar character of the common law. In his illuminating lectures on the "Spirit of the Common Law," he distinguishes its two characteristics. One is its extreme individualism; the other is its treatment of individuals as members of a group.

It is the second characteristic which is of importance to us here. Quoting Dean Pound's own words: "On the other hand, it (the Common Law) is characterized by another element tending in quite another direction: a tendency to affix duties and liabilities independently of the will of those bound, *to look to relations rather than to legal transactions* as the basis of legal consequences, and to impose both liabilities and disabilities upon those standing in certain relations as members of a class rather than upon individuals.[15]

His explanation of this characteristic is that it represents the feudal element in our law and is, in its origin, due to the fact that, when the common law was in process of formation, the principal social and legal institution of the time was the feudal relation of lord to man. "Here the question was not what a man had undertaken or what he had done but what he was. The lord had rights against the tenant and the tenant had rights against the lord. The tenant owed duties of service and homage

[14] *Cf.* Wyman, Bruce. *Ibid.*

[15] Pound, Roscoe. *The Spirit of The Common Law*, Marshall Jones Co., Boston, 1921, p. 14. (Italics are ours.)

or fealty to the lord and the lord owed duties of defense and warranty to the tenant. And these rights existed and these duties were owing simply because the one was lord and the other was tenant. *The rights and duties belonged to that relation.* Whenever the existence of that relation put one in the class of lord or the class of tenant, the rights and duties existed as a legal consequence. The first solvent of individualism in our law and the chief factor in fashioning its system and many of its characteristic doctrines was the analogy of this feudal relations, suggesting the juristic conception of rights, duties, and liabilities arising, not from express undertaking, the terms of any transaction, voluntary wrong-doing, or culpable action, but simply and solely as incidents of relation."

Sec. 4. **Public Utility Origins in Medieval Economy**

It is not wrong to speak of the medieval ideal as that of an ordered society where each had his place, for this appears to have been in large part true. Life was cast in a régime of custom and status and economic wants were viewed from this narrow outlook. Ordinary buying and selling in incorporated towns was controlled by the gilds. Exceptions were found in the market towns and at fairs. A similar system of control and exclusive jurisdiction obtained in the villages where the feudal lord was the center of the manorial economy. His control was exercised in person or through bailiffs sitting as judges in the manor courts. Prices and character of services were thus controlled. From this point of view, peculiar to the political economy of feudalism, medieval courts considered those economic transactions of which our modern public utility dealings are the lineal descendants.

It must not, however, be lightly assumed that the distinction between a public and private calling, drawn in modern times upon some theory of monopolistic as against competitive undertakings, was the basis of the medieval distinction. As E. A. Adler has shown,[16] to import this meaning into the medieval term of common carrier, common innkeeper, common tailor, common surgeon, common blacksmith, common barber, and common miller would be to read into simpler economic conditions the complexities of modern economics. The term "common" when used by the medieval lawyer indicated rather that the

[16] Adler, E. A., "Business Jurisprudence," 28 *Harvard Law Review*, 135, December, 1914.

employment was public in the sense of available to all who might want to be served. In the self-sufficing economies of that distant time there were many craftsmen who were employed entirely on private account. Such employment required them to be distinguished from the plying of a craft for common use and for account of the craftsmen. Viewed in this light, gild regulations and judicial regulations are illustrative merely of the all-pervading spirit of authoritarian control of industry and life.

The peculiar nature of gild organization, which assembled all members of the same trade or craft into separate associations, and granted them a local monopoly of plying their trades or crafts, and the restricted, self-sufficing character of the manorial or town economy, was effective in giving to these public or common callings a status that required close regulation.

The next step in the process is not clear. Why certain occupations or callings, conceived to be carried on under peculiar conditions, were subjected to special regulation, is worthy of intensive historical study. Wyman asserts that it was due to the undeveloped state of the law of contract. He also refers to the existence of virtual monopoly in such callings as that of the common carrier and innkeeper. It is certain that justices in the royal courts decided cases involving these callings upon a theory that the individual customer was in a position of dependence and required protection. In the cases of the ferryman and wharfinger, presumably occupations requiring a license, we have the authority of Lord Hale in his treatise De Portibus Maris: "If the king or subject have a public wharf unto which all persons that come to that port must come as for the purpose to unlade or lade their goods, *because they are the wharfs only licensed by the queen,* according to the statute of I Eliz. cap. II or *because there is no other wharf in that port,* as it may fall out where a port is newly erected, in that case there cannot be taken arbitrary and excessive duties or cranage, wharfage, pesage, and so forth, neither can they be enhanced to an immoderate rate, but the duties must be reasonable and moderate though settled by the king's license or charter. For now the wharf and crane and other convenience are affected with a public interest and they cease to be *juris privati only.* As if a man set out a street in new building on his land, it is no longer bare private interest, but it is affected with a public interest."

Sec. 5. The Modifications Introduced by "Laissez Faire"

The re-awakening in the seventeenth and eighteenth centuries of ideals of laissez faire brought forward the open market as the predominant exchange mechanism, where the gild and manorial system had relied upon the controlled market. Competition and individualism as social forces gained ever wider applications. Legal monopolies were restricted. The callings once closely controlled by gild regulations were freed.

The tendency for competition to displace public authority in the control of industry was stopped, however, when the turn came to apply the prevalent notion of unrestrained competition to certain public callings. The laissez-faire period served, in general, as a test of the merits of the restrictive system. In the case of these public callings, however, the essential elements in the medieval framework of regulation survived its general collapse. They continued to be businesses "affected with the public interest". Their legal duty to provide adequate service and facilities was not abated. Even more than under conditions of a restricted market was it incumbent upon them to render service to all applicants without discrimination. The law continued to require that the prices charged be reasonable.

(a) *Peculiarities in the United States.*

In the United States another factor helped to emphasize competition and, although not affecting the legal status of these callings, to hold the exercise of governmental restrictions in abeyance. Along with a desire to free industries from colonial restrictions, there went the desire to give individual initiative free scope. In the conquest of a continent, facilities of transport and communication were agencies of the first order. The need, therefore, of getting these facilities early resulted in a multiplication of these agencies, thus giving competition, when it arose, greater scope. Early charters testify to public liberality. Courts were seldom called upon to adjudicate complaints. It was not until after the Civil War, when complaints concerning discrimination and high rates arose in those territories where railways had been introduced, and when it was found that competition was not working satisfactorily, that a demand came for supplementary governmental regulation. Pioneer communities still needing these facilities did not take part in the agitation and continued to be friendly.

The courts, however, by going back to the historical elements

of our jurisprudence before the Revolution, adopted the conception of a public calling worked out in the mother country. When the epoch-making case of *Munn* v. *Illinois* was decided, the court referred to this historical element, as we have seen, and took it as a maxim of the law that, since to serve all at a fair price was immemorial practice, the legislative regulation of price was in accord with "due process of law".

(b) *The public utility as a legal institution.*

We conclude, therefore, that the significance of the phrase "business affected with a public interest" resides not so much in the character of the industry thus classified, as in the complex of rights and duties that go with such classification. This implies that its importance is that of an institutional development. The core of it is represented by the *feudal conception of relation* which has been hardened into a social habit by becoming commonly accepted. The conception, thus generalized, has been given greater solidity and rational, coherent form by being organized into a definite mode of legal procedure. There was a persistent need for developing such forms of procedure and, as a consequence, these forms have crystallized into an institution which controls the continued performance of the function.

It must be clear that the conduct of public utility enterprises, subject to these legal obligations, exhibits a strange mixture of volition and compulsion. The use of compulsion was a characteristic of feudal times and of the system of mercantilism, while the use of persuasion, the touchstone of laissez faire, was a characteristic of the system of industrial liberty. The legal rights and duties to be observed by individuals toward one another in feudal times flowed as a result of the *relations* that individuals bore to one another, whereas in the freer atmosphere of laissez faire the rights and duties were a result of express undertakings or *contracts*. The public utility institution, originating in feudal times and modified by laissez-faire doctrines, combines the compulsory affixing of rights and duties as a consequence of "relation" with the *voluntary* procedure of entering into a "public utility" relationship. Persons are free to conduct a public service enterprise, but, having entered upon an undertaking of this character, they are constrained by its peculiar system of rights and duties. Persons are free to consume the products or use the services of a public utility or not, as they choose; but having voluntarily agreed to take such service they are bound by its peculiar system of rights and duties. Thus, volition and

compulsion are combined in the elaboration of a scheme which collectively constitutes the law of public service companies.

There are many types of undertakings, relationships with which, either as producer or consumer, bring about the legal consequences described above. The nature of the institution itself—the complex of legal rights and duties—is singularly fixed and unvarying, changing only as rights and duties are multiplied, or as they become more clearly defined. It is an institution not solely of economic significance but also one of large political importance; for while, on the one hand, it is concerned with the material need of individual economic life, it serves, on the other hand, to strengthen and make possible socio-economic life. Out of its institutional character arises the public interest in its maintenance and development.

From this point of view the term, public utility, does not refer to any specific industry, but is used as a collective name for an entire group of industries. It becomes a highly abstract conception of certain relationships embracing certain definable rights and duties. What the medieval jurist, as well as the modern jurist, means when he says that certain employments are public employments is this: that the objects of property engaged therein are "affected with a public interest" and that he wants these employments to be cast within the mold of relationships which will insure their being carried out successfully. If one would know the nature of the institution, one must understand the rights and duties which compose it. If one would understand the rights and duties, one must appreciate the public interests which those rights and duties are to conserve. If one would be convinced that the preservation of these public interests must become a matter of rights and duties, molded and enforced by the state, one must be aware of the process of social evolution. The state lends to the institution the coercive power of its sovereignty. It is not without significance that some modern French writers[17] have discussed even the state itself in terms of a great public service corporation, on account of the great public interests which both of these institutions protect.

Sec. 6. **Legal Tests of Classification**

In determining whether an industry is subject to this coercive law, or, in other words, whether it is a public utility, the courts

[17] Duguit, Leon, *Law in the Modern State*, B. W. Huebsch, N. Y., 1919, Chap. II.

have adopted certain practical tests to aid in making the distinction between a public utility and a private utility. These tests are both legal and economic in character.

The problem arose first in connection with turnpikes. The law here had no difficulty, since the turnpike was simply a highway and that had always been a public utility. In the absence of a franchise grant to private persons to build the highway and charge tolls, the highway would have been a public facility and free to all users. When bridges began to replace ferries, the charters of bridge companies similarly authorized tolls, the provisions in some cases being that when the tolls had been sufficient to repay, in addition to operating expenses, the entire first cost of the bridge and a designated annual profit, the bridge should become free. Bridge companies were treated as successors to the ferryman. With the coming of the canal and the steam railway, the same legal principles were brought into play, until it seemed that the common carrier relation would exhaust all types of services to which this special system of rights and duties might be applied.[18] The test was the logical one of analogy.

The first break in the development came with the telegraph and the gas light company. At first telegraph companies were treated as carriers. Soon it was perceived, however, that the analogy was misleading, that the legal category of public utility might cover other than transport industries. It was then that the various economic tests began to appear in the decisions.

The clearest economic test is the one which bases the classification upon *natural limitations as to source of supply.* A water company which utilizes the most advantageously situated watershed in gathering its water supply is classified as a public utility. Under the same head would fall an irrigation company which impounds the only available stream and a water power company which utilizes the only available site for a dam. Gas companies drawing their gas supply from natural gas fields are similarly classified.

A second economic test relates to *the conditions under which the product is supplied.* If these facilitate control of the market, the courts have conceded that this constitutes a basis for separate classification. Thus artificial gas plants and electric plants sell a service which must be taken by customers directly connected with the plants. In view of the difficulties of granting

[18] Telegraph companies, for instance, were treated as common carriers of messages.

occupation of the streets to competing concerns, the customer may, in effect, be dependent upon a single source of supply.

Another test looks to the *scarcity of advantageous sites,* such as sites for stations and terminal companies, for elevators and for wharves. Another emphasizes *limitations of time* as a factor in the situation. Thus innkeepers, cab companies, telephone and telegraph companies are held to come within a situation in which their customers are placed in a position of dependence, since their demand for service is urgent.

A less satisfactory test is based upon the broad ground that where a product or service is *supplied under conditions which deter effectual competition from entering the market,* the industry may be specially classified. In elaborating these conditions the courts have pointed to the large initial cost of the plant, and to the tendency of costs to decline with increases in business as deterrents to potential competition. Unsatisfactory as some of these tests may appear to the logician looking for refinement in analysis, they have, nevertheless, been of great aid in the process of classification.

Sec. 7. Rights and Duties of Public Utilities

What is the precise nature of this peculiar system of rights and duties? A public utility is under the extraordinary duty to render reasonably adequate service to all who apply. Persons engaged in private business are at liberty to refuse to serve any or all. As to those in private business, the law assumes that their own private interest and the ability of customers to seek out others are self-corrective of any failure to provide service or to provide it adequately. Again, a public utility is required to serve up to the limit of its capacity, where capacity is more and more being defined, not as mere physical capacity, but as the limit of profitableness. It may not let customers' wants go unsatisfied. Nor may it attach unreasonable conditions to contracts for service so as in effect to negative its duty "to serve all comers." Furthermore, it must serve without discrimination all customers similarly circumstanced. Finally, a public utility must observe more than ordinary care in the rendition of service in view of the generally hazardous nature of the circumstances surrounding the service and the dependence of the public upon such care.

On the other hand, the law concedes the public utility the right to collect a reasonable price, to render service subject to

reasonable rules and regulations and to withdraw service under prescribed conditions after giving notice to customers. While customers are given the right to demand that a public utility live up to its duties, they are, on the other hand, required to accept reciprocal obligations. Such in general terms are the rules of law outlining the rights and duties of public utilities toward their patrons.[19]

Sec. 8. **An Economic Interpretation**

We may now venture an interpretation of these developments. It is clear that the elaboration of the legal tests is gradually bringing about a recognition on the part of the judiciary that the fundamental basis for separate classification of one industry from another is the presence of elements of natural monopoly in such number and strength that competition is not doing its work successfully. Under these conditions the danger exists that fair prices, in the sense of competitive prices, will not be realized in practice. A willing buyer is not negotiating with a willing seller. Elements of compulsion are mingled with persuasion. In order to dissolve the elements in the exchange situation whereby a seller coerces a buyer, the power of the state must be invoked. The power of the state will be used either so to regulate industries as to restore equality of bargaining power by maintaining competition and controlling competitive practices, or it will be used to promote the inherent trend toward monopolistic organization by conferring upon such industries legal monopolies and then controlling their economic relations by a distinct system of rights and duties, sharply distinguished from those recognized in the competitive field. If there is to be more than an historical warrant for these classifications, we must be ready to state the conditions under which the public utility institution will be applied.

It will be helpful at this point to distinguish between industries in which, by law, all persons have a common right to engage, and industries in which the legal right to enter depends upon securing the permission of the state. This permission, we have seen, is variously called a franchise, permit, or license. As compared with industries of common right, an industry based upon the franchise involves a form of special privilege. This does not imply that all industries based upon some special governmental license must be classed as public utilities. Under

[19] *Cf. Shepard* v. *The Milwaukee Gas Light Co.*, 6 Wis. 526 (1858).

modern conditions barbers, stationary engineers, pilots, dealers in real estate, doctors, and lawyers pursue their callings upon the basis of governmental license. It merely implies that the occupation or calling requires the kind of regulation which is involved in licensing. Banks, fiduciary, and insurance companies are subjected to special kinds of regulation. In one sense this is a recognition of the fact that the business of banking and of insuring is "affected with a public interest". But does this make them public utilities? Although the law gives no definite answer, it would seem that they are not. Banking and insurance enterprises are competitive in nature and hence the regulation of these enterprises has assumed a different character. The coercive law of public callings does not apply to them. That law, by all the tests, is applied only to those enterprises that have become monopolistic in nature.

In the famous "Cotting case"[20] Justice Brewer recognized that the services rendered by stockyards were such as to affect these properties with a public interest and that governmental regulation was proper. Yet the presence of competition between stockyards required that these facilities be given special treatment under regulation. He, therefore, concluded that prices charged should be non-discriminatory; but he also concluded that the amount of profit made by stockyards was not a matter of public concern.

Further light is thrown upon the question by certain cases in which the question of the legal nature of the franchise was discussed. In these cases a franchise is treated as a grant of privilege or power in matters of public concern which may be exercised by government directly, or by public agents like public service companies which are created for that purpose and operate under such conditions and regulations as government imposes in the public interest.[21] This has come to be known loosely as the "agency theory". In an early case, Olcott v. The Supervisors,[22] this view of railway franchises is most explicit. The court there said: "That railroads, though constructed by private corporations and owned by them, are public highways, has been the doctrine of nearly all the courts ever since such conveniences for passage and transportation have had any existence. Very early the question arose whether the

[20] *Cotting* v. *Kansas City Stock Yards Co.*, 183 U. S. 79 (1901).
[21] *Cf.* Hartman, H. H., *Fair Value*, chapters 1 to 3, Houghton-Mifflin Co., 1920.
[22] 16 Wall. 83 U. S. 678, p. 694 (1873).

State's right of eminent domain could be exercised by a private corporation created for the purpose of constructing a railroad. Clearly it could not, unless taking land for such a purpose by such an agency is taking land for public use. The right of eminent domain nowhere justifies taking property for a private use. Yet it is a doctrine universally accepted that the state legislature may authorize a private corporation to take land for the construction of such a road, making compensation to the owner. What else does this doctrine mean if not that building a railroad, though built by a private corporation, is an act done for a public use? And the reason why the use has been held a public one is that such a road is a highway, whether made by the government itself or by the agency of corporate bodies, or even by individuals when they obtain their powers to construct it from legislative grant.

"Whether the use of a railroad is a public or a private one depends in no measure upon the question who constructed it or who owns it. It has never been considered a matter of any importance that the road was built by the agency of a private corporation. *No matter who is the agent, the function performed is that of the state.* Though the ownership is private the use is public. So turnpikes, bridges, ferries, and canals, although made by individuals under public grants, or by companies, are regarded as *publici juris.* The right to exact tolls or charge freights is granted for a service to the public. The owners may be private companies, but they are compellable to permit the public to use their works in the manner in which such works can be used. That all persons may not put their own cars upon the road, and use their own motive power, has no bearing upon the question whether the road is a public highway. It bears only upon the mode of use, of which the legislature is the exclusive judge." [23]

In a dissenting opinion in the recent case of Missouri ex rel. Southwestern Bell Telephone Co. v. Public Service Commission of Missouri et al,[24] Justice Brandeis, with Justice Holmes concurring, made his view of a constitutionally compensatory rate turn upon this interpretation of a franchise. "The investor agrees, by embarking capital in a utility, that its charges to the public shall be reasonable. *His Company is the substitute for the State in the performance of the public service; becoming a public servant.* The compensation which the Constitution guar-

[23] 83 U. S. 678, p. 695 (1873). (Italics are ours.)
[24] 43 Sup. Ct. Rep. 544, p. 547 (1923). (Italics are ours.)

antees an opportunity to earn is the reasonable cost of conducting the business."

From the foregoing it appears that legal interpretations afford no clear notion under what conditions an industry becomes a public utility. Some make the term public utility practically synonymous with public functions; others give it a wider connotation.

From an economic point of view it is clear, however, that the notion of a public utility is made up of two ideas: (a) the idea of monopoly and (b) the idea of necessity. Both must be present in order that an industry may become a public utility. Neither alone will suffice. The supply of housing facilities is a necessary economic function but since it takes place upon a competitive basis, the customer is not coerced. Alternative opportunities are open to him. Freedom of choice has not been restricted. But when, in emergencies, such as the acute housing shortage during and after the World War, the consumer is forced to bargain for a necessity under conditions of temporary monopoly, the courts will uphold the regulation of rents during such emergency conditions. Yet the character of regulation will be attuned to the normal condition. The emergency having passed, as building operations are resumed, competition again sets in, and the reason for regulation disappears. It is therefore clear that the housing industry represents a border line case which nevertheless ought not to be classed as a public utility under normal conditions.

We may take another illustration, the lighting of homes. When gas as an illuminant was developed and gradually displaced the oil lamp and candle, the lighting industry attained the full status of a public utility, because a necessary service was being supplied under conditions of monopoly. There was freedom of choice, to be sure, between gas illumination on the one hand and illumination by means of lamps and candles on the other hand; but it was a choice between alternatives of which one was generally thought inferior. When electric lighting was introduced, it soon came to be recognized as a public utility because common consent established its definite superiority in the lighting field. Gas was no longer an *effective* substitute. In both cases customers were dependent for service upon the plant with which they were directly connected. Again the conjuncture of necessitous consumers dealing with monopolistic producers made it appear advisable that electric utilities be classified as public utilities.

We may generalize by saying that when in the course of economic evolution freedom of choice is seriously restricted—that is, when the coercion residing in private property makes itself felt as a monopolistic power—public interest arises in proportion as equality of opportunity to choose is restricted, provided that the wants supplied are recognized as a common necessity. Monopolization of a luxury will not call forth regulation, for public opinion is the final arbiter in the selection of those common economic needs whose monopolization engenders regulation. The doctrine of *public use* referred to in the Olcott case and the doctrine of *public interest* referred to in the Munn Case are a recognition that the notion of a common necessity for civilized life underlies them both. The concept of public utility thus becomes a legal instrumentality to achieve an improvement of the standard of life. In a society which is accustomed to look to governmental initiative for the supply of common needs, the facility will be supplied as a public service. On the other hand, a society which is distrustful of the state will leave the supplying of such common needs to a private agency under a franchise privilege, not as a matter of common right, but as an agency of the state.

Since the law has long recognized the rights and duties of public utilities, this legal conception has attained a certain fixity in the form of legal rules. There is nothing fixed, however, about the number and kind of industries that may be subjected to these rules. To borrow an expression from legal literature, it may be said that the legal notion of public utility is that of a fixed concept with a changing content. The industries at any time recognized as "affected with a public interest" are not necessarily the industries which may legally be classified as public utilities at another time. The industrial and political situation as mirrored in public opinion will determine, (a) the number and kind of industries classified as public utilities, (b) the elaboration of the system of rights and duties which make up the institution, (c) the regulating agencies and instrumentalities employed (whether the legal rules and decrees of courts, or the charters, special franchises and statutes of legislatures), and (d) the subordinate administrative standards which are evolved in practice. The trend in the development and application of the institution will be a resultant of the amount of social inertia, of the pressure of the economic environment and of the influence of intellectual progress. Special attention should be directed to these dynamic factors: (a) the growth and exten-

sion of monopoly, (b) war and other conditions creating special emergencies, (c) the movement for conservation of natural resources, (d) the movement for public ownership.

Sec. 9. **Implications**

In conclusion one may ask: What is the practical significance of this conception of a public utility? It is believed that the institutional interpretation of the public utility concept illuminates the entire field of regulation and management. When we regard public utility enterprises as going concerns having relations with customers, investors, stockholders, and employees that differ from the corresponding relations of private businesses, we realize that the economic and legal principles applied to private concerns cannot and should not be applied in the same degree to public utilities. In other words, the transactions of public utilities with consumers, investors, stockholders, and even employees are fundamentally of a different order from the same transactions of private utilities. This is clearly recognized when the state establishes a policy of regulation and grants or imposes distinctive rights, duties, or privileges, which place these businesses in a separate sphere of economy.

Practical difficulties arise, however, when in applying this point of view to the details of regulatory policy, courts, administrative officials, and even economists attempt to apply without modification to a regulated economy the principles which may hold true for a competitive economy. When the distinction is made, this point of view will throw a flood of light on the various problems of financing public utilities, their regulation and evaluation. It is of peculiar importance also for an understanding of relations between employers and employees. Without multiplying or detailing illustrations, enough has perhaps been said to show that this dynamic conception of public utilities opens up a realistic approach to the changing problems of this class of enterprises.

CHAPTER VIII

THE CONSTITUTIONAL BASIS OF PUBLIC UTILITY REGULATION

Sec. 1. **The Adjustment of Private Rights and Public Interests**

Public utilities are controlled by two social processes: (1) regulation by means of the judiciary and (2) regulation by means of the legislature. In the United States legislative regulation must be authorized by constitutional law and must be exercised under constitutional restraints subject to review by the judiciary in order to determine whether private rights guaranteed by federal and state constitutions have been invaded. We have seen that historical developments as guided by judicial decisions have brought forth a distinct legal institution which antedates our constitutional form of government. The power of the legislature to regulate public utilities is not usually set forth in so many words in American constitutions, but the courts read this power into them. Private property, however, another legal institution antedating our constitutions, has been specifically recognized by the framers of constitutions as one of the private rights which may not be invaded by regulation. The courts have thus, through constitutional interpretations, made the legal institution of public utility a part of our jural system of social control. From a constitutional point of view the central problem of regulation is, therefore, one of reconciling this power of regulation with the protection of private rights.

In order to understand what is involved in such a reconciliation it becomes necessary to review briefly the essential elements of our constitutional law in so far as they relate to public service enterprises. The seller-buyer relationship between public utilities and their customers, although it is evidenced by contract, is conditioned by a superior obligation not arising out of contract. The character of the service and its exchange value are subject to a distinct system of rights and duties whose definition is a matter of law. It is pertinent to inquire, therefore, what is this power which creates an obligation independent of the will of particular individuals.

Fundamentally, it is the power of government to perform all acts necessary to advance the general welfare. In American constitutions this power, often referred to as sovereignty, takes certain forms which have been given specific names and a more or less definite subject matter by the judiciary in interpreting constitutional provisions. A state must act by means of agents to whom governmental powers are entrusted. Hence constitutions set up an organization for governmental purposes. In a very real sense, however, the true nerve fibers of government which transmit the collective will are these powers delegated to governmental agents. And yet these powers are limited by constitutional rights. Constitutional government, as implied in the very term "due process of law" which is used in these instruments involves "a weighing or balancing" of social or collective interests as against private or individual interests where these conflict, and finding "a rational reconciliation or compromise." It is within the province of the judiciary to perform this function in the first instance, although the court of last resort is public opinion as expressed in constitutional legislation. The judiciary when it sets limits to state powers with the view of protecting individual interests will be guided by changing conceptions of what will promote the public welfare.[1]

Sec. 2. The Function of the Judiciary in Interpreting Constitutions

It is, perhaps, unnecessary to state that governmental powers are within the keeping of the legislative branch of the govern-

[1] The process of social control through the law has not been more realistically interpeted than by Dean Pound: "I venture to think of problems of eliminating friction and precluding waste in human enjoyment of the goods of existence and of the legal order as a system of social engineering whereby those ends are achieved. If we think of it in this way we will not fail to see that no legal institution or legal doctrine may stand fast forever as the final thing in juristic achievement any more than the products of mechanical ingenuity and engineering skill may stand for all times as the ultimate of which man is capable. New wants and new forms of old wants speedily make the best products of social engineering no less than of mechanical engineering insufficient and obsolete, and our instincts of curiosity and construction lead us to new devices by which to satisfy a greater num ber of wants. What we may do is to discover, to survey these wants, to perceive when and where they conflict or overlap, to observe how as a result there is friction and waste, and to study how the existing social and legal machinery may be improved or new machinery may be devised whereby to obviate the friction, preclude the waste, and insure the best social engineering of which in the time and place we are capable." Pound, Roscoe, "A Theory of Social Interests," *American Sociological Society*, Vol. XV, May, 1921, p. 44.

ment. The executive and, latterly, the administrative branches of government are primarily concerned with carrying legislation into effect. It is the function of the judiciary to interpret and apply the law. This division of labor in the exercise of governmental powers has resulted in the American doctrine of judicial review, which asserts the power, at first tacitly assumed by the courts, of interpreting the constitution, and of declaring legislative acts inconsistent with such interpretations as unconstitutional and, therefore, void. This tri-partite division of governmental functions is for the purpose of preventing arbitrary action (the so-called system of checks and balances), a result likely to flow from giving distinct duties to different men or groups of men having distinct qualifications.[2]

A division of powers is incapable of rigorous application. As a matter of convenience and necessity the functions of one branch are sometimes exercised by another. Legislative investigations preliminary to law-making often use judicial processes. Courts, executives, and administrative bodies must often make rules concerning procedure that partake of a legislative character. The segregation becomes, in the end, a question of degree with the courts determining when essential powers of one branch of the government are usurped by another. Thus, in Kansas, when the legislature created a "court of visitation," giving it the power to regulate public service companies, to pass upon the reasonableness of such regulations, and, finally, to enforce them, the court held that this combination of legislative and administrative functions with judicial functions was unconstitutional.

[2] An authority on Constitutional Law offers this explanation of the doctrine: "The true reasons for the American practice in this regard, which is now universally recognized in this country, are political. It is desirable that such a power be lodged outside of the departments upon whose action our constitutions have placed restrictions in the interest of the rights and liberties of the individual. The departments upon which these checks have been placed are chiefly the executive and the legislative. For them to measure their own powers in a popular government in times of public excitement is to make a constitution inoperative in the very emergencies for which these prohibitions were inserted. The judiciary is the weakest of the three departments of government. It controls neither the purse nor the sword, and unassisted it can do little that is injurious to political or civil liberty. Its members are likely to be more conservative and to be less influenced by momentary passion than are the members of the legislature. Giving the judiciary a certain negative control over the acts of the other departments is likely to result in the provisions of a constitution being more faithfully observed than would otherwise be the case." Hall, J. P., *Constitutional Law*, LaSalle Extension University, 1911, p. 35.

Sec. 3. Public Utilities in their Relations to Governmental Powers

The machinery by means of which social interests and private interests are recognized and reconciled has been schematically presented in the form of an organization chart (see Chart XVI). It can there be seen at a glance that the idea of balance between public and private interests dominates the scheme. Social interests are secured by means of governmental powers. Private interests are protected by the guarantee of private rights. What these social interests and private interests are with respect to public service enterprises can best be made concrete first, by giving a classification of governmental powers with an explanation of their significance in the operation and control of public utilities, and second, by explaining the private rights of public service enterprises as limitations upon these governmental powers.[3]

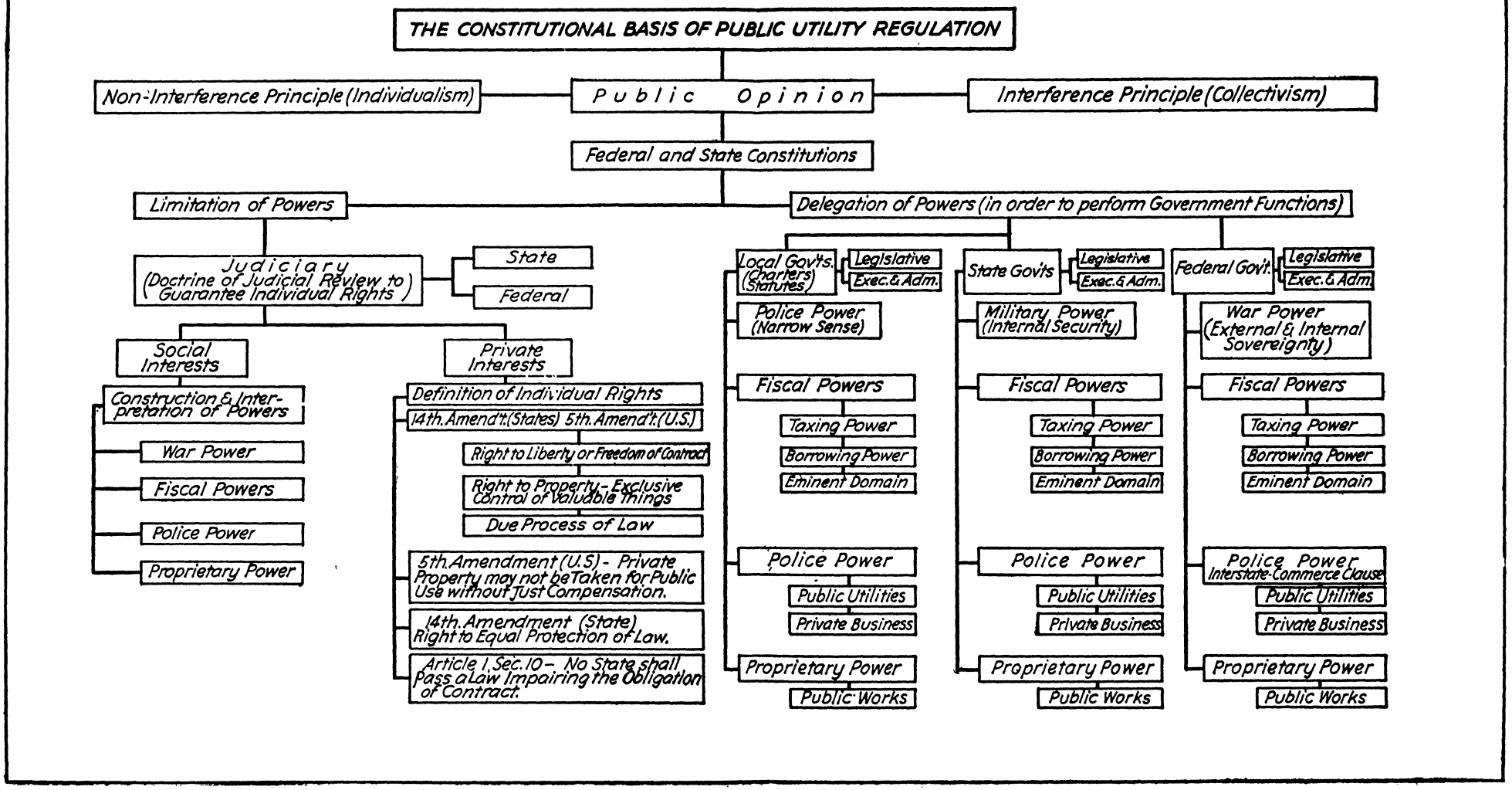
Sec. 4. The Police Power

The police power represents the heart of the problem of public utility regulation from both a legal and a political point of view. Its general purpose is the regulation of conduct in the interest of the general welfare. The police power is the great unwritten clause of American constitutions. It is difficult to give a satisfactory definition of this power. Judge Cooley defines it as follows:[4] "The police power of a State, in a comprehensive sense, embraces its whole system of internal regulation by which the state seeks not only to preserve the public order and to prevent offenses against the State, but also to establish for the intercourse of citizens with citizens those rules of good manners and good neighborhood which are calculated to prevent a conflict of rights, and to insure to each the uninterrupted enjoyment of his own in so far as is reasonably consistent with a like employment of rights by others." Professor Thayer refers to the police power as "that vast, unclassified residue of legislative authority which is called, not always intelligently, the police power." It is, as Dean Pound points out, "not a definite, specially limited and specially defined power like the power of Congress over interstate commerce. Indeed the significant thing in the police power is not *power* but *pur-*

[3] The chart may help to visualize the system of social control by means of which the "wise balancing" of public and private interests is secured.

[4] Cooley, T. M., *Constitutional Limitations*, Little, Brown & Co., 1903, 706.

Chart XVI


THE CONSTITUTIONAL BASIS OF PUBLIC UTILITY REGULATION
Non-Interference Principle (Individualism)
Public Opinion
Interference Principle (Collectivism)
Federal and State Constitutions
Limitation of Powers
Delegation of Powers (in order to perform Government Functions)
Judiciary (Doctrine of Judicial Review to Guarantee Individual Rights)
State
Federal
Social Interests
Private Interests
Construction & Interpretation of Powers
War Power
Fiscal Powers
Police Power
Proprietary Power
Definition of Individual Rights
14th. Amend't. (States) 5th. Amend't. (U.S.)
Right to Liberty or Freedom of Contract
Right to Property - Exclusive Control of Valuable Things
Due Process of Law
5th. Amendment (U.S) - Private Property may not be Taken for Public Use without Just Compensation.
14th. Amendment (State) Right to Equal Protection of Law.
Article 1, Sec. 10 - No State shall Pass a Law Impairing the Obligation of Contract.
Local Govts. (Charters) (Statutes)
Legislative
Exec. & Adm.
Police Power (Narrow Sense)
Fiscal Powers
Taxing Power
Borrowing Power
Eminent Domain
Police Power
Public Utilities
Private Business
Proprietary Power
Public Works
State Govts
Legislative
Exec. & Adm.
Military Power (Internal Security)
Fiscal Powers
Taxing Power
Borrowing Power
Eminent Domain
Police Power
Public Utilities
Private Business
Proprietary Power
Public Works
Federal Govt.
Legislative
Exec. & Adm.
War Power (External & Internal Sovereignty)
Fiscal Powers
Taxing Power
Borrowing Power
Eminent Domain
Police Power
Interstate Commerce Clause
Public Utilities
Private Business
Proprietary Power
Public Works

pose." The difficulty of defining limits has persuaded one authority [5] to say that "the police power is nothing more nor less than a name for the residual powers of sovereignty after shearing off the powers of taxation and eminent domain."

The best attempt to generalize in regard to matters with which this power is concerned is that of Professor Ernst Freund.[6] He divides social interests into three spheres: (a) a *conceded sphere* affecting the public safety, public order and public morals, in which, acting under the police power, society gives effect to public policy through restrictive legislation; (b) a *debatable* sphere, affecting economic interests which are chiefly concerned with the proper production and distribution of wealth, in which legislation is still in an experimental stage; and (c) an *exempt sphere* affecting moral, intellectual, and political movements in which public policy as laid down in constitutional provisions gives expression to the principle of individual freedom. In the third sphere restrictive legislation, in so far as applicable at all, should have the utmost regard for freedom of science, art, literature, and religion. Individual rights to freedom of speech, of the press, of worship, assembly, etc., should only be interfered with if restraints required by interests of the conceded sphere are involved. In the second sphere are included that wide range of legislative restrictions upon individual initiative in economic affairs of which the regulation of "property affected with a public interest" is the best illustration. Other legislative restrictions relate to the employment of labor,[7] to contracts in restraint of trade, and to the utilization of property.[8]

Professor Ely, in an equally suggestive treatment of the subject, gives an economic interpretation in one happy sentence: "The police power is that power of the courts committed to them by the American Constitution whereby they must shape *property and contract to existing social conditions* by settling the question of how far social regulations may, *without compensation,* impose burdens upon property." [9] Or, as the same

[5] McGehee, L. P., *Due Process of Law*, Edward Thompson Co. 1906, p. 302.

[6] A good discussion of the Police Power from an economic point of view is found in Ely, *Property and Contract*, chapter VII. Of particular interest is the genealogy of the term police. A very excellent treatment from the point of view of constitutional law is by Professor Ernst Freund, *The Police Power*, Callaghan & Co. (1904).

[7] *Cf.* Pound, R., "Liberty of Contract," *Yale Law Journal*, Vol. 18, p. 454 (1909).

[8] Williams, F. B., *Law of City Planning and Zoning*, The Macmillan Co (1922).

[9] Ely, R. T., *Ibid.*, Vol. I, p. 220.

writer says, in another place:[10] "The police power is that power of the courts to *interpret* the concept property and to establish its *metes and bounds* and to give the *concept a content* at each particular period which fits it to serve the general welfare."

Among the specifically enumerated powers delegated to the United States by the federal constitution is one which provides that Congress shall have the power "to regulate commerce with foreign nations and among the several states."[11] This power over interstate commerce, as it is ordinarily called, is within its proper sphere the federal equivalent of the police power of the states. Another specifically enumerated federal power provides[12] that the federal judicial power shall extend to all cases of Admiralty and Maritime jurisdiction. This has been interpreted by the courts to give Congress full legislative power over all maritime matters.[13]

It hardly needs to be added that American governments proceed under the police power and quasi-police power when they regulate the rates charged and the service rendered by public utilities. But this does not exhaust the opportunities in which the police power finds application, for it is used also in restraining private businesses where the object is to promote the public health, the public morals, or the public safety. This has, as Freund observes, been its traditional, if somewhat restricted, domain. Recently there has been a disposition on the part of the courts not to confine it alone "to the suppression of what is offensive, disorderly, or unsanitary," but to extend it "to so dealing with the conditions which exist in the state as to bring out of them the greatest welfare of the people." Building codes, zoning and city planning legislation, to illustrate from a field closely allied to public utilities, are recent noteworthy extensions of the domain of the police power. Its flexibility and importance has, perhaps, never been better portrayed than in the words of Justice Holmes: "The police power extends to all the great public needs. It may be put forth in aid of what is sanctioned by usage, or held by the prevailing morality, or the strong and preponderant opinion to be greatly and immediately necessary to the public welfare."[14]

[10] Ely, R. T., *Ibid.*, Vol. I, pp. 206-7
[11] U. S. Constitution, Art. I, sec. 8.
[12] U. S. Constitution, Art. III, sec. 2, paragraph 1.
[13] *In re. Garnett*, 141 U. S. 1 (1891), pp. 12-14.
[14] *Noble State Bank* v. *Haskell*, 219 U. S. 104, p. 111 (1911).

Sec. 5. **The Power Which Maintains Peace and Security**

In some respects the most significant of governmental powers is that which assures the territorial integrity of the state and domestic security of life and possession. In the case of the federal government it is called the War Power, because it is concerned with the maintenance of external and internal sovereignty. Under this power government has assumed, at infrequent intervals, not only the regulation but also the operation of private as well as public utility enterprises. Under the pressure of great national emergencies, as during the World War, the executive, acting under War Powers conferred by Congress, has regulated and operated all kinds of public utilities. It is the least restrained and limited of all governmental powers. An analogous power resides in the state governments (here called the Military Power). This power comes into play at times of great public calamities, riots, and disturbances of the public peace. Under this power private business as well as public utility business may be summarily dealt with.

Sec. 6. **Fiscal Powers**

A further classification of governmental powers concerns those which provide the economic means for carrying on public functions. Such funds are provided in two *primary* ways, by taxation and by incurring public debts. The provision of capital through the *taxing power* is of first importance. Resting upon the power of taxation, and hence in a sense derived from it, is the *power of governments to borrow money.*

On account of its importance the taxing power should be examined in some detail. A tax may be defined as that part of the wealth of private individuals which the authority of the state, province, or municipality appropriates in order to provide for expenses incurred for the advantage of the general body of citizens. Legally, the word taxes is generally taken to mean burdens, charges, or impositions placed upon persons or property for public uses and levied in accordance with some general principle of distribution. The taxing power is justified upon the general grounds that since all private ownership of property depends upon the maintenance of the state, the state may properly exhaust all the resources of private property in its own support and in the preservation of its existence. Again, since all privileges and liberties derive their value from the protec-

tion of the state, it may take any share of the value of those privileges and opportunities for its support, even to the extent of their entire value.

The point that stands out as most important in any consideration of the taxing power is that a *public purpose* must be served in its exercise. This principle of law is firmly established. As the United States Supreme Court has put it: "To lay with one hand the power of the government on the property of the citizen and with the other to bestow it upon favored individuals to aid private enterprises and build up private fortunes, is none the less a robbery because it is done under the forms of law and is called taxation." [15]

The borrowing power is subject to the same limitation, as was held in an important case: [16] Neither has the legislature any constitutional right to create a public debt, or to lay a tax, or to authorize any municipal corporation to do it, in order to raise funds for a mere private purpose. No such authority passed to the assembly by the general grant of legislative power. This would not be legislation. Taxation is a mode of raising revenue for public purposes. When it is prostituted to objects in no way connected with the public interests or welfare, it ceases to be taxation and becomes plunder."

It has been found impossible to give any exact definition of what are public purposes. Each exercise of the taxing power has rested upon its own special facts. The legislature has been the primary judge of "public purpose." The courts have been reluctant to give a narrow interpretation of what are public purposes. We may again quote Judge Cooley: [17] "I do not understand that the word 'public' when employed in reference to this power, is to be construed or applied in any narrow or illiberal sense, or in any sense which would preclude the legislature from taking broad views of state interest, necessity or policy, or from giving those views effect by means of the public revenues. Necessity alone is not the test by which the limits of state authority in this direction are to be defined, but a wise statesmanship must look beyond the expenditures which are absolutely needful to the continued existence of organized government and embrace others which may tend to make that government subserve the general well-being of society, and advance the present and prospective happiness of the people. To erect the public

[15] *Loan Association* v. *Topeka*, 20 Wall. 655, p. 664 (1875).
[16] *Sharpless* v. *Mayor of Philadelphia*, 21 Pa. St. 147, p. 168 (1853).
[17] *The People* v. *The Town of Salem*, 20 Mich. 452, 475 (1870).

buildings, to compensate the public officers, and to discharge the public debts, are not the sole purposes to which the public revenues may be applied, but, on the contrary, considerations of natural equity, gratitude, and charity are never out of place when the general good of the whole people is in question, and may be kept in view in the imposition of public burdens."

Other constitutional limitations relate particularly to the debt-incurring power of states and their subordinate divisions. These limitations affect the amount of indebtedness rather than the purpose. Their object is to prevent extravagance and the undue burdening of future governmental revenues.[18] Whether they result in more harm than good is a debatable question.

Sec. 7. **Eminent Domain**

Another power which enables government to provide itself with ways and means of carrying out its purposes is the power of Eminent Domain. This power again is that attribute of sovereignty by virtue of which the state appropriates the property of individuals, taking, if need be, the title itself, but paying the individual an equivalent compensation. Thus, it is not, like the taxing power, a *burden* upon individuals. Eminent domain relates to designated items of property which the state must prove that it needs for its purposes. "The need of the public for the *particular* piece of property in question is the element which sets the power of eminent domain in motion."[19] The necessities and convenience of the public are the considerations that warrant its exercise. In his epoch-making work on "The Com-

[18] The Wisconsin Constitution provides Article VIII, Sec. 6. "For the purpose of defraying extraordinary expenditures the state may contract public debts (but such debts shall never in the aggregate exceed one hundred thousand dollars). Every such debt shall be authorized by law, for some purpose to be distinctly specified therein; . . . and every such law shall provide for levying an annual tax sufficient to pay the annual interest of such debt and the principal within five years from the passage of such law." . . .

Article XI, sec. 3. ". . . No county, city, town, village, school district, or other municipal corporation shall be allowed to become indebted in any manner or for any purpose to any amount, including existing indebtedness, in the aggregate exceeding five per centum on the value of the taxable property therein, to be ascertained by the last assessment for state and county taxes previous to the incurring of such indebtedness. Any county, city, town, village, school district, or other municipal corporation incurring any indebtedness as aforesaid, shall, before or at the time of doing so, provide for the collection of a direct annual tax sufficient to pay the interest on such debt as it falls due, and also to pay and discharge the principal thereof within twenty years from the time of contracting the same . . ."

[19] Gray, J. N., *Limitations of the Taxing Powers*, Bancroft-Whitney Co. (1906), p. 130.

mon Law" Mr. Justice Holmes lays bare the social significance of this power in characteristically vigorous language. "The dogma of equality makes an equation between individuals only, not between an individual and the community. No society has ever admitted that it could not sacrifice individual welfare to its own existence. If conscripts are necessary for its army it seizes them and marches them with bayonets in their rear, to death. It runs highways and railroads through old family places in spite of the owner's protest, paying in this instance the market value, to be sure, because no civilized government sacrifices the citizen more than it can help, but still sacrificing his will and his welfare to that of the rest." [20]

The importance of the fiscal powers and of eminent domain to public utility industries lies in the following considerations. Public service industries, like other private property, are subject to the taxing power. In fact there was a time in the history of the control of these corporations when the franchise, then regarded as a special privilege, was singled out for *special taxation.* Because there were difficulties in regulating effectively the rates and services of these companies, the taxing power was relied upon to recapture some of the profits that had eluded the power of regulation. Earlier still, the taxing power and the power of contracting public debts was used in aiding these enterprises by the loan of public funds or by public participation in stock subscriptions. And again, the construction or acquisition by public authority of public utilities is financed by means of the taxing power, supplemented by the borrowing power. Not infrequently the taxing power also supports the operation of such enterprises when, as in the case of the Post Office, considerations of public policy appear to require that these enterprises be conducted in part on a basis of deficit financiering.

Sec. 8. **The Compact Clause**

The federal constitution was designed to bring about the coöperation of the states in a national government. From the very beginning, however, there was conflict over what belonged to the sphere of the federal government and what belonged to the states. This conflict, it has been observed, is inherent in the very conception of federalism. We shall see in a later

[20] Holmes, O. W., *The Common Law*, Little, Brown & Co., 1881, p. 43.

chapter that public utility operations, when they became more largely interstate in character, outgrew the regulative power of the states and were accordingly subjected to federal control. This might be taken to mean that there are but two alternatives. Intrastate operations are subject to state control while interstate operations are subject to federal control. But not all interstate operations are necessarily national in scope. They may never become more than merely regional operations and hence the subject of an interstate but solely regional interest. In order to bring about coöperation between states in matters that are interstate in character but not necessarily matters of national concern, the Federal Constitution provides a third alternative. It authorizes a state to enter into an agreement or compact with another state with the consent of Congress.[21] This so-called compact clause may be effectively used and has been so used to organize coöperative action for various purposes.

Our interest in the compact clause is that states may with the consent of Congress undertake effectively to regulate their interstate public utility operations without creating federal machinery. The usual procedure is for states to secure authorization from Congress to negotiate agreements, with or without the participation of federal authorities. These agreements are then ratified by Congress and the participating states and thus become effective legislative acts, capable of enforcement. Usually a permanent, joint administrative agency is set up to carry out the purposes specified in the agreement.

An outstanding illustration is the joint control of New York Harbor by the states of New York and New Jersey. This compact became effective in 1921. "In brief, the agreement established an administrative agency known as the Port of New York Authority which is empowered to own or operate transportation facilities in conjunction with municipalities and private owners, to procure coöperation among existing agencies, and most important, to formulate a comprehensive plan for the development of the port, the administration of which, approved by the legislatures of the two states, is entrusted to the Port Authority."[22] Other instances of the use of the same device concern the joint control by states of water supply, irrigation and hydro-electric power development.

[21] U. S. Constitution, Article I, Sec. 10.

[22] *Cf.* Frankfurter, Felix, and Landis, James M., "The Compact Clause of the Constitution—A Study in Interstate Adjustment," *Yale Law Journal*, May, 1925, p. 685.

Sec. 9. The Proprietary Power

This power provides for and regulates the carrying on of public functions by governmental units. It is usually contrasted with the other powers in that the latter are regarded as governmental in character while the proprietary power is quasi-private. In fact, in a strict legal sense, the proprietary power exists only as a power of *local governments.* When a municipal corporation, for instance, under statutory authority, contracts for the construction or purchase of local public utilities it is acting in a business capacity for its own special benefit, which is, of course, the common advantage of its citizens. The important legal distinction is that the city is not responsible for acts done or left undone in its governmental capacity, while it is liable in the same way and to the same extent as a private corporation for acts done under the proprietary power.

Sec. 10. The Protection of Private Interests or Rights

Arrayed against the above-mentioned powers of government are those constitutional limitations that are usually spoken of as individual rights. So far as they concern the rights of privately owned public utilities, they proceed largely from the fifth amendment (1791) and the fourteenth amendment (1868) of the federal constitution. The fifth amendment represents a limitation upon the powers of Congress. It provides that "no person shall . . . be deprived of life, liberty or property without due process of law; nor shall private property be taken for public use without just compensation." The fourteenth amendment, limiting the powers of state governments, is of similar import: ". . . no state shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States, nor shall any state deprive any person of life, liberty or property, without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws." Similar clauses expressing like limitations upon legislative powers appear in state constitutions.

One further clause of our federal constitution should be mentioned because it is a limitation upon the legislative power of state governments. On account of the disorders of the Revolutionary War and the exhausted state of public and private credit, several states passed laws altering or discharging private contracts, to the great detriment of commerce and credit. A

clause was accordingly inserted in the federal constitution that "no state shall pass any law impairing the obligations of contracts."[23] The interpretation of this clause has brought about a further limitation upon the regulatory power when this takes the form of public utility regulation by means of the franchise, as will be explained in detail in the next chapter.

The respective limits of governmental powers on the one hand and of individual rights to liberty (freedom of contract), and property on the other hand are fixed by a process of judicial definition, as was explained above. Governmental powers are thus a positive element which aims to secure collective interests while private rights are a negative element which aims to secure individual interests. The atmosphere of conflict thus introduced is in reality a conflict between legislatures representing the people in their collective capacities and the people in their individual capacities. The courts, in exercising their function as umpires, decide the disputes by construing and interpreting these constitutional provisions.

When courts in special cases nullify legislation they proceed upon some theory of the general welfare. As the United States Supreme Court said in *Smyth* v. *Ames*:[24] "The idea that any legislature, state or federal, can conclusively determine for the people and for the courts that what it enacts in the form of law or what it authorizes its agents to do is consistent with the fundamental law, is in opposition to the theory of our institutions. The duty rests upon all courts, federal and state, when their jurisdiction is properly invoked, to see that no right secured by the supreme law of the land, is impaired or destroyed by legislation. This function and duty of the judiciary, distinguishes the American system from all other systems of government. The perpetuity of our institutions and the liberty which is enjoyed under them depend, in no small degree, upon the power given the judiciary to declare null and void all legislation that is clearly repugnant to the supreme law of the land."

As opposed to the police power, the definitions of "liberty" and "property" state the conditions under which owners of public utilities are free to bargain and exchange. These conditions are important because they tell us how far regulation may go in controlling public utilities when they are privately owned. Moreover, legislation under the police power must not deny equal protection of the law. It would not, for instance, be proper for a state to single out one enterprise which carries passengers by

[23] Art. I, Section 10, paragraph 1. [24] 169 U. S. 466, p. 527 (1898).

motor bus, regulating its service and rates, while leaving other like enterprises unregulated. And, finally, regulation must observe the all-embracing injunction that such deprivation of liberty and property as the constitution permits must still be in accordance with "due process of law." [25]

Proceedings under the power of eminent domain are limited by the constitutional doctrine of "public use" which permits the judiciary to determine what are the public purposes for which private property may be taken. They are also limited by the constitutional requirement that this power may not be exercised without giving the person whose property is thus taken full compensation.

We shall be discussing these limitations from time to time as we proceed in the development of our subject. No further explanations are thus necessary at this point. It should be added, however, that the interpretation of these clauses, consisting of such colorless phrases as "just compensation," "deprivation of liberty and property," "due process of law" and the like, has proved to be capable of some flexibility. As we proceed to an analysis of these interpretations we shall find that, after all, the courts are giving us their definitions of economic relationships. The United States Supreme Court, as Professor Commons puts it, thus "occupies the unique position of the first *authoritative* faculty of political economy in the world's history.[26]

[25] "This term would naturally seem to refer to the forms of orderly procedure, setting no limits on the subject-matter which might be regulated. But under the interpretations of the Supreme Court it comes about that the regular procedure of an act of a state legislature is "due process" if the subject-matter of the act is within the scope of the "police power," and is not "due process" if the subject-matter is outside the scope of the police power. In cases which come under this power the state may reduce the value of property without compensation, but not otherwise; and even here it must compensate if the taking of property becomes the "main thing." See *Pennsylvania Coal Co.* v. *Mahon*, 260 U. S. 393 (1922).

Furthermore, the actual enumerating of powers is not done by the written constitution, but by the courts, for neither the police power nor the concept of a "business affected with a public interest" is found in written constitutions. They are creations of the courts, and seem to represent their ideas of the essential needs of the community. These ideas rest partly on custom and partly on what seems to be at bottom a weighing of values: an economic act. The courts' notions of economics have sustained the control of monopolies, but when the labor contract was regulated in the interest of one of the contracting parties, this seemed to the courts an invasion of natural right of free contract, and they were slow to sustain it except in the case of children. It is chiefly on this issue of the labor contract that the judicial economics appears backward, as judged by ideas of contemporary social thinkers." Clark, J. M., *Social Control of Business*, University of Chicago Press, 1926, p. 192.

[26] Commons, J. R., *op. cit.*, p. 7.

CHAPTER IX

THE PRE-COMMISSION SYSTEM OF STATE REGULATION

The common law basis of regulation as developed by English and American courts was discussed in Chapter VII. At the same time that judicial regulation was developing a system of direct regulation by legislatures was likewise growing up. The constitutional basis of such legislative regulation in the United States was briefly reviewed in the preceding chapter. The rest of Part II will be concerned with the evolutionary aspects of public utility regulation and the discussion limited almost entirely to developments in the United States. In this review our emphasis will be upon legislative methods of regulation, taking account chiefly of the *agencies* and *instrumentalities* of regulation as they were successively adopted. A summarized and greatly simplified view of the course of development may be gained from Chart XVII, p. 196. It is there shown in its three aspects of federal, state and local regulation. We may distinguish roughly three stages: a first stage in which legislative regulation is largely the concern of the states alone; a second stage in which federal and local governments have also become active, indicating the growth of problems of regulation arising on the one hand out of interstate commerce and on the other hand out of urbanization and the desire of cities for a greater measure of local self-government; a third and contemporary stage in which the regulatory jurisdiction is still divided between the three types of governments but the active work of regulating has been delegated to administrative agencies.

Sec. 1. **Judicial Regulation**

Judicial regulation implies that the *courts* and their *decrees* are the agents and instrumentalities of control. The basis of judicial regulation is the "common law" right of customers to reasonable service at reasonable rates. This type of regulation was dominant throughout a rather undefined period which antedated the movement for *legislative* interference. It is impor-

Chart XVII

EVOLUTIONARY STAGES IN LEGISLATIVE REGULATION

Regulatory Stages	Power of Regulation	Constitutional Agency	Regulatory Instrument	Administration & Enforcement
First Stage	Federal -	-	-	-
	State - Police Power	State Legislature	Special charter & Special legislation	State Attorney General State and Federal Courts
	Local - -	-	-	-
Second Stage	Federal - Interstate Commerce Clause	Congress	Special legislation	U.S. Attorney General Federal Courts
	State - Police Power	State Legislature	General Incorporation Acts and Special Regulatory Acts	State Attorney General State and Federal Courts Advisory Commissions
	Local - Police Power (delegated by state in charters or in General Legislation)	Local Governing Boards (Common Councils Boards of Trustees Boards of Supervisors etc.)	Special Franchises and Special Ordinances	City Attorneys - State and Federal Courts
Third Stage	Federal - Interstate Commerce Clause	Congress	General Legislation	U.S. Attorney General Federal Courts - Administrative Commissions
	State - Police Power	State Legislature	General Legislation Indeterminate permits	State Attorney General State and Federal Courts Administrative Commissions
	Local - Police Power (delegated by state in charters or in General Legislation)	Local Governing Boards	Special Franchises and Service-at-cost Franchises Special Ordinances	City Attorney - State and Federal Courts - Local Administrative Commissions

tant to note that judicial regulation was the chief form of control at a time when ideas of laissez faire held undisputed sway in this country. The police power lay dormant. The courts alone made a conscious effort to correlate utility regulation with the demands of the complex and dynamic industrial civilization then rapidly growing up. Though legislative regulation has now largely supplanted judicial regulation, the latter, nevertheless, remains in the background as a potential agency which may become active again if legislative regulation should disappear.

However, the attempt to apply a policy of "regulation by lawsuit" failed. Judicial methods, certainly those of that period, were designed primarily to remedy past wrongs and visit punishment.[1] It was a piece-meal process whereby individual grievances could be brought to trial. Regulation, in order to be effective, must be preventive and promotive as well as remedial and exemplary. This is a lesson which legislatures have not yet fully learned. Moreover, the machinery of the courts did not move with sufficient expedition and spontaneity. Altogether the method proved too expensive for the use of the ordinary individual in securing redress for his grievances, for, after all, these grievances were petty, and loomed large only when taken in the aggregate. But the central difficulty was the one referred to above, that judicial remedies were characteristically limited to acts already committed, whereas the situation increasingly required that difficulties be forestalled by making rules which would control future conduct.

Another disadvantage of judicial regulation lay in the fact that the training of the judiciary was not sufficiently specialized and technical to assume the tasks of constructive regulation. As one critic has put it, the immediate tasks of regulation required rather "a long look ahead instead of a long look into the past to conform to precedents". The judges' field of usefulness has accordingly become restricted to that of judicial review of matters of law, leaving the determination of questions of fact and delineation of policy to non-judicial or quasi-legislative agencies.

Sec. 2. **Earlier Forms of Legislative Regulation**

A survey of the history of regulation must necessarily begin with the regulation of transportation utilities because they

[1] *Cf. Shepard* v. *The Milwaukee Gas Light Co.*, 6 Wis. 526 (1858). Also *City of Madison* v. *Madison Gas & Electric Co.*, 129 Wis. 249 (1906).

were the pioneers and consequently the first to be made the subject of regulatory experiments by legislatures. This early history has served to shape the development of regulatory systems for other classes of public utilities.

Another pivotal fact which has first changed and then conditioned the entire character of public utility regulation has been the almost world-wide adoption of the corporation as the legal form of organization of the business unit. The corporation, as such, has been subjected to much unscientific criticism. Gradually, however, with the growing appreciation of institutional developments for social progress, the true significance and function of the corporation are coming to be understood. Regulation by means of the corporate charter was one of the earliest forms of legislative regulation.

(a) *The distinction between general and special franchises.*

The words charter and franchise may be used interchangeably. We must, however, distinguish different kinds. One legal writer [2] distinguishes (a) the franchise *"to be"* which is the *grant of corporate life* from the state and belongs to the members of the corporation and cannot be parted with by the legal person, the corporation; (b) the franchise *"to do"* which is the *grant of corporate power* from the state to carry on some business, public or private in its nature, which belongs to the corporation; and (c) the franchise *"to use"*, which is the *grant* to a corporation that already exists and has authority to engage in a particular business, *of the right to use the public streets* in carrying on such business. The first two of these elements, the franchise "to be" and the franchise "to do", have come to be known as the *general franchise* or "the charter", while the third element, the franchise "to use" is called the *special franchise.* The general and special franchise were both used in regulating utilities.[3]

[2] Gray, J. M., *Limitations on the Taxing Power and Public Indebtedness*, Bancroft-Whiting Co. (1906), p. 39.

[3] The New York Court of Appeals, in *Lord* v. *Equitable Life Association*, 194 N. Y. 212, 225 (1909), makes this explanation: "The charter of a corporation is the law which gives it existence as such. That is its general charter, which can be repealed at the will of the legislature. A special franchise is the right, granted by the public, to use public property for a public use, but for private profit, such as the right to build and operate a railroad in the streets of a city. Such a franchise, when acted upon, becomes property and cannot be repealed, unless power to do so is reserved in the grant although it may be condemned upon making compensation. As we recently said, 'The general franchise of a corporation is its right to live

(b) *Regulation of transportation utilities by means of the charter.*

The first charters created turnpike and canal companies. Early railway charters were modeled after these, because it was assumed that a railway, like turnpikes and canals, was a public highway upon which shippers and travelers would use their own conveyances. The principal feature of these charters was the right to charge tolls. In later railway charters this became the right to fix rates. In some cases the power to fix rates was granted to the board of directors without restrictions. Usually, however, some limitations were fixed, and these give charter regulation its distinctive character. The regulatory program is embodied in charter provisions. Out of the great number and variety of such provisions only a few important ones will be mentioned.

In addition to the usual provisions relating to the legal and financial organization of a company, the charters contained clauses granting the power of eminent domain, specifying routes, controlling construction and extensions, and prescribing some of the details of operation. Although most charters were silent as to their duration of life, there were some whose life was

and do business by the exercise of the corporate power granted by the state. The general franchise of a street railway company, for instance, is the special privilege conferred by the state upon a certain number of persons known as the corporators to become a street railway corporation, and to construct and operate a street railroad upon certain conditions. Such a franchise, however, gives the corporation no right to do anything in public highways without special authority from the state or some municipal officer or body acting under its authority. When a right of way over a public street is granted to such a corporation, with leave to construct and operate a street railroad thereon, the privilege is known as a special franchise, or the right to do something in the public highway, which, except for the grant, would be a trespass.' (*People ex rel. Metropolitan Street Railway Co.* v. *State Tax Commission*, 174 N. Y. 417, 435 (1903).

"The right to be a corporation is frequently called a franchise, as it is in one sense, but not in the sense that the grant of a right to build a railroad in a public street is a franchise, and it is unfortunate that the same word is used with widely different meanings, for it leads to confusion unless qualified by an appropriate adjective, such as 'general' or 'special.' The right to be a corporation, or the corporate right of life is inseparable from the corporation itself. It is part of it and cannot be sold or assigned. That franchise is general and dies with the corporation, for it cannot survive dissolution or repeal. On the other hand, grants to do something in the public streets or special franchises are not a part of the corporation. They can be made to an individual with the same legal force or effect as to a corporation. Unless there is some legislative restriction, they can be mortgaged and sold. They are no part of the corporate life if owned by a corporation any more than they are a part of the individual life if owned by a human being."

Cf. also the discussion of franchises in *People* v. *O'Brien*, 111 N. Y. 1, 30 (1888).

limited, the usual term being 99 years. In some cases the state reserved the right to purchase the facilities at a stated valuation. In order to encourage the building of these facilities many charters conferred privileges of tax exemption or of tax limitation either for an indefinite period or a limited period.[4] But charters also restricted the variety of businesses that a given corporation might enter as well as the amount of land it might hold.

Three kinds of provisions illustrate the range of expedients which were used in controlling rates. Usually they took the form of a prescribed schedule of maximum rates. Within the limits of these charter maxima, the carriers were free to fix their own charges. A second type provided that rates, fares, or tolls should not yield a net income greater than some definite quantity, let us say, twenty per cent. upon the common stock. Any excess would have to be paid, for instance, into an internal improvement fund. A third type, typical of New England, stipulated that at the end of some definite period, often 25 years, and of each 20 year period thereafter, the legislature had the power to prescribe rates if the net income was greater than a specified percentage of the capital of the concern. These restrictions often were such as to allow profits which would be deemed excessive today. Indeed, the charters even went further in assuring promoters that these returns would be earned by conferring at least a limited monopoly through an exclusive charter.

(a) *The weakness of charter regulation.*

It seems that maximum rate provisions soon lost their effectiveness because the prescribed rates were in excess of those actually charged by the companies. Under conditions of increasing competition between railways and waterways, and between railways themselves, the initial rates had to be cut. The decreasing unit cost of operation, brought about in part by increased utilization of plant capacity, in part by a decreasing level of prices particularly after the Civil War, and in part by continuous improvement in technique, made it possible for railways to render service at rates lower than those fixed in their charters.

All early forms of charter regulation more or less assumed that the companies would voluntarily fulfill their charter obligations. Consequently, little attention was paid to securing proper *execution* of regulatory provisions except such as could

[4] H. D. Simpson in a forthcoming book on *The Taxation of Public Service Corporations* gives interesting details.

be obtained by suits at law or by means of sporadic boards of railroad commissioners with limited powers. Rate control of the second and third types—ostensibly secured by reserving to the legislature the power to revise schedules when net income exceeded, for instance, 10 per cent. on the investment or when dividends exceeded 20 per cent. upon the stock—was avoided by padding investment accounts or by new issues of capital stock. The failure to provide adequately for financial and accounting control thus made these earlier forms of rate control ineffective.

As the first disposition to be liberal abated, the control became stricter. In particular did legislatures grow cautious about granting exclusive franchises, the more so when the community began to feel that competition should be relied upon to protect the public. And so, whereas earlier charters protected carriers against parallel lines for a limited period of time or for a designated distance, railway charters now prohibited the purchase, lease, or joint operation of parallel or competing lines. However, while the East was emphasizing the restrictive aspects of regulation, the West, still in the promotion stage, continued to grant charters on the theory that inducements must be held out to secure transportation facilities.[5]

(d) *Charter regulation of local utilities.*

In the field of the local utilities policies of regulation went through the same evolution. Here the problem of franchise grants came to the forefront during the early part of the nineteenth century when cities had grown in population and area to such an extent that public services became not only essential but also profitable. It was at first customary to provide for such service by special acts of state legislatures. These acts incorporated public service companies and gave them specific rights in the streets of individual cities. Examples of such legislation were an act of the Territorial Legislature of Colorado in 1864, incorporating the Occidental Gas Light Company

[5] "The legislative history of railways in the various states in the Union is essentially similar, and as we observe the movements of this legislation from east to west we may notice that in turn each state goes through, in the main, all the experiences and stages of advancement of other states which preceded it in railway development. An examination of the contents of these charters, as one observes their march westward, clearly indicates the fact that the restrictions of the earlier types granted in the east are gradually made milder if they are not altogether lost. Occasionally there is a reversion to type—a Western charter embodying all the salient restrictions and regulatory features of the severest Eastern charters." Meyer, B. H., *Railway Legislation in the United States*, The Macmillan Co., 1909, p. 80.

of the City of Denver and giving it for thirty years "the exclusive privilege of supplying the city of Denver with illuminating gas" and, again, the act of 1867, incorporating The Denver City Horse Railway Company and giving it for "a period of thirty-five years the sole and exclusive right and privilege of constructing and operating a horse railroad in the City of Denver." [6]

In time public opinion began to oppose legislative grants of such rights without giving the city a voice in the choice of the company. The argument was that grants by a state legislature were less intelligent and consistent than those conferred by the cities themselves acting under delegated authority. Even after the authority had been conferred upon cities, conflicting grants were often made by the state and local authorities owing to confusion regarding their respective powers. Or municipalities granted franchises which were subject to amendment and repeal by the legislature. In these cases the legislature might still make exceptions in favor of particular companies. These complications led to the adoption of constitutional provisions which forbade the granting of franchises and rights in city streets *without the consent* of local authorities. Such constitutional legislation terminated what may be regarded as the first period in the history of franchise regulation of local utilities in the United States.

Sec. 3. General Incorporation Acts and Their Effect on Regulation

So long as each charter was a vehicle of special regulation, there was bound to be great diversity of restrictions. But there were nevertheless certain tendencies toward uniformity. In drafting charters states copied largely from one another. When the work of granting charters by special acts became burdensome, the legislatures developed the custom of abbreviating railway charters by referring to charters previously granted in the same or other states. By this means a gradual transition to the policy of granting charters by general law was worked out. General legislation appeared in the early thirties, although special charters continued to be granted as late as the seventies.[7]

[6] King, C. L., *The Regulation of Municipal Utilities*, D. Appleton & Co., 1914, p. 79.

[7] Charters were originally special acts except in the case of a few Western States—Arizona, California, Colorado, Idaho, Montana—that began with general laws.

The change to the new system was gradually completed, but not until the passage of special acts in a perfunctory, indiscriminate and even corrupt way had yielded a grist of charters that contained all manner of restrictions and of special privileges. By this time the corporation had become so favored a form of organization for economic enterprises that men began to advocate the free and unrestricted use of the device. In other words, the corporation had by this time become an expression of laissez faire. This explains the enactment of general statutes which prescribed the general manner and conditions of securing incorporation.

Typical of this situation are the following clauses in the Wisconsin constitution: "Corporations without banking powers or privileges may be formed under general laws, but shall not be created by special acts, except for municipal purposes, and in cases where, in the judgment of the Legislature the objects of a corporation cannot be attained under general laws. All general laws or special acts enacted under the provisions of this section may be altered or repealed by the Legislature any time after their passage."[8] In spite of such provisions the legislatures continued to amend earlier special charters and even to grant new ones until the legal situation, in view of the consolidation of railways, became very complex.[9]

It is, accordingly, a mistake to assume that the adoption of general incorporation laws brought about an improvement in the machinery of regulation. As a matter of fact, the first effect was a recession in the vigor of regulation. Under such laws a small number of persons, by simply filing a certificate, could organize a public utility corporation and be subjected to very little control in their operations. The era of free competition among utilities should really be associated with this system. It is small wonder that abuses crept into corporate organization and management. Even the power of eminent domain was often used by rival companies to defeat legitimate and sound enterprises by blocking construction, or to force one

[8] *Constitution of Wisconsin*, Art. 2, Sec. 1, 1871.

[9] As a leading authority writes, "The Pennsylvania Company, for instance, represents more than 150 original lines, each having its special charter or certificate of incorporation. Many of these charters represent conflicting, if not mutually exclusive privileges, and what the charter rights of such a corporation are is a question difficult of solution. Not only is there a possibility of conflict between the diverse provisions of different charters, but also between the charters and the general laws, although in many states the supremacy of general over special laws has been at least acquiesced in, if not publicly recognized." Meyer, B. H., *op. cit.*, p. 85.

of them to purchase needed properties at exorbitant prices. The reaction set in after it was recognized that the system involved social waste and that the inevitable outcome of competition would be consolidation. Thereupon, in response to public clamor, legislative regulation entered upon a new phase—control by "direct action"—which is known in history as the "Granger Movement."

In the regulation of local utilities, general incorporation laws brought the same result. Although companies were incorporated by general laws and obtained their special franchises from local governments, the result was an era of competition. This policy predominated during the latter half of the nineteenth century. Although the new method was believed to be an improvement in the procedure of granting franchises, it led to many abuses with which the history of these utilities is replete. The regulatory provisions in general incorporation laws were lax and ineffective. The familiar charges of fraudulent capitalization, over-capitalization, exorbitant and discriminatory rates date from the practices that crept in during this period. Owing often to the lack of clearness in the general laws, serious questions arose whether a city, in granting the special franchise, was authorized to impose conditions upon applicant companies in addition to those imposed by general statute. There was as yet no definition of the powers of the cities and the rights of the companies. Cities tried to protect themselves by granting franchises to competing companies, often with no reservations or restrictions in the interest of the city and the consuming public. Thus here, as in the railway field, the belief prevailed that competition was the best regulative power and that governmental regulation was unnecessary where there was competition. Competition was destined, however, to have a shorter life here.

Denver again furnished an example of the practice. In 1880 its council granted a general electric franchise "to all comers" in a resolution which provided solely "that permission be granted to any company desiring to supply the city with electric lights, to erect posts and such other appliances as may be necessary to carry on their business; provided, that said companies do not obstruct the public thoroughfares." Such competition, of course, could not and did not persist for the industries are inherently monopolistic. Consolidations and mergers have placed upon the final incumbent an unnecessary duplication of investment, besides keeping alive in some of the cities the terms of the competing grants.

Sec. 4. **Judicial Interpretation of Charter Regulation**

The lessons of experience growing out of the first phase of charter or franchise regulation may now be summarized, (a) as contained in special acts, and (b) as based upon general incorporation acts but conferred in accordance with a theory of competition.

(a) *The franchise as a special privilege.*

Attention should first be called to the paradox that while the historical view was that corporate charters were special privileges of immense value, a situation was developing in which corporate charters were issued as a matter of common right.[10] The conception of the franchise as a special privilege, conferred by government upon particular individuals or companies for their private profits, is derived from English constitutional history and is intimately associated with the grants of monopolistic privileges that were made famous by Queen Elizabeth.[11] Public opinion has carried this idea forward to the present time.

(b) *The franchise as a contract.*

In due course the courts were more and more forced to abandon the conception of franchises as monopolistic special privileges. The facts were that the charters were merely a thin disguise for bargains between the government and the franchise holders whereby the public secured service on the best terms possible. This transition came with the Dartmouth College case (1819) when the law was prone to regard all legal relations from the point of view of contract. In that case the court held that a charter is a contract between the state and the grantee, the obligation of which cannot be impaired by enactments of subsequent legislatures.

In order to establish this interpretation the court had to read the contractual element of *consideration* into the situation. The way in which it solved the difficulty appears from this citation:

[10] General incorporation laws, while still regarding incorporation as a privilege, have tended to make of incorporation rights something akin to common rights.

[11] Blackstone defines the franchise as follows: "Franchises and liberty are used as synonymous terms; and their definition is a royal privilege, or branch of the king's prerogative, subsisting in the hands of a subject. Being therefore derived from the crown they must arise from the kings grant; . . . But the same identical franchise that has been granted to one cannot be bestowed upon another, for that would prejudice the former grant." ***Blackstone's Commentaries,*** Clarendon Press, Oxford, 1766, Bk. 2, p. 37.

"The objects for which a corporation is created are universally such as the government wishes to promote. They are deemed beneficial to the country, and this benefit constitutes the consideration and, in most cases, the sole consideration of the grant." [12] Accordingly, the view has prevailed that a franchise granted by the state cannot be resumed, that there is an *implied contract* on the part of the state that it will not invade the domain of the franchise holder and on the part of the grantee that he will perform the specified service. In other words, a franchise is not granted as an honorarium, but for a purpose supposed at least to be beneficial to the public.

The vice of the situation was that charters, which were loosely drawn and freely granted with no adequate assertion of or protection for public rights to reasonable service at reasonable rates, came to be regarded as contracts the obligation of which would be strictly enforced. Attempts, therefore, to amend charters, and especially to change the faulty provisions relating to rates and service, were declared unconstitutional and void by the courts, because they came within the inhibition of the federal constitution that "no state shall pass any law impairing the obligation of contracts." The doctrine of the Dartmouth College case is firmly established and has been extended to all types of corporate charters, to special as well as general franchises. It has also been effective in securing to corporations the continuous enjoyment of such special privileges as exemption from taxation, rate regulation,[13] or competition.[14]

The harmful effect of this doctrine was only gradually revealed. In order to prevent the bartering away by contract of such important powers as the powers of taxation and regulation, the courts set up the doctrine that the terms of any contract conveying special privileges granted by the state must be strictly construed, i.e., the abandonment of legislative power must be expressly stated and cannot be implied. Any doubt or ambiguity was resolved in favor of the state. Thus in the famous case of *Charles River Bridge* v. *Warren Bridge*,[15] the court held that an express grant of power to build a toll bridge did not also imply that the state might not subsequently charter a com-

[12] *Dartmouth College* v. *Woodward*, 4 Wheaton, 518, 637 (1819).

[13] *Los Angeles* v. *Los Angeles Water Co.*, 177 U. S. 558 (1900), *Detroit* v. *Detroit Street Railway Co.*, 184 U. S. 368 (1902).

[14] *The Binghamton Bridge*, 3 Wall. 51 (1865); *New Orleans Gas Co.* v. *Louisiana Light Co.*, 115 U. S. 650 (1885); *New Orleans Waterworks Co.* v. *Rivers*, 115 U. S. 674 (1885).

[15] 11 Peters 420 (1837). See also *Blair* v. *Chicago*, 201 U. S. 400 (1906).

peting bridge. Similarly, it has been held that the grant of special privileges is to the grantee alone and may not be transferred unless expressly permitted.

There has always been judicial dissent from the doctrine that charters are contracts.[16] The chief reason advanced by the

[16] A very good summary is in a recent opinion of the Wisconsin Supreme Court in *Superior Water, Light & Power Co.* v. *City of Superior*, 174 Wis. 257, 274 (1921). Because this opinion is based upon a thorough-going review of all previous decisions in this state and of the leading cases in other jurisdictions, we will consider the case at some length.

The action was brought to enjoin the City of Superior from acquiring the properties of the company under the terms of the Public Utility Law of the state and to compel it instead to purchase under the terms of a franchise of 1887 as amended in 1889. The franchise provided among other things that:

(1) The city would not grant a similar franchise to another party for thirty years.
(2) That after its expiration in 1917, if the city refused to extend it for another thirty years upon the same terms, the city must purchase the system of waterworks.
(3) That the purchase price should be fixed at an amount which represents the capitalization at 5% of the net earnings for the year preceding the purchase.

The city refused to purchase in accordance with the terms of the franchise, denying the existence and validity of the contract, and began proceedings under the Public Utility Law. The question raised was whether compensation should be fixed in accordance with the terms of the franchise or according to the Public Utility Law.

The Company contended that the ordinance constituted a contract entered into by the city in its proprietary capacity and hence the contract was immune from subsequent legislative interference—clearly the contract conception of a franchise. The legislature in 1907 had provided that a company might surrender its franchise and take out an indeterminate permit. The company had not availed itself of this option, and was consequently affected by the provisions of the law of 1911 which provided that every license, permit or franchise granted prior to July 11, 1907, was to be an indeterminate permit.

The *specific* question to be decided was, therefore, whether the legislature may require the substitution of an indeterminate permit for a term franchise *without the consent* of this public utility. Clearly, this power of the legislature rested upon an interpretation of the reserved powers in the constitution. The company tried to restrict the scope of the legislative power only to laws for the formation of corporations. It made use of the distinction between a corporate franchise which was not the property of the corporation and the franchise acquired after the company came into existence which it might sell as property, contending that the former was within and the latter without the province of the legislature.

In reviewing the early Wisconsin decisions upon the point, the court quoted some forceful language rejecting this view and holding that by virtue of "the constitutional power reserved and of the uniform construction and application of it, the rule in the Dartmouth College case as applied to corporations, never had place in this state, never was the law here. The state emancipated itself from the thraldom of that decision in the act of becoming a state and corporations since created here have never been above the law of the land." The undeviating gist of the decisions was that the reserved power was for the purpose of imposing such salutary restraints

dissenters has been that the legislature may not thus divest itself of legislative powers, thereby tying its hands for the future. The courts have recognized this contention to this extent, that "rights and privileges arising from contracts with the state are subject to regulations for the protection of the public health, public morals, and public safety, in the same sense and to the same extent as are all contracts, or all property whether owned by natural persons or corporations."[17] Even the power to regulate rates, it has been held, could not be given up by contract for a term grossly unreasonable in point of time.[18]

The policy of states in granting franchises was accordingly changed. Reservations to alter, amend, or even repeal franchises were inserted in the instruments themselves or the grant was made in view of constitutional or statutory reservations of the power of the legislature to alter, amend, or repeal. Thus the

upon corporations "as experience might prove necessary." The court then continued:

"The early judges who thus discussed, considered and applied this clause of our constitution were of a time when the decision of the Dartmouth College case was still a subject of criticism and resentment. The reserved power was an invention of their generation, and they understood well its purposes. Prompted by the suggestion of Mr. Justice Story in his concurring opinion in that case, that if the states desired to retain the power to alter or amend corporate charters they should reserve it in the grant, many states provided by general statutes that all corporate grants should be subject to the power to alter or amend. Other states made similar provision in the respective charters as granted, while others, subsequently coming into the Union, including our own, reserved such power in the constitution. While there was a lack of similarity in the language used, the purpose intended to be accomplished was uniform. The purpose of all the states was to regulate and control corporations of their own creation, to the end that the recipients of corporate grants—which may seem wise today and prove improvident tomorrow—should not be permitted to convert the bounty of the state into an instrument for the oppression of its people. This result could not be accomplished by a reservation of power to alter or amend the primary franchise of the corporation. It is the use made of the secondary franchise, grants in the nature of property which may be turned to the public detriment, that must be kept under the control and regulation of the state if the generosity of the state is not to be turned to the exploitation of its people. And so far as our investigations have gone, reserved clauses of this character have been given the scope and effect necessary for the accomplishment of this purpose. The reservation affects the entire relation between the state and corporation, and places under legislative control all rights, privileges and immunities derived from its charter directly from the state. *Tomlinson* v. *Jessup*, 15 Wall. 454." The decision of the state court was reversed on appeal in 263 U. S. 125 (1923). The basis of the reversal appears to have been the doctrine of the Dartmouth College case since the federal court discovered elements of contractual obligation in the peculiar circumstances and facts out of which the case arose.

[17] *New Orleans Gas Co.* v. *Louisiana Lt. Co.*, 115 U. S. 650, 672 (1885). *Stone* v. *Mississippi*, 101 U. S. 814, 819-20 (1880). *Butchers Union Co.* v. *Crescent City Co.*, 111 U. S. 746, 750-751 (1884).

[18] *Home Telephone Co.* v. *Los Angeles*, 211 U. S. 265, 273 (1908).

view prevailed that, although a franchise is a contract, it may be altered or repealed if it is so stipulated in the grant itself or in the law of the state. But where these powers to alter, amend or repeal are reserved, such powers must be reasonably exercised and not used to inflict wrong or oppression.[19]

Although agreeing that some alterations appeared necessary, the courts at this juncture were looking for a way to protect property rights which might be adversely affected if the terms of the franchise were materially altered. The question may now be raised whether the obligation to render reasonable service at reasonable rates is the kind of an obligation the terms of which ought to have been fixed by contract. If it is true that the relation between customer and utility is one of status, not contract, then the legislative power should be free to alter the terms in accordance with a sound public policy.

The difficulty may be viewed from another angle. Is the charter of a corporation a contract between the state and the members of the corporation, or is it merely an ordinary legislative act, permitting that which could not be done without the act? It is conceivable that when corporations were chartered by special act, the courts could read an obligation into a corporate charter that the grant should not be revoked or materially amended without the consent of the corporation. Yet material changes in economic conditions might soon make even the most reasonable initial terms obsolete. If regulation was to accomplish its purposes a more flexible method than charter regulation had to be devised. For, as Davis in his examination of corporations writes, "The doctrine that 'a charter is a contract' is vicious; the conception of a bargain between a state and a group of its citizens is illogical; the only final guaranty of the protection of rights and the performance of duties is a sound social sentiment."

The courts appear to have found ways and means of overcoming the technical obstacles to continuous and effective regulation that were raised by the Dartmouth College case. This is true at least so far as our interstate carriers are concerned. But in the regulation of local utilities, as we shall see, the contract conception of the franchise still raises difficulties. The adjustment of economic relations between public utilities and their patrons involves a continuous application of the legislative power of regulation. This is implied, if not expressly stated, in the famous decision of the United States Supreme Court in

[19] *Cf.* Joyce, J. A., on *Franchises*, The Banks Law Pub. Co., 1909, p. 319.

Smyth v. Ames, where the corresponding rights and duties of a public utility and the government are well stated.[20] "A corporation maintaining a public highway, although it owns the property it employs for accomplishing public objects, must be held to have accepted its rights, privileges and franchises subject to the condition that the government creating it, or the government within whose limits it conducts its business, may by legislation protect the people against unreasonable charges for the services rendered by it. It cannot be assumed that any railroad corporation, accepting the franchises, rights and privileges at the hands of the public, ever supposed that it acquired or that it was intended to grant to it, the power to construct and maintain a public highway simply for its benefit, without regard to the rights of the public. But it is equally true that the corporation performing such public services and the people interested in its business and affairs have rights that may not be invaded by legislative enactment in disregard of the fundamental guarantee for the protection of property. The corporation may not be required to use its property for the benefit of the public without receiving just compensation for the services rendered by it. How such compensation may be ascertained, and what are the necessary elements in such inquiry will always be an embarrassing question."

Sec. 5. **The Granger Movement**

We have seen that the regulation of common carriers by means of the charter was justified by the theory that a railway was a public highway. This doctrine of the courts reflects the notion, prevalent before 1830, that it is the duty of the state to provide for inland transportation, whether by turnpike, canal, or railway. At this point, a circumstance entered which accounts for the failure of policies of regulation to develop continuously in accordance with this principle. "As in 1830 the federal government stepped aside for state governments, so in 1850 the state governments assigned to corporations the duty of furnishing the means for inland transportation. The twenty years intervening were marked by a gradual decline of the theory that the development of a country through canals and railways was a public function, and the gradual rise of the theory that this duty was one which could with greater safety

[20] 169 U. S. 456, 545 (1898).

be entrusted to private enterprise."[21] In other words, the opinion began to gain ground that the business of a common carrier was purely private.

During the pioneer period of active railway construction before 1870, there was little thought of legislative control. The demand was usually for more railways to beget competition. The various forms of public aid (loans of public credit, subscriptions to stock) were supplemented by appeals to private parties, particularly to farmers along the rights of way, who would be benefited by the new roads. Shares of stock were sold and frequently paid for out of funds obtained by mortgaging farms. When the promised dividends failed to materialize and the new transportation facilities did not at once cheapen the price of transport, attempts were made to repudiate county and municipal railway bonds, by having them declared illegal. The reason assigned was that they had been issued for the benefit of private railway corporations. Fortunately, the attempt failed; the legality of the bonds was upheld by the United States Supreme Court upon the theory that they were issued in aid of a governmental function.[22]

Other events of that period fanned the flame of public indignation. Construction rings and unscrupulous directors had wrecked some of the properties. Competition was being eliminated by consolidations. Rate agreements between trunk line carriers, the first railway pool in 1870, kindled an opposition which revealed vividly the extent to which faith in competition had penetrated public opinion. The uncompromising position of railway managers who shielded themselves with the Dartmouth College decision only added to the desire of legislatures to subject these corporations to rigid control.[23] Absentee ownership was blamed for such lack of amenability to public opinion. Moreover, legislative and official corruption appeared in the shape of the free pass system and the transfer to legislators of stock at less than its market value. What appeared to be unjustifiable rate discriminations between persons and places were subjects of public complaint as was the high level of rates which made the shipment of farm products unremunerative. This was particularly true after the close of the Civil War when

[21] Adams, H. C., in introduction to Dixon, F. H., *State Railroad Control*, Thomas Y. Crowell and Co., 1896, p. 6.

[22] *Olcott* v. *The Supervisors*, 16 Wall. 678, 694 (1872).

[23] For an earlier reaction in Wisconsin see Frederick Merk, *Economic History of Wisconsin*, Publications of Wisconsin Historical Society (1916), Chap. 12.

prices fell from the high level they had reached through currency inflation during the war.

When abuses, real and imagined, flowing from the unrestricted activity by the pioneer utilities had kindled "Granger Movements" in the different states,[24] investigations of the "railroad problem" were begun by legislative bodies and temporary advisory commissions. The publication of their reports and the public discussion thus invoked accomplished a good deal of informal regulation. This was the atmosphere in which the police power was rejuvenated.

At this stage in the history of regulation appeared a plethora of laws and regulations, very precise and definite as to subject matter. Specific laws were aimed at specific abuses. The immediately important result was a wave of maximum rate legislation which centered in the four states of Iowa, Illinois, Wisconsin and Minnesota, but spread to many other states in the decade from 1875 to 1885. The state-wide classifications of freight and the maximum distance tariffs of freight rates, which were in effect in some of the Granger states until quite recently, are present-day relics of this period of legislative regulation.

(a) *The establishment of administrative commissions by state governments.*

Although the Granger Movement began with the legislation which prescribed maximum rates and fares and prohibited discriminations, it ended with legislation creating commissions with power to prescribe reasonable maximum rates. It is customary to speak of regulation by state commission as beginning about 1905. This is historically inaccurate because the commission as an *agency* of regulation has had a long history. But the great variety of historical conditions that lie back of this movement for commission regulation make it difficult, if not impossible, to generalize.

Even under charter regulation supervisory control was exercised by means of special statutes, covering not so much the economic phases involved as those which fell under the police power in its narrower sense, that is to say, regulations in behalf of the public health and safety. Such supplementary regulation was conceived by the courts not to be inconsistent with regulatory provisions embodied in the charter. At this point com-

[24] *Cf.* Buck, S. J., *The Granger Movement*, Harvard University Press (1913).

missions were first introduced into our regulatory scheme of things.

An enumeration of some of the functions of these early commissions will give an idea as to their character. For instance, the commissions were required to appraise the value of private property when railroads exercised their charter power to take such property under eminent domain. They were required to inspect the roads and help in the enforcement of laws designed to prevent accidents. Upon them also fell the duty of apportioning revenues and expenditures to the state when operations of the railroad extended beyond state lines. This was necessary to determine whether the net income exceeded that authorized under charter provisions. Indicative of the prevalent spirit of parochialism, the commissions were required to investigate the conduct of these enterprises in other states to see that no greater advantage was given to citizens in other states. Such investigations were likewise necessary in order to determine whether the railroad corporations were violating their charters in other respects. In short, we may say that their duties were largely like those of the modern "fact finding" commission, consisting of the collection of statistical and other data relating to the financial affairs and operating methods of the companies, and designed either to serve as a basis for suits at law, or for further specific legislation. Such were the commissions established by Rhode Island in 1836, by New Hampshire in 1844, by Connecticut in 1853, by Vermont in 1855, and by Maine in 1858.

(b) *The mandatory as distinguished from the advisory commission.*

Without departing radically from the avowed purposes for which the earlier commissions of New England were established, New York in 1855 and Massachusetts in 1869 set up commissions with enlarged powers. More and more, as emphasis shifted to rates charged and particularly to discriminatory practices, the need for more detailed and authoritative information about the rapidly growing railroad business became evident.

In meeting this need the eastern states developed a policy that varied considerably from that of the western and southern states. In the East, in regulating the relations of railroads to one another and to the public, great reliance was placed upon *publicity* and the *force of public opinion* to correct abuses. Under this system the commission first investigated and made recommendations, and this was followed by legislation only when the

companies proved unyielding. In the West, on the contrary, public opinion demanded legislation first and *set up commissions* later to make and enforce orders and collect penalties. This difference in approach was the basis for the distinction drawn between commissions of the advisory or "weak" type and those of the mandatory or "strong" type.

The Massachusetts Board of Railroad Commissioners of 1869 is the outstanding illustration of the former type. It consisted of three men appointed by the Governor with the consent of the Council. The term of office was three years, one person being appointed each year. This commission was empowered to investigate the operations of the carriers, to determine whether they were living up to the terms of their charters and of such special legislation as had been adopted to supplement the charters. It was likewise empowered to investigate complaints or begin investigations upon its own motion. It could hold hearings, summoning witnesses and examining them under oath. Its findings might be coupled with recommendations, which were usually accepted. As an incident to its supervisory powers, it could prescribe a uniform system of keeping accounts and had the power to inspect the books of account. It acted as a board of arbitration in settling disputes and issued an annual report to the legislature upon the general subject of railroad transportation in relation to the welfare of the state, in which report it suggested such additional legislation as seemed appropriate. Since this board early developed a reputation for courage and intelligence throughout the country, its example served appreciably to give the commission idea great vogue. Being reasonably free from political influence, the commissioners set out upon their task of investigation; and by the force of facts and arguments they succeeded in fathering much sound legislation, such as that designed, for instance, to prevent the construction of useless roads built only for speculative and blackmailing purposes.[25]

In the West and South, the opposition of the carriers to the new legislation, particularly their ability in using the technicalities of legal processes to delay and emasculate its effective-

[25] The personality whose presence on this board for many years gave it preëminent standing was Charles Francis Adams. Commissioner Eastman of the Interstate Commerce Commission says of this board that it is distinctly the product of evolution, that it did the laboratory work by which the whole country has profited. Moreover, he finds in the Massachusetts experiment the germ of "nearly every important power now exercised by the various public service commissions in the United States."

ness, soon taught the lesson that the law on the statute books and the law in action are horses of a different color. Moreover, during the period of falling prices following the Civil War, statutory rate-structures were left "up in the air" by the voluntary reductions of the carriers themselves, just as the maximum rates fixed in earlier charters had become "paper rates". Thus the statutes soon lost all their regulatory vigor. The increasing complexity of rate problems and the preoccupation of legislatures with many new problems in time brought a realization that statutory regulation should be general rather than specific; that the subject-matter of statutes should be the statement of principles and standards, rather than the specification of concrete details; that the new policy of continuous legislative regulation required an effective agency, sufficiently "informed by experience" to carry legislative standards into effect. The administrative commission filled this need. It is, in one sense, a new political institution which has revolutionized, if not created, administrative law.

Thus, in the western and southern states, the Granger Movement led to the establishment of commissions of the mandatory type. Illinois took the initiative and its commission may be taken as typical. A revised constitution, adopted in 1870, required the legislature to enact laws regulating the railroads and warehouses. Such legislation, prescribing maximum rates and fares and prohibiting discriminations, was passed in 1871. Accompanying it was legislation establishing a Railroad and Warehouse Commission to supervise railroads and assist in enforcement. Two years later, in 1873, this commission was given the duty of prescribing a schedule of maximum rates. The commission also had to investigate operations and to prescribe the form of a report to be made by the railways. The new element, however, was its power to prescribe rates and to compel obedience. A wave of maximum rate laws spread over other states, some establishing commissions and some proceeding without one. Iowa and Wisconsin acted in 1874. Minnesota in the same year established its Railroad and Warehouse Commission. Georgia followed in 1879. In the same year California took the unusual step of providing in its constitution of 1879 that the legislature establish a railroad commission with power to fix maximum rates.

(c) *Reaction against mandatory commissions.*

The panic of 1873 placed many of the roads in financial difficulties. Coming at the same time that these boards were being

created, this fact was used to turn public opinion against the newer form of regulation. The attempt was everywhere successful except in Illinois. The commissions with power to prescribe rates and issue orders were changed into advisory commissions or into public bureaus presided over by a single commissioner whose functions again became merely investigatory, supervisory, and of a reporting character. The Michigan Commission of 1889, consisting of the Commissioner of Railroads, the State Treasurer, and the Secretary of State, is an example of what came to be known as an ex-officio board whose duties were also largely ministerial. What is important in this reaction against strict legislative control is that it represents as in Massachusetts a declaration in favor of *publicity* as a remedy for abuses. The argument was that publicity together with enlightened self-interest could be depended upon to eradicate what was evil and to promote what was good. This policy was less of a break with the traditions of the past and was more adapted to the prevailing American psychology. A legislative statute enforced by an administrative commission, with hordes of inspectors prying into the sanctity of private affairs and issuing mandatory orders as to details of conducting business, was regarded as introducing into American institutions the agencies and instrumentalities of the continental European "Police-State". There appeared also the grave constitutional question whether the power to fix rates and set service standards *for the future* could be delegated to a commission or board.

CHAPTER X

EARLIER REGULATION OF LOCAL UTILITIES BY SPECIAL FRANCHISES

The second phase in the regulation of local utilities begins when cities were given the power to grant special franchises. At first, there was a tendency to confer them without adequate restrictions. In due time, however, the significance and value of these rights were perceived. Accordingly, toward the close of the nineteenth and the beginning of the twentieth century, cities began to protect their future interests in reasonable rates and service by incorporating in *statutes* and *city charters* strict provisions particularly *as to procedure* in granting franchises. In the future there would have to be ample publicity, careful deliberation by the council, reservation on the part of the city of the power to regulate rates and service, a maximum limit as to the number of years for which a franchise could be granted, and the submission of franchises to a popular vote either by compulsion of law or on formal petition.

Sec. 1. **Underlying Conditions Coloring Franchise Regulation**

Before taking up the minutiae of regulation by special franchise, a few important underlying conditions should first be explained. Those who believed that democracy offered a solution for all public questions and who at the same time were distrustful of representative law-making bodies, came forward with the proposition that the granting of franchises is best controlled by making them subject to the initiative and referendum. It is clear now that this suggestion was dictated more by a desire to make headway against corrupt practices in legislative bodies than to secure efficient and intelligent administration. The ignorance of the public upon questions of technical import and their sense of utter irresponsibility until disaster threatens are two profound reasons, as effective today as they were about 1900, for eliminating the initiative and referendum from consideration. Only the most general questions of public policy can be decided by this method.

Another difficulty was that in negotiating franchises public authorities worked in the dark because of the inexperience of public officials in dealing with technical problems. The inexperience may be traced to the brief and uncertain tenure of office, to a lack of organization in city administration in securing competent men and charging them with the duty of obtaining the facts, and to the fact that there had been little publicity regarding the detailed operations of public service enterprises. With public ownership and operation at a very low ebb in this country, the experienced and competent personnel, together with knowledge of the facts, was largely on the side of the companies. While these conditions have passed to some extent, it is nevertheless well to recall them here.

As a final factor in the situation mention should be made of the complexity of the legal situation. Cities acted only under delegated authority; the law was not clear at many points; the results were that the courts often emasculated the terms of franchises by holding that cities had exceeded their delegated powers, or for other reasons declared franchises unconstitutional.

Sec. 2. The Changing Objectives of Regulation under Special Franchises

In presenting the history of special franchise grants it is important to note the successive stages of public opinion in regard to them, for after all public opinion finally dictates how franchises shall be granted and what these franchises shall contain.

In the first stage cities welcomed franchise seekers as public benefactors. The franchise was regarded as a necessary inducement to begin a much needed service. The cities wanted to grow and, realizing that the new improvements would greatly enhance realty values, they were anxious to have the services extended. This was a stage of boom and promotion, and hence franchises were readily granted and their terms were liberal.[1]

With the advancing prosperity of the companies municipal officials began to realize that the franchises were valuable. As the more valuable ones were taken up, local authorities increasingly insisted that the cities should participate in the large revenues which it was supposed would accrue in growing communities. The same optimistic view of prospective revenues prevailed among those seeking new franchises or the renewal or amendment of those already conferred. An atmosphere was thus cre-

[1] Wilcox, D. F., *Municipal Franchises*, McGraw-Hill Co., 1910, Vol. I., p. 3.

ated in which franchise-granting could become a means of self-enrichment on the part of corrupt politicians. Undoubtedly, this was a passing phase, but it left its impress on public opinion. The considerations mentioned gave birth to a new movement in franchise-granting, dictated by a desire on the part of some to clear civic life of corrupt politicians and on the part of others to bring a share of the expected profits *to the tax-payers.* The demand arose throughout the country that franchises should be sold to the highest bidder. Accordingly, franchises were granted to those who offered the largest payment expressed as a lump sum, or as an annual sum, or as a percentage of gross revenue.

But these policies, although supposedly benefiting taxpayers, left out of account that portion of the public most vitally interested in the utilities—*the patrons.* Their interest was in lower rates rather than lower taxes. This new angle of public opinion asserted itself in demanding that rates be regulated. Regulation of rates under the conditions then existing meant rate reductions. Only a minority of the people in our cities, it was argued, are direct tax-payers. The large majority who use the facilities have no interest in arrangements that were designed to make a few franchise holders enormously rich or relieve property owners from taxes.

But, after all, a company bent upon maintaining its net revenues in the face of rate reductions may lower its operating costs by reducing wages and by rendering poorer service. The *service problem* and *labor problem* have as a consequence come to the fore in recent years. The requirement that service be improved or wage scales bettered has figured in most recent franchise settlements. The rapid spread since 1910 of the city planning movement has further emphasized service requirements, not only as service is viewed by patrons, but also as it relates to the city's growth and proper functioning. Hence many students of the problem have concluded that the fundamental question in regard to franchise grants is the maintenance of city control over street uses. At the present time common councils are again besieged by a host of franchise seekers for the right to establish motor-bus lines, and some of the incidents of past struggles are being re-enacted. In the meantime, however, the public highways, which theoretically are open to all users as a matter of common right, have become so overburdened by such common uses as well as franchise uses, that some attention must be given to a proper coördination and proportioning of all public and private uses.

To this end franchises of a definite or indeterminate duration have been offered, municipalities reserving to themselves stringent regulation of operations thereunder so as to secure adequate service at reasonable rates and to prevent undue conflict between ordinary street uses and franchise uses. The monopolistic nature of public utility industries is being recognized more and more, with a resulting tendency to grant only exclusive franchises. Local administrative boards and commissions are being set up to handle the enormous amount of technical detail involved in the administration of the grants. Specialization and the scientific spirit are being asserted here as elsewhere.

There has, of course, been no clear transition from one stage to the next. Old elements linger on. With the coming of the system of regulation by state commissions a confusion of jurisdiction was introduced. This system of regulation is so distinct that it will be separately discussed in the following chapter. The state commission plan has been resisted and is criticized on the ground that it tends to dull the sense of responsibility of local officials for the solution of local problems. Accordingly, a movement for "Home Rule" is clearly discernible in the larger cities in order to insure the local regulation of utilities within their borders. Local regulations by service-at-cost franchises, is another type so distinct that we shall discuss it separately in Chapter XIII.

Sec. 3. **The Problem of Tenure**

One central, vexing problem runs through the history of special franchise regulation and is even now demanding attention. This problem relates to questions of tenure. Should franchise grants be exclusive, that is, should the utility empowered to supply water, gas, electricity, transportation to the inhabitants of a city be given complete control of its market? For what period of time should the privilege be granted? What compensation, if any, should the recipient of the privilege make in return?

(a) *Perpetual and long-term franchises.*

The term of franchises and the exclusiveness of franchises can best be discussed together. Many of the earliest franchises, particularly in the eastern states, were expressly perpetual, or lacking a definite time limit, were held by the courts to be

perpetual.[2] Long-term franchises whose expiration dates were so far in the future, often 999 years, as practically to put them in the same class as perpetual grants, were ill-adapted to the desired ends. We have already mentioned how competition failed to function because consolidations were the ultimate outcome. Obviously, these developments put the companies in a position where they might legally collect a monopoly profit. It undoubtedly is true that in many instances the companies had to develop the demand for service. In other cases, particularly in newer communities, utilities had to await that increase in population which has been so general in this country, before a reasonable return could be realized. Nevertheless, in our larger and more rapidly growing cities, substantial earnings began early and developed into true monopoly profits. The gas companies of New York City are perhaps the best illustrations of this tendency. It is understood, of course, that a monopoly profit could be realized only if this type of franchise either contained no rate restrictions or such maximum rates as would soon become inoperative as a result of economic changes.

(b) *Short-term franchises.*

When the view became sufficiently general that the profits of a monopoly based upon a franchise should be limited, the terms of franchises were shortened. The short period franchise ranged from ten to fifty years. A New Jersey commission which investigated municipal franchises in 1905 recommended that franchises should not be granted for a longer period than thirty-three years, unless a majority of voters should authorize longer grants not to exceed sixty-six years. The National Municipal League early recommended twenty-one years. In Illinois the maximum period was fixed at twenty years, in Ohio at twenty-five years, and in Michigan at thirty years.[3] With the current popular opposition to exclusive franchises, indeed with express constitutional prohibitions against the practice in many states, it was hoped that the short-term franchise would prevent franchise holders from establishing rates at the point where they would yield monopoly profits. This position represents a middle

[2] "This kind of franchise affords ample protection to capital, unless accompanied by fare provisions which, like the character of the franchise itself—unchangeable against the objection of its owner—are absolute and unyielding to altered conditions without the consent of the public authorities." Argument and brief of American Elec. Rys. Assn. to Federal Elec. Rys. Commission. *Cf. People* v. *O'Brien*, 111 N. Y. 1.

[3] Wilcox, D. F., *op. cit.*, p. 35.

ground between the opinion expressed by Mayor Tom L. Johnson of Cleveland that "the best franchise is a dead one" and the view of the Committee on Public Policy of the National Electric Light Association [4] that all franchises should be perpetual.

On the whole the short term franchise was a failure. The original vice of awarding competing grants brought about a situation where there was such diversity in the termination of the different grants that at no time could cities exercise complete control over all of them so as to work out a uniform policy of control. This becomes peculiarly significant when we bear in mind that local utilities in the larger cities are an amalgamation of constituent companies. The Consolidated Gas Company of New York, for instance, is an aggregation of seventy gas and electric companies. The resettlement of franchise terms was thus made difficult. Some claimed that the public service companies "have not failed to see the advantage to be derived by them from franchises that are not co-terminous." Since cities could not successfully take over the system piecemeal or secure bids from competitors, the existing companies had an advantage in negotiating for renewals.

Another disturbing factor was the operation of the so-called property owner's consent laws. These required, as in New York in the case of street railways, that franchise grants be conditional upon the company securing the consent of a majority of the property owners having an interest along each street to be traversed; or that, in lieu of such consent, the company secure an order from a court authorizing the construction of the road. Moreover, as Wilcox has shown, the difficulty of determining at a later period just what constituted the requisite consents for a particular street, together with the poor condition of the public records, surrounded many franchise grants now in use with considerable uncertainty.

Another difficulty under limited term franchises was that such franchises did not specifically provide what should be done with the fixtures laid in city streets upon termination of the grants. The companies claimed that by virtue of their *general charter* they might continue operation under revised conditions, or else, in the event of failure to agree upon a new franchise-contract with the city, continue under "day to day franchises" with such reasonable regulations as to rates and services as the city might from time to time enact. In the absence of specific

[4] "Report of Committee on Public Policy," *Nat'l Elec. Lt. Ass'n*, June, 1907, p. 8.

provisions for service in the future, the courts as well as the communities were reluctant to have the fixtures reduced to scrap and service discontinued.

Short-term franchises have also handicapped the companies by creating uncertainty as to renewals. If the franchises were not extended under reasonable conditions, what would happen to their investment in street fixtures and other specialized properties? The piecemeal nature of franchise grants and their differing and uncertain tenure often created a situation which made refinancing difficult if not impossible. A bond issue for a period in excess of the expiration dates of important franchises is a difficult issue to sell. With franchises terminating in the near future the companies were unwilling to build needed extensions unless suitable arrangements could be made to insure a continuance of their right to operate and thus enable them to secure the necessary capital. Companies tried, therefore, to keep the expiration dates of important franchises sufficiently far in the future so that their investments would be secure. This served to keep the franchise issue in the foreground. One method adopted was to obtain a renewal of operating rights by consolidating all franchises in the renewal grant. According to the terms of one of these "blanket franchises" granted in 1900, the Milwaukee Electric Railway and Light Company was given an exclusive franchise until 1934. This time limit was likewise made to apply to all prior rights, privileges and franchises, granted to the company and its precedessors, whether a definite time limit had been specified or not. It was similarly provided that if the suburban territory in which the company held franchises should in the future be annexed by the city, the suburban franchises should likewise expire in 1934.

(c) *The common ground of experience.*

Out of the welter of this experience finally came the conviction that franchises should be reorganized *into a system* with a definite period of tenure and a grant of monopoly rights, but with regulation of service and rates. As the Commission on Public Ownership and Operation of the National Civic Federation said in its report:[5] "Public utilities, whether in public or in private hands, are best conducted under a system of legalized and regulated monopoly." The impelling motive was the recognition that where competitors are bound to be few, consolidation is apt to follow anyway, while the difficulties of operation

[5] Part I, Vol. 1, p. 26, 1907.

in crowded streets require that street facilities be used to maximum capacity. The advantages of unified operation of street railway, telephone, electric power, and gas utilities in giving better service to patrons and a lowered operating cost due to the economies of large scale operations imperiously dictated the change. Moreover, public policy requires that, in addition to being as cheap as possible, the service should be extended over as wide an area geographically as the economic situation will permit. An illustration is the transit situation in Boston. Since December 9, 1897, when the West End Street Railway system was leased by the Boston Elevated Railway Company, the entire system of subway, elevated, and surface lines in this city and its suburbs has been operated by one company.

And yet these term limitations, often without provisions for city purchase or purchase by some other grantee at the end of the period, had the effect of making investments insecure. As the termination date of franchises approached, there was no assurance that they would be renewed. Failing to obtain a renewal, the property of the company would be worth practically only its scrap value. The inducement was too great, therefore, to manipulate operations so as to enable investors to recoup their capital out of earnings. Improvements and extensions were not made; the service was restricted to the area where population was densest; replacements and necessary repairs were deferred; as a result service deteriorated. The privately owned street railways, formerly operating in Toronto and Detroit, are the best recent illustrations of the disintegrating effect of the term franchise.

Sec. 4. Regulation of Rates and Service under Term Franchises

While a term franchise or a revocable franchise limits monopoly power in one dimension (i.e., as to time) it is even more important that monopoly power be limited in another dimension (i.e., as to the extent of power) by regulating the rate of charge. This was done by fixing maximum rates for the franchise period. Street railway franchises adopted the convenient five-cent cash fare with some provision for free transfers and lower ticket rates for regular customers. Similarly, maximum rates were fixed for gas service, telephone service, and electric energy; but these maximum rates soon became obsolete because the growing business of the companies required more complex and flexible rate schedules. Moreover, the companies began to appreciate that

increased earnings, both gross and net, could be secured by means of rate reductions.

With franchises interpreted as contracts, a maximum or a specific rate became an inflexible term of a binding agreement. In case of the long-term or perpetual franchise this ruling was particularly vicious. Although franchise renewals or consolidations of companies provided some opportunities for modifications, yet the atmosphere was hardly such as to bring about substantial concessions in a spirit of mutual accommodation. The same difficulty of fixing terms made its appearance in negotiating limited term franchises. The hope of reaping an exceptional reward or the fear of a probable heavy loss were the imponderables that made bargaining a matching of wits between company and city representatives. An earning power guaranteed by a fixed rate was dependent upon the growth in traffic units and the changes in cost of operation; yet both were subject to favorable as well as unfavorable tendencies that could not be foreseen for all the years of even comparatively short-term franchises. Once agreed to, the parties were bound by the terms of the grant. Attempts by cities to change the terms were met by the objection that the change would violate a contractual obligation and confiscate the property of the companies. Only when the franchise was silent on rate questions or when the power to alter, amend or repeal the terms of franchises was reserved, could the power to regulate rates or service be exercised by state or local legislatures.[6] In other cases the rates could not be disturbed.

The suggestion was made that cities reserve the power of adjusting rates periodically or at any time. The companies were not enthusiastic over the adoption of such provisions, because they lacked faith in local councils. In any event the problem of reasonableness of rates or services was left to the courts for decision. Meanwhile the gradual increase in the costs of operation beginning after 1900 placed the companies in a position where they in turn had to apply for increases in franchise rates. The courts have been consistent, however, by holding that the terms could not be amended without agreement between the parties.

Ultimately, the World War with its abnormal increase in the levels of wages, prices, and interest rates, severely strained this contract conception of a franchise. Of the innumerable cases

[6] In California the right to regulate the service of local utilities is reserved to the localities by constitutional provisions.

illustrating this situation only two will be mentioned here.[7] In these cases continuous operation of the properties was jeopardized by fixed fares. The courts were asked to order increases. In both cases the applications were denied and the appellants thrown back upon the legislative discretion of local or state governing bodies. The facts brought out by the Columbus case, are particularly illuminating:

"The increased cost to complainant of performing its franchise contracts differs only in degree and quality from that due to other economic causes prevailing since they were made. If the war or economic changes had decreased the price of coal, materials, supplies and labor, it would not be urged upon any one that the city would have the right to declare null and void these contracts, or the fare provisions therein, and establish a new rate in accordance with new conditions; and if the city should take such a position, it would be met, and justly, with an injunction on the ground that such action impairs the obligations of a valid and binding contract. . . .

"This opinion should perhaps be ended here, but the importance of the interests at stake moves me to make some further observations, in the hope that the apparently strained relations between the complainant and defendants may be ameliorated. It cannot be denied, on the showing made, that the present war has greatly increased the cost of street railway operation. The award of the National War Labor Board in the wage controversy cannot be regarded otherwise than binding on the company, and the increase of wages granted by the company pursuant thereto cannot, in any fair sense, be considered as its voluntary act. It is also undoubtedly true, on the showing made, that complainant cannot, under existing conditions, finance any improvements required to meet new demands for heat, light, and power, or for increased street railway facilities, and its failure so to do must injure the interests of the defendant and its inhabitants as much as it injures the complainants.

"Prolonged operation under these conditions would seem to be a manifest impossibility, and must result in impairing the street railway service and grievously harming the people and business of the city. These conditions do not, for the reasons already stated, present any ground upon which a court can grant relief, for it has power only to declare the law and apply it. A sound public policy forbids usurpation by the courts of governmental power lodged in other departments of the government. No power inheres in a court, either to make contracts for parties, or to absolve them from the effect of their contracts, provided the parties are competent in law to contract, and no fraud intervenes in the making thereof.

"In view of these well recognized limitations of the court's power, I can only suggest that the present emergency, likely as it is to become much graver in the near future, calls urgently for some kind of accommodation or temporary compromise between the parties."[8]

The Supreme Court of the United States on appeal took substantially

[7] *North American Construction Co.* v. *Des Moines City Ry. Co.*, 256 Fed. 107 (1919); *Columbus Ry. Power and Light Co.* v. *City of Columbus*, 253 Fed. 499 (1918), affirmed by 249 U. S. 399 (1919).

[8] 253 Fed. 499, 509 (1918).

the same view of the case: "It is undoubtedly true that the breaking out of the World War was not contemplated, nor was the subsequent action of the War Labor Board within the purview of the parties when the contract was made. That there might be a rise in the cost of labor, and that the contract might at some part of the period covered become unprofitable by reason of strikes or the necessity of higher wages might reasonably have been within their contemplation when the contract was made, and provisions made accordingly. There is no showing in the bill that the War or the award of the War Labor Board necessarily prevented the performance of the contract. Indeed, as we have said, there is no showing, as in the nature of things there cannot be, that the performance of the contract, taking all the years of the term together, will prove unremunerative. We are unable to find here the intervention of that superior force which ends the obligations of a valid contract by preventing its performance. It may be, and, taking the allegations of the bill to be true, it undoubtedly is a case of a hard bargain. But equity does not relieve from hard bargains simply because they are such. It may be that the efficiency of the service and fairness in dealing with the company which performs such important and necessary service ought to require an advance in rates; such was the strongly announced opinion of the War Labor Board. But these and kindred considerations address themselves to the duly constituted authorities having the control of the subject matter."[9]

(a) *Discriminatory rates.*

Another evil that crept into the administration of these enterprises as a result of the ineffectiveness of rate control under the special franchise was that of discrimination in rates. We cannot do better than to quote Commissioner B. H. Meyer, now of the Interstate Commerce Commission, but at that time a member of the Railroad Commission of Wisconsin.[10] "The whole state was literally streaked and plastered with discriminations in the rates of utilities; and in all the rest of the country where the extent of such discriminations has not yet been determined as it has in Wisconsin, it is quite probable that discriminations similar in character and extent likewise exist. . . . For thirty-two of the reporting (telephone) companies, eight out of every one hundred subscribers received free or reduced service." The same commission found the following situation with respect to other utilities. "Seven big consumers were served water in one city of 4000 inhabitants without charge. In Madison, the capital of the state, 1360 telephone users out of 5000 received reductions amounting to $1,120 a month. Discriminations also existed between public and private users, between metered and unmetered users, and between power and light consumers. In Ashland

[9] 249 U. S. 399, 413 (1919).

[10] Quoted from Holmes, F. L., *Regulation of Railroads and Public Utilities in Wisconsin*, D. Appleton and Co., 1915, p. 295.

the city was paying about $8,400 less for water than its share." Often the franchises themselves carried provisions for free service to the cities. Thus, electric utilities were required to furnish free power to swing bridges, and, in addition, to provide pole room for police and fire alarm wires. Street railways carried policemen, fireman, and other public employees free of charge. We will return to this subject of free service again in another connection.

(b) *Control over service.*

Term franchises were even less effective in securing control of service. Under dynamic conditions service requirements are bound to change, for both technical improvements and growth of population change the character of demand. The common law formula of "adequate service" is found upon examination to be composed of so many elements that specification of concrete detail becomes impossible.[11] Nor can the need for extensions be intelligently determined in advance. Some cities accordingly inserted provisions whereby the power to require extensions and to prescribe the characteristics of adequate service were reserved. These reservations were believed to be necessary in order to secure the administrative flexibility that is essential to efficient regulation and in order to insure that the utility in question would be operated in coördination with other public utilities and with municipal functions. This objective was not generally achieved in earlier franchises, although recent franchises record some advance in this direction.

One aspect of service is continuity which is liable to be destroyed by labor disturbances. As a result the rights and powers of cities in the event of strikes and lockouts were made the subjects of specific provisions. The principle upon which such intervention is based is that the public may reasonably expect uninterrupted service, because under modern conditions communal life is dependent upon it. Obviously, then, it is necessary to prevent strikes and lockouts, and in doing so the provocative causes must be made the point of attack. Cities have accordingly undertaken to obtain proper wages and treatment for employees, and to secure for the companies protection against destruction of their property by recalcitrant workers. To bring this about franchises have frequently stipulated the rights of employers and employees, and have provided for boards of conciliation or arbitration.

[11] See Chapter XXVII.

Sec. 5. The Problem of Compensation for Franchises

Fixing the compensation to be paid for franchises was somewhat of a problem. It is difficult to conceive now how important this question appeared to a generation which has not yet gone to its grave. The all-important issue was to secure compensation somewhat commensurate with the value of the grant. This was a feature particularly of the earlier franchises, when the view was widely held that municipalities should participate in the profits. However, if a special franchise is the grant merely of the right to use the public streets in the performance of what is a public function, the exaction of a sum in payment for the grant merely operates to increase the cost of rendering service and thus constitutes an indirect method of taxation which the companies take into account in the adjustment of rates to consumers. In fact, this policy indicates that the regulatory movement at this stage was not fully conscious of its objectives.

Something may be said for such franchise payments where the amount of the payment is regarded as compensation to the cities for additional city expenditures made necessary by the presence of the facilities in the street; but this was hardly a moving consideration at that time. The demand for compensation was a result rather of the feeling that a portion of the excessive earnings could be recouped by such payments. Even when franchises were not exclusive and their earning power was limited by elements of competition, it was believed that the value of the privilege was such that the city should share in it.

The first method was to require license fees. For instance, in the Baltimore street-railway franchise of 1859, the license fee was $20 per car. Of course, this tended to restrict the number of cars and to lead to overcrowding. Similar in effect were license fees per pole or per mile of wire or per foot of underground conduit. In all cases, under this method of exacting compensation, the tendency was ever present to reduce the basic unit to a minimum to the great inconvenience of the public.

Of a similar character were special obligations to pave the streets in whole or in part, in extreme cases to grade streets, putting in even gutters, sidewalks, and sewers, or to pay a portion of the cost of street widening. These and other special burdens served to bring out the bargain atmosphere which surrounded the grants. Concessions to the city were, of course, offset by higher prices to consumers. Here, too, there developed that tendency on the part of the companies to evade the more

extreme of these obligations by direct legal attack, by giving poor service or by lobbying in the councils to influence legislative action.

In some franchises definite lump sum payments were fixed. This method proved equally unsatisfactory on account of the difficulty of gauging the value of the franchise in advance. Or the franchise was given to the highest bidder without considering whether the highest bidder would provide the best service. Somewhat more successful was the last method developed. the method of requiring the corporation to pay the city a definite percentage of its annual gross receipts. This assured at least a flexible compensation varying with gross revenues and one which could be gauged with some degree of accuracy.

It is difficult to discuss with restraint the absurdities of a policy which treated franchises as privileges to be bartered away. From whatever angle the matter be viewed, whether that of the city or the franchise-seeker, the franchise should not be treated as the object of property rights. Franchises ought never to have imposed special burdens, and only such payments ought to have been imposed as would compensate for such special costs as the administration of the franchise would occasion. From the vantage point of the present it appears that property rights can be protected by the courts without resorting to the constitutional clause insuring the inviolability of contracts. In the past, however, instead of the regulatory power being free to discover that periodic reasonable adjustment between service requirements and rates which dynamic life requires, the relations were adjusted upon the theory of a bargain under which both the government and the franchise-seeker, operating in the dark, fixed terms for a long time in advance.[12] The sense of injustice, welling up on either side, was met by the other with the shibboleth, "it is not so written in the bond."

Sec. 6. Public Ownership and Operation as an Alternative

Although earlier franchises usually made no provision for public ownership and operation, clauses looking toward this end appeared oftener toward the close of the last century. The belief in competition favored this development. With the move-

[12] The decision in *Monongahela Bridge Co.* v. *U. S.* by the United States Supreme Court, 216 U. S. 177 (1910), is merely the logical unfolding of legal consequences based upon such premises. In the light of that decision the treatment of franchise value in the *Consolidated Gas Co.* case (212 U. S. 19, 1909) by the same court is the merest subterfuge.

ment for the short-term, non-exclusive franchise went the demand for keeping the government in the position of a potential competitor. Moreover, it was felt that this purchase option would serve as a bargaining asset in renewing franchises and would forestall consolidations. Later, with the development of sentiment for monopoly, it was felt that the government itself might desire to undertake the service. Consequently, provision was made for the ultimate reversion of the plant to the city. Sometimes companies were allowed to accumulate out of earnings an amortization fund to retire investment when the franchise should terminate and the plant revert to the city.[13] This method proved unsatisfactory. It complicated the regulatory machinery because, necessarily, the charges had to be increased during the life of the franchise, and this set up an inducement to a low standard of maintenance and to poorer service as the expiration date approached.

At present the best mode of procedure is to grant either franchises of indeterminate duration or short-term franchises with the privilege of renewal but with a firm option to the city to purchase the plant. In the case of indeterminate grants this purchase option may be exercised at any time, or at any time after a fixed period; in the case of term franchises it may be exercised at succeeding expiration dates. Sometimes a new company may be substituted for the old company but the former is obliged to purchase the existing properties. These methods obviate amortization charges and protect the investment. The purchase price is usually fixed by arbitration at the time or the method of computing the price is definitely fixed in the franchise.

Although there was gradual improvement in conditions under exclusive local regulation by means of special franchises, the inflexibility of the system was not overcome soon enough to prevent the development of a movement whose object was securing exclusive state regulation by administrative commissions. The best known type of this form of regulation is that which accompanies the grant of an indeterminate permit instead of the term franchise. This will be discussed in the next chapter.

Sec. 7. **Public Utility Franchises and Municipal Corruption**

A word should be added upon the general subject of the responsibility of public service corporations for municipal corruption under special franchise regulation. At this late date

[13] This is a feature of the Cleveland street railway franchise.

no useful purpose would be served in rehearsing the sordid details. It is sufficient to say that the corporations have been accused (and often justly accused) of open-faced bribery of public officials, and of subtly influencing the actions of public officials by little favors such as free services, the awarding of contracts to businesses in which such officials were interested, and the more indirect methods of granting preferment. Complete publicity of accounts with detailed scrutiny by official bodies has proved the best corrective of such practices. Happily, these tactics are no longer employed by most public utility operators. The improvement in the personnel of our city governments and the clearer understanding of the social objectives of franchise regulation have served to relieve the relations between government and the public utilities of this political incubus. Apparently, responsible private management realizes that public utility property is peculiarly vulnerable when outraged public sentiment, resulting from corrupt conditions, seeks to avenge a public wrong.

CHAPTER XI

THE REGULATION OF PUBLIC UTILITIES BY STATE COMMISSIONS

In Chapter IX we have seen that public utilities, after an initial period of more or less strict charter legislation, passed through a stage during which reliance was in fact placed upon the automatic regulation of rates and service through the influence of competition, although the outward forms of charter regulation were maintained. Legislative regulation of railroads was again resumed after 1870, this time taking the form of statutory regulation independent of charter provisions. In the course of this movement mandatory and advisory commissions were established. The mandatory commission, for a while, fell upon evil days, and was either eliminated entirely or changed into a commission of the advisory type. In the regulation of local utilities the development of legislative regulation as a substitute for competition came very much later, roughly after 1900, because the states had handed this problem over to local units. Thus the development of regulation by state commissions was a gradual process of broadening the scope of compulsion.

The fundamental drawbacks of charter and special franchise regulation as we have seen, were (1) that regulation proved inadequate, even under grants for short periods, when communities grew rapidly or when, as in recent years, underlying economic conditions changed rapidly; (2) that administrative machinery for the execution of franchise terms proved to be inadequate.

It is difficult to describe the transition to the existing system of regulation because its history must be traced in forty-eight states, not to mention the development of federal regulation and the changes taking place in the control exercised by local units of government. An attempt will be made, however, to sketch the essentials in three successive chapters. We will discuss in the present chapter the system of regulation by the states; the following chapter will be devoted to federal regulation; a con-

cluding chapter will take up the chief present tendencies in local regulation.

Sec. 1. Reëstablishment of Mandatory Commissions

The evils of a competitive régime of public utility operation were too deep-seated and too flagrant to be eradicated by any policy which stopped short of thorough-going administrative control. This was particularly true of railroads. Consequently, Minnesota in 1885 and Iowa in 1888 reëstablished commissions with power to fix rates. In 1887, when the Interstate Commerce Commission was organized, twenty-five states had established commissions to assist the legislature in this work. By means of new laws and successive amendments to old laws the movement toward the establishment of strong commissions continued unabated, except for a brief lull from 1893 to 1897 occasioned by the business depression. Even the Massachusetts railroad commission was converted into one of the strong type in 1913. Mention should also be made of the Mississippi and Texas commissions, which were "strong" commissions with power not only to review rates established by the carriers but to fix rates on their own initiative. In short, the commission system was accepted as the best agency for administering a general regulatory statute.

Sec. 2. Expansion in the Scope of State Regulation

Another reform and expansion movement set in about 1905, concurrent with the reëstablishment in Wisconsin, under the political leadership of the late Senator LaFollette, of a commission of the strong type. New York, under Governor Hughes, adopted similar legislation. The public utilities hitherto subjected to commission regulation had been the utilities of the common carrier type, or those ancillary thereto, express companies, warehouses, freight line and equipment companies, steamship lines, telegraph lines. The advent of a new utility of the carrier type, the interurban electric railway, suggested the possibility of expanding the jurisdiction of the commissions. Just at this time dissatisfaction with the franchise system of regulating local utilities was most widespread. Many advocated municipal ownership and operation as a way out. The progress of this movement was, however, slow, and so it came to pass that the impatience of the reform movement with public ownership

induced it to adopt exclusive regulation by means of a state commission as a quicker way to the appointed goal. Following the example of Wisconsin and New York the jurisdiction of commissions over common carriers was expanded to include street and interurban electric railways, gas utilities, water utilities, electric light and power utilities, and telephone utilities. The latest accessions are motor bus and truck lines. Where the powers of some commissions have grown by accretion, other states established separate commissions to supervise only the local utilities. Here Massachusetts again early set the fashion with its Gas and Electric Commission of 1885. In some cases, as in Massachusetts, the regulation of telephone and telegraph utilities was placed in the hands of State Highway Commissions because these bodies had originally been given the power to grant permits to erect the lines. Increasingly, too, State Boards of Health have been assigned regulatory functions with respect to Water and Sewerage utilities.

With the growing authority of the Interstate Commerce Commission over all types of utilities doing an interstate business, the earlier railroad commissions are being reorganized. Thus, in 1908 Vermont changed its Board of Railroad Commissioners into a Public Service Commission and the Illinois Railroad and Warehouse Commission was in 1913 reorganized into the State Public Utilities Commission which in turn has been rechristened the Illinois Commerce Commission. Some states [1] created corporation commissions, whose authority extended to public utility corporations, and to banking, insurance, and certain kinds of industrial corporations as well. This type of commission illustrates well the all-inclusive scope of police power regulation. Only one state, Delaware, has no state regulatory commission.[2] The jurisdiction of Congress over local utilities in the District of Columbia and the territorial possessions of Porto Rico, the Hawaiian and the Philippine Islands, has been vested in public utility commissions. In eight states the commission system is anchored in the constitution, thus giving it greater stability.

Sec. 3. **Legislative Standards of Reasonableness**

The distinguishing characteristic of the general laws which provide for commissions is that they regard the regulation of public utilities as a problem upon which *continuous* attention

[1] Arizona, New Mexico, North Carolina, Oklahoma, and Virginia.
[2] In 1911 alone seven states adopted the commission system.

must be bestowed. This is true whether the utilities concerned are of the common carrier type or whether they are local utilities. Instead of periodic adjustments of rates by means of legislative acts or special franchises the new legislation sets up conditions which are to be *continuously* operative. In this respect legislation concerning railways in states like Wisconsin, New York, and California are well in advance of legislation enacted by Congress, as will be explained in the following chapter. The regulatory systems developed in these three states and in Massachusetts have served as models for other states, and the great degree of similarity between the model systems has given some degree of uniformity which makes possible the delineation of the scheme at least in rough outline.

Instead of prescribing the *specific* rate for *each public utility,* as had hitherto been the case, the statute merely *lays down a general standard.* This general standard is legislatively declared to be the one to which all public utilities must conform. To this extent the new system represents a return to the relatively simple basis originally worked out in the common law. This does not mean, however, that specific rates and service regulations are not fixed; it merely means that they are not fixed by statute, but are instead promulgated by administrative order of the commission. In exceptional cases the legislature may override its administrative agent, as was true when many state legislatures after 1907 enacted two-cent passenger fare laws applying on intra-state business of railways. Under the common law the owners of public utilities had the right to fix their own rates and to render the quality of service which they felt obligated to render; but their acts were subject at all times to court review as to their reasonableness upon application by an aggrieved customer. The new system adopted the common law *rule of reasonableness* and declared it to be the *legislative* standard. The administrative commission was then selected as the *agency* to apply this standard to the concrete facts in each case and to name the particular rate or service regulation reasonable under the circumstances. In the course of their investigations of particular situations, the commissions have gradually evolved standards of administrative policy which we will examine in detail in Part III. These subordinate administrative standards should constitute, if they have been well conceived, an organic theory of regulation.

The central problem with which these legislative standards deal has two aspects: (1) The furnishing of "reasonably ade-

quate service and facilities"; (2) the collection of a charge for every service rendered which is "reasonable and just." As in most respects typical of the provisions in the public utility laws of the different states, we may quote from the California General Laws of 1920.[3]

(a) "All charges made, demanded or received by any public utility, or by any two or more public utilities, for any product or commodity furnished or to be furnished or any service rendered or to be rendered, shall be just and reasonable. Every unjust or unreasonable charge made, demanded or received for such product or commodity or service is hereby prohibited and declared unlawful.

(b) "Every public utility shall furnish, provide and maintain such service, instrumentalities, equipment and facilities as shall promote the safety, health, comfort, and convenience of its patrons, employees, and the public, and as shall be in all respects adequate, efficient, just and reasonable.

(c) "All rules and regulations made by a public utility affecting or pertaining to its charges or service to the public shall be just and reasonable."

Another legislative standard contained in the public utility laws of practically all states prohibits discrimination in rates or service. The administrative commissions are given the power to prevent unjust and unlawful discriminations or to prohibit rates and practices unduly preferential. This legislative injunction has been made practically operative in connection with another one calling for *publicity of rates* and providing that only those rates and regulations which are on file and have been approved by the administrative authority are the lawful rates.[4]

[3] Act. 3775, Sec. 13.

[4] A pertinent and typical illustration is from the Wisconsin law relating to railroads:

"(1) If any railroad, or any agent or officer thereof, shall directly or indirectly, by any special rate, rebate, drawback or by means of false billing, false classification, false weighing, or by any other device whatsoever, charge, demand, collect, or receive from any person, firm or corporation a greater, less or different compensation for any service rendered or to be rendered by it for the transportation of persons or property or for any service in connection therewith, than that prescribed in the published tariffs then in force, or established as provided herein, or than it charges, demands, collects or receives from any other person, firm or corporation for a like and contemporaneous service, such railroad shall be deemed guilty of unjust discrimination, which is hereby prohibited and declared to be unlawful, and upon conviction thereof shall forfeit and pay into the state treasury not less than one hundred dollars nor more than ten thousand dollars for each offense; and any agent or officer so offending shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than fifty dollars nor more than one hundred dollars for each offense.

"(2) It shall be unlawful for any railroad to demand, charge, collect or receive from any person, firm, or corporation a less compensation for the transportation of property or for any service rendered or to be rendered

The introduction of our federal system of railroad regulation was dictated largely by the need of eliminating unequal treatment of shippers or groups of shippers with regard to service and rates. The earliest congressional report (Windom report of 1874) upon the subject of railroads recommended competition, public and private, as a preventive of extortionate rate practices. The next report (Cullom Report of 1886) stressed the need of controlling discrimination, the primary cause of which was competition. Discriminatory rate practices, including rebates, were used as a means of enticing patronage away from a rival carrier. Rival shippers used their power to divert traffic as a means of coercion in securing favored treatment.

Paralleling the efforts to secure national uniformity in accounting classifications,[5] the American Bar Association, acting through its section of Public Utility Law, was instrumental in securing a draft of a uniform public service act which was submitted July 7, 1924. The committee which drafted the report felt that its efforts should be restricted to legislation for those utilities not primarily interstate in their nature. They defined the term public utility in accordance with this view. The following sections of the draft relate to legislative standards of reasonableness and will serve further to illustrate the present trend of legislation:

SECTION 14. (Rates)—All rates and charges made, demanded or received by any public utility, or by any two or more public utilities jointly, shall be just and reasonable to both the public and the utility or utilities.

---

by said railroad, in consideration of said person, firm or corporation furnishing any part of the facilities incident thereto; provided, nothing herein shall be construed as prohibiting any railroad from renting any facilities incident to transportation and paying a reasonable rental therefor.

"If any railroad shall make or give any undue or unreasonable preference or advantage to any particular person, firm, or corporation, or shall subject any particular person, firm or corporation to any undue or unreasonable prejudice or disadvantage in any respect whatsoever, such railroad shall be deemed guilty of unjust discrimination, which is hereby prohibited and declared unlawful.

"It shall be unlawful for any person, firm or corporation knowingly to accept or receive any rebate, concession or discrimination in respect to transportation of any property wholly within this state, or for any service in connection therewith, whereby any such property shall by any device whatsoever, be transported at a less rate than that named in the published tariffs in force as provided herein, or whereby any service, or advantage is received other than is therein specified. Any person, firm, or corporation violating the provisions of this section shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than fifty dollars nor more than one thousand dollars for each offense." *Wisconsin Statutes*, Sec. 195.39-195.41, 1925.

[5] Described in Chapter VI.

SECTION 15. (Service)—Every public utility shall furnish adequate, efficient, just and reasonable service to the full extent that it is commercially feasible so to do. The commission and each public utility subject to its jurisdiction shall coöperate to maintain the reliability and bring about the most general practicable use of the service rendered by such utility, to secure economies in operation, to reduce the unit cost of such service and to promote the industrial and other development and convenience of the community or communities served, and rates shall be fixed with a view, among other things, of enabling such public utility to secure, on reasonable terms, adequate capital to enable it from time to time to extend, develop and expand its service as public convenience or necessity may require.

SECTION 16. (Schedules)—Under such rules and regulations as the commission may prescribe, every public utility shall file with the commission within such time and in such form as the commission may designate schedules showing all rates collected or enforced, or to be collected or enforced.

SECTION 17. (Adherence to Schedules)—No public utility shall directly, or in any wise, charge, demand, collect or receive from any person a greater or less compensation for any service rendered or to be rendered by such public utility than that prescribed in the schedules of such public utility applicable thereto then filed and published in the manner provided in this act nor shall any person receive or accept any service from a public utility for a compensation greater or less than that prescribed in such schedules.

SECTION 18. (Discrimination)—No public utility shall, as to rates, make or grant any unreasonable preference or advantage to any corporation or person or subject any corporation or person to any unreasonable prejudice or disadvantage. No public utility shall establish or maintain any unreasonable difference as to rates, either as between localities or as between classes of service. The commission shall have the power to determine any question of fact arising under this section.''

(a) *Peculiarity of the service problem.*

One word more should be said upon the general subject of service regulation. The earlier legislation was very precise and explicit as to details. Gradually the realization came that, on account of the multiplicity of operating conditions, the constant changes and improvements in technique, and the very large number of elements that go to make up good service, it was necessary to lay down such general standards of good service as would give commissions the utmost latitude and elasticity in carrying these into effect.

One outstanding purpose of service regulation is to secure the public safety in the use and enjoyment of the service and in the operation of the facilities. The past practice of legislating in detail in regard to safety appliances has given way to the practice of setting forth in a legislative standard the criteria of good service, allowing commissions to determine specific stand-

ards by administrative regulations. Nevertheless, legislatures will, in obedience to public sentiment, frequently pass upon technical questions.

Individual consumers may often be unable to see attributes of unfitness in goods and service, just as the importance of safety and sanitary precautions are insufficiently appreciated. Private motives of gain constantly jeopardize the quality of the service. Even continuity is not assured where irregularity of service makes operation cheap and easy though inconvenient to the public. Extensions and improvements are often unremunerative in themselves though socially necessary and desirable. Regulation, therefore, seeks to overcome managerial inertia by forcing the extension and improvement of service to the limits of reasonable profitableness.

(b) *Scope of statutory regulation.*

The scope of state regulation under the commission system varies in different states. In its most developed form it applies to the following industries: (1) Common carriers by rail and water, including such supplementary facilities as are provided by passenger and freight terminals, toll bridges and ferries, docks and wharves, freight line, equipment and terminal companies; (2) Telephone, telegraph, and express companies, and interurban electric railway companies; (3) Utilities supplying water, electric light and power, electric railway service including subway and elevated lines, natural and artificial gas service, heating and refrigerating service. In a few states the scope of state regulation is still restricted to interurban utilities of the first two types mentioned above, leaving urban utilities to regulation by local authorities.[6] In other states certain utilities, more particularly street railway utilities and water utilities, remain under local supervision. Here a type of regulation, approaching that just described, is beginning to develop in the shape of service-at-cost franchises, or ordinance regulation.[7]

Mention should also be made of a miscellaneous assortment of industries and facilities which some states have included under their regulatory systems. The most important of these are the newly formed motor-bus and motor-truck companies. Other odds and ends are represented by canal companies, irrigation companies, signalling and messenger service companies, companies operating inclined-planes, warehouse, grain elevator, and boom-

[6] These states are Nebraska, Arkansas, Iowa, Kentucky, Mississippi, South Dakota, and Texas.

[7] See Chapter XIII.

ing and rafting companies. In Kansas regulation has also been extended to companies engaged in the shipping, marketing, and handling of live stock. Another state includes commission merchants. And so the line drawn by statute is a wavering and uncertain one, often drawn experimentally.[8]

In another way the scope of regulation is, however, decreased, at least so far as the state commission system is concerned. State legislatures show a tendency to keep municipally owned utilities, especially the water utilities,[9] entirely outside the scope of state regulation or the same result is accomplished practically through the discretion of the state commission. Similar to this exemption is the exclusion of coöperative companies and mutual associations carrying on public utility enterprises. The necessary implication is, of course, that public and coöperative enterprise is sufficiently responsive to social needs without administrative guardianship.

Sec. 4. The Franchise Problem under State Commission Regulation

Some legal doubt surrounds the validity of the above legislation where it supersedes the terms of franchises previously in force. There is no doubt where the original permit or franchise is issued by the state as in the case of railroad, telegraph and telephone franchises, and where such permit did not specifically name the rates to be charged. There is also little doubt where the state constitutions have reserved the power to revoke or amend franchises. In cases, however, where municipalities were authorized to grant franchises and where the power to revoke or alter these franchises had not been specifically reserved, either in constitutions, statutes, or the contracts themselves, this movement to substitute state for local regulation rests upon somewhat insecure foundations.[10] A local ordinance regulating rates may be set aside by a state law unless the state constitutions confer "Home Rule" upon cities.

[8] An interesting but erroneous attempt to define public service corporations and public utilities is that of Virginia which defines them as those industries authorized to exercise the right of eminent domain or to use or occupy any street, alley, or public highway in a manner not permitted to the general public.

[9] A recent decision of the Wisconsin Supreme Ct. upholds this power of the Commission, *Pabst Corporation* v. *City of Milwaukee*, 190 Wis. 349, 1926.

[10] *Quinby* v. *Public Service Commission of N. Y.*, 223 N. Y. 244 (1918); *cf.* also 227 N. Y. 601 (1919).

(a) *The indeterminate permit.*

The best illustrations of commission regulation of local utilities are found in those states where the indeterminate franchise has been adopted. In considering this form of franchise [11] we are limited in our field of inquiry, since only a few states, among which Wisconsin was one of the first, have substituted it for the special franchise.[12] From an historical point of view, it may be said that the indeterminate permit was the logical and inevitable outcome of the attempt to secure efficient regulation by commissions in states which had a constitutional reservation of power to amend or revoke special franchises. If commission regulation was to enforce proper service and reasonable charges, the future of corporations, operating under special *term franchises,* which had not maintained amortization funds which would mature at the time the franchise expired, gave no assurance either to capital or to the public that satisfactory conditions would be maintained. The indeterminate permit offered a satisfactory alternative in that it recognized the monopoly character of the business, removed the need for amortization funds, provided for flexible accommodation in rates and service to changes in economic conditions, gave the municipality an option to purchase at a fair price, and protected the exclusive nature of the grant by requiring potential competitors to secure a certificate of convenience and necessity from the state commission. In this form it was adopted in Wisconsin.

As a new development in the technique of regulation, the indeterminate permit is part and parcel of the commission system of regulation. It first came into prominence in 1898 when a special legislative committee in Massachusetts called attention to its advantages. In the Massachusetts form of a revocable license that does not require compensation to the companies for their property in the streets, it violated the spirit of the indeterminate franchise in its more developed form; although in practical operation in Massachusetts the properties of the companies have been secure.[13] The Congress of the United States likewise adopted the policy of granting indeterminate franchises in the District of Columbia as well as in the insular possessions of

[11] The indeterminate permit as a type of franchise should not be confused with the license-franchise of Massachusetts, which likewise has no fixed term.

[12] These states are Arkansas, Colorado, Indiana, Minnesota, Ohio, Oklahoma, and Wisconsin. Illinois is now considering the question.

[13] See Report of Committee on "Terminable Permit," *American Elec. Ry. Assoc.*, 1924.

the United States (Porto Rico, the Hawaiian and Philippine Islands). In 1907 the indeterminate form was introduced into state public utility laws, largely because disinterested students of the subject like Milo R. Maltbie of New York and Professor John R. Commons of the University of Wisconsin, advocated its adoption.

(b) *Economic and judicial interpretation.*

The indeterminate permit can be understood best by studying it in the state of Wisconsin where it has been most fully developed, and where judicial interpretation has given definite content to the idea. A law enacted in 1907 gave public utilities the option of surrendering their franchises and taking out in lieu thereof indeterminate permits. Not all companies availed themselves of this option.[14] Consequently, legislation enacted in 1911, based upon the reserved power of the constitution, revoked all existing franchises granted by local authorities as agents of the state and in their stead gave the companies indeterminate permits. The law also provided that in the future all franchises granted by local authorities shall be indeterminate permits. Thus the indeterminate permit is, like the franchise, a grant of power by the state, through the city in the first instance. It is made to corporations which are furnishing or propose to furnish transportation, light, heat, water, power, etc., for public use; *but it embodies specific limitations upon the exercise of the grant which can be made immediately operative,* without awaiting the end of a definite term of years.

The first significant feature is that, so far as permission to operate and to occupy the streets is concerned, the scope of privilege acquired by surrendering a franchise and taking out an indeterminate permit under the public utility law is the same as under the old franchise but the conditions are abrogated and the conditions of the public utility law substituted therefor. As the Wisconsin Supreme Court said: "It was thought (by the legislature) that sound policy required old franchises with their multiplicity of differences to be brought under one system, so that the things formerly privileged might continue to be so, but solely under conditions and limitations referable to a single standard, to wit: The public utility law with its administrative board to dominate the situation as between the owners of privileges and

[14] The companies were deterred by doubt as to their legal right to make the surrender without the consent of bondholders, whose consent could not be obtained on account of practical difficulties.

the public to the end that each might be coerced, if need be, to deal justly with the other." [15]

Since the power to amend or revoke franchises could not be directly delegated to a commission, though the commission would necessarily have to use all the regulatory powers of the legislature, it was clear that in some way the commission must be able to control the very grant upon which the utility's economic life depended. This exigency gave birth to the idea of a terminable monopoly. The real difference between the new grant and the old one is that under the indeterminate permit the monopoly feature of the new grant can be changed at any time by the commission through the issuance of a permit to a competing utility. While the commission cannot exercise the power of revocation constitutionally reserved to the legislature, it nevertheless has a power which is potentially its equivalent. In addition to this, the utility under the new grant agrees that it will sell its properties to the municipality at any time without the cumbersome condemnation procedure which was necessary under the old grant.

Although the law frankly recognizes the monopoly character of the industries in question, the grant is a monopoly coupled with a condition. As the Supreme Court of Wisconsin said: "It was the interests of the consumers which were the prime subject of the legislative solicitude; such object to be conserved without injustice to others. . . . So while in common parlance it is proper to characterize the exclusive privilege in question a monopoly, it is one purchased by giving an equivalent to the public, as in case of a patent allowed by the federal government. It is a grant for a public, not for a private, purpose, and not a grant of that which without it would be a common right. It has none of the essentials of the monopoly so offensive anciently in the eyes of the law." [16]

The monopoly feature of indeterminate permits is very much misunderstood and hence subject to much irrelevant criticism. That the monopoly was conferred in order to benefit consumers appears from what the Wisconsin Supreme Court said on another occasion: "The Public Utilities Law was undoubtedly framed on the theory that certain kinds of business were of such a character that the duplication of plants for the purpose

[15] *La Crosse* v. *La Crosse Gas & Electric Company*, 145 Wis. 408, 426 (1911).

[16] *Calumet Service Co.* v. *City of Chilton*, 148 Wis. 334, pp. 359, 366 (1912).

of carying them on was undesirable because it results in economic waste, the loss from which in the end usually fell upon the consumer. . . . Competition in the public utility business in our cities in the end generally resulted in consolidation or an agreement between competing companies as to the rates to be charged. In either event the rates were usually adjusted so as to cover fixed charges, and to yield a return on the cost of constructing the competing plants. These are matters of common knowledge. One of the main purposes of the law was to avoid duplication, and it was thought that by efficiently controlling the rates to be charged by a single utility the consumer would derive the benefit resulting from economy in production. In construing the public utilities law the apparent purpose of the Legislature should be kept in mind." [17]

Security of investment so long as service and rates are reasonable is the essence of public policy under the indeterminate permit. The maintenance of reasonable service and rates is the best warrant for a continuation of the permit. To sum up the essential features which distinguish indeterminate permits from term franchises:

(1) The indeterminate permit recognizes the monopolistic character of public utilities and prohibits the competition of new enterprises unless public convenience and necessity, as determined by the administrative commission, require another utility.
(2) The right to operate and to occupy the public streets is indeterminate, subject to the right of a municipality to purchase at any time at a fair price to be fixed by the administrative commission.

(c) *Some objections to the indeterminate permit considered.*

One objection urged against this legislation is that it, in effect, creates perpetual permits. In answer it may be said that, assuming the public does not desire to acquire ownership, the idea of continuity in the permit is appropriate to the continuous nature of the service. With rates and service adequately and continuously controlled, an unlimited and exclusive franchise offers no objections. But the law also provides that the municipality may automatically terminate the grant provided it purchases the existing plant. The indeterminate permit is therefore perpetual or non-terminable only if no adequate provision is made by appropriate enabling legislation whereby municipalities may finance the acquisition of these properties.

[17] *Wisconsin Traction, Light, Heat & Power Co.* v. *City of Menasha*, 145 N. W. Rep. 231, p. 233 (1914).

The remedy is not, however, the abrogation of indeterminate permits but the perfecting of financial legislation.

It is also true that a municipality may not set out to compete with a public utility corporation which is operating under a valid indeterminate permit, granted pursuant to the public utility law. For, as the Supreme Court of Wisconsin held in an important case,[18] the privileges conferred in the franchise cover the whole field, and if these privileges have not been abandoned, the municipality has no power to build a municipal plant which encroaches upon this exclusive field, and it has no authority to issue bonds for carrying out such an "ultra vires" purpose. Moreover, the statutory conditions which preceded the public utility law, empowering a municipality to construct or own public utility property for municipal or general use within the municipality and to incur indebtedness for this purpose, were superseded by the public utility law so as to render the latter paramount and the former subsidiary.

Another objection is that the indeterminate permit is an exclusive franchise and hence perpetuates a monopoly which may be most objectionable to the community. This is not strictly true. The law empowers the administrative commission to allow a competing utility to enter the field, if, after a public hearing, the commission finds that public convenience and necessity require competition. The commission then grants to some applicant competitive utility a certificate of public convenience and necessity, whereupon the consent of the municipality to use the public streets must also be obtained. The usual grounds for granting the certificate are that the existing utility is unable or unwilling to build extensions, or that its service has become wholly inadequate to supply the geographical market within which it has a monopoly. There are thus two additional safeguards if regulation fails to bring results: the purchase of the property by the public at a price fixed by the commission or the opening of the exclusive market to potential competition. A third alternative has been suggested which would permit the substitution of some other private company for the incumbent, but the suggestion has never been enacted into law. The weakness of the indeterminate permit is therefore a weakness which inheres in all terminable franchises that the cities may not be financially able to make use of their purchase option.

[18] *Calumet Service Co.* v. *City of Chilton*, 148 Wis. 334 (1912).

(d) *Purpose of certificates of convenience and necessity.*

A certificate of convenience and necessity is also required before a new public utility may begin operations in territory not yet supplied with service. This type of legislation has been more generally adopted than has the indeterminate permit. The New York law may be taken as an illustration. It provides that: "No corporation shall begin construction without first having obtained the permission and approval of the commission of each district.[19] within which any part of the construction is to be done. . . . Before such certificate shall be granted, a certified copy of the charter of such corporation shall be filed in the office of the commission, together with a verified statement of the president and secretary of the corporation, showing that it has received the required consent from the proper authorities and also that the incorporators shall publish the certificate of incorporation in the newspapers. The commission within whose district such privilege, right, or franchise is to be exercised, shall have power to grant the permission and approval herein specified, whenever it shall after due hearing determine that such exercise of the right, privilege or franchise is necessary or convenient for the public service." [20]

Without entering into details, it is clear that the legislature intended to control the investment of capital in specific enterprises by restricting the franchise right to those undertakings which meet *public convenience and necessity.* This legislative standard together with the indeterminate permit gives a wide scope for administrative discretion. Under these laws commissions seek to prevent unnecessary duplication of investment as well as the expenditure of capital under circumstances which do not promise a reasonable return.

The theory is that regulated monopoly is better than unregulated competition. As we have seen, the statute also provides that rates shall be fixed so as to provide earnings reasonably necessary in giving adequate service. Excessive earnings are prohibited. Any advantage obtained by the producer in thus securing control of the market, such as the elimination of the costs of competition, or of the investment risks attendant upon

[19] New York for a time had two commissions, one having jurisdiction of all utilities in the city of New York (the first district), another having jurisdiction in the rest of the state (the second district).

[20] The term "convenience and necessity" is a misnomer. Unless given an economic interpretation by administrative commissions, extensions may be proposed or demanded by consumers which, while convenient and necessary for one group, are an extravagant burden upon the rest of the community.

a franchise of uncertain tenure, is passed on to the consumers. Having deliberately chosen monopoly under the indeterminate permit and accept its benefits, the public must also accept the responsibilities that the policy entails. These may be felt as restrictions upon the city's accustomed power of freely granting franchises. The Wisconsin court has held that where an indeterminate permit has been acquired the municipality is under a disability to grant any conflicting franchise privileges except in case of public convenience and necessity, facts in that regard to be found and certified by the Railroad Commission prior to making such conflicting grant.[21]

A further reason for adopting the law was the feeling that unsightly obstructions in public streets and the crowding of the surface and sub-surface by duplicate equipment should be prevented.

The economic grounds for eliminating duplication and preventing cut-throat competition were most persuasively put by former Commissioner Halford Erickson:

"In connection with the applications for certificates of convenience and necessity that have come before the Wisconsin Commission, I have often had occasion to investigate the effect upon the existing utility and customers as well as upon the municipality of dividing up its business with an additional plant. In these investigations I have almost invariably found that such a division of the business would have greatly reduced the net earnings of the existing plant, while at the same time it would have seriously increased the cost per unit of service to the public. Time will not permit me to go into detail. But in one case where the city officials desired to erect a municipal plant for the purpose of lighting its streets and public buildings, it was found that the granting of this application would have decreased the revenues of the existing company by considerably more than twice as much at it would have decreased its expenses; that it would have caused an increase of about 15 per cent in the cost to the city of the street and other public lighting; that it would have increased the cost per kilowatt hour to private lighting and power users of the city by nearly 20 per cent; and that these increases in the costs were far-reaching enough so that under rates that were high enough to cover them it would have been impossible to expand the electrical business or even to retain all of the business the existing plant then had."[22]

By means of the power to withhold certificates of convenience and necessity, commissions may prevent the expansion of a plant through new construction or the acquisition of new property. Ordinary extensions of existing systems in the usual course of

[21] *State ex rel. Kenosha Gas & Electric Co.* v. *Kenosha Electric Ry. Co.*, 145 Wis. 337, p. 338 (1911).

[22] Halford Erickson, *The Indeterminate Franchise or Permit* (1914), p. 16 (Commission leaflet).

business are generally permitted;[23] but major extensions may not be made without the approval of the commission. Exceptions are those extensions within political subdivisions in which a particular utility already has lawfully begun operations. Where an extension injuriously affects another utility, complaint may be made to the commission. In Connecticut and New Mexico the application must be made to a court. Some thirty-three states now have legislation of this character,[24] applying to steam railway, street railway, and telephone utilities, and in a number of states to all public utilities.

In states that do not have the indeterminate permit, the certificate of convenience and necessity applies only to franchises which may be granted in the future or to grants that have not yet been exercised. Some states limit the power to apply for a certificate to domestic corporations or foreign corporations licensed to do business in the state. In considering applications the commissions may issue the certificate, refuse to issue it, or issue it only in part, and then attach such terms and conditions upon the exercise of the rights conferred as the public convenience and necessity in their judgment may require.

(e) *Anti-duplication laws.*

In the case of telephone utilities equivalent legislation is sometimes embodied in the so-called "anti-duplication laws," which pertain chiefly to unincorporated territory. Such a law was introduced into the Wisconsin public utility code by an amendment in 1913.[25] Difficulties had arisen on account of the ease

[23] Examples are found in the usual rules for routine extensions of electric service.

[24] These are: Alabama, Arizona, Arkansas, California, Colorado, Connecticut, Idaho, Utah, Wyoming, Illinois, Indiana, Kansas, Maryland, Maine, Minnesota, Missouri, Nevada, New Hampshire, New York, Ohio, Oregon, Pennsylvania, Vermont, Washington, Wisconsin, Iowa, Michigan, Oklahoma, New Mexico, Tennessee, New Jersey, and Massachusetts.

[25] "No public utility already engaged in furnishing telephone service shall install or extend any telephone exchange for furnishing local service to subscribers in any municipality where there is in operation a public utility engaged in similar service without first having served notice in writing upon the commission and any other public utility already engaged in furnishing local service to subscribers in such municipality of the installation or extension of such exchange which it proposes to make, or make such installations or extensions if the commission, within twenty days after the service of such notice, shall, upon investigation, find and declare that public convenience and necessity do not require the installation or extensions of such exchange, except that any public utility already engaged in furnishing local service to subscribers within any city or village may extend its exchange within such city or village without the authority of the commission." *Laws of Wisconsin*, 1913, C. 610, p. 762.

with which telephone lines, particularly rural lines, could be extended. In rural territory, tapped by the lines of two companies whose exchanges were located in different communities, there was bound to be a certain amount of intermingling of subscribers. This was a reason for permitting some overlapping of territory. The commission so interpreted the law in one case: "In border territories, like that involved in this case, there is sometimes presented a situation where some overlapping of telephone lines is required in order that public convenience and necessity with regard to telephone service may be fully satisfied. While such overlapping may at times do some injury to one of the companies and the general policy of the law is usually against the duplication of lines which will impair investments, still it is also true that the convenience and necessity of the public itself in the matter of telephone service is the paramount consideration. Again where the public need can only be satisfied by permitting a certain amount of overlapping, the doctrine of protection for existing interests cannot be carried to its full length." [26]

Another reason for the enactment of this legislation was to prevent the needless multiplication of companies, where territory could as well be served by extending an existing facility. The determination in each case is a question of fact combined with the exercise of reasonable administrative discretion. Telephone service is most adequate when the number of subscribers to be reached by the lines of any one company is a maximum consistent with technical requirements. The economics of securing maximum utilization of a plant within the market naturally tributary to it, is as much the true objective of anti-duplication laws as of the legislation concerned with certificates of convenience and necessity.

Sec. 5. Administrative Superiority of the Commission System

The general overhauling of state regulatory statutes which has just been described began early in the twentieth century when it was perceived that regulation based only on publicity would not bring the desired results. The changes in the federal act to regulate interstate commerce are a separate phase of this development.[27] The desire to standardize conditions on a statewide basis for local utilities resulted in a movement to eliminate

[26] *Wisconsin Railroad Commission Reports*, Vol. 14, p. 768 (1914).
[27] See Chapter XII.

local regulation, at least in part. Similarly, standardization on a nation-wide basis is now forcing the state governments to give way to federal regulation in the case of transport utilities. The movement for exclusive state control under the ægis of administrative commissions was further aided by the exposure of wholesale graft and corruption among municipal officials, particularly those concerned with the grant or enforcement of franchises. It is now believed by many that the final goal has been reached in that administrative commissions, freed from direct political influences, with their expert personnel and broad investigatory, advisory and mandatory powers, can combine scientific research and administration in achieving a sound public policy. It is at least in accord with the facts to think of a commission as having become a permanent legislature with a special jurisdiction.[28]

The alternatives to commission regulation proved ineffective. A legislature meeting once in two years or a board of aldermen meeting one day a week, obviously could not make the necessary investigations nor maintain the close supervision necessary for prompt and efficient regulation. On the other hand, commissions, both state and local, are competent by daily contact and continuous supervision to enforce both statutory and franchise provisions. They afford a means of informal and inexpensive redress of individual and public grievances. Protection is given investors and the corporations by placing responsibility for decisions in the hands of a body of men *whose action will be controlled by a scientific technique and a judicial tradition.* In this way decisions are removed from immediate contact with political considerations. The contractual system applied the theory of fixing specific terms in advance and securing compliance therewith by applying to a court of law. The commission system determines what is just and reasonable in each case by reference to an organic theory of regulation, the structure of which is being molded continuously. Suits at law, besides being both slow and expensive, deal only with specific causes and specific parties. As a result of such procedure and the judicial practice of deciding only those legal questions that necessarily

[28] While we have frequently borrowed from English legislation the substantive part of our law, the commission appears to be an American invention. Thus American legislation limiting discrimination in rates to those charged under substantially similar circumstances and conditions was modeled upon the English Railway and Canal Traffic Act of 1854. Similarly the provision that increases in rates could be suspended until approved by a commission, thus placing the burden of proof upon the carriers, was derived from English legislation.

arise in disposing of a case, a piecemeal rather than an organic theory of regulation grew up. Commissions, on the contrary, may lay down in advance such conditions as will enable utilities and customers to measure their respective rights and duties.

(a) *The legal status of administrative commissions.*

The commission did not spring "full grown" into existence; it grew out of existing perplexities and had to run the gantlet of legal, political and economic criticism. In seeking to understand the growth of this new agency of regulation, we may profitably recall the two chief objects of utility regulation: first, to lay down such conditions, chiefly as to tenure, that public utility industries can function economically; and second, to state the rights and duties of public utilities in such general terms that they represent standards for the guidance of future conduct. As soon as the problem is stated in this way, it is apparent that experts have to be called in.

The tendency toward administration by experts is not restricted to utility regulation.[29] Commissions to handle administrative problems are being set up in connection with labor legislation, the so-called industrial commissions, with pure food laws and with laws regulating insurance and banking. Perhaps the earliest aids of this kind to legislatures were the administrative tax authorities, variously called State Boards of Assessment or of Equalization and State Tax Commissions. A legislature, being a representative body, is a cross section of the public and expresses public opinion upon matters of public policy; but it needs a technical body as an aid in investigations of fact and in securing administration and enforcement.[30]

Yet the introduction of this new governmental agency did not come without a struggle both political and legal in its nature. The public utility interests felt that their comparative immunity from control was threatened. There were also those who opposed commissions because of what appeared to them to be a usurpation of legislative prerogative. The battle-ground upon which this issue was finally decided was in the courts.

We may gain an understanding of this conflict by observing it first in connection with the Interstate Commerce Commission. The Interstate Commerce Act of 1887 [31] required "that the com-

[29] *Cf.* Commons, J. R., *Labor and Administration*, The Macmillan Co., 1913, Chap. 22.

[30] *Cf.* Lowell, A. L., *Public Opinion and Popular Government*, Chaps. 17, 18, and 19, Longmans, Green and Co., 1921.

[31] United States Statutes at Large, Vol. 24 (1885-87), Ch. 104, p. 383.

mission hereby created shall have authority to inquire into the management of all common carriers subject to the provisions of this act, and shall keep itself informed as to the manner and method in which the same is constructed and shall have a right to obtain from such common carrier full and complete information necessary to enable the commission to perform the duties and carry out the objects for which it was created; and the commission is hereby authorized and required to enforce the provisions of this act and upon the request of the commission it shall be the duty of any district attorney of the United States to whom the commission may apply to institute in the proper court and to prosecute under the direction of the Attorney General of the United States all necessary proceedings for the enforcement of the provisions of the act and for the punishment of all violators thereof; and the costs and expenses of such prosecution shall be paid out of the appropriation for the expenses of the courts of the United States and for the purpose of this act the commission shall have power to require by subpœna the attendance and testimony of witnesses and the production of all books, papers, tariffs, contracts, and documents relating to any matter under investigation."

As stated the creation of commissions was first opposed on the theory that such legislation constituted an unlawful delegation of legislative power. But this objection was overruled by the United States Supreme Court. As Justice Harlan pointed out:[32] "The government, which has the right to do an act has imposed on it the duty of performing that act (and) must, according to the dictates of reason, be allowed to select the means; and those who contend that it may not select any means appropriate, that one particular mode of effecting this object is excepted, take upon them the burden of establishing that exception." It was clear that the constitutional validity of such legislation depended upon what duties were delegated.

The distinction as to what may and what may not be delegated, has been drawn upon this ground that "the legislature cannot delegate its power to make a law, but it can make a law to delegate a power to determine some fact or state of things upon which the law makes or intends to make its own action depend." The distinction was cleared up further in the case of Ruggles v. Collier,[33] where it was said that the legislative power implies a judgment and discretion on the part of

[32] *I. C. C.* v. *Brimson*, 154 U. S. 447, p. 473 (1894).
[33] 43 Mo. 353 (1869).

those who exercise it, and a special confidence and trust on the part of those who confer it, and that consequently the legislative power cannot be delegated, although a purely ministerial power may be delegated.

This gives us the distinction between a delegation of power to make a law and the delegation of power to administer a law which has already been made. The former contemplates discretion as to what the law shall be and this may not be delegated by a legislature, while the latter contemplates the exercise of discretion in its administration and may be delegated.[34] These general ideas were applied in the famous case of *Minn. St. P. & S. S. M. Ry. Co.* v. *Wisconsin Railroad Commission* [35] where the general law merely provided that rates shall be reasonable and just. The gist of the opinion appears from the following extract: "If it were conceded that the commission had power or discretion to fix one of several rates either of which would be just and reasonable, it would be hard to say that this was not a delegation of pure legislative power to the commission; but the theory of this law is to delegate to the commission the power to ascertain facts and make administrative regulations and therefore it is valid."

In the early days of commission regulation, objection was also raised to the provisions of law giving the commissions power to compel the attendance and testimony of witnesses and the production of records, etc., as being a usurpation of judicial power and an invasion of personal liberty. This barrier has also been leveled since it is now held that this power of a commission is merely incidental to its duty to investigate and does not constitute a delegation of pure judicial power nor an invasion of personal liberty.

We may therefore say that in its developed form a public utility commission is a permanent administrative body of trained experts whose services are continuously available for purposes of investigation and for adjusting conflicts between public utilities and their patrons. They give to these problems their exclusive attention and soon build up in the course of their investigations and their adjustments of disputes an apparatus of administrative working rules and a basis of technical facts upon which a coördinated and predictable policy of detailed control may rest.

The essential nature of administration has been various inter-

[34] *State* v. *Chittenden*, 107 N. W. 500 (1906).
[35] 136 Wis. 146, p. 164 (1908).

preted. Justice Holmes of the United States Supreme Court, for instance, points out that the acts of the commission are quasi-legislative in that the commission looks to the future and changes the existing condition by establishing a new rule. The establishing of a rate is equivalent to the making of a future rule.[36] Justices Fuller and Harlan of the same court were of the opinion that the acts of a commission were of a judicial nature, since the commission sat as a court. This view, although having some merit, does not take into account the present function of commissions and is, perhaps, a judicial estimate of the character of commissions based upon their earlier functions. Justice Brewer maintains that their powers are administrative in that they may merely make rules not inconsistent with existing law. Properly understood, there is no conflict between these interpretations because the powers of a commission are quasi-legislative *and* quasi-judicial, the combination being, indeed, what is meant by administrative power.

(b) *Commission organization and procedure.*

We may now look at commissions in somewhat greater detail as to both organization and procedure. Three, five, and even seven commissioners usually comprise these state boards, although a membership of three predominates. In the state of Washington a single official is now in charge. The Interstate Commerce Commission was recently increased to eleven members. The members in the majority of instances are appointed by the governor for terms varying from two to ten years, the customary term being six years. The elective commission still obtains in twenty states. Those most conversant with the situation tend to favor appointive commissions with long period of tenure (from six to twelve years) making use of the principle of rotation of appointments, so that there will always be members holding over after each biennial election of a governor.

It is commonly provided that commissioners and the employees of commissions can have no pecuniary interest in the public utilities subject to their jurisdiction. Commissioners are required to be resident electors of the state, and in some states, must belong to different political parties. Again, in some states, the law specifically lays down qualifications for at least some of the members, such as a legal training, or experience in the operation or management of public utility enterprises. One very ex-

[36] Friedman, H. J., "Commissions and Their Functions," *Case and Comment*, Vol. 20, p. 385.

cellent provision, though not yet sufficiently general, requires in substance that commissioners devote their entire time to official duties. This requirement depends, of course, upon the annual compensation fixed by statute. This compensation varies from $2,000 in Vermont to $15,000 in New York. Recent legislation shows a tendency to provide adequate compensation although the situation is not yet what it ought to be. Important administrative work is performed by subordinate employees. Therefore, in many cases it has been found necessary in order to retain this experienced subordinate personnel, to advance their salaries beyond those fixed legislatively for the commissioners.

A close acquaintance with the intimate details of commission practice would convince legislatures that certainty and reasonable length of tenure as well as adequate remuneration are necessary to attract and hold properly qualified persons in the public service. There are critics of regulation who protest the tendency of commissioners and of experienced employees to leave their posts for better paid positions in private concerns; but these conditions can not be changed unless governmental agencies are willing to pay the price of excellence. In spite of these untoward conditions the amount of good work done, even under the incubus of an administrative incognito, is a splendid testimony of the intrinsic interest and of the worthwhileness of the task. In the last analysis the success of commission regulation will depend upon the personnel of the commissions and their staffs.

Commissions are provided with funds by means of recurring legislative appropriations.[37] They are largely consumed in the payments of salaries, under authority such as that typified by the Massachusetts public service commission law: "The commission may appoint or employ such engineers, accountants, statisticians, bureau chiefs, division heads, assistants, inspectors, clerks, and other subordinates as it may deem advisable on such terms of office or employment and at such salaries as it may deem proper."[38]

Generally speaking, authority is conferred upon commissions to adopt rules and regulations governing hearings, investigations, and the proceedings before them, although the more vital regulations are specifically laid down by statute. The reason for the grant of such authority has been to insure administra-

[37] In a few states the cost of supervision and regulation is placed directly upon the public utilities, the amount being determined by means of a fee system assessed upon the basis of gross operating revenues.

[38] Acts 1913, Chapter 784, section 9.

tive flexibility and to prevent the burdening of procedure by technical rules of evidence such as courts require. For instance, in some states it is provided that no informality in any hearing, investigation, or proceeding, or in the manner of taking testimony shall invalidate any order, decision, rule or regulation made, approved or confirmed by the commission. Usually the statutes also provide that all hearings must be public and that any party in interest may be heard either in person or by attorney. Commission rules of procedure must, of course, provide for the two essentials of "due process of law," that is to say prior notice and a hearing.

Since commissions are primarily agencies for hearing complaints, the procedure for bringing complaints is definitely fixed by statute. The laws usually provide that a *formal complaint* may be made by both public utilities and their customers. In the latter case, one or some specified larger number of persons, firms, corporations, or associations may make complaint, except that any body politic or municipal corporation may bring a complaint in its capacity as representative of consumers generally. *Informal complaints* may, of course, be made by any single individual. These will be attended to like formal complaints and may, if the matter is deemed important enough, be made the subject of formal complaints upon the commission's own motion. The purpose has been to make investigation and redress of grievances easy, inexpensive, and sufficiently general to reach the real difficulties of any situation. In a functional sense the complaint always is that the existing rates or service do not measure up to the legislative standard of reasonableness.

Usually, upon receipt of a complaint, commissions are directed to make a preliminary investigation. If upon investigation the facts appear to warrant further proceedings, a public hearing is held, with due notice (usually ten days) to all interested parties. Quite generally, too, the states have followed the Wisconsin practice of initiating investigations upon the commission's own motion without the intervention of a complaint. This procedure was thought at one time to be in the interests of timid customers or those who feared retaliation at the hands of public utilities. It has since been expanded into a method whereby investigation may be so organized as to scope and subject matter as best to meet situations. After the hearings and investigations are concluded the commissions are directed to make appropriate findings and issue orders that will either relieve difficulties or else dismiss the complaints.

The course of investigation is charted by keeping a complete record of the proceedings, including the testimony and the evidence presented. Orders are usually accompanied by opinions. The chief reason for this procedure was that the laws provide that certified copies of the opinions and orders are *prima facie* evidence of the facts found upon investigation if a case is taken to the courts.

In order to facilitate investigation the commissions are given authority to inspect, audit, and have access to all records of the utilities. This power is additional to that which requires the utilities to make annual reports as to their operations upon forms prescribed by the commissions. And in order that these reports as well as the records upon which they are based may be made most effective in aiding the process of regulation in all its phases, the commissions are empowered to prescribe uniform systems of accounts and accounting records.

The orders must be served upon the utilities affected in a prescribed manner and acknowledgment by the utilities is usually required. The effective date of the orders is usually left to the discretion of the commissions and is fixed by them in each case. In some states the statute fixes a minimum time (usually twenty days) after which orders become effective. A necessary implication from the power of the commission to make orders is that the persons to whom they are directed shall comply with them. This implication may be reinforced by an express provision making it the duty of the public utility and its agents to obey and by providing penalties for failing or refusing to obey. Additional flexibility is introduced by empowering the commission to modify, alter, amend, or rescind its orders or to provide for a rehearing upon application of the parties.

(c) *Judicial review.*

In all cases the orders of state commissions are made subject to review by the courts. This provision was necessary so that regulatory statutes might pass the vigilant eyes of the courts. This right of the contending parties to have the commission's decision tested as to its constitutional validity by the courts is exercised either by an independent action brought to set aside the order of the commission or by a method according to which the commission's orders are appealed.[39]

[39] The Wisconsin provision may be taken as typical: "Any railroad or other party in interest being dissatisfied with any order of the Commission fixing any rate or rates, fares, charges, classifications, joint rate or rates,

The laws of most states make provision for the review of commission orders in courts of subordinate jurisdiction, usually called trial courts. Here questions of fact are gone into and the commissions' decision as to the facts is taken as *prima facie* correct. In some states the practice of designating special courts has been helpful because it tends to make these courts familiar with many technical details. An appeal may then be taken to the State Supreme Court or to such other court as has final appellate jurisdiction. The final step in the process of judicial review is an appeal to the United States Supreme Court upon questions within the scope of the federal constitution. No legal problem is disposed of until passed upon by this court.

The exact methods of securing court review are not very important for our purposes. One point, however, should be brought out because of its importance in making commission decisions conclusive. In order to discourage the practice by public utilities of withholding material evidence at the time a case is being tried before the commission and later presenting such evidence to the court on appeal, it has been provided that, if the court finds such evidence is different from that offered to the commission or that it is additional evidence, the case be remanded to the commission.[40]

or any order fixing any regulations, practices, or service, may commence an action in the circuit court against the commission as defendant to vacate and set aside any such order on the ground that the rate or rates, fares, charges, classifications, joint rate or rates fixed in such order, is unlawful, or that any such regulation, practice, or service, fixed in such order is unreasonable, in which action the complaint shall be served with the summons. The commission shall serve and file its answer to said complaint within ten days after the service thereof, whereupon said action shall be at issue and stand ready for trial upon ten days' notice by either party. All actions brought under this section shall be commenced within ninety days after the rendition of such order and shall have precedence over any civil cause of a different nature pending in said court, and the circuit court shall always be deemed open for the trial thereof and the same shall be tried and determined as other civil actions."

[40] The Wisconsin law is typical:

"(b) If, upon the trial of such action, evidence shall be introduced by the plaintiff which is found by the court to be different from that offered upon the hearing before the commission, or additional thereto, the court before proceeding to render judgment, unless the parties to such action stipulate in writing to the contrary, shall transmit a copy of such evidence to the commission, and shall stay further proceedings in said action for fifteen days from the date of such transmission. Upon the receipt of such evidence the commission shall consider the same, and may alter, modify, amend, or rescind its order relating to such rate or rates, fares, charges, classification, joint rate or rates, regulation, practice or service complained of in said action, and shall report its action thereon to said court within ten days from the receipt of such evidence.

"(c) If the commission shall rescind its order complained of, the action

This provision regarding new evidence is important because it prevents the handling of the appeal by the court as though it were a new trial. This we shall see was one of the defects in the administration of the original act to regulate interstate commerce. The absence of such provisions has a tendency to substitute the old technical process of judicial regulation for commission regulation. With this proviso commission regulation attains greater power, respect and prestige in that parties have nothing to gain by withholding evidence at hearings before the commission.

Under the method of judicial review outlined above, it is not the function of the courts to substitute their judgment and evaluation of the facts for that of the commission, but merely to determine whether, as the order stands, a constitutional right has been invaded. An interesting comment upon the relations of the judiciary and the administrative commission under this procedure comes from the opinion in the "Soo Case," already referred to above.[41] "The commission has the charge of and the determination of interests vast in amount and delicate and complicated in their legal and economic relations, affecting the happiness and prosperity of all the people of the state, and involving the consideration and protection of private rights of the most sacred character. Experience tends to show that public officers as well as private citizens are apt to rise in character and integrity to meet great responsibilities but to shift that responsibility when opportunity of shifting is easy, and thereby to deteriorate in efficiency and character. Besides this, the work of the commission requires such expert knowledge of the difficult subject of rates of transportation, and requires the consideration of economic as well as legal principles and an intimacy with local and state traffic conditions. Consequently, unless required to do so by the mandate of the law, the circuit court should interfere as little as possible with the work of the railroad commission and its determinations. But the courts, too, are bounden to duty and cannot throw off at will that which is imposed upon them by law, fairly construed and properly understood." Judicial review has, on some issues, brought about serious conflicts.

shall be dismissed; if it shall alter, modify, or amend the same, such altered, modified or amended order shall take the place of the original order complained of, and judgment shall be rendered thereon, as though made by the commission in the first instance. If the original order shall not be rescinded or changed by the commission, judgment shall be rendered upon such original order."

[41] Page 30 *supra*. Case cited, 136 Wis. 146, p. 156 (1908).

(d) *Enforcement of commission orders.*

The duties and prohibitions laid upon public utilities by the various statutes are enforced by creating a liability to punishment if the utilities or their agents fail to live up to statutory duties or if they fail to obey administrative orders of the commissions. This liability may be a criminal liability to fine and imprisonment or a civil liability to pay damages to patrons injured through such violations. The old method of enforcement of criminal liability was by means of suits brought by district attorneys and the attorney general. The later legislation has frequently made it the duty of the commission to aid in enforcement.[42]

(e) *Miscellaneous administrative duties.*

The public utility laws contain other important provisions which place far-reaching responsibilities upon commissions. Some are too detailed for consideration here, while others will be treated subsequently. Among those which deserve at least passing mention are the control exercised by commissions over navigable streams and the utilization of water-powers; over freight car supply as affected by demurrage rules and by rules for the distribution of cars; over the safe construction of roadbed and rolling stock; and over spur tracks and depots and the safety of highway crossings.

Sec. 6. **Peculiarities of Rate Control by Commissions**

Finally, special attention should be given to some features of rate control under commssion regulation. Disregarding the system which authorizes commissions in a few states to fix only maximum rates, the more usual arrangement authorizes the fixing of *absolute* rates. Repeated amendments to the Interstate

[42] The Wisconsin law provides: "The commission shall inquire into any neglect or violation of the laws of this state by any railroad corporation doing business therein, or by the officers, agents or employees thereof, or by any person operating a railroad, and shall have the power, and it shall be its duty, to enforce the provisions of . . . laws relating to railroads and report all violations thereof to the attorney general; upon request of the commission it shall be the duty of the attorney general or the district attorney of the proper county, to aid in any investigation, hearing or trial had under the provisions of section 1797-1 to 1797-38 inclusive, and to institute and prosecute all necessary actions or proceedings for the enforcement of . . . laws of this state relating to railroads and for the punishment of all violations thereof. . . . The commission shall have authority to employ counsel in any proceeding, investigation, hearing or trial. . . ." See *Wisconsin Statutes*, 1923 or 1925, sec. 195.48.

Commerce Act have finally inaugurated its equivalent in the field of federal regulation of interstate carriers. While the Interstate Commerce Commission early claimed the power to name specific rates, the lower courts, and finally, in 1897, the United States Supreme Court, denied that it had this power. The Hepburn Amendment of 1906 specifically gave this power to the Commission, thus changing it to one of the mandatory type.

At the time of its organization in 1905 the Wisconsin Railroad Commission was not required to fix an entirely new system of rates such as legislatures and commissions of a preceding era had attempted. All existing rates, including joint rates, were to be filed with the commission, and these became the legal rates. The commission was then authorized to review any and all rates upon complaint or upon its own motion. In this way the administrative burden was reduced at the outset. The railroads were still free to make special rates since the law provided that nothing in the act "shall be construed to prevent concentration, commodity, transit and other special contract rates," but these special rates had to be made available to all shippers and to receive the approval of the commission. This procedure made all existing rates *prima facie* reasonable. They could not be changed without the permission of the commission and then only after giving thirty days' notice. It placed the burden of proof upon the party asking a change in rates. The new rates when fixed by the commission in turn become the *prima facie* reasonable rates. It is also apparent that this arrangement was of great assistance to the commission in administering the provisions prohibiting rebates and discriminations inasmuch as the commission alone was empowered to order refunds for overcharges.

Sec. 7. **Conclusion**

If the work of regulation is to be effectively done it must be in the hands of administrative commissions of the mandatory type. In the development of legislative policies the initiative must be taken by commissions since they are in closest touch with the problems. Criticisms, investigations and experimentation should be encouraged. At the same time the public utilities must be protected from insincere political attacks. Yet nothing can be more suicidal than to have regulation settle down to a complacent routine which contents itself with the mere adjudication of differences.

CHAPTER XII

THE REGULATION OF PUBLIC UTILITIES BY FEDERAL COMMISSIONS [1]

Writers on the subject of railway transportation generally agree that the history of railroad regulation may be roughly divided into the following periods: (a) a period of comparative freedom from regulation ending about 1870; (b) a period ending in 1887 during which legislative regulation originated and developed into the mandatory type of commission control, with the states as the jurisdictional units; (c) a period ending in 1906 during which the federal and state governments undertook jointly to carry on the work of regulation, the federal government restricting its jurisdiction to the growing amount of interstate business while states were nominally concerned with intrastate business; (d) a period ending in 1917, with the taking over of the railways by the government as a war measure, during which federal regulation was perfected and gradually overshadowed in point of effectiveness regulation by the states; (e) the period of governmental operation which was clearly one of abnormal economic conditions leading, however, to a transition and readjustment; (f) and finally, a period since the resumption of private operation when a scheme of regulation, similar to that applied to local utilities, is being put to a test.

Sec. 1. The Origin of the Federal System of Regulation

In reviewing the history of regulatory policies we must recall that the developmental era of public utilities coincided with the period when the spirit of individualism was supreme in economic affairs. Our railway plant was built up by a speculative

[1] The regulation of common carriers engaged in interstate commerce is treated in many special works devoted exclusively to this subject. The historical development of our national transportation system offers so much of detail which is important to the student of transportation, that he will want to acquaint himself with these special works. We are here concerned only with outstanding developments in order to appreciate the unity of the principles, both legal and economic, that underlie the regulation and management of all public service enterprises.

stimulus with the crest of each wave of speculation followed by a trough of depression. There was little thought of scientifically coördinating supply with demand. Much necessarily hasty and mistaken construction was undertaken. Fortunes were made and lost. It has been estimated that in excess of seventy per cent. of American railway mileage has passed through receivership. In the end there emerged strong transportation systems, reorganized and consolidated by the energy and capacity of leading executives.

The importance of these conditions in any true estimate of the history of regulatory institutions has never been better stated than by Professor F. W. Taussig:[2] "Historically, the course of development seems to have been controlled by a fated destiny. Given the impossibility of public ownership and management (and for the earlier stages of railway development in this country public operation was out of the question); given the eager desire of the community for ways of transportation and its willingness to encourage their construction in every way; given the looseness of corporation laws, the universal speculative temper, the laxness of business standards; given the periodic fluctuations in industry, the economic peculiarities of railways, the opportunities for large scale returns—and the harvest was prepared for the daring and able operator. Perhaps all the advantages of rapid construction, wide permeation of the land with railway facilities, from competition and consolidation and vigorous management, could have been gotten in some other way; but a train of deep-seated causes seems to have decreed that they should come in just this way and with just these checkered results." Other factors which have added to the complexity of the regulatory problem were the great expanse of the country with the accompanying diversity in local conditions, and the extremely rapid succession of new inventions and improvements. Regulatory institutions could not be brought to that stage of maturity which alone affords a sufficient test of their adequacy, before new conditions arising out of the country's growth or fundamental changes in the art confronted them and subjected them to the strain of altered circumstances.

After a community's first concern to get transportation facilities had been satisfied, its next concern was to get improved service at lower rates. To this end the competition of railroads with each other or with carriers by water was primarily relied

[2] Taussig, F. W., *Principles of Economics*, The Macmillan Co., 1920, Vol. II, p. 393.

upon. When at length the time arrived to assert a policy of governmental regulation of service and rates, it proved difficult to reverse the trend of at least half a century. The Granger movements came during a period of linear consolidation of hitherto disconnected lines. And thus arises the circumstance that the regulation of interstate carriers has always been hostile to monopoly and colored with a desire in some way to retain competition. Even the carriers were anxious to retain the differential advantages arising out of strategic locations, and thus competition was kept alive.

The first important step looking toward federal regulation of railroads was the report of the Windom Committee to the United States Senate in 1874. (Senate Report No. 307, 43rd Cong., 1st Sess.) As already mentioned, this investigation was occasioned by Granger opposition to what were regarded as excessive railway rates. The remedy proposed reflected the spirit of the times, namely, further encouragement of competition by developing waterways and the construction by Congress of parallel railways to the seaboard. Although the report argued at length that Congress had the constitutional power to regulate railroad rates, it actually proposed that regulation be brought about indirectly by the competition of government-owned railroads which could not be drawn into the vortex of the consolidation movement.

The next important step was the report of the Cullom Committee in 1886, likewise to the Senate. (Senate Report No. 46, 49th Cong., 1st Sess.) Instead of complaining about high rates this committee contended that the "paramount evil" in the conduct of the transportation system was "unjust discriminations between persons, places, commodities, or particular descriptions of traffic." Improvements in railway facilities, the growth of traffic, and particularly rate wars had in the time between the two reports changed entirely the incidence of the railway problem. Discrimination, as a new phase of the railroad problem, was the direct result of excessive railway competition, a competition which pooling was unable effectively to combat. Place discriminations arose out of the fact that railroads regarded themselves as adjuncts to the markets which they entered and their rates were consequently adjusted to favor the markets which particular railroads desired to build up. Higher rates were also in effect upon local traffic, not subject to competition, as compared with rates applying on traffic moving between junction points where competitive influences were

felt. Another type of discrimination arose between large and small shippers, because the large shipper was able to secure a rebate or other preferential treatment on account of the larger quantity of traffic which he could offer.

Between 1874 and 1887 various bills were introduced looking toward federal regulation, but none of them became law. Finally in 1886 the United States Supreme Court, in the famous Wabash Case, decided that state regulation must confine itself to intrastate traffic. In view of the growing importance of interstate traffic, this decision forced action by Congress, with the result that the interstate commerce act regulating such traffic and creating the Interstate Commerce Commission was passed early in the following year.

The difficulties which stood in the way of the adoption of federal legislation illustrate well our policy of drift and of mental lethargy in thinking about these problems. Very little thought has been given to the proper selection of governmental agencies best fitted to carry on the work of regulation. The federal constitution provides that Congress shall have power "to regulate commerce with foreign nations and among the several states and with the Indian tribes."[3] The Tenth Amendment distinguishes the sphere of state and federal activity by providing that "the powers not delegated to the United States by the constitution, nor prohibited by it to the states, are reserved to the states respectively, or to the people." Largely as a result of the judicial leadership of Chief Justice Marshall it was early established that within the sphere thus marked out by definitely delegated powers, Congress was supreme.[4] Similarly, each state under the police power regulates commerce within its own boundaries.

The successive steps in the interpretation of the commerce clause may be presented as follows:[5] During an initial period ending about 1829 the power of Congress over interstate commerce was interpreted by the courts to exclude regulation by the states. On the other hand, the power of the state to regulate its internal commerce (both beginning and ending in the state) was regarded as equally exclusive. But the arbitrary nature of the distinction between interstate and intrastate commerce became apparent when it was realized that in the regulation

[3] Art I, Sec. 8.

[4] *Gibbons* v. *Ogden*, 9 Wheaten (U. S.) 1 (1824).

[5] Coleman, Wm. C., "The Evolution of Federal Regulation of Interstate Rates: The Shreveport Rate Cases," *Harvard Law Review*, Vol. 28 (1914), p. 34.

of intrastate traffic it was impossible, with the increasing volume of through business, not to affect indirectly also interstate traffic. Yet the idea of States' Rights was so strong that even as late as 1876 in the Granger Cases it was held that "until Congress undertakes to legislate for those who are without the State, Wisconsin may provide for those within, even though it may indirectly affect those without."[6] The dominance of federal power was only potential. Naturally, this led to a situation where state control was more and more permitted to affect interstate commerce, until the decision in the Wabash case definitely stopped encroachment. The court's language in this case is significant:[7] "It cannot be too strongly insisted upon that the right of continuous transportation from one end of the country to the other is essential in modern times to that freedom of commerce from the restraints which the state might choose to impose upon it, that the commerce clause was intended to secure." This decision points to the first criterion upon which regulatory institutions must be judged, namely: Do they create an administrative area sufficiently large to cope with the expanding market of the industry itself?

Sec. 2. **The Act to Regulate Commerce and its Emasculation**

The act to regulate commerce merely set forth principles already contained in most of the state laws. It provided, for instance, that all charges should be "just and reasonable" and prohibited the various forms of discrimination. It provided for the publication and posting of all rates and fares, required them to be filed with the Interstate Commerce Commission, and provided further that the commission be promptly notified of all changes. Only the rates on file were to be considered lawful charges. Owing to the fierce competition between rival carriers it came about that rates between competitive points were usually lower than rates to intermediate points. Accordingly, the so-called "long and short haul clause" made it unlawful "for any common carrier . . . to charge or receive any greater compensation in the aggregate for the transportation of passengers, or of like kind of property, under substantially similar circumstances and conditions, for a shorter than for a longer distance over the same line, in the same direction, the shorter being included within the longer distance." The Interstate Com-

[6] *Peik* v. *C. & N. W. Ry.*, 94 U. S. 164, p. 178 (1876).
[7] *Wabash, St. Louis and Pacific Ry. Co.* v. *Illinois*, 118 U. S. 557 (1886).

merce Commission was given authority to suspend the operation of this part of the law if, after an investigation of the competitive situation, it appeared that a particular carrier would be injured by loss of competitive traffic were the clause applied to it. Another provision of the act prohibited pooling in deference to public sentiment represented most strongly in the House. The commission created by the act was authorized to make investigations upon complaint or upon its own motion and to make a report as to its findings of fact together with a recommendation as to the amount of reparation, if any, to which an injured party was entitled.

It was clear that the act was aimed principally at discrimination and rebating. So far as the general level of rates was concerned, competition was relied upon as before to prevent extortion. Where competition was not effective, the long and short haul clause was depended upon to extend the benefits of competitive rate levels. Regulation of the worst forms of competition rather than regulation of rates may be taken as the real objective of the interstate commerce law in its original form.

The first period of federal railroad regulation under the Interstate Commerce Commission ended in 1906. It was in large part an experimental period, in which much technical knowledge was gained as to how the railroad problem must be handled under regulation. Barring the first few years, it was a period marked by hostility between the companies and the commission; in fact, the commission worked in an atmosphere of contempt for its processes and of suspicion of its agents. Congress had not sensed the full import of the problem.

Some of the defects were remedied by amending legislation. While the original act had stipulated that ten days' public notice be given when rates were advanced, the act was silent in regard to reductions. Since the carriers continued to grant special concessions by means of "midnight tariffs," an amendment in 1889 required that three days' notice be also given of reductions. It proved, moreover, to be difficult to get witnesses to testify. This defect was remedied by the Compulsory Testimony Act in 1893. Delays in enforcement of the act by the courts led to the passage in 1903 of an Expediting Act. Although the cash rebate was gradually eliminated, personal discrimination of which the larger shippers were the beneficiaries continued under cover of various "devices". This time the carriers themselves sought legislation to conserve their revenues.

Public sentiment favored such legislation because it was believed to counteract one of the causes for the growth of "trusts". The Elkins Law of the same year declared that *every* departure from the published tariffs should be deemed to be conclusive proof of discrimination. Liability under the act was extended to reach corporations as well as their agents, and shippers receiving rebates were also made subject to penalties which the act strengthened.

The principal difficulty, however, grew out of judicial interpretation of the law. Vital defects were uncovered by a series of decisions. It seemed as if the courts were jealous of the usurpation of functions that had been in their hands from time immemorial. Although the law assumed that the commission's orders were *prima facie* reasonable, the courts took the position that they might review the evidence as in a new proceeding. This operated to reduce in significance proceedings before the commission.

Again, for ten years the commission assumed that it had the power to fix maximum rates. In 1897, however, the United States Supreme Court in the Maximum Freight Rate Case [8] held that, since fixing rates was a legislative power, it could not be assumed to have been granted by general language regarding the reasonableness of rates but could only be delegated in unmistakable language. It concluded, therefore, that this power to fix rates for the future was not, according to the court's interpretation of the language of the act, among the powers granted to the commission. This decision effectively destroyed the rate-making power of the commission, which was not restored until 1906, and not vouchsafed by judicial decision until 1910. It reduced the commission's power practically to the equivalent of that possessed by advisory commissions. The commission might still find that a particular rate was too high or discriminatory, but it could not name a specific rate to be substituted for the future. It could order reparations to be paid to shippers, but the rate-making function was left, as before, in the hands of the carriers so that there was no warrant that these practices would be discontinued in the future. As a particular rate might be discriminatory and thus injurious to competitive industry, so the entire schedule of rates might be excessive, unduly increasing the price of the product of consumers and enabling the carriers to collect an extortionate income.

[8] 167 U. S. 479 (1897).

Even the commission's power over place discrimination was emasculated by judicial interpretation. The commission had interpreted the "long and short haul clause" in such a way as to permit higher rates for shorter hauls than for a longer haul *only* when the competition of water carriers, or of rail carriers not subject to the act, fixed the lower rate for the longer haul. Such competition was regarded as "constituting dissimilar circumstances and conditions" and therefore as affording relief under the law. The Supreme Court, however, in the Import Rate Case [9] of 1896 and the Alabama Midland Case of 1897 [10] overruled this interpretation. Even the competition of interstate railroads was held by the court to "constitute dissimilar circumstances and conditions". Because the carriers under this interpretation were generally able to prove that circumstances were dissimilar, the commission's power to control this form of place discrimination was gone. As Justice Harlan said in his dissenting opinion in the Alabama Midland Case, these decisions had "made the commission a useless body for all practical purposes". In other words, judicial interpretation had shorn it of power to accomplish the important objects which Congress had in mind.

At this juncture a new angle of the rate problem appeared. The act of 1887 had declared illegal all pooling arrangements designed to eliminate cut-throat competition. As a consequence existing pools were dissolved or reorganized. The next move on the part of the carriers in controlling competition was to enter into "rate agreements". In 1897 and 1898 these were held to be illegal in cases brought under the Sherman Anti-Trust Law of 1890,[11] which declared illegal every contract, combination, etc., in restraint of trade. These decisions ushered in the great combination period among railroads extending from 1898 to 1903. It was then that E. H. Harriman, to take a typical illustration, built up in 1897 the Union Pacific System, and in 1901 the Southern Pacific System. So great was the degree of concentration among railroads that a report, made in 1905, showed that thirty-nine persons constituted a majority of the board of directors of all railroads in the eastern part of the United States. A cursory examination of the literature of the time will suffice to show that the public mind was beset with fear of monopoly. The time-honored American tradition of in-

[9] 162 U. S. 197 (1896).
[10] 168 U. S. 144 (1897).
[11] *I. C. C.* v. *Trans-Missouri Freight Assn.*, 166 U. S. 290 (1897), also *I. C. C.* v. *Joint Traffic Association*, 171 U. S. 505 (1898).

dividualism, which means in practice the principle of competition, was endangered by monopoly.

Sec. 3. The Interstate Commerce Commission Becomes a Mandatory Commission

About 1900 the cost of operating railroads was rising so that, unless rates were also increased, net earnings would be adversely affected. This fact once more changed the incidence of rate regulation. Whereas, in the past, applications had been principally by shippers to get reparations or adjustments in particular rates, from this time forward the initiative was taken by the carriers. A series of what appeared to be concerted rate increases caused widespread public criticism.

In 1904 President Roosevelt recommended making railroad regulation effective. The House was favorable, but the Senate delayed with investigations. Yet President Roosevelt persisted in his attempt to "put teeth in the law". The railroads brought to bear a tremendous publicity campaign. As an argument against giving increased power to the Interstate Commerce Commission, they pointed to its past inefficiency as shown by the reversals of its decisions in the courts. The principal issue at stake was the power of the commission not only to declare that an existing rate was discriminatory and hence unlawful, but also to fix maximum rates, regulations, and practices to be observed *in the future*. Against this meddling in what they deemed their private managerial function, the railroads put up a "finish fight". But under the impetus of President Roosevelt's dynamic personality, the act was changed in this respect by the Hepburn amendment and further strengthened by the provision that the decisions of the commission should be final except as to questions of constitutionality. The year 1906 thus ushers in a new era in regulation by the federal government just as the years from 1906 to 1911, as we saw in the preceding chapter, marked a change in regulation by most of the states.

Startling disclosures in regard to further discriminatory practices in 1905 aided in securing the passage of the Hepburn amendment. The most important provision of this law, as stated, was that expressly conferring upon the commission power to fix maximum rates for a period of two years, if existing rates were found to be unjust, unreasonable, or discriminatory. This power was further supplemented in 1910 by the Mann-Elkins Law, which gave the commission authority to suspend rate

advances by carriers and to proceed either upon complaint or on its own initiative to hear evidence as to the propriety of such increases. This placed the burden of proof upon the carriers, while it tended to protect the shipper against rate increases. These provisions are peculiarly important because in progressive steps they deprived the carriers of their rate-making initiative, which was very important at a time of rising prices and wages. Moreover, they went far to make the Interstate Commerce Commission an administrative authority with delegated powers comparable to those exercised by mandatory state commissions. It still lacked the power to fix minimum rates, which was important to prevent the rate structure from being constantly disturbed by competitive rate-cutting. Its request in the annual report to Congress of 1916 that this power be conferred was not acted upon until 1920. It is important to bear in mind, therefore, that federal regulation lagged appreciably behind the best state regulation of railroads so far as the perfection of the regulatory machinery is concerned.

Other amendments embodied in the Hepburn and Mann-Elkins Acts need only brief mention. In 1906 the jurisdiction of the commission was enlarged to include express and sleeping car companies and pipe lines. The terms "railroad" and "transportation" were redefined to include all manner of special facilities and services, terminal and otherwise, particularly those afforded by industrial railways and private car lines. Authority was conferred over joint rates. The commission's power to prescribe the character of accounts and reports was enlarged. An anti-pass provision was incorporated. By eliminating the phrase "under substantially similar circumstances and conditions" in 1910, the "long-and-short haul" principle was reëstablished without qualification, unless the commission expressly authorized departures. The "commodities clause" of the Hepburn Act was directed against objectionable discriminatory practices relating particularly to the carriage of coal. This clause makes it unlawful to transport in interstate commerce any commodity, except lumber and its products, in which the carrier is interested as owner or producer.

Enforcement was measurably strengthened. The orders of the commission became immediately binding, except that carriers might seek relief under certain restrictions by applying to the courts for an injunction. Courts were not merely authorized but required to enforce the commission orders. Between 1910 and 1912, in a series of decisions testing out the new legisla-

tion, it was clearly established that the courts could not and would not set aside the commission's orders merely because of disagreement as to policy. The court recognized that it was not their province to decide where "reasonable men might well differ." In short, administrative regulation had also become an accomplished fact in the field of interstate commerce.

There are other details regarding the history of federal regulation of interstate carriers that might be mentioned. Some will be taken up later at points where discussion of them will prove more illuminating. It is desirable to add here that in 1910 the commission's jurisdiction was extended to telegraph, telephone, and cable companies. At the same time the Commerce Court was created and was given special jurisdiction over rate matters, but it was abolished in a little over three years. This court was the special contribution of President Taft, who urged its adoption in order further to expedite the adjudication of cases and to secure a greater degree of uniformity in court decisions. The same idea had already been applied in some of the states in order to secure greater expertness on the part of judges by specializing their jurisdiction. However laudable the object, the members of the court reverted to the practice of unduly interfering with orders of the commission. They proceeded to substitute their own judgments for those of the commission. The temper of Congress and of the country was hardly such as to brook interference, judicial or otherwise, with the legislative purpose of establishing and perfecting administrative regulation; consequently, the court was abolished. The Panama Canal Act in 1912 gave the commission power over the relations between rail and water carriers, and the Clayton Act of 1914 extended its power over inter-corporate relations of railroads.

Sec. 4. **Development of its Powers—The Significance of the "Advanced Rate Cases"**

The commission's control over rates is so crucial a matter that no mere enumeration of amendments can suffice to bring out its full significance. After 1906 the commission began to have a true rate-making power. In order, however, to set this power in motion there had to be a complaint and the complainant had to assume the burden of proof. Evidence substantiating the complaint had to be based upon experience with rates actually in effect. If the commission found that rates were unreasonable it might award the shipper reparation for his loss and secure a

change of rates for the future. This remedy, however, would not meet the difficulty that shippers, engaged in competitive business, might suffer irreparable losses due to a falling off in business. Moreover, the working procedure was slow and costly. Nor is the question of rate reasonableness entirely a shipper's problem. Under competitive price-fixing, when consumers "pay the freight," it becomes also a consumers' problem. It was necessary, therefore, that the commission have the power upon complaint, or *upon its own motion without complaint* to determine the justice and reasonableness of *new rates in advance of their going into effect.* This was accomplished by the Mann-Elkins amendment.

While the commission's power over rates was thus tremendously enhanced it did not yet have complete control. It could not name future rates to be effective as minimum rates as well as maximum rates. Competition or other considerations might still induce carriers to file, publish, and charge lower rates than those fixed by the commission. Many influences were still at work tending to make the commission's rate determinations inconclusive. Accordingly, in its 1916 report, the commission also suggested that the interests of all concerned would be best served by enacting a law, like that in effect in Wisconsin, which declared all existing interstate rates, fares, classifications, rules, and regulations reasonable for the past and which provided that no change be made except upon order of the commission.

Before this recommendation was acted upon came the series of events which laid bare the true nature of the problem of regulation in the field of railroads as it had long ago been demonstrated in the field of local utilities. It is necessary to go back a little to pick up the threads. As the unfavorable relation between income and outgo became more and more apparent, the railroads realized that applications for increases would have to be made not by individual carriers but by associations of carriers. In 1906, in connection with the Hepburn Amendment, the carriers had learned the advantages of coöperation. Accordingly, in 1910 the Bureau of Railway Economics was founded to supply information, and an association of railway officers was formed to prosecute cases before the commission.

In 1910 arose the first important case, involving simultaneously rates in eastern and in western territory. Due principally to increased labor cost, the railroads complained that a fair return upon the value of their property was not being earned. The application was denied early in 1911 by the commission

which held that operating revenues were increasing sufficiently to absorb increased expenses and that efficient management could take care of the situation.

The next general application for an increase in rates was the so-called "Five Per cent. Case" of 1914. The commission granted horizontal increases in class and commodity rates in Central Freight Association territory, but denied it in the rest of Official Classification territory. In doing so it again called attention to the fact that income could be increased by increasing the rates on special commodities, by securing increases in passenger fares from state legislatures, and by the introduction of economies and the abandonment of wasteful and unremunerative services. With the outbreak of the World War and the traffic slump following it, the railroads decided they could not afford to wait upon the suggested reforms. They applied for a rehearing and in December, 1914, the commission approved the five per cent. advances with certain exceptions.

This decision marks a new period in the handling of the railroad problem by the commission. The old standards of determining the reasonableness of rates, where the inquiry was not as to the reasonableness of the rate-structure of the carriers as a whole but as to the reasonableness of particular rates, were of no avail. It now was a question of the earning power of the carriers. In the Eastern Advance Rate Case of 1911, fifty per cent. of the tonnage and of the freight revenue of the whole country were involved in the application. Yet such was the conservatism of even those intimately associated with the work of regulation that the commission was divided upon the question whether the need of carriers for earnings should be considered. It is significant that Commissioner Daniels, fresh from his duties with a state commission where most rate cases involved questions of earning power, was one of the group who argued for a "living wage" for capital and a margin of profit to attract new capital for extensions and improvements.

We must also import into this chronology the Valuation Act of March 1, 1913, the purpose of which was to furnish some standard by which to test the reasonableness of rates. The question of a physical valuation of the railroads had been raised sporadically in the past, but as long as the chief focus of attention was the problem of adjusting *particular* rates, it had not been seriously urged. In fact, the carriers contended that revenues did not depend upon the value of their properties. After 1910, however, when the general level of rates moved into the

center of attention, their attitude changed. And when in 1911 the Commission refused to advance rates upon such evidence as to general earning power as was available, but intimated that physical valuation would introduce a new element into the calculation which might lead to a different result, the carriers changed their attitude and favored valuation.

In the Western Advance Rate Case of 1915 advances were granted in only a few commodities and in passenger fares. Commissioner Daniels again called attention to the importance of earning power and while he admitted that financial mismanagement in the cases of the Rock Island, the Frisco and the Alton had undoubtedly contributed to the bad showing, that the time had come to look at the problem from the standpoint of the consumers. Any attempt, he contended, to punish all the roads on account of the shortcomings of a few was unjust; that mismanagement was traceable to those not now connected with the enterprises; and that the proper remedy was the prosecution and punishment of the individuals and not the withholding of adequate rates to the carriers as a whole.

A fourth application for a rate increase came in the spring of 1917 shortly before our entrance into the war when one amounting to 15 per cent. was applied for. No country-wide emergency was deemed at hand and the Commission granted increases only in class rates and a few commodity rates. The trouble with the entire situation was that the period had passed when the railroads had unused capacity on hand which they were actively bidding to use. New problems of investment had arisen calling less for extensions into new territory and more for increasing the capacity of existing plants. These improvements would have to be made in the congested districts of cities where enlarged terminals, yard-tracks, sidings, warehouses, roundhouses, etc., could be acquired only at heavy costs. While there was a steady increase in the efficiency of handling traffic as shown by steady increases in the number of tons per train and per car and in ton miles per mile of road, operating expenses continued to increase. Expenses unproductive of additional revenues were also multiplying, such as grade crossing protection and safety work. While, between 1908 and 1916, $4,625,000,000 additional investment was made, these improvements appeared not to be sufficient.

For the reasons so far outlined, the railroads entered the war period with inadequate facilities for handling traffic. The war traffic still further aggravated the situation so that the under-

supply of existing facilities as compared with traffic requirements became a factor of grave public concern. The blame for this situation cannot be placed at the door of the Commission as the railroads were inclined to do. The decline in railway credit was due to more fundamental facts than any that the Commission could control. Financial mismanagement, the cumbersomeness of the rate-making machinery to which the recalcitrance of the railways themselves had measurably contributed, and the existence of lucrative opportunities for investment outside, were the chief reasons for the decline of railway credit.

We may summarize the period immediately preceding the war by a statement of the condition that the railroads were in when the President sent his message to Congress that the government take over the roads as a war emergency measure. The net earnings of the railroads had been sapped by increasing costs of operation, particularly wage increases, by the inability of the carriers to get horizontal increases in rates corresponding to the increases in cost of service. The credit of the roads was impaired by the example of bad financial management which was given wide publicity. From the physical standpoint, the roads were in a condition where, in spite of increased efficiency, the traffic offered could not be handled adequately. The capacity of the plant had been reached and further increases in capacity could only be obtained at the cost of increased investment for which no credit base appeared. While there had been several good years since the depression of 1907, these good years were by no means sufficient to offset the increasingly bad showing since 1900.

The fact of the matter appears to have been that regulatory policies developed differently in the field of national utilities as compared with local utilities. Where monopoly was early recognized as the principle of organization in local utilities, competition was the principle under which railroads were developed, and to this principle regulatory policy was attuned. It was in accord with the traditional American belief in competition among railroads as the ultimate controller of earnings. Those members of the Interstate Commerce Commission who refused to concede that the earning power of rates was a consideration to be taken into account were at least consistent in applying this tradition. With such an objective in the background, regulation was designed merely to control competition, not to displace it. The limit of rate and service control ought to be the control of discriminatory practices and no more. This, it is submitted, rough-

ly characterizes the implicit philosophy of railroad regulation previous to 1906.

But when, in the piece meal process of building up our national regulatory machinery so as to control discrimination more effectively, the provisions giving rate control to the commission had been so maneuvered as to take the rate-making initiative away from management and to give it to a regulating authority, *the crucial step had been taken which represented a break with the traditions of the past.* Continuous development along this line was bound to usher in a new policy. Commissioner Daniels' position was therefore the correct one, albeit an advanced position, in this twilight period between the passing of an old epoch and the coming of a new.

Sec. 5. Government Operation of Railroads during the World War

During the war period the motive which dominated all others in the management and regulation of railroads was unification.[12] For eight months under the Railroad War Board the aim was to "coördinate their operations in a continental railway system, merging during such period all their merely individual and competitive activities in the effort to produce a maximum of national transportation efficiency." Though this aim was only realized in part, significant administrative changes were introduced which were worked out more fully under federal control and then retained under the Transportation Act of 1920 under which the roads were returned to the owners. The most important legislation during this period was the lodging of full rate-making powers in the hands of the President by the Federal Control Act of March, 1918, at the same time that the Commission's power was reduced so that it could no longer suspend rates, but would have to content itself again with making findings after complaint. Even then the Commission was required to take into account that the transportation system was being operated as a unit, and that the Director-General could certify that the increased revenues were necessary to defray expenses. Speaking of the increases in rates made effective by the government one writer[13] says, "The method by which the increases were accomplished must have won the envy of all railroad officials who had

[12] Cunningham, W. J., *American Railroads: Government Control and Reconstruction Policies*, A. W. Shaw Co. (1922).

[13] Dixon, F. H., *Ibid.*, p. 159.

struggled through protracted hearings with federal and state commissioners, and had been obliged in the end to accept increases, if any at all, far below what they deemed necessary to meet their needs."

The over-all results of federal control during and after the war were well summarized by Director-General Hines in his final report: "It made practicable a war transportation service that could not have been otherwise obtained; its unification practices have increased the utilization of the inadequate supply of equipment so that an exceptionally large transportation service has been performed in the busy periods of 1919 with a minimum of congestion; it met the emergency of the unprecedented coal strike in a way which private control could not have done and absorbed a heavy financial loss on that account which would have proved highly disturbing to private control; it provided more additions and betterments and equipment than private control could have provided during the difficult financial period of 1918 and 1919; it dealt fairly with labor, and gave it the benefit of improved and stabilized working conditions which were clearly right; it not only did not cost more than private control would have cost during the same period, but cost considerably less on account of the economies growing out of unifications, and the total burden put upon the public (through rates and taxes) on account of railroad costs was substantially less than would have been necessary if the railroads had remained in private control and rates had been raised enough to preserve their credit; it protected the investment in railroad properties, whereas without federal control those investments would have been endangered; and it turned the railroads back to private control functioning effectively, with a record of exceptional performance in an exceptionally difficult winter, despite the disruption caused by the coal strike, and in condition to function still more effectively with the normal improvement to be expected in the weather and in other conditions." [14]

Sec. 6. **The Transportation Act of 1920**

The Transportation Act of 1920 provides, first, for a transitional policy to be applied for what has been called the guaranty period, during which the nationally conceived system of railroad organization for war purposes was to be transformed again into an organization consisting of efficient individual units;

[14] Hines, W. D., *Report to the President*, Feb. 28, 1920, pp. 45-46.

and second, it provides for a revised system of commission regulation which was to obtain in the future. We will restrict the discussion to the second of these objects, and, summarize only the provisions dealing with rate regulation, because these are the hub of the wheel.

In this connection, the greatest significance attaches to the congressional declaration of policy in regard to rates. This statutory rule of rate-making provides: "In the exercise of its power to prescribe just and reasonable rates, the Commission shall initiate, modify, establish, or adjust such rates so that carriers as a whole (or as a whole in each of such rate groups or territories as the commission may from time to time designate) will, under honest, efficient, and economical management and reasonable expenditures for maintenance of way, structures, and equipment, earn an aggregate annual net railway operating income equal, as nearly as may be, to a fair return upon the aggregate value of the railway property of such carriers, held for and used in the service of transportation." Briefly, the new rule puts upon the commission the task of fixing rates which are reasonable relative to one another, also that of so adjusting the rate structure as a whole as to yield no more than a reasonable earning power. The commission was still authorized to adjust specific rates, but the problem of adjusting the relativity of individual rates was subordinated to the requirement that rates as a whole should yield a reasonable rate of return. This provision brings federal railroad regulation more nearly in line with the practice that state administrative commissions have evolved in the control of local utilities.

For the first two years beginning March 1, 1920, Congress fixed the fair return at 5½ per cent., to which the Commission might, at its discretion, add an amount not to exceed one-half of one per cent. to be used for improvements, betterments, or equipment chargeable to the capital account. After this period the actual percentage upon property value constituting the fair return was to be determined from time to time by the commission. In such determination it was to take into account the transportation needs of the country "and the necessity (under honest, efficient, and economical management of existing transportation facilities) of enlarging such facilities in order to provide the people of the United States with adequate transportation." In determining the aggregate value of carriers' property the Commission was to give due consideration to all elements of value recognized by the law of the land for rate-making

purposes, and it was authorized to make use of the results of the work, so far as available, of its Bureau of Valuation.

Minor changes in the rate-making power were the restriction of the Commission's suspension power from ten to five months and the conferring upon it of power to prescribe minimum rates. The former amendment was designed to expedite the work of rate control while the latter sought to put an end to the competitive lowering of rates. The authority to grant relief from the long and short haul principle was surrounded with some restrictions, the most important being the requirement that the Commission may not "permit the establishment of any charge to or from the more distant point that is not reasonably compensatory for the service performed." Authority over joint rates was increased by a grant of power to fix them upon its own initiative as well as upon complaint, to fix them as minima as well as maxima, and to prescribe their division between participating carriers.

The development of railroads on a competitive basis has made some railroads financially strong and others weak. Although the act contemplates that the reasonable earning power may be determined by rate-territories, in which strong and weak roads will be commingled, this does not eliminate the competition of these roads with each other for traffic upon the basis of the rates fixed. Some carriers will therefore have earnings in excess of a fair return. To take care of these cases, the act introduces the new principle that the public has a vested right in these excess earnings. The so-called "recapture clause" provides for the disposition of such excess, as follows: "any carrier which receives such an income so in excess of a fair return, shall hold such part of the excess, as hereinafter prescribed, as trustee for, and shall pay it to, the United States."

The act then goes on to provide that one half of all net operating income in excess of 6 per cent. must be placed in a reserve fund by each carrier to be used in any year for making up deficits below a 6 per cent. return. These sums may be used only in meeting interest, dividends, and rentals. The reserve may be built up until it equals 5 per cent. of the total value of the carriers' property. Excess earnings beyond this amount may be retained by the carrier and used for any lawful purpose. The other half of the excess earnings must be paid to the Interstate Commerce Commission, which must use these funds to maintain a general railroad contingent fund. An exception is provided for in the case of those carriers that propose to undertake the

construction and operation of new lines. These may secure permission from the commission to retain all earnings derived from the new line for a period not in excess of ten years.

The commission is authorized to use the sums in the contingent fund as a revolving fund for the purpose of making loans to carriers when the object of the loans is to refund maturing securities originally issued for capital account or to meet expenditures properly chargeable to capital account. The commission may also purchase transportation equipment and facilities and lease these to carriers under certain prescribed conditions.

The arrangement just described has met with much opposition, particularly from the strong carriers. It was, however, approved by the United States Supreme Court in the Dayton-Goose Creek case.[15] The reason for such opposition is readily understood when we compare past traditions with the policy contained in the recapture clause; for the break with the past is striking. The arrangement is somewhat similar to service-at-cost franchises in the local utility field, which will be described presently. What is of peculiar significance in a study of the comparative development of regulatory institutions is that in one way or another the inner meaning of regulation, both in the field of the local as well as of the national utilities, has come to be the control of earning power through the medium of rate control. It is as yet imperfectly realized in the case of railways.

Sec. 7. Extension in Scope of Jurisdiction of the Interstate Commerce Commission

Prior to 1906 the Interstate Commerce Commission had been almost exclusively a railroad commission. The act of 1887 had included water carriers only when joint arrangements had been made for continuous shipment by rail and water. The Hepburn Act, as we have seen, added express and sleeping car companies and pipe lines, as well as industrial railways, private car facilities, and terminal facilities of every kind by broadening the definition of the terms "railroad" and "transportation". These extensions of the commission's jurisdiction were as much for the purpose of ending the discrimination evil among railroads as to extend to new types of public service enterprises the prohibitions and requirements of the Act to Regulate Commerce. The Mann-Elkins Act of 1910, however, extended jurisdiction in a

[15] 263 U. S. 456 (1924).

new direction by including telegraph, telephone and cable companies.

Gradually the Interstate Commerce Commission pared down the power of the states to regulate national utilities. The first step in this process was the previously cited [16] Wabash Case which induced federal action while at the same time it checked state control. The next step in subordinating state to federal regulation was taken in the Minnesota [17] and Shreveport Rate Cases.[18] In both cases the railroads were under the competitive necessity of adjusting interstate rates to rates fixed by state authority, and the decision in the former foreshadowed the decision in the latter. Justice Hughes, who rendered the opinion in both cases, said in the Shreveport Case: "Wherever the interstate and intrastate transactions of carriers are so related that the government of the one involves the control of the other, it is Congress, and not the state, that is entitled to prescribe the final and dominant rule. . . . It is for Congress to supply the needed correction. . . . So far as these interstate rates conformed to what was found to be reasonable by the Commission, the carriers are entitled to maintain them, and they are free to comply with the order by so adjusting the other rates to which the order related as to remove the forbidden discrimination. But this result they are required to accomplish."

The Transportation Act of 1920 made the above a part of declared public policy. The law provided that whenever the Interstate Commerce Commission, after full hearings, finds that any rate, classification or regulation imposed by the authority of a state (or fixed by the President during the period of federal control) causes any undue or unreasonable advantage or preference or prejudice as between persons or localities in intrastate commerce and those in interstate or foreign commerce, or causes unjust discrimination against such commerce, the commission shall prescribe the rate, classification, or regulation thereafter to be charged or applied that will remove the discrimination or preference and which must be observed by the carrier "the law of any state or the decision or order of any state authority to the contrary notwithstanding." This provision as interpreted by the commission deprives the states of any effective rate-regulating power. While the state commissions may be called upon to confer with the federal commission or to hold joint hearings, the latter is required merely to give

[16] At page 267 *supra*.
[17] 230 U. S. 352 (1913).
[18] 234 U. S. 342 (1914); 23 I. C. C. Reports 31 (1912).

notice and an opportunity to be heard. Operating under this clause the Interstate Commerce Commission has not only swept aside state-made rates where the claim was made that the rates discriminated against interstate commerce, but it has also held that rates of its own selection should be substituted for state-made rates where an insufficient amount of income, as measured by the Congressional standard, was being obtained from such state-made rates.

In the regulation of interstate carriers the federal government is thus clearly in the ascendant with the states giving way step by step. The same is true of the telegraph industry. In the electric railway and telephone industries, however, we have a field where a very definite overlapping of jurisdiction has occurred. The Interstate Commerce Commission from the first maintained that interurban electric railways carrying passengers on an interstate journey were subject to the Act, although the courts were inclined to hold that such interstate carriage must be a substantial part of its business.[19] The rates and service of a large number of interurban electric railways are thus subject to the federal commission's regulations. That body has laid special stress upon the establishment of through routes and joint rates over electric railways in connection with steam railways.

Long distance telephone rates and service are likewise subject to the Interstate Commerce Commission. At one time it was contended that telephone exchanges could be operated without being subject to regulation because the telephone was patented. This attempt to escape regulation failed. Local and state regulation has taken complete jurisdiction of this industry. But as long distance communication increases in volume we may expect that state authority will be displaced by federal authority in the control of the toll business of our telephone utilities. In principle there is little difference between the legislation affecting these utilities as laid down by Congress and as contained in the different state laws. The difficulty has come in the diversity of practices introduced by the federal commission as compared with those adopted by state administrative commissions.

Sec. 8. **The Regulation of Water Carriers**

Few states are concerned with the regulation of water carriers owing in large part to the fact that water carriage is generally for long distances and hence interstate in character. In

[19] *Omaha and Council Bluffs St. Ry. Co.* v. *I. C. C.*, 230 U. S. 324 (1913).

fact, administrative regulation has been slow to develop because competition among carriers by water has been much more prevalent than among carriers by land. The protection afforded by this rivalry supplemented by such regulation as is contained in general laws, and in the application of common law principles of regulation by the courts (admiralty law), was regarded as sufficient until recently.

Owing to the competition between rail and water carriers, however, Congress became more interested in the conduct of water transport. The Interstate Commerce Act of 1887 applied to interstate traffic and to traffic moving between the United States and foreign countries, when transported over joint rail and water routes where the transportation takes place under "a common control, management or arrangement for a continuous carriage or shipment." Under this act the Interstate Commerce Commission had power to establish through routes and joint rates; it fixed maximum joint rates, and determined the division of such joint rates between rail and water carriers; it ordered physical connection between rail and water carriers, and regulated terminal facilities, which were operated in connection with such joint handling of interstate traffic. The scope of the commission's power was extended by the Panama Canal Act of 1912 to include what is called "port to port" traffic of such water carriers as are owned or controlled by railroads. In other words, the act adopted the policy that the railroads must not be in competition with water carriers which they own or control in order that their ownership or control of the lines may continue. Indeed, continued ownership and operation were contingent upon securing the consent of the commission and upon the further condition that the rates, schedules and practices of these controlled water carriers be filed and become subject to the act.

Even though joint rates and routes to foreign countries not adjacent to the United States had been voluntarily established between domestic railroads and ocean carriers, no control was exercised over such ocean traffic. But it was provided that the commission might require any railroad entering into such an arrangement "to enter into similar arrangements with any or all other lines of steamships operating from said port to the same foreign country." The object of this proviso was to prevent undue discrimination between water carriers by rail carriers engaging in foreign commerce. Thus administrative regulation was not applied to independent water carriers engaged in interstate or foreign commerce in port-to-port traffic.

This omission was corrected by the United States Shipping Act of 1916. This act applied to common carriers by water engaged either in foreign or interstate commerce on the high seas or the Great Lakes on regular routes from port to port. However, tramp vessels are expressly excluded. As to included common carriers the act made illegal any unjust discrimination or undue preference in rates or service as to any shipper, locality, or kind of traffic. It prohibited rebates and provided for the filing of reports and rates with the United States Shipping Board which was created by the act.[20] The Board's rate-making powers were limited to domestic carriers, and included approval of increases in rates, the prescription of the form of tariffs, and the fixing of just and reasonable classifications and practices. Only the provisions against unjust discrimination between shippers and ports apply to water carriers in foreign commerce. It is important to note that in domestic commerce carriers are free to fix *minimum* rates while in foreign commerce the only limitation is that rates should not be unjustly discriminatory.

The United States Shipping Board consists of seven commissioners, appointed for six years by the President. It was created to investigate violations of the act either upon complaint or upon its own motion, and it was empowered to issue orders and secure their enforcement. Its orders are subject to court review, in accordance with the usual administrative routine.

There appears thus to be some danger of overlapping of jurisdiction as to these administrative bodies. Certainly there is interrelation between port-to-port rates on the one hand and rail-and-water rates and all-rail rates on the other. The need for close coöperation is clearly apparent.

[20] The board's functions were further expanded by the Merchant Marine Act of 1920. As a part of its regulatory work, the board coöperates with the Post Office Department in fixing rates for ocean mail. It also determines whether a United States vessel may be transferred to foreign registry and it grants charters to aliens. Cases of discrimination by foreign governments are reported to the President. Its promotional activities involve (a) study of the main routes desirable for American commerce; (b) the making of loans from a construction loan fund in an effort to aid private citizens in building ships; (c) the investigation of the comparative costs of building and operating American and foreign vessels: (d) the adjustment downward of income taxes of shipping companies under certain conditions in order to encourage new construction.

Through a subsidiary organization, known as the Emergency Fleet Corporation, the board also maintains and operates the government owned merchant fleet. Actual operation is carried out by the President of the Corporation who reports to the Shipping Board as to a board of directors.

Sec. 9. The Federal Power Commission

Recently we have witnessed a further extension of federal authority in the regulation of public service companies.[21] On June 10, 1920, Congress passed the Federal Water Power Act which marked the climax of a long period of discussion in regard to the adoption of a new national policy with respect to the water powers under federal control. Previous legislation (in 1901 and 1910) had failed to take into account the growing importance of electric power in transportation and in industry, and nothing had been done to meet the need of securing regulatory programs which would on the one hand lead to a development of these natural resources and would on the other hand safeguard public interests, particularly those of regulation and of conservation. It was generally agreed that the chief defect of the earlier legislation had been that the licenses conferred only an uncertain tenure which in turn made the financing of developments difficult.

The Federal Water Power Act provides for the improvement of navigation, the development of water power and the use of public lands in connection with such development. To further these purposes the act creates a Federal Power Commission consisting of the Secretary of War as chairman, the Secretary of the Interior, and the Secretary of Agriculture, with jurisdiction over all projects involving the construction, operation and maintenance of dams, water conduits, reservoirs, power houses, transmission lines, and other works associated with the development, transmission, and utilization of hydro-electric power. The commission's jurisdiction extends only to navigable waters of the United States, and public lands, and such other waters of the United States over which Congress has jurisdiction under its authority to regulate commerce among the several states and with foreign countries.

The purpose of the act was to enable applicants for a power project yet to be developed, or the incumbents of a grant under previous legislation, to secure a license for a term not exceeding fifty years. This license is a contract between the government and the licensee, the terms of which cannot be altered by the government without the consent of the licensee. The license can be cancelled by executive action if the licensee fails to begin

[21] Kerwin, J. G., *Federal Water Power Legislation*, Columbia Univ. Press (1926).

construction. After construction has been started the license can be cancelled only through action by a court. When the license expires the property may be taken over by the federal government for its own use or a new license may be issued to the old licensee or some newcomer. If the properties are taken either by the government or a new licensee, the old licensee is paid his "net investment." This is an amount equal to his actual investment plus severance damages and less the sums set aside for depreciation and amortization. The act also provides that renewals of the license must be upon reasonable terms.

The terms of the leases provide that the licensee must make his improvements conform to a scheme of development which will secure the fullest reasonable utilization of the resources of the stream; he must keep the plant in good operating condition by making all necessary repairs and replacements; he must pay the United States an annual rental for the use of public property and reimburse the government for the cost of administering the act. Other duties of the commission are the regulation of rates, services, and securities where the business is purely interstate or where, though the business is intra-state, the state has not provided a similar agency. In the execution of these principal objects the Federal Power Commission makes all needed investigations and is authorized to make others relating to water-power resources.

If the safety of the country demands such action, the President of the United States is empowered to take possession of such properties for the purpose of manufacturing nitrates, explosives, or munitions of war, managing and controlling the operations for such length of time as may appear necessary. The commission is then required to fix just and fair compensation to the licensee for such use.

The Federal Power Commission is thus an administrative commission with powers of regulation conferred under general congressional authority and applying to hydro-electric power utilities. The regulation in this instance also has a proprietary aspect because the leases cover the use of public property for which compensation must be given.

We are indebted to the political principle of federalism in many respects. It has borne its best fruit in maintaining political union by affording recognition for local differences. The United States are now an economic unit for all practical purposes. Public utilities having a national market cut across these

state lines and cannot be advantageously confined within them merely to save the autonomy of states in regulating such utilities. It may become necessary to provide some means of administrative decentralization, such as regional commissions; but the policies upon which the regulation of national utilities must be based should always be conceived from a national point of view.

CHAPTER XIII

LOCAL REGULATION OF PUBLIC UTILITIES—FLEXIBLE RATE FRANCHISES

The regulatory powers of state commissions have been under fire from two directions. From one direction comes the federal government extending the powers of the Interstate Commerce Commission to control even the intrastate service of national utilities; from the other direction come some local governments seeking a decentralization of the state commission's control over utilities. This latter tendency is the subject-matter of the present chapter. It is a tendency that is growing in significance as urbanization continues and complex metropolitan areas acquire a sort of political self-consciousness.

This trend raises important questions of policy. They may be grouped around three major problems: (1) In what respects has regulation of local utilities by state commissions proved ineffective? (2) Is decentralization of control the best remedy? (3) If so, what new institutions or devices need to be developed in order to make local regulation effective? The last question brings in the discussion of flexible rate franchises.[1]

Sec. 1. Centralization versus Decentralization in Public Utility Regulation

In tracing historically the evolution of utility regulation one deals largely with the shifting back and forth of sentiment toward centralization and decentralization of control.[2] The present movement of federal power into the intrastate field, which has just been described, is a parallel of what happened when local control by franchises was being replaced by centralized control by a state commission. Recently, however, the home rule aspirations of our metropolitan cities have called for a reversal of this

[1] As will appear shortly, flexibility of rate-structures may be obtained by means of local administrative commissions, to some extent by "sliding scale franchises," but best of all by means of "service-at-cost franchises."

[2] The question, how far these two conflicting principles should be recognized, is too large and too technical to be discussed in detail here. All that can be done is to point to the trend and the problems involved.

tendency—a demand, in short, for the reëstablishment of a greater measure of local control.

It cannot be gainsaid that many aspects of rate and service regulation have both a state and a municipal setting. They require detailed knowledge of local conditions as well as coöperation between state and municipal officers. It is thus proper to question whether the existing distribution of power and responsibility is a final settlement of the problem. Conceivably, the future may see some rearrangement into subordinate territorial jurisdictions, with a power of appeal to central authority upon matters requiring administrative uniformity.

A primary element of the problem is that of enlisting and securing local coöperation. This brings in the psychology of public officials. It cannot be denied that the removal of regulatory powers from common councils to state commissions (and we may, perhaps, add from state commissions to the Interstate Commerce Commission as well) has introduced on the whole a non-political influence into the decision of economic questions. It has, however, also weakened those influences which develop a coöperative spirit.

In the trial of cases at which local officials are always representing consumers' interests, the combative, rather than the coöperative, instincts are developed. No doubt, this controversial attitude has brought some good results, particularly while the more fundamental basis for a regulatory structure was being laid. However, in making the more delicate adjustments which the future calls for, a spirit of compromise will be needed in order to find solutions for historical maladjustments, and in order to devise expedients where human judgment and experiment play a large part. If the conduct of public utility enterprises is a truly public function, involving complex and intimate social relations, no approach to a satisfactory adjustment of these relations can come when decisions are made entirely by third parties and by means of judicial or semi-judicial processes. The history of a number of franchise situations shows that even the tensest atmosphere of controversy may beget a coöperative spirit. This social-psychological element is one which the state commission system does not sufficiently emphasize.

There has also been a tendency in view of the concentration of regulatory processes elsewhere for local communities to lose touch with *the facts* as they develop. It is no answer to say that laws provide for complete publicity. The publication of commission reports and decisions does not bring that close touch

with the facts which can come alone from actual and continuous participation in regulation.

In view of the litigious nature of the regulatory process there has often been undue delay in rendering decisions, which has worked hardship sometimes upon the companies and at other times upon consumers. The delay is partially traceable to inadequate appropriations in view of the expanding scope of regulation. However, on account of these time-consuming conflicts the commissions have been unable to turn their energies in the direction of constructive investigations, one of the chief purposes of their creation. Under existing conditions there is no clear allocation of responsibility for furnishing adequate service. In many of its details good service requires the concurrent functioning of the companies, the local authorities and the state commissions. In view of the effect of service orders upon the cost of rendering service, and hence, indirectly, upon net earnings, minor matters that ought to have been attended to quickly have been treated as a matter of principle. They have been litigated in formal cases and the decisions frequently appealed to the courts, where they might have been adjusted through informal conferences. Centralization, unless reasonably counteracted, begets bureaucracy and formalism in administration. Local responsibility stimulates community interest and the result shows itself in all the channels of community life.

Sec. 2. **Local Regulation of Public Utilities**

Since the advent of the state commission system of regulation there has been much discussion of the relative merits of state and local control. It has always appeared that the issues were not properly joined. Each side to the controversy has too often been content to set up a man of straw as its adversary and proceed to demolish him. The historical treatment accorded the various systems of regulation in this volume has, it is to be hoped, set the subject in its proper perspective. We have seen that the system of local regulation has generally been the dual one of *contractual regulation* by means of the *franchise* and of *police power regulation* by means of the *ordinance*. The subject-matter of police power regulation usually covered such matters relating to service, construction, and operation as grew out of the municipality's control over streets. These rights of control by means of the police power were held by the courts to be such that they could not be bartered away under a franchise.

Yet there always remained an element of conflict between matters supposedly fixed by franchise and matters left to continuous regulation under the police power.

As to contractual provisions, the municipality, of course, had the power to compel performance by means of legal proceedings. A legal proceeding usually took the form of an action, brought by the municipality in behalf of the state, to forfeit the franchise for "non-user or mis-user". These actions were difficult to maintain. An improvement was sought by working along two lines. The first was an attempt to draw up franchise provisions which would give larger powers of administrative control to the local councils acting either as legislative bodies or through administrative agents like local commissions or bureaus. These will be described presently. The second line of advance was by creating state commissions which would have general powers of control, particularly over the more vital matters relating to rates and security issues, but giving to local councils full control over service *in the first instance.* This may be spoken of as local regulation *adjunct* to state commissions.

(a) *Local regulation as adjunct to state commission regulation.*

In Wisconsin, for instance, the common councils were given full power (1) to determine by contract, ordinance or otherwise the quality and character of service to be furnished by any utility operating within the municipality and to fix initial charges to be made therefor; (2) to require of any public utility such additions and extensions to its plant as shall be reasonable and necessary for the public service; (3) to designate the location and nature of all such additions and extensions, the time within which they must be completed and all conditions under which they must be constructed; and (4) to provide a penalty for non-compliance with any such requirements. Utilities were required to obey these orders unless they had been set aside or modified by the state commission (which had concurrent jurisdiction) upon complaint of the public utility or any qualified complainant. This procedure made the state commission a board of appeals. It was claimed that the powers of local councils were thereby enlarged, and that an intermediary was at the same time placed between the municipality and the courts (to which such legislation could be brought by the utilities under a power to review), whose equipment, skill, experience and position of unbiased responsibility would inject greater wisdom into the regulatory process. The commission had the power to

make nugatory unreasonable regulatory measures taken by municipal councils.

This view of local regulation goes on the assumption, at that time, perhaps, largely true, that local councils act without proper investigation and are unrestrained by legal and economic principles. The background of those favoring state commissions in the first decade of the twentieth century, both as regards the inefficiency of court processes and the helplessness of local councils, is well illustrated by two citations from the decisions of one court. Referring to a rate litigation involving the Des Moines Water Utility, Judge McPherson wrote: "It is now more than three years since the passage of this ordinance. This case illustrates the evils in connection with the fixing of rates by municipalities to govern public utility corporations, . . . by the time this case is decided by an appellant court, at least four years will have elapsed from the passage of the ordinance until the matter is put at rest by the courts. . . . The present expensive chaos should be brought to an end. It is well known by all informed men that city councils necessarily adopt rates with but little or no investigation as to what rates ought to be fixed. The result is that we have ordinances fixing rates based upon little intelligent effort for the ascertainment of the facts. Some of the states like New York, Massachusetts, and Wisconsin, have state commissions of competent men, who give public hearings, and who do nothing behind doors, nor in secrecy—a commission with no member interested as a taxpayer of the city, and with no member subject to influences other than the ascertainment of the truth and the facts. Rates are thus fixed with which most fair-minded people are ready to acquiesce."[3] Shortly after, in another rate case the judge returns to this subject in the following words: "This litigation has cost both the gas company and the city extravagantly large sums, most of which cannot be taxed as costs, nor recovered back by the party successful in the end. Much of this kind of litigation and practically all the expense, would be avoided if Iowa, like so many of the others, including some neighboring states, had an impartial and city non-resident commission or tribunal, with power to fix these rates at a public hearing, with all interested parties present, with the tribunal selecting its own engineers, auditors, and accountants. Too often we have selfish, partisan, prejudiced and unreliable experts engaged for weeks at a time,

[3] *Des Moines Water Co.* v. *City of Des Moines*, 192 Fed. Rep. 193, p. 194 (1911).

at $100 or more and expenses per day, exaggerating their importance and making the successful party in fact a loser." [4]

These excerpts point out some of the reasons why exclusive regulation by state commissions has been advocated. Another argument has been the inability of local agencies to introduce a scientific basis for regulation by requiring accurate, uniform, and well-conceived systems of accounting and statistical records. This, undoubtedly, has been a development for which state regulation must be given much credit. It was also urged that the expense of maintaining a competent staff of administrative officials to supervise utilities would be prohibitive to all but the larger cities.

The most serious defect, however, was found in the fact that the incorporated city or village is no longer the natural unit of control in proportion as it has ceased to be the natural economic unit of supply. This was recognized also by Dr. Delos F. Wilcox who best represents those who would enlarge municipal powers. In an early work [5] he writes: "After all, the day of walled cities is past and now an urban community is primarily a congested spot on the state map, a center of population and an industrial activity intimately related to the personal and property interests of all the citizens within its sphere of influence, which often extends to and beyond the boundaries of the commonwealth itself. Public utilities, although still comparatively simple industries, have grown far enough beyond merely local bounds to require complex governmental machinery to operate or regulate them."

The advocates of exclusive regulation by state commission point to certain facts in the development of public utilities to prove their claim that exclusive local regulation would be difficult if not impossible. One writer [6] explains that in his state at the time of writing (1914) more than 93 per cent. of the telephone exchanges extended beyond municipal limits. It is a matter of common knowledge that the expanding consolidation movement, combined with the technical progress in long distance transmission of electric power, gas and electric signals, has joined together under single corporate or administrative control the supply of public utility services hitherto rendered by organizations operating in separate cities and even separate villages.

[4] *Des Moines Gas Co.* v. *City of Des Moines*, 199 Fed. Rep. 204, 205 (1912).

[5] Wilcox, D. F., *Municipal Franchises*, The Eng. News Pub. Co., 1910, Vol. II, p. 704.

[6] Holmes, F. L., *Ibid.*, p. 301.

This fact, undoubtedly, makes for an enlargement in the unit of control. For, after all, our incorporated cities and villages, since they are "public instrumentalities established in aid of the administration of the affairs of the state," have authority limited to the geographical area entrusted to them by the parent state. The paramount and original power of regulation is in the state which may and does delegate that power to subordinate public corporations. It must, therefore, be admitted that the successful administration of a system of local regulation has a great handicap to overcome, imposed upon it by the economic evolution of these industries.

No unbiased student of the history of regulation will deny that the system of franchise regulation required radical amendment. By no means all are willing to admit that the system of continuous regulation by state commission should be exclusively substituted for it. There are many who contend that public ownership in its varied forms will best secure the true objectives of the social economy. Others are insistent that a larger measure of local autonomy be left to cities in the control of their local utilities. They point out, for instance, that the concessions made to local regulation in Wisconsin and elsewhere, at the time the state commissions were created, brought forth no activity on the part of municipalities because of a fear that all determinations of consequence would be appealed to the state commission.

The problem of working out some measure of local autonomy under state regulation has been variously met in the different states. At the time that state commissions were established much conflict existed over drawing a line between state commission regulation and local regulation. Where there were constitutional provisions granting home rule to cities, or where local sentiment was strong in the legislatures, a good deal of authority was left in local hands. The Colorado constitution, as amended in 1902, gave the city of Denver "home rule" as to its municipal affairs. The city charter provided for the initiative in legislation and for the adoption of franchises by vote of all tax-paying electors. Arkansas, Texas, Iowa, Kansas, Kentucky, Michigan, Minnesota, and Nebraska are states in which important local utilities remain subject to local regulation.[7]

Legislatures were particularly unwilling to grant to state commissions regulatory powers over publicly owned and operated

[7] Arkansas and Minnesota have recently enlarged the jurisdiction of their state commissions.

local utilities. Only eleven states have such a provision. Arkansas and Michigan make it the duty of the state commission to advise these publicly owned utilities in their operation and management.

With respect to privately owned local utilities some measure of local control is granted in exceptional situations. In New Mexico, South Carolina, Virginia, and Oklahoma, for instance, the commission in fixing rates must remain within the maximum rates originally fixed in the franchises, and the law gives the local authorities a good deal of autonomy. In Alabama and Pennsylvania contracts between cities and public utilities must first be approved by the state commission. In Mississippi the state commission and local authorities are given concurrent jurisdiction over street railways. In Ohio, under a home rule provision, cities may fix both rates and service by ordinance as franchises expire. But the ordinance provisions may be appealed to the state commission which may determine reasonable rates and service. In California, Illinois, and Louisiana, cities may regulate local utilities in the same manner as is done under the state commission system, but if a city intends to take over such regulation the proposal must first be submitted and favorably voted upon by the electors. In the same manner a city may surrender its powers of exclusive regulation to the state commission.

(b) *Regulation of public utilities by local commissions.*

The strong sentiment for local autonomy brought forth another line of advance which has been pursued in some localities. This advance has assumed two forms. The redrafting of franchise provisions so as to make them service-at-cost franchises, will be discussed later in this chapter. A second form of local regulation, which adapts administrative regulation to local conditions will be explained first.[8]

Under a constitutional provision granting home rule to California municipalities, the city of Los Angeles inserted a section in its charter empowering the city council to fix the compensation for the sale of public utility services. Thus the rates for gas, electric light and power, telephone and water service were for a long time fixed by the local council. In 1909, acting under the initiative provision of the city charter, the people of Los Angeles adopted an ordinance which created the Department

[8] The commission or city manager form of local government tends to aid this movement.

of Public Utilities, consisting of three commissioners. At first the rate-fixing power of this department was merely limited to recommending annual scales of charges to the council. In 1911, however, by an amendment to the charter, the Board of Public Utilities was created and given the power conclusively to determine rate schedules subject to an appeal by a dissatisfied customer to the council. The council, by a two-thirds vote, was empowered to set aside the Board's ruling. This Board thus had all the powers and duties of an administrative commission, including powers of investigation, the duty to report, to fix rates, to investigate problems and to control generally by means of rules and regulations the operation of utilities. Later in the year, a constitutional amendment was adopted whereby cities by vote of their electors might relinquish the right of local control to the railroad commission, or, having previously relinquished it, reassume control.[9]

Missouri adopted similar legislation in 1907 empowering cities to fix reasonable rates by ordinances for all local utilities. It also authorized the setting up of commissions with investigatory powers. Pursuant to this enabling legislation Kansas City in 1908 established a Public Utility Commission of seven members. This was later reduced to three members. The commission was given power to investigate facts in regard to reasonable service and rates and to administer franchises. Another Missouri city, St. Louis, established the St. Louis Public Service Commission in 1909. This was a commission of three members appointed by the mayor and confirmed by the council. It was empowered to investigate operations, service, rates and franchises and to make recommendations to the council.

The three illustrations given were not in all respects comparable to the state commissions as we now know them. In the first place they were of the type of advisory commissions. Although they had extensive powers of investigation, they did not have the plenary power of making orders. They depended for their effectiveness upon the close coöperation of the local council. The St. Louis and Kansas City commissions have since been superseded by the Missouri Public Service Commission. The St. Louis commission, on account of the thoroughness of its valuation and rate work, gained a very fine reputation and did much to further the technique of regulation. These local com-

[9] A constitutional amendment of 1915 again reserves rate-making powers to the California Railroad Commission, leaving control over service upon an optional basis.

missions should not be confused with the New York Public Service Commission of the First District, or, latterly, with the New York Transit Commission. These were state commissions having a geographical jurisdiction limited to the metropolitan district of New York City. They were independent of the local common council with which they have been in more or less open conflict. In fact, it would seem that, instead of satisfying home rule aspirations, the New York arrangement has aggravated them.

For small communities the Wisconsin system appears to be admirably calculated to give effective regulation, at the same time giving scope to local interests. For the large cities an optional system appears best, whereby designated cities may be authorized to work out flexible-rate agreements with designated public utilities, subject to commission approval, as will be more fully explained in the following sections. The commission idea is so well established and knowledge of administrative standards has become so widespread, that, in the case of large communities, the earlier objections to local regulation fail longer to make their mark.

Sec. 3. **Sliding Scale Franchises**

A fundamental defect of franchises in the United States, other than the indeterminate type, was that there was no flexibility in the rate structure. In Great Britain a similar situation obtained but the bad results did not become as apparent because Great Britain early adopted methods that secured better administration. This was accomplished by resorting to two measures: (1) a regulatory authority whose function was the periodical determination of maximum rates with which was associated a maximum dividend; (2) the legislative control of the capitalization of public service companies.

(a) *The "Official Revision System" of Great Britain.*

In Great Britain, after a preliminary period of competition, the maximum rate and maximum dividend plan was applied to gas companies. The theory was that if profits were more than enough to pay the stipulated dividend and to make up the reserve fund allowed by law, then the excess should be used to reduce the price of gas. If a company did not make reductions voluntarily, the Court of Quarter Sessions, on the petition of two gas consumers, was empowered to bring about rate changes compulsorily. It could appoint revision commissioners to make

an inquiry by holding hearings and examining witnesses. It could appoint an accountant to examine the company's accounts. If the court then found that there were no grounds for the complaint, it might assess the cost of the proceedings against the petitioners. The system was known locally as the "Official Revision" system. The scheme was a comparative failure. It was resorted to infrequently because of the difficulty of finding men who were willing and competent to secure a revision of the rates. In this connection recent experience in the United States is more reassuring.

Robert Whitten points out succinctly the inherent defect of this particular mode of procedure: "Although there were undoubted difficulties in a system of rate regulation by commission, the failure of the official revision system in London is certainly no evidence of the impracticability of this method of regulation. In this case the revision commissioners were so tied up by the terms of the statute of reference that they could do little towards securing any degree of equity in their judgment.

"The vested rights claimed by the companies under prior legislation and confirmed in the revision statute so limited the commissioners that a decision of the question on its merits was impossible. A fundamental defect that made a farce of the revisions was that the entire system was based on a maximum dividend on a capitalization that was not subject to adequate regulation. The maximum dividend system is based on a limitation of profits, but there can be no limitation of profits through a maximum dividend system unless capital is also controlled. Moreover, the revision commissioners had to confine their inquiry to the earnings of the current year."

(b) *The "Sliding Scale System."*

The revision system having failed, a demand arose for some *automatic* system of regulation. To that end, it was suggested that the maximum dividend be replaced by a sliding scale of returns. The germ of this suggestion was contained in a Gas Act proposed for Sheffield in 1855. It provided that dividends to stockholders might be increased to a certain maximum rate if accompanied by certain prescribed reductions in gas prices. In the period from 1855 to 1875 there was considerable agitation on the part of consumers for the more general adoption of sliding scales, but the attitude of companies was hostile to the proposal. It should be stated that the adoption of the system has at all times been optional with the companies. After 1875 there was

a marked change of sentiment on the part of the companies, and its adoption became quite general.[10]

The sliding scale implies a change in dividend rates to the stockholder with a given change in service rates to customers. In accordance with the London Sliding Scale, generally used in England, there is first established a *standard* selling price for gas and a *standard* rate of dividend. For every penny of reduction below the standard price, the companies are empowered to pay ¼ per cent. above the standard dividend. The purpose of the new plan was well stated by Sir George Livesay, President of the British Association of Gas Managers, in his annual address before the Association back in 1874:

"It is now universally admitted that the supply of gas must be a monopoly of which we are the fortunate possessors; but the objections to all monopolies are so great that nothing but necessity can justify them. It is, therefore, of the utmost importance, if we would retain our position, that our customers be satisfied, which I unhesitatingly contend is possible of attainment.

"It ought to be possible to frame a scheme, to be embodied in a general act, that should cause the interests of gas companies and their consumers to run side by side, whereby both should participate in any improved or economical working, giving the companies a slightly increased dividend for every reduction in price below a certain minimum standard; and, to be perfectly fair, the companies would have to submit to a reduction of dividend if their prices exceeded a maximum limit. . . . I hold it to be most strongly to the interests of gas shareholders, directors and managers to heartily assist in carrying out some system whereby they might have their customers with them, some easily workable self-acting arrangement that would put an end to the cat-and-dog life, and make them live and work in peace with each other."

Another speaker in an argument of counsel for the Metropolitan Board of Works at the Parliamentary session of 1875 set out the theory as follows:

"As we have not got in this trade the general check and stimulus of supply and demand, we must attempt to replace it by some other motive, and the contention seems to lie between the existing machinery, which is a revision by gentlemen as competent as can be found, and that proposed

[10] A Massachusetts report in 1906 by a Special Legislative Committee on the London Sliding Scale for gas companies records the following increase in the number of companies working under this plan:

	1875	*1883*	*1893*	*1903*	*1904*	
England and Wales....	1	72	157	192		
Scotland		..	1	4		211
Ireland		2	5	7		

The number has since increased to over 250 companies comprising about half the total in the gas industry. *Cf.* C. S. Morgan, *Regulation and the Management of Public Utilities*, Houghton Mifflin, 1923, p. 157.

by the bill—that is to say, a fine if they charge a high price and a reward if they charge a low price. . . . And the idea before my mind as a man of business is that the general stimulus and interest in conducting a trade—that is to say, getting a large profit, or appearing to incur a smaller profit—would be a greater stimulus to very good management than the visits or inquiries of outsiders would be a check against bad management."

In 1876 provisions known as "Auction Clauses" were included in the sliding scale arrangements for two London companies. These provisions later became an integral part of all grants. In their most common form such clauses provided that the companies might sell new issues of stock either at public auction or by advertising for bids. In the latter case an upset price was fixed and communicated under seal to the Board of Trade. If the bids did not realize the upset price, the stock was then offered to the company's stockholders at that price. Premiums received were to be devoted exclusively to capital expenditures. By means of the auction clauses it was hoped not only to control the capitalization of the companies but also to secure capital at a lower rate.

Another variation, first introduced in the Newcastle Gas Act of 1879, was the provision for a neutral zone about the standard price within which no rise or fall in dividends could take place. This was for the purpose of enabling the companies to overcome some sudden emergency such as a strike or a sudden increase in the price of coal.

It is clear that the crucial points in the arrangement were: (1) the initial price; (2) the standard dividend or return on capital; (3) the ratio of increases or decreases in return to decreases or increases in price. The proper determination of these elements proved to be matters of great delicacy and importance and were usually the result of an agreement between specific companies and Parliament.

(c) *The Sliding Scale System of Massachusetts.*

The sliding scale in a modified form was extended to some electric light and power companies in Great Britain and was later imported into the United States. A special committee [11] of the Massachusetts legislature made an exhaustive investigation in 1905. Only the minority report recommended that the sliding scale system of rate regulation be applied in the case of the Boston Consolidated Gas Company. This recommendation, however, was enacted into law in 1906.

[11] Justice Brandeis was actively associated with this committee.

The Boston sliding scale plan, the adoption of which was also made optional, provided a standard price for gas of 90 cents per thousand cubic feet, and a standard dividend rate of 7 per cent. For every reduction of five cents in price the company was allowed to increase its dividend rate 1 per cent. during the following year. An emergency reserve fund was created by requiring that a sum up to 1 per cent. of the capital should be set aside annually out of earnings until the fund equalled 5 per cent. of the capital stock. Excess earnings above these requirements were to be paid back to the towns according to the number of miles of main. The minimum price at which additional issues of stock were to be sold was fixed by the Board of Gas and Electric Light Commissioners, the sale to be made alternately at public auction and to stockholders. After ten years the Board might raise or lower the standard price of gas on the petition of either the company or the mayor or selectmen of the cities and towns. Greater or lesser tax burdens imposed upon the company, improved methods of manufacture, changes in prices of material and labor, and other changes affecting the general cost of manufacture and distribution of gas, were regarded as sufficient reasons for the Board to change the standard price.

Operation of the sliding scale system has been tolerably satisfactory. Under it rates have been decreased and returns to stockholders increased. It is unnecessary to give details. In the literature of the period from 1905 to 1910 there is considerable discussion of the merits and defects of the plan. The reports of the National Electric Light Association in 1906 and of the National Civic Federation in 1907 have discussions, the tenor of which, on the whole, is favorable to the plan. Those opposing the introduction of the sliding scale in the United States called attention to the difficulty of fixing a normal initial rate which represents a proper balance of the forces affecting the cost of production. Management might find it increasingly difficult to make further reductions in price due to economies in manufacture as the point is reached where physical obstacles interpose a halt. Those favoring the sliding scale countered by pointing to the fact that once these relationships have been properly established, the future application of the sliding scale required only the ascertainment of certain facts and their relation to each other—all matters comparatively easy to find. It was conceived to be like a child's toy which, if properly wound up, would run by itself. The crucial objection, however, was that the plan assumed static economic conditions; that it in-

augurated a régime under which subsequent relations were fixed for many years in the future; that if radical changes in the art or great fluctuations in the prices of raw materials and wages intervened, the plan would prove unworkable.[12]

The Massachusetts act met this contingency by providing that after ten years the Board might raise or lower the standard price of gas upon petition. This, said the opponents, was only a partial remedy and a tacit admission of a fundamental defect. In spite of such objections the scheme was given a trial. The basis of its appeal at the time appears to have been its simplicity, the fact that rate regulation would be automatic, that money for extensions and improvements might be cheaply obtained through the auction sale of stock, and that it might bring about coöperation between the public and its utilities, besides giving owners an incentive to greater economy and efficiency.

The rapid change in economic conditions beginning about 1910, aggravated by the war and post-war inflation, has inclined the balance in favor of those who were calling attention to the defects. We now hear little of the sliding scale system, its significant elements having been merged in the service-at-cost franchise.

Sec. 4. **Service-at-Cost Franchises**

The service-at-cost plan combines the outstanding advantages and eliminates the disadvantages of the sliding scale. It aims to make regulation automatic and as simple as regulation can well be made; it aims to make rates flexible and to adjust both character of service and cost of service to economic and technical changes.[13] The city of Cleveland was the pioneer in

[12] It was also contended by some that incentives to efficiency do not penetrate to subordinate employees.

[13] "That service should be provided at cost, is not a new principle in the regulation of public utilities. It is back of all public service commission regulation and expresses the reaction from the original contractual relations between utilities and communities, under which fares were fixed and limited while return was not. The application of the term "Service-at-Cost" to recent working agreements between electric railways and communities does not clearly describe such agreements. They are, in effect, devices for automatically and quickly adjusting price to cost and embody a theory that is today almost universally subscribed to by both the public and the utilities." See Argument and Brief presented by the Committee of One Hundred, American Electric Railway Association, to the Federal Electric Railways Commission. *Proceedings of the Fed. Elec. Railway Commission,* Vol. 3, pp. 2149, 2212 (1920).

The above quotation clearly indicates the kinship of the service-at-cost

adopting and working out what may be termed a true service-at-cost franchise. The Chicago agreement of 1907 had some service-at-cost features, but it nevertheless resembled more nearly the old-fashioned term franchise. The Cleveland franchise became effective in 1910. It has since been amended in minor matters and somewhat liberalized during the past year (1926). For seven years it remained the only one of its kind. Service-at-cost plans were not more generally adopted during the period from 1906 to 1917 for the reason that this was the time when the state commission system of regulation was developing. Beginning in 1917, however, service-at-cost agreements were adopted in rapid succession. In the majority of instances they are thus a war or post-war phenomenon. Of the 24 plans now in effect all but one originated in this period. All but one relate only to electric railways. In a number of cities such plans were proposed but rejected for various reasons.[14]

franchise with the sliding scale system. It also correlates this type of franchise regulation with the commission type of regulation as it has been fully developed in the United States. The latter may be taken as the answer of the United States to the comparative failure of the Official Revision System in Great Britain.

[14] The Cleveland contract is generally known as the "Taylor Ordinance." It has been measurably successful in operation though by no means above criticism.

The World War and the consequent rise in the level of prices brought on an epidemic of conflicts over franchise requirements. In some cases amendments were obtained from local authorities granting higher rates but not affecting the character of the franchise; in other cases new agreements, embodying the principle of service-at-cost, were adopted. The order in which these contracts went into effect was as follows:

Cleveland, Ohio, Feb. 17, 1910 (More liberal terms adopted June 5, 1926).
Dallas, Texas, July 3, 1917.
Westerville, Ohio, August 1, 1917.
Montreal, P. Q., Canada, Feb. 10, 1918.
Eastern Massachusetts, May 22, 1918 (Bay State Street Ry. Act.).
Massachusetts General, May 31, 1918.
Boston, Mass., July 1, 1918 (Boston Elevated Ry. Act).
Cincinnati, Ohio, Sept. 23, 1918.
Youngstown, Ohio, Jan. 16, 1919. (Franchise redrafted and railways consolidated, Nov. 1, 1925).
Memphis, Tenn., April 1, 1920.
Rochester, N. Y., August 1, 1920.
Toledo, Ohio, Feb. 1921 (Redrafted Oct. 1926
Pittsburgh, Pa., Dec. 20, 1921.
Des Moines, Iowa, 1921.
Findlay, Ohio, Feb. 14, 1921.
Louisville, Kentucky, 1922 (Reverted to old type, Oct. 1926).
Fresno, Cal., May 13, 1922.
Grand Rapids, Mich., 1922.

The trusteeship plan, as elaborated in Massachusetts, is a true service-at-cost agreement with an added provision for public subsidies in case of a

Although several states in their general public utility legislation provided for the adoption of sliding scale and profit sharing arrangements on a voluntary basis and under commission supervision, these authorizations, as we have seen, remained dormant. Service-at-cost franchises, however, were adopted in some communities where state commission regulation did not exist and where expiring franchises forced new agreements. In these cases efforts were directed toward bringing into harmony the two basic elements of regulation, that the government can prescribe the extent and character of the service to be furnished and that it must permit the earning of sufficient revenues to defray the cost of such service. In order to harmonize relations upon these bases it became necessary to devise machinery which would function with the least possible friction in providing an automatic system of rate regulation.

The Cleveland agreement was accepted after six years of "open warfare". It represents a compromise between the company desiring a renewal of its franchise and a popular movement for low car fares headed by Mayor Tom Johnson. This historical fact is reflected in the provision that the rate of fare be fixed experimentally at 3 cents cash and 1 cent for a transfer but that the fare may fluctuate in the future with the cost of the service. That a reconciliation between public and private interests was made on the basis of the cost of service principle appears clearly from the preamble: "It is agreed that a complete readjustment of the street railroad situation should be made upon terms that will secure to the owners of the property invested in street railroads security as to the property, and a fair and fixed rate of return thereon, at the same time securing to the public the largest powers of regulation in the interest of public service, and the best street-railroad transportation at cost, consistent with the security of the property, and the certainty of a fixed return thereon, and no more."

Another important step in bringing into national prominence the proposal that flexible rate structures based upon production

deficit. It is a product of peculiar conditions in that state. After an initial period of *de facto* public operation has expired, these plans provide for service-at-cost. For contracts proposed but not accepted, see Clarke, H. C., "Service-at-Cost Plans," *Am. Elec. Ry. Assn.*, 1920, p. 229 *et seq.* In the following cities service-at-cost plans have either been proposed and rejected, or the question is still under consideration: Denver, Minneapolis, St. Paul, Indianapolis, Houston, Buffalo, New Orleans, Syracuse, Norfolk, Akron, Milwaukee, Vancouver, and Ottawa. Chicago, Ill., in 1907, and Kansas City, Mo., in 1914, are cities that adopted franchises containing some service-at-cost features.

costs should be recognized in resettlement franchises was taken with the appointment on May 31, 1919 by President Wilson of a Federal Electric Railways Commission. It was the Commission's duty to study the entire electric railway problem which had assumed national importance owing to the fact that a considerable percentage of the total electric railway mileage of the country was in the hands of receivers and many large systems were hard pressed financially. After extended hearings and investigations, accompanied by organized publicity, the commission published its report under date of July 28, 1920. Service-at-cost plans were widely reviewed and received much favorable comment from witnesses. In its report the commission "strongly recommends the principles of the service-at-cost contract not as the only solution, but as one means of solving a very difficult problem."

The variety of detail in service-at-cost franchises is so great that no satisfactory summary and discussion of them can be attempted. In general, these plans seek to protect invested capital by giving the company an exclusive right to conduct the particular utility, the right being terminable upon purchase of the property by the city or other designated licensee at a stipulated price. So long as private operation continues the owners are to receive a rate of return deemed sufficient to attract the necessary new capital into the business and to retain the old capital. In order to fix the required earning power it is necessary to agree as to the value of the property upon which the stipulated rate of return can be based. Reasonable allowances are also fixed by various methods for operating expenses including depreciation. In order to provide an automatic and equitable method of making service rates responsive to cost, the contracts either fix an automatic sliding scale of fares (not returns) or they give a specially constituted local board or commissioner power to change rates when such action is warranted. Provisions calling for a stabilizing or barometric fund serve to indicate when rates shall be raised or lowered and are also for the further purpose of preventing too frequent changes in rates.

Control of service is placed wholly or predominantly in the hands of local officials. They prescribe standards of service and determine upon extensions of service, subject, however, to the limitation that the grade of service demanded will and can be paid for. Provision is made for the accurate ascertainment of all operating costs attributable to any accounting period includ-

ing therein the fixed return upon capital and an allowance for depreciation. Since it is recognized that rates depend in part upon the economy and efficiency with which the property is being operated, the plans seek to prevent waste, reduce the complexity of operations, and secure the coöperation of the public in the elimination of unnecessary service and the introduction of operating economies. Often the agreement provides the amount of taxes or other compulsory contributions to be borne by the utility. Only in a few instances is provision made for public subsidies in case a deficit is incurred. This feature is not service-at-cost.

There is much prevalent suspicion that service-at-cost was invented as a fare-raising device and that under these plans rates have been more often increased than decreased. The fear of rate increases, the fear that service-at-cost would undermine commission regulation, that it would reintroduce the era of political control and municipal corruption, that it would postpone public ownership, have all counted as arguments with different groups and have induced them to vote down such proposals at the polls. The "cost-plus contract," developed in the late war, increased the suspicion.

On the other hand it must be recalled that in practically every case service-at-cost was suggested under emergency conditions, and in situations where it had to contend with a legacy of ill-will which had accumulated under the term franchise régime in this country. Furthermore, service-at-cost was inaugurated during trying economic conditions when all our economic barometrics were indicating a trend to progressively higher price levels. That is how it came by its name as a device favorable to the companies to get increases in rates. Finally, the plans have thus far been applied in the main to those electric railway companies which, in Shakespeare's phrase, had experienced "the slings and arrows of outrageous fortune". If the history of this movement is therefore not entirely reassuring, the reasons are not far to seek. A state commission which had jurisdiction only over the electric railways now operating under service-at-cost would probably be the most unpopular in the country. Looking at the matter, therefore, from a purely partisan consumer's point of view, one would have to say that, other things being equal, the best time to enter into service-at-cost agreements is during periods when prices in general and hence costs are on the decline. It would also seem that service-at-cost plans would operate most effectually in the case of the electric,

gas and telephone utilities, for whose service no effective substitutes are available.

In the case of urban transportation, however, there is one further circumstance that makes service-at-cost peculiarly available. Assuming that a city is unable or unwilling to take over its local transportation plant as a public enterprise, some method must be devised whereby cities can assure themselves that there shall be no breakdown in rendering this necessary service. This is the problem which confronts both the larger and smaller cities. Confining attention to the larger cities, we have here a metropolitan transportation problem in which suburban steam railways, urban, suburban and interurban electric railways, busses, elevated railways and subways must be coördinated into a well articulated transportation machine. All now agree that we must have monopoly; that elevated, surface and subsurface lines must be combined to give both local and express service. This will in most cases involve the adoption of rapid transit programs, the facilities to be provided by public capital at least to the extent of the permanent way. Here the experience of Philadelphia should be a warning, for a company which has the monopoly of local transportation should not refuse to operate such public facilities or coördinate them with the rest of the transportation machine. Service-at-cost plans, when properly drawn, provide *in advance* for the operation of such rapid transit facilities, fixing terms and conditions.

Current criticisms of service-at-cost contracts have centered very largely upon the valuation assigned to the property and upon the rate of return allowed. The charge is that the valuations and rates of return are too favorable to the companies because all franchises, except in Cleveland, were formulated at a time when commodity prices and money rates were high.

(b) *Economic interpretation of Service-at-Cost.*

Particular attention should be called to the meaning of the term cost-of-service in this connection. The old controversy between cost of service and value of service as the basis for particular rates is pushed aside and replaced by a new conception of cost of service which takes account of the total earnings to which a particular public utility is entitled. So conceived, the question how the total operating cost is to be distributed among classes of users is left to administrative policy in which both the cost of a particular service to the company and the value of a particular service to the consumer may be given requisite weight.

Regulation based upon the cost of service principle seems to be the goal toward which all forms of regulation, national, state, and local, are tending. In a report upon "A Plan for Railroad Consolidations" by John E. Oldham for the Investment Bankers Association of America, published in November, 1921, this writer recognizes that the distinctive contribution of the Transportation Act of 1920 to the development of regulatory policy in the field of steam railway transport is the use of the cost-of-service principle in its rate-making provisions. The gist of the argument is that this salutary principle can only become operative if the railroads of the country can be consolidated into a limited number of competing systems of such uniform operating characteristics that the same system of rates will yield approximately the fair return upon invested capital as contemplated in the Act. The same principle is being applied, in a more or less nebulous way, by practically all state public service commissions.

It remained for the service-at-cost franchise to adopt unequivocally the cost-of-service principle, with monopoly, or at least limited competition, in the supply of service to definite market areas. Under these franchises the general level of rates is determined by cost components each of which is regarded as reasonable in amount. There has thus been a complete "about-face" in that regulation at first was not at all concerned with the question of earning power, but has since developed into a regulatory *procedure* in which *reasonable costs of operation,* based in turn upon *reasonable service requirements,* become the measure of reasonable earnings and therefore the chief causal factors in rate changes.[15]

A critical summary of the workings of regulation is deferred to Chapter XXXIII because strengths and weaknesses can be discussed better after the administration of public utilities under regulation has been reviewed in Part III.

[15] A good example of a service-at-cost agreement is reprinted in Appendix A and discussed at length in Chapter XXXII. This proposed contract between the City of Milwaukee and the Milwaukee Electric Railway and Light Company illustrates how the economic and legal principles upon which public service enterprises are based may be practically applied in a specific and concrete program.

PART III

THE ADMINISTRATION OF PUBLIC UTILITIES UNDER REGULATION

CHAPTER XIV

THE MOVEMENT FOR PHYSICAL VALUATION

In considering the valuation of public utilities we enter upon a new phase of public utility economics—namely, the administration of these enterprises under the peculiar restraints that have been developed. This involves reconciling in one administrative process initiative for management with initiative for administrative commissions.

Sec. 1. Rate-making as a Governmental Process

Previous chapters have made clear that the central problem of regulation is that of rate control. This has two aspects which condition each other. The first aspect is furnishing *reasonably adequate service and facilities.* Detailed consideration of this subject will be reserved until later.[1] The second aspect is *insuring the collection of a reasonable and just charge for every service rendered.* Assuming for the time being that the service rendered by public utility concerns is such as to meet the legal standard, we must inquire: What is involved in the process of fixing just and reasonable prices? How has the statutory term "reasonable" been defined by administrative commissions? What methods were adopted and what obstacles and problems have arisen as administrative commissions delved into the detailed facts surrounding these businesses?

In the very first chapter certain working distinctions between public services, public utilities, and private services were set up. These distinctions had to be made because in each case the rendition of service is differently organized. Public services are paid for out of taxes, whether the taxpayer is a consumer or not.

[1] See Chapter XXVII.

Public utility and private services are normally paid for only by those who use the service.[2]

For public utilities administrative commissions name the rate at which producers sell and consumers buy. This represents a revolution in the way in which the business is conducted. In competitive business the value of the capital goods employed depends, among other factors, upon prices of products. For public utilities commissions fix prices by estimating the total reasonable costs of manufacture and sale, and they include among these reasonable costs an element of *return* upon what is incorrectly called the *value of the property* employed. A schedule of rates is fixed which is estimated to yield earnings approximately equal to the total reasonable costs.

In this *process* of rate-making, it should be noted that fixing the "valuation" is only the first half of one step. The other half of the same step is fixing the "*rate of return*" upon the "*valuation*". It has, therefore, been suggested—and the suggestion is a happy one—that the "valuation" is better termed a "*rate base*". The amount of return allowed as a part of the reasonable cost is thus the product of the "rate-base" multiplied by some reasonable "rate-of-return." Other important steps in the same process are (a) *estimating* for some future period the quantity of service customers will use at the rates fixed by the commission; (b) *estimating* the reasonable operating expenses which will be incurred in furnishing this quantity; (c) *estimating* the amount customers will pay in earnings for service consumed. Since actual operating experience may prove that these *estimates* were incorrect, the public utility may realize more or less than the amount of "return" which the commission had in mind as a "reasonable cost". An element of risk thus inheres in the very process of regulation.

It was said above that fixing the rate-base is incorrectly called valuation. This is a matter largely of terminology. From an *economic point of view* the capitalized value of the return or

[2] The sale of some services and commodities, which might be commercially profitable, is either prohibited or severely restricted. The manufacture and sale of spiritous liquors and the operations of games of chance are familiar illustrations of prohibited businesses. Fire protection and the supply of a money currency are monopolized by the state. However, in the commercialization of the vast range of commodities and services useful to man government gives private initiative comparatively free rein, selecting only the public utilities for price regulation. Ordinarily, competitive business earnings do not concern government except for purposes of taxation. It is assumed that large profits accruing to one producer will stimulate competitors to copy his methods or to invade his market. Prices are fixed by bargaining between sellers and buyers under the spur of legalized competition.

net income becomes the true *"economic value"* of the capital goods employed in producing public utility services. By so considering it, capital invested in public utilities may be compared with capital invested in other productive economic undertakings. It is not illogical, therefore, to apply the term "valuation" to the *entire* official price-fixing process whereby the reasonable net income for public utilities is determined. The context should make clear, however, in which of these two senses that slippery term "value" is being used.

Part III will be concerned with this price-fixing process. We have seen that the purpose of regulation is to bring about an economic balance between cost and income. We shall now proceed to a discussion of cost and income bargains in detail. In each case we shall try to bring out the extent and manner in which the several bargains are controlled. Costs in the sense of reasonable and necessary costs will be considered in Chapters XIV to XXVI. Income in its various aspects will be taken up in Chapters XXVIII to XXX. Chapter XXVII, relating to service, is the connecting link between cost and income. Compare Chart XII, p. 104.

Sec. 2. **Analysis of the Investment Bargain** [3]

The major conflict so far has concerned the investment bargain. The reason for this is that this bargain controls the input of capital into public service industries and thus is inseparable from questions of earning power. It must be borne in mind that these industries bid for capital in the open market. A proper appreciation of the problems centering in the investment bargain can thus be gained only by taking a functional point of view, and by asking ourselves what are the moving considerations in the minds of investors which will induce them, in view of all the available investment opportunities, to embark their capital in public service enterprises. If we know the return investors demand, we also know what commissions should allow.

The first of these considerations relates to the rate-base which regulatory bodies recognize as entitled to a reasonable rate-of-return. Obviously, investments not included in the rate-base can earn no return under the rate-making process just described, especially when it is recalled that these investments will be transmuted into fixed capital of a highly specialized character. This

[3] See Chap. V for an analysis of the various types of bargains or transactions of going concerns.

is the peculiar incidence of the rate-base problem upon the investment bargain.

Another question in the mind of investors is: What will be the rate of return by means of which regulatory bodies gauge permissible earnings? Interest and dividend payments will have to come out of this return. This income return conditions the bargaining strength of public utilities as compared with other industries and with the state itself in the market for capital. The size of this return is also an earnest of the ability of management to live up to its obligations under investment bargains. The rate-base and rate of return problems are complementary.

A third consideration relates to the safeguards which surround the different investment bargains and which operate as legal and economic guarantees that investments will remain unimpaired. Aside from the usual precautions involved in good management and in accurate accounting, it may be good policy for the state to recognize the need of formal safeguards which may be worked into the institutional background of these industries. Investors will take into account legislative safeguards thrown around individual business units by means of charter and franchise provisions, indeterminate permits, certificates of convenience and necessity, and other measures designed to prevent cut-throat competition and needless duplication of investment. This is the problem of obtaining security of investment through control of the market. In this connection we must also take into account depreciation in its various aspects, in other words, the fiscal measures necessary to keep the investment intact. And, finally, we must consider certain financial arrangements designed to give security to preferred creditors, as well as the safeguards arising out of the public control of security issues. The financial structure of public utilities and the volume of their security issues must be so adjusted as not to impair either the investment of individual security holders or the return. This is the problem of reasonable capitalization.

Upon a final evaluation of all of the above factors will depend the investors' willingness to embark capital in these enterprises. Reciprocally, the financial credit of public utilities as going concerns depends upon the inducements which they can hold out to investors in these respects. The amount a public utility can afford to pay depends upon the amount it is permitted to collect from customers and actually does so collect. In a very real sense, therefore, consideration of the investment bargain is a consideration of the fundamentals of public utility credit.

Sec. 3. History of the Movement for Physical Valuation

In order to appreciate the difficulty of this process of rate making and to understand the reasons why it has been adopted, a brief review of the history of the movement for physical valuation will be helpful. Prior to about 1870 the legislatures did not use their power to fix rates *periodically*. The system of regulation then in force was that of regulation by charter. The charters usually granted the power of fixing rates to the board of directors. Competition among railroads, street railways, and gas companies was relied upon to keep rates down, if, indeed, any thought was given to the matter at all. Some charters, as we have seen, named only maximum rates or limited earning power in some other way. One reason why early regulation of rates was so imperfect was, of course, that the dominant public policy had little faith in regulation. Moreover, governmental inexperience in such matters, coupled with the undeveloped state of public service enterprise, made regulation experimental and primitive. An industry must be mature and its operations well understood before regulation can be successfully attempted.

Outstanding evils of the pioneer period are attributable also to certain other factors. Of first importance was the inordinate desire for profits which possessed all classes of people. Next in importance was the economic need for an expansion of the new facilities. Thus conditions were right for speculative development, outrunning immediate and even proximate needs. This, in turn, engendered overcapitalization, excessive competition, useless duplication, and hasty construction. The reaction came in the Granger Movement, which challenged the validity of the old let-alone policy. Laissez faire was believed harmful to the public good. The dormant power of regulation was asserted in the maximum rate laws of the Grangers. This is the starting point of the modern movement for legislative regulation.

(a) *Emergence of judicial review.*

The roots of the doctrine that "valuation" is the cornerstone of rate regulation go back at least to the Granger legislation. It will be recalled that the legislative right to regulate not only grain elevators but also railroads was called into question in the so-called Granger cases.[4] But the Supreme Court of the United

[4] *Munn* v. *Illinois*, 94 U. S. 113 (1876); *Chicago, Burlington & Quincy R. R. Co.* v. *Iowa*, 94 U. S. 155 (1876); *Peik* v. *Chic. N. W. Ry. Co.*, 94 U. S. 164 (1876); *Chic. Milw. & St. P. R. R. Co.* v. *Ackley*, 94 U. S. 179 (1876);

States decided that the fixing of reasonable rates is a legislative function not inconsistent with the Fourteenth Amendment. The court found the historical basis for its opinion in the common law of England.

It was unavoidable that in limiting rates the legislature should also limit earnings, not indirectly by sanctioning competition, but directly under the police power. This fact brought about a train of consequences not at first appreciated. It meant first of all a gradual relaxation of the ideal of competition as applied to public utilities and the gradual substitution of regulated monopoly or quasi monopoly. It brought about a redefinition of private property in public utilities under the Fourteenth Amendment which differentiates itself sharply from private property which is subject to competition. Private property remains as sacred as it was before, with this difference that, while ordinary private property must continue to seek its value content in the commercial markets under competitive conditions, public utility property receives its value content under regulated rates. The fundamental question raised by the Granger cases is: How can an industry be established, developed, and maintained under regulation? What must be the economic milieu under which its exchange transactions take place?

At first the judiciary did not see clearly its duty under the constitution of protecting private property "affected with a public interest". When the courts assumed this duty later on, they failed to make the distinction between private property subject to competition and private property where competition is eliminated.

The development of judicial review as affecting public utility rates may be traced in the opinions of the United States Supreme Court. In the Munn case in 1876 the United States Supreme Court assumed a position of judicial *non-interference.* It held that the fixing of public utility rates is a prerogative of the legislature and that legislative discretion can not be interfered with. This put private property already invested in such enterprises and all future developments along these lines in the hands of the legislature alone. When the court said that complaints by public utilities against low rates should be addressed to the legislature and not to the court, it was avoiding a duty which has since been recognized as peculiarly its own.

Ten years later, in 1886, after much urging by lawyers ap-

Winona & St. Peter R. R. Co. v. *Blake,* 94 U. S. 180 (1876); *Stone* v. *Wisconsin,* 94 U. S. 181 (1876).

pearing for the public utilities, the court finally recognized this duty. In the Railroad Commission cases [5] it said that the power of the legislature to fix rates is itself not without limits. In the language of Chief Justice Waite, "This power to regulate is not a power to destroy, and limitation is not the equivalent of confiscation." At this point one may ask what it is that is being destroyed? In any real sense it must be the economic value of property, the right to derive a reasonable income out of economic transactions. Without this right, property would be without substance.

Two years later, in 1888, in Dow v. Beidelman,[6] while uttering similar precautionary words, the court excuses its own inactivity in the premises by confessing that it has as yet no basis upon which to rest its assumption of duty to limit the legislative power over public utility prices. In the following year, without stating what the basis of its interference would be, the court, in the first Minnesota Rate cases,[7] clearly asserts the doctrine of judicial review as applying to public utility cases. For public utility law this opinion is the equivalent of the opinion in Marbury v. Madison.[8] It may be that the court thought it was on safer ground in this case than in the earlier cases because the rates in this instance had been fixed by an administrative commission under delegated authority. Whatever may be the explanation for this change of front, the court held that due process of law involves not merely legislative discretion but considerations of reasonableness, which may be tested by the courts. The first judicial characterization of reasonableness, therefore, is the purely negative definition that confiscation is a measure of *unreasonableness,* and that confiscatory rates are illegal.

(b) *"Valuation" as a legal doctrine.*

The first definite adoption of the valuation doctrine as the fulcrum of reasonableness in rate regulation came in 1896 in a case in the lower courts. In San Diego, etc. v. Jasper [9] the court said that it is "the actual value of the property at the time the rates are to be fixed that should form the basis upon which to compute just rates." Two years later, in 1898, this idea was accepted by the United States Supreme Court in the famous case of *Smyth* v. *Ames* [10] in which the doctrine of "fair

[5] 116 U. S. 307, 331 (1886).
[6] 125 U. S. 680 (1888).
[7] 134 U. S. 418 (1890).
[8] 1 Cranch 137 (U. S.) (1803).
[9] 74 Fed. 79, p. 83 (1896).
[10] 169 U. S. 466 (1898).

value'' was announced in the form in which it has been operative until the present time. With it comes a recognition that limitation of rates results in limitation of earning power and thus involves the question of what is a ''reasonable rate of return.'' The court's answer is that it must be a *fair return* on a *fair valuation* of the property used and useful for the convenience of the public. An earning power large enough to allow this return is the chief test of constitutionally reasonable rates.

Why is it so important to recognize that limitation of rates implies limitation of earning power? Because it is often said, even in judicial pronouncements, that there is such a thing as a reasonable rate apart from earning power. It is implied that the quality of reasonableness exists as a metaphysical something, a ''ding an sich,'' apart from the facts in any individual case. If the legislature fixes a rate which is reasonable to the customer and reasonable to the utility, no thought need be taken of earning power.[11]

Under the common law, courts have declared rates illegal because they were unreasonable; but the common law notion of an unreasonable rate goes back to the canon law which recognized the idea of ''just price''.[12] Yet, what are just prices? Economic history provides two interpretations. One was the ancient Stoic notion that just prices were the prices obtaining in open markets—in other words, the modern, competitive market price. The other was the notion of the church fathers that just prices were those based upon sacrifices by the producer. This interpretation introduces an equitable concept which a more reflective and analytical political economy than that of medieval times has worked over into a price theory formulated upon the basis of normal production costs. Modern governmental price fixing at times has taken the view that reasonable prices are normal or usual market prices, evidence of which may be obtained by making price comparisons. At other times the view has been that reasonable prices must be founded on reasonable expenses of production.

The first interpretation, that just prices are prices obtaining in open markets, assumes that all earning power should flow from the free interaction of demand and supply, and that rates fixed by legislatures must be comparable with competitive rates. This interpretation overlooks the policy of the law that a producer may fix his own price if he is operating in a competitive market.

[11] Compare the Cotting Case, p. 176 *supra.*
[12] Compare Chap. VII, p. 157 *supra.*

If legislatures undertake to interfere they do so because competition has been restricted or entirely eliminated. In such cases the remedy is either to restore competition or to recognize that economic evolution has created a new set of facts to which the theory of competitive price may not be applied.[13] Even if the rates of only monopolistic producers are compared, the procedure is, nevertheless, illogical because one producer does not have access to the market of the other. Under such conditions rate comparisons give no clue to reasonable earning power.

The only reasonable alternatives are the introduction of competition and the elimination of monopoly, or the scientific study of the monopolistic costs of production so that only costs (not rates) for the same operations may be compared and allowances made for non-comparable elements. This implies that scientific management must become the basis of rate regulation. Just price in terms of scientific management, and not competitive price in terms of supply and demand, will be the direction in which a solution is sought for the problem of price-fixing in the public utility field. This necessarily involves a rate-fixing process of which valuation is the point of departure.

(c) *Valuation as a device of legislative policy.*

The origin of the notion that there is something basic and equitable in the use of the value of property as a "rate base" is to be found in our traditional policy of taxation, which uses

[13] The situation may be illustrated by a hypothetical case. Assume two markets M and N, where M is a city in which four producers, A, B, C, and D, compete in the sale of a product, while N. is a city in which only one producer X, sells the same product. The physical conditions of production and sale are such that producers at M can not sell in N and vice versa. A, B, C, and D must sell at the same price, let us say at a price of 10. But the several physical conditions of production are such, together with the effectiveness of the separate managements, that producer A makes a profit of 3, B of 2, and C of 1; while D meets only the necessary costs. Neither A, B, nor C can expand operations so as to take over any portion of each other's market demands or that portion supplied by D. This is the typical case of simple competition, where the business has become stabilized. The reasonable profits under competition are therefore 30, 20, and 10% of gross sales for A, B, and C, respectively. What is the reasonable price that X should charge at N? Should it be the price 10? That would give X a possible range of profit from 0% to 30%, depending upon his costs of production as compared with those of A, B, C, and D. A price of 10 may conceivably result in a loss or in a gain greater than 30%. If rates are fixed upon the basis of comparison the stimulus of profit and loss in production is made to depend, not upon the willingness of the consumer to pay the price of 10 or of the producer to offer to sell at 10, but merely upon the choice exercised by the price-fixing agency.

the value of property owned as a "tax base".[14] "Valuation" or assessment of property was therefore developed first by tax officials. It was also resorted to in measuring the compensation to be paid for condemning private property for public uses. The legal principles of "valuation" were largely developed in cases arising under the powers of eminent domain and of taxation. Since rate-fixing may be confiscatory, it was argued that the measure of compensation to be allowed public utilities under the police power should be the same as when private property is "taken" under eminent domain. This condemnation analogy has had much to do with the confusion in legal theory which identifies value under eminent domain with value for rate-making purposes.

After the United States Supreme Court had given its official sanction to the practice of making valuations in rate cases by announcing the doctrine of "fair value", the practice of appraising property became very much more general. "Valuations" have also been made in connection with the private sale of properties, the organization and reorganization of corporations, and litigation arising under the law of damages. The fraternity of certified public accountants began to link up its services with those of professional appraisers in an endeavor to give stockholders and creditors some notion of the financial condition of enterprises in which they were interested. Requirements arising out of state and federal income tax legislation and the adjustment of fire losses have given further impetus to the activities of professional appraisers.

The chief purposes for which valuations of public utilities have thus been advocated are:

1. Valuations for purposes of taxation.
2. Valuations for public purchase under eminent domain or under charter and special franchise provisions.
3. Valuations in connection with the validation of security issues.
4. Valuations for accounting and insurance purposes and for private purchase.
5. Valuations for rate-making purposes.

In this and the following chapters we will treat only of valuation for rate making.[15]

[14] Where European countries have founded their tax policies upon the concept of income—the ability to pay theory—the United States, until quite recently, has made the market or cash value of real and personal property—the benefit theory—the basis for the assessment of taxes.

[15] It is inconceivable that the term "value" should have the same meaning in all of these different connections or that the pecuniary estimate arrived

As far back as 1888 the Interstate Commerce Commission, in its 2nd Annual Report to Congress, discussed valuation as a basis for railroad rates. Beginning, however, with its annual report for 1903 it has regularly referred to the need of having a basic valuation in its work of rate regulation.[16] As the powers of the Interstate Commerce Commission were extended and its influence upon the rate structure grew, the problem of the reasonableness of the general level of rates moved into the center of attention as we have seen.[17] This factor is peculiarly important in cases involving group rates upon important commodities and in cases involving general advances in class and commodity rates. Three important cases, in which the commission was especially handicapped because basic valuations were not available, were the Rate Advance Case of 1903,[18] the Eastern Rate Advance Case of 1911,[19] and the Five Percent. Case of 1914.[20] In 1911 the Hadley Railroad Securities Commission advocated valuation of the railroads in its report to President Taft. Finally, in 1913, the requirements of the situation had become such that Congress passed, practically without opposition, the LaFollette Valuation Act, requiring the Commission to ascertain and report to Congress the valuation of the railroads of the United States. This official valuation, now in process of completion, has been consolidated with the rate-making provisions of the Transportation Act of 1920 and may thus become the backbone of railroad rate regulation in the future.

Meanwhile in 1900 in the state of Michigan and in 1903 in Wis-

at will be the same regardless of the purpose. See, however, Ransom, W. L., *Journal of Land and Public Utility Economics*, April, 1926, p. 186, for a contrary view. We will refer to valuation for taxation in Chapter XXVI, for security issues in Chapters XVII and XVIII and for public purchase in Chapters XXXI and XXXII. Valuation for accounting purposes and for private purchase or sale are outside the main lines of development of this subject and will be disregarded.

[16] The Interstate Commerce Commission first took the position that its power was limited to inquiries into the reasonableness of particular rates. It is in this connection that so much use was made of the method of obtaining evidence of reasonableness by making rate comparisons. In fact, the prevalent notion appeared to be that rate control could be obtained by combining two distinct elements. The first was to rely upon competition in rates between rival carriers at junction points and to common markets in order to yield a basic rate structure. The second was to rely upon the long-and-short-haul clauses embodied in state and federal legislation, in order to secure rates at local non-competitive points that conformed to the competitive rates. The difficulties of maintaining railroad competition always rendered this a doubtful mode of procedure.

[17] See Chapter XII, p. 273.

[18] 9 I. C. C. 382, p. 404 (1903).

[19] 20 I. C. C. 243 (1911).

[20] 31 I. C. C. 350 (1914). See particularly the dissenting opinion by Commissioner Daniels.

consin ad valorem tax laws had been passed placing the taxation of railroads upon the basis of a so-called "physical valuation". In 1905 and again in 1907 when Wisconsin and New York passed laws regulating both railroads and local utilities, commissions were empowered to make valuations for rate-making purposes. The practice has spread to all the states in the Union, so that valuation has become the most discussed subject in public utility literature.

Sec. 4. The Valuation Doctrine and the Theory of the Going Concern

One of the most important consequences of the attempt to apply physical valuation to the properties of public utilities has been the recognition that there are other elements besides the existing physical property that must be considered. The financial history of properties was explored and it was found that physical property had disappeared although the books still recorded the investment. Expenditures had also been made in building up a financial and legal structure for these enterprises. It was further shown that in consolidations losses had been sustained on account of the scrapping of property, and that deficits had developed during the years when the enterprise was building up its business. These items have been lumped together under the term "intangible" or "non-physical" property. It is now recognized that valuation must take notice not merely of the tangible physical property but also of the intangible non-physical items. This has served to broaden the scope and purpose of valuations.

This broadening of the scope and purpose of the valuation doctrine can best be seen in a further development of the meaning of intangible property. In assessments for taxation a theory was developed which has profoundly influenced the development of this subject. This theory is embodied in what is known as the "unit rule" of assessments. The traditional American policy of local assessors had been to assess real and personal property on some basis related to its selling value. This was not difficult so long as assessors dealt only with property which had a ready market, like city residences, machinery, equipment, stock-in-trade, etc. Steam railroads, however, offered difficulties because these properties seemed to be unique in character. Moreover, it was a form of property not regularly sold. At first assessors based their assessment only upon the

physical property of the roads within their jurisdiction, valuing it on the traditional basis. As the roads grew beyond the limits of any one taxing jurisdiction, difficulties multiplied, particularly when mobile property like rolling stock had to be assessed. Tax officials then saw the need of assessing the physical property of the road as a whole. This was usually done by State Boards of Equalization and the amount assignable to local tax jurisdictions was determined upon some basis like the miles of track. In other words, adequate assessment required recognition of the fact that corporations are single business units, that their property must be assessed as a unit and then apportioned for local taxing purposes.

An important case in which this method of assessment was an issue was *Cleveland, Cincinnati, Chicago, and St. Louis Railway* v. *Backus*.[21] Referring to assessment of railroads, the court there said:

"The true value of a line of railroad is something more than an aggregation of the values of the separate parts of it, operated separately. It is the aggregate of those values plus that arising from a connected operation of the whole, and each part of the road contributes not merely the value arising from its independent operation, but its mileage proportion of that flowing from a continuous and connected operation of the whole. The value of property results from the use to which it is put, and varies with the profitableness of that use, past, present, and prospective, actual and anticipated. There is no pecuniary value outside that which results from such use. In the nature of things it is practically impossible, at least in respect to railroad property, to divide its value and determine how much is caused by one use to which it is put and how much by another."

That the economic value of an assembled plant is controlled by its earning power and that the ordinary selling value of component property units has no relation to a value created when property is joined in a unified use appears even better from a consideration of the assessment of express companies. When the Ohio State Board of Assessment, for instance, assessed the property of the Adams Express Co., it found a figure of $449,377.60, although the tangible property in the state was assessed at only $23,400. In other words, the term property was interpreted by the Ohio tax authority to include certain intangible elements. It used as the basis for its assessment the market value of the capital stock and bonds of the entire company and assigned to

[21] 154 U. S. 439, 444 (1894).

Ohio an amount proportional to the mileage in the state. The rule was thus applied to both tangible and intangible property.

In appealing to the United States Supreme Court [22] the company contended that its Ohio property subject to taxation consisted of the horses, wagons, safes, and other personal property at their piecemeal market values. It argued that there was no unity between its physical property in Ohio and that in other states except a "unity of ownership"; that stock and bond values reflected this physical property value but in addition "the skill, diligence, fidelity, and success" with which its properties were used and the reputation and good will of the company among its customers. That the analogy to a railroad company did not apply, the express company affirmed by saying that railway and telegraph companies had a connected physical plant and hence the unit rule applied. In the express business the unit rule was a mere "intellectual fiction," a metaphysical or intellectual relation. But the majority of the court took the view that there was "unity of use" in the conduct of one business and that this gave a value to the separate items of property. The court pertinently asked: "Considered as distinct objects of taxation, a horse is indeed a horse; a wagon, a wagon; a safe, a safe; a punch, a punch; but how is it that $23,430 worth of horses, wagons, safes and punches produce $275,446 in a single year?" The court answered the question by holding that where there is unity of use, the physical property must be assessed as that of a "*going concern.*" "Whenever separate articles of tangible property are joined together, not simply by a unity of ownership, but in a unity of use, there is not infrequently developed a property, intangible though it may be, which in value exceeds the aggregate of the value of the separate pieces of tangible property." This is what, in Massachusetts taxing parlance, is called the "corporate excess" or in other states "the value of the franchise." Here it was called good will, and the court ruled that, "If a state comprehends all property in its scheme of taxation, then the good will of an organized and established industry must be recognized as a thing of value."

The significance of this decision cannot be overestimated. One authority [23] sees in this a change in the definition of property from that of *tangible things* to one of *business relationships.* Consequently, the inference is that all values are intangible.

[22] *Adams Express Co.* v. *Ohio*, 165 U. S. 194, 222 (1897), rehearing, 166 U. S. 185 (1897).

[23] Commons, J. R., *Legal Foundations of Capitalism*, p. 173.

The significance of this case in the development of the valuation doctrine is that it lays the foundation for the valuation of the objects of property owned by public utilities. The case is precedent for the view that objects of property should not be appraised at their market value as *separate instruments* of production for *any use*, but should be valued as productive instruments on the basis of their *integrated use* for the particular public utility service for which the corporation was created by the state. This is what we call the "going concern theory" in valuation and regulation.

Sec. 5. The Underlying Purpose of the Movement

Before proceeding to a discussion of valuation standards in detail some further general observations should be made. Gradually, physical valuation was deemed to be of such importance as to be favored by both of the major political parties. It was believed that valuation would put an end to controversy. In the course of long and involved financial histories most public utilities had lost the ideal relation between asset accounts and liability accounts. This is well set forth in the above-mentioned report of the Railroad Securities Commission:[24] "In so far as the value of the property is an element in rate regulation, the outstanding securities are of so little evidentiary weight that it would probably be of distinct advantage if courts and commissions would disregard them entirely, except as a part of the financial history of the property, and would insist upon direct evidence of the actual money invested and of the present values of the properties. For this and other reasons discussed in the body of the report, your Commission recommends that the Interstate Commerce Commission should have authority and adequate funds to make such a valuation of the physical property of railroads wherever the question of the present value of these roads is, in the judgment of that Commission, of sufficient importance."

Except in the case of Massachusetts, where financial transactions had early come under state control, neither the capital stock accounts nor the property accounts could be relied upon to show the true cash investment. The seat of the trouble lay in American methods of corporate promotion and of legal organization. Without official scrutiny of transactions and official regulation of accounting, the companies were permitted to capi-

[24] Report, p. 38.

talize not only the cash investment in existing properties but also the prospective future value of an assumed increased earning capacity. It was this reckless inflation of security issues that gave American public utilities their top-heavy financial structures and their unreliable investment accounts. In this extremity it was believed that physical valuation would prove a helpful remedy and place these industries again upon a sound financial basis. Thus the valuation problem is beset with all the difficulties that a confused and troublous history brings forth.

Sec. 6. The "Rate-Making Rule" of Smyth v. Ames

"Cost is not synonymous with value." This oft-repeated sentence has done more to muddy the current of ideas upon public utility valuation than any other. Although the statement is an economic truism, it has no relevancy to the rate-making problems under discussion here. The cost of the fixed plant of a public utility may bear no relation to the capitalized value of the income which this plant is instrumental in earning, but that does not preclude consideration of the question whether the cost of the fixed plant is an administrative standard for rate-base purposes. Once the doctrine was accepted that reasonable rates must be premised upon some estimate of the "value" of the property, the search was begun for a definition of value as applied to public utilities. Much of this discussion accepted as a point of departure that cost does not represent value. In order, therefore, to understand the existing state of confusion we must trace briefly the further development of the valuation concept in legal literature.

(a) *Judicial statement of the rule of rate-making.*

The rule of rate-making as applied to public utilities was first announced, as we have seen, in the leading case of *Smyth* v. *Ames* in the following paragraph.[25]

"We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a public highway under legislative sanction must be the *fair value* of the property being used by it for the convenience of the public. And in order to ascertain that value, the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stock, the present as compared with the original cost of construction,

[25] 169 U. S. 466, 546 (1898).

the probable earning capacity of the property under particular rates prescribed by statute, and the sum required to meet operating expenses are all matters for consideration and are to be given such weight as may be just and right in each case. We do not say that there may not be other matters to be regarded in estimating the value of the property. What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience. On the other hand, what the public is entitled to demand is that no more be exacted from it for the use of a public highway than the services rendered by it are reasonably worth."

This excerpt has become a classic quotation in the literature of valuation. It has controlled the rate-making procedure of legislatures and commissions from that day forward, while courts have heeded this authoritative text with a unanimity which has tended to raise it to the level of a rule of property. The rule may be interpreted as follows: The fixing of rates under a legislative act should be based upon a calculation of the gross revenues which given rates may reasonably be expected to yield. From these estimated earnings must be deducted the anticipated operating expenses. The balance of the earnings must be related to the *fair value* of the property which thereby becomes the *basis of the calculation.* In determining what is the fair value, that is, in fixing the basis of the calculation, the rate-making authority must take into account the following:

(a) The original cost of construction, which can refer only to the first cost of the original plant with which the enterprise began operations. To this may have been added in the course of time extensions and improvements of the fixed plant; consequently there must be added the amount expended in permanent improvements. Together, these items constitute what has come to be known as the *historical cost* of the tangible property.

(b) The amount and market value of its bonds and stock, which is the third item in the above enumeration. The *amount* of bonds and stock can refer only to the aggregate par value of capital stock, actually issued and outstanding, plus the par amount of the outstanding long-term debt. The *market value* of bonds and stock can refer only to the current market rates at which the corporation's bonds and stocks are being sold upon the exchanges. These figures have been taken as indicating respectively the *capitalized value* and the *commercial value* of the business.

(c) The present as compared with the original cost of construction. Interpretation here meets an ambiguity in the language of the court. No useful purpose would be served by comparing the original cost of construction alone with the present cost of constructing a plant which has in the course of time been materially extended and improved. A study of the report of the case reveals, however, that what the court had in mind was that present costs of constructing a similar plant should be compared with the actual construction costs. Whether the present cost of construction was to be ascertained in order to provide a check upon actual cost as some surmise or whether the court was cognizant of the effect of price changes and improvements in technique, cannot be determined. Be that as it may, in order to make the suggested comparison, rate-making authorities have generally determined a figure which would represent the cost of reconstructing the plant as it stood at the date when rates were being fixed. This has been called the "*cost of reproduction new*" of the property.

These various measures of the cost of the plant, together with the capitalization and commercial valuation of the business, should then be considered as evidentiary facts, which must be "given such weight as may be just and right in each case". In the end they are to be combined in a final judgment or "finding" as to what sum represents a "fair value." This final sum must then be related to the estimated earnings (after deducting estimated operating expenses) by arithmetically computing the per centum of return. If the estimated rate of return is deemed to yield a reasonable amount, that amount becomes the "fair return", and the tentative rates may become the prescribed rates.

The court adds to this rate-making rule an element which might be termed a judicial "factor of safety." Having previously stated elsewhere in its opinion that in fixing the "just compensation" to be paid by customers to public utilities, the delineation of "the necessary elements in such inquiry will always be an embarrassing question," the court adds the statement: "We do not say that there may not be other matters to be regarded in estimating the value of the property."

Making all due allowances for judicial ineptitude in describing a technical rate-making process the rule may fairly be criticized because it was based upon an inadequate analysis of a very complex problem. The last two sentences,[26] for example,

[26] See p. 327 *supra*.

are a good illustration of logical dualism. The rights of consumers and the rights of producers are stated but not harmonized. If consumers, *collectively* called the public, should be charged *individually* and *collectively* only what services are *reasonably worth,* this reasonable worth must find its fundamental basis of measurement in what the company is entitled to ask, which is, in addition to reasonable operating expenses, a fair return upon the fair value. In the absence of such an interpretation reasonableness is referable either to the economic needs of the producer or to the necessities of the consumer. As stated, the rule calls attention to the conflicting claims but offers no basis for their reasonable reconciliation. Nevertheless, rate-making by public authority was constrained to develop with this rule as a constitutional guide. Therefore, we should not be surprised to find that different opinions are held by managements, commissions, and courts as to its validity, and that actual procedure under the rule has become a veritable comedy of errors.

Sec. 7. The Investment Standard of Determining the Rate-Base

Broadly conceived, three standards of valuation are suggested in that portion of the rate-making rule which deals with the valuation doctrine. The first standard may be called the *investment standard* because it deals with the amount of cash or cash value of property and services that have been contributed to the capital of the concern. The investment standard is best evidenced by the books of account if these have been correctly kept. The amount of the capital investment can be obtained by looking either at the asset or the liability side of the balance sheet.

On the asset side the fixed capital accounts should show the amount that has been paid for the fixed properties.[27] But considerations may arise which will render this evidence less probative. Properties grow, diminish or change in character. Ordinarily, growth is taken care of by increased investment which should be recorded on the books by debiting the increased cost to the proper accounts. Properties diminish through losses, sales, and abandonments. These should be recorded on the books as retirements by crediting the cost of the property lost, sold, and abandoned. Properties also change their identity by

[27] In an accounting and legal sense all assets are capital; but from an economic point of view and for practical purposes capital may be restricted to fixed and current assets.

being renewed after depreciation has made such replacement necessary. At such times identical units of property or units more or less different will be substituted. The significance of these changes for us is not the technological one by which a generator of one description is displaced by an improved one of another description, but rather the pecuniary one that the new generator costs more or less or as much as the displaced generator. If their respective costs are the same, the capital cost of the enterprise has not been enlarged; if the former costs more, the investment has been enlarged; if it costs less, the investment has been diminished.

Amid all these vicissitudes of property changes, especially in a complex property having a long history, it may well happen that the pecuniary cost will not be accounted for with the fidelity that the investment theory assumes. It may be that important accounting sources have been lost or destroyed so that the historical continuity of the investment accounts is broken. At other times the same property, speaking physically, has been held in the ownership of different corporations. Corporation A, the first owner, may have sold the property to corporation B at a price that had no relation to cost; still the investment of B will be represented by this figure. Or corporation B may have purchased the property at a receiver's sale, the price again being fixed without relation to construction cost. Very often the opening entries in property accounts represent merely the offsetting entries to adjustments in stock and bond ownership at the time of reorganizations. In all these various ways the determination of the correct historical cost may prove difficult if not impossible.

This difficulty may be partially circumvented by recourse to a physical appraisal. Although the books of account are gone or are incorrect, the property is still there and may be inventoried. By determining, then, for each unit of property on hand, the cost of its acquisition, the sum total of these inventory items will give a measure of the cost of *existing items of property*. This procedure, however, does not do full justice in the determination of the investment cost of a particular concern which may have failed, on account of insufficient earnings, to retire the full cost of property items lost, sold, or abandoned by charges to the depreciation reserve or by charges against surplus revenues. And yet these particular changes in the property have been a part of the integral growth of the business taken as a unit.

Another problem that enters into the determination of the investment is the wisdom or lack of wisdom with which expenditures were made. From one point of view, all that is necessary is to determine the amount regardless of any questions involving managerial discretion; but having found the actual investment it is still necessary to determine whether such investment was prudently made.

The considerations advanced above should make it tolerably clear that the application of the investment standard may require one or all of the following:[28] (1) an audit of the accounts of the company in order to determine the *historical* cost of the fixed properties; (2) an engineering survey or appraisal of the *existing items* of property in order to ascertain from accounting records or by means of engineering estimates the investment costs; (3) a financial history of the business in order to ascertain from an economic and operating point of view whether any deduction should be made from the present investment as determined under (1) or (2) above to cover imprudent expenditures, or whether an additional allowance should be made to cover past financial losses on equitable grounds. We will discuss these matters in greater detail later.

We must, in passing, stress a further point, namely, that investment could also be ascertained by scrutinizing the source of investment funds, that is, by examining the liabilities of the enterprise. The par value of bonds, provided there have been no discounts, should indicate the sums available from this source. Stock subscribed and fully paid for represents another principal source. The shares of capital stock represent the legal capitalization of the enterprise. With this must be included reserves set aside and invested in property, and the surplus account. To it should also be added the par value of notes or other evidences of indebtedness. This combination (stocks, reserves, surplus, and bonds) represents the economic capitalization of the enterprise in terms of liabilities, that is, in terms of claims or legal interests. The satisfactory recognition and protection of these legal interests gives the business its going concern character. Under proper conditions there should be little variation between these two measures of investment, one derived from assets and the other from liabilities.

Unfortunately, however, the use of the par value of stocks and bonds has been vitiated on account of the historical prac-

[28] Only the most important points, that will afford the reader some criteria of judgment, will be here developed.

tice, by many corporations, of distributing shares of stock as a bonus to encourage the purchase of bonds, and even by issuing bonds in reorganization plans so that their par value has lost its relation to the investment of funds. Par value in individual instances may thus represent investor's future expectations rather than past investment. These difficulties go back, of course, to the uncontrolled nature of past public utility operations and to the mistaken policy of competition under which so many of these industries were developed.

Sec. 8. The Capitalization of Income Standard of Determining the Rate Base

The second standard suggested in the rate-making rule is that of the market value of outstanding securities. The market prices of bonds and stocks reflect the *desirability* of these securities as investments. But at particular times, market values, especially of stocks, may also represent *desirability* from the standpoint of control or of their mere possession for purposes of security market operations. However, the element of income yield upon the securities is the common and abiding factor which underlies them all. The income yield in the case of bonds depends for its amount upon the terms of the loan contract and it depends for its certainty of accrual upon the amount of net operating revenues available and the relative priority of the claim. The income yield in the case of stocks depends upon the net operating revenues available for dividends, and upon the terms of subscription. Like considerations affect the certainty of accrual. It is apparent, therefore, that the market value of outstanding securities is premised in large part upon past income yields, and upon the way in which these past incomes appeal to current buyers as investments. Therefore, for purposes of rate control where reasonable earning capacity is to be determined, this standard moves in a circle. Moreover, it *imputes* to all securities outstanding the market prices paid from time to time for the limited number which is actually sold on the security exchanges.

Although not mentioned in the rate-making rule, another variant of this standard has from time to time been suggested and also applied. This assumes that the value of an enterprise can be determined by capitalizing the net operating revenues at some rate which is assumed to be reasonable. The capital sum so derived is also clearly dependent upon the existing earning

capacity and, in addition, upon the assumed capitalization rate. It is as defective for rate-making purposes as the market value of outstanding securities, whatever may be its usefulness for purposes of private sale or tax assessments. The market value of outstanding securities does, however, offer some clue as to what the market thinks of the credit of the enterprise and particularly of its future prospects. This may prove helpful in cases where the economic future of these businesses is beclouded by imprudent investments in the past.

Sec. 9. **The Cost of Reproduction Standard of Determining the Rate-Base**

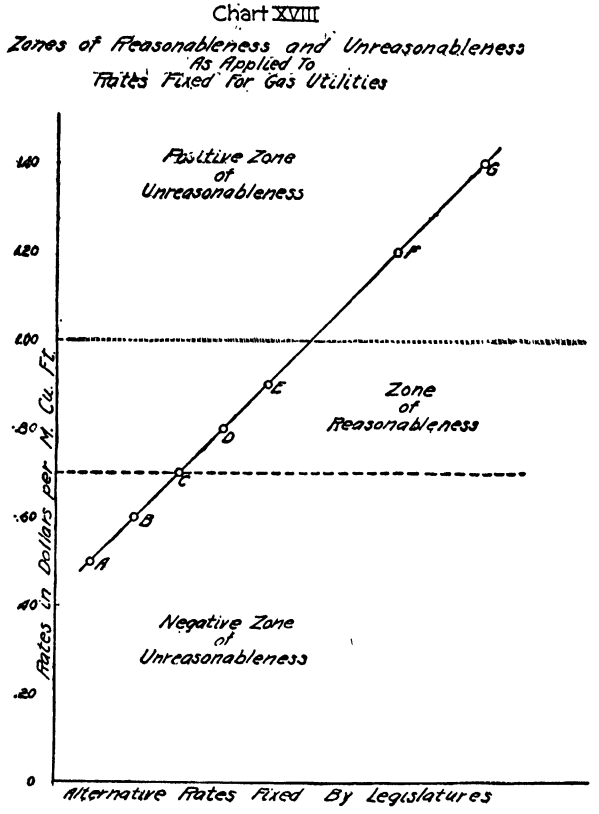
The third standard suggested in the rate-making rule is that which takes its departure from an assumed present cost of construction of the fixed properties. It has been called the cost of reproduction theory. We are accustomed to speak about "stubborn facts." Yet nothing proves more stubborn at times than a theory widely held. This is peculiarly true of this standard. It has found persistent advocates and has maintained itself until the present time.

First we must get in mind clearly what cost of reproduction means. This standard also has two variants. It may mean what it would cost to reproduce *the service* at the present time, the new producer being free to choose and coördinate his factors of production; or it may mean what it would cost to reproduce the service rendered by an existing plant where the new producer assembles and coördinates a plant like the existing one. These two hypotheses will be referred to respectively as "the substitute plant" hypothesis and the "equivalent plant" hypothesis. The value of the fixed plant for rate-making purposes may thus equal what it would now cost to assemble (a) the component parts of the present plant or (b) the component parts of a substitute plant capable of rendering the same service.

It is clear in the first place that this standard is free from the defect of the standard based upon income. As distinguished from the investment standard it uses as its basic calculation not costs actually incurred in the past but one or the other of these estimated present costs of construction. We will give a critique of these standards in a subsequent chapter.

Sec. 10. Purpose of the Judicial Rule of Rate-Making in Legislative Regulation

In order that the rate-making power may escape constitutional limitation under judicial review, the United States Supreme Court has set up these standards as a constitutional



guide. It should be noted that the rule of rate-making fixes what may be called a line of confiscation and a line of extortion. The procedure is illustrated in Chart XVIII. A rate must not be so adjusted as to bring it within either of the zones of unreasonableness there shown. The diagram arbitrarily assumes gas rates varying from 40 cents per M. cu. ft. to $1.30 per M. cu. ft. Under the rate-making rule a rate of less than 70 cents is con-

fiscatory and a rate in excess of $1.00 is extortionate, that is to say, in the latter case the cost to the consumer is more than the service is reasonably worth.

This "reasonable worth" in the eyes of the customer means the cost of some alternative *substitute* service or the expense which some customers would be forced to incur themselves in order to supply the same service. It is at this point that the distinction must be drawn between public utilities and other industries. Public utilities are industries that have control of the market. There are no competitors from whom customers may get the identical service. There may be *substitute* services, to be sure; but this involves a resort to services which are either inferior in quality, or else rendered by enterprises which are themselves public utilities. The economic significance of the upper limit beyond which rates may not be fixed will be more fully discussed in Chapters XXVIII to XXX. Our present concern is only with the legal significance of these limits.

Clearly, rates may vary between 70 cents and $1.00 and yet be within the judicial zone of reasonableness. Except under abnormal conditions the court is not so much concerned with rates that are extortionate. It has concerned itself principally with rates that are *unreasonably discriminatory* as between customers. It also watches particularly the line of confiscation, leaving the determination of rate levels above the line of confiscation to the discretion of the legislature. In 1913, in the very important second Minnesota Rate Cases,[29] this is explicitly recognized. The legislature is there given the choice of varying degrees of limitation of earnings so long as limitation is not clearly confiscatory. It is the zone of reasonableness which Justice Hughes had in mind when he wrote: "The rate-making power is a legislative power and necessarily implies a range of legislative discretion. *We do not sit as a board of revision to substitute our judgment for that of the legislature,* or of the Commission lawfully constituted by it, as to matters within the province of either." But cases do arise where it becomes a choice between confiscation of property or exacting for a time an extortionate rate. These are a species of "rare and peculiar" cases which fall outside the operation of *normal* rate-making principles.

[29] 230 U. S. 352, p. 433 (italics are ours).

Sec. 11. Modification of the Rule by Administrative Commissions

The fair value doctrine of the courts ushered in a long period of discussion. At first this was confined largely to legal arguments made before courts when rate cases came up for review. With the development of commission regulation the forum of discussion has broadened and now includes the literature of courts and commissions, the technical and scientific press, and even the popular journals and newspapers.[30]

A survey of this literature will show that the discussion was at first largely concerned with the development of methods with very little emphasis upon the philosophy of the subject. The eclecticism of Smyth v. Ames was taken for granted. Later, more attention was given to the meaning and signficance of valuation and it was then that standards of valuation, now partly clarified as to method of determination, came in for an *increasing measure of criticism.* The concrete result of this period of criticism was the definite elimination of standards based upon existing revenues as a measure of value. It was recognized that a commercial valuation predicated upon earning capacity had no place in a *process* of price determination whose objective was the determination of the reasonable exchange value of services produced under regulated monopolistic or semi-monopolistic conditions. The establishment of theoretically correct criteria of valuation has been made more difficult by the persistence of competition. In the field of transportation particularly, where the area of operations had become interstate, legislative policy continued to favor the maintenance of at least some elements of competition. It was felt that regulation could not be perfected to do the *full* work of competition. Opposition to consolidations was such that the combination movement could not bear its full fruit. With a fine inconsistency Congress was, nevertheless, giving more and more power over rates to the Interstate Commerce Commission, so that now the situation is a confusing one.

A good deal of truth, it must be admitted, is on the side of those who contend that the cost of service does not determine even the general level of rates so long as competing carriers

[30] The valuation of railways by the Interstate Commerce Commission was made the occasion for the calling of a Conference on Valuation (held at Chicago, May 25-26, 1923) by the late Senator LaFollette, whose constructive work so largely shaped the development of public utility regulation in his own state and elsewhere.

must meet each other's rates and so long as there are differences in the cost of service among competing carriers. The so-called strong and weak road problem is one of the legacies of our laissez-faire past which makes the selection of any *one* standard of valuation difficult.

If exchange value based upon private sale or upon capitalization of earnings is thus inapplicable, the courts are, nevertheless, continuing to stress a new interpretation of exchange value. They contend that if the present cost of construction of the going plant has increased that cost should be the principal ingredient of "fair value". A fair exchange value is one which has reference to present costs of construction. Under competitive conditions the present cost of construction of a competing plant will be recognized in the prices paid for the products of all the competing plants. A competitor whose plant has cost less than that of marginal producers will say to himself that his plant is worth at least the cost of producing it, less the estimated deterioration. At the present time we hear a good deal about the determination of "fair *present* value" or the "value at the time of inquiry regarding rates", and always the emphasis is put upon the fact that the cost of assembling the elements of a going plant has increased, that land has increased in market value, that other enterprises not public utilities are securing the "benefit" of these increases.

The situation may thus be summarized as follows: In the progressive development of valuation principles and practice rate-making authorities soon recognized that the capitalization of income standard was inapplicable. Choice was thus narrowed down to the investment and cost of reproduction standards. So far as the investment standard is concerned the par value of securities was infrequently used for the reason given above. While commissions have given lip homage to all of the evidentiary facts, their main reliance has been upon investment as evidenced by accounting records and cost of reproduction as ascertained by appraisal giving "due weight" to each.

In applying the cost of reproduction standard a host of embarrassing questions was soon raised, all of them pertaining to the hypothetical character of the theory that any plant has a value equal to its cost of reproduction. The determination of the investment cost was beset with difficulties of another character. The upshot of the matter was that commissions came to rely more and more upon cost of reproduction which could be obtained at any time and for all properties by ordering that

the properties be appraised. Historical cost, on the other hand, was neglected. The reason is well stated by Professor Ripley:[31] "It has been neglected in part because of the inchoate condition of accounting principles and practice, and in part because of misunderstanding by laymen of such sound distinctions between capital and income as were well recognized among experts. Great confusion is everywhere apparent as to what the term implies. 'Book value' or cost of property . . . seldom represents anything even approximating the facts. The meagreness of corporate records, either because of carelessness or bad faith, is indeed a severely practical objection and yet experience has already shown that original cost can be unearthed."

If no definite conclusion is reached at this point as to what should be the standard for determining the rate-base, it only reflects the present uncertainty of commission procedure. The practical difficulties are so great and the legal theory of the subject is at present so confused that no generally valid summary can be attempted. We will return to this subject again in Chapters XXI and XXII, after we have discussed the other problems involved in controlling the investment bargain. If a conclusion is ultimately reached it must take into account these other factors—such as depreciation, control of the market, control of security issues—having to do with security of investment. But security of investment, in turn, conditions the rate of return which will have to be considered next. Finally, we must take into account the practical difficulties involved in making appraisals. We will then be in position to review the entire investment bargain and to come to some conclusion regarding valuation standards for rate-base purposes. This will also enable us to review critically certain later court decisions concerning valuation.

[31] Ripley, W. Z., *Railroads: Finance and Organization*, p. 347.

CHAPTER XV

SECURITY OF INVESTMENT AND DEPRECIATION

The rate-base is only one of two factors necessary for a determination of the "fair return". The other factor is the *rate* of return. In considering the rate of return we shall be approaching the question of the "fair return" from the point of view of investors and we shall want to know what return investors demand as inducement to supply capital to the going concern. The amount will depend in part upon the degree of risk which attends investment. Hence it is necessary to determine first what factors produce *security or insecurity of investment.*

Sec. 1. A Classification of Factors Producing Insecurity of Investment

The discussion is best begun by considering causes of insecurity. Omitting for the time being insecurity which arises out of the way in which the rate-base is determined, two classifications of insecurity may be distinguished. In the first class are those causes which can be eliminated by a proper ordering of the institutional setting for public service industries. These preventable causes of risk relate, first, to the conditions under which an enterprise keeps control of its market, and second, to the conditions under which the several kinds of investment bargains may be protected against financial abuses. These forms of insecurity will be considered in the three following chapters. In the second class come those causes of insecurity which cannot be eliminated. They are a necessary accompaniment of operation. Provision may be made, however, for insuring the investor against some of the risks which operation entails. These will be discussed in the present chapter. Risks which cannot be eliminated, or cannot be counteracted by a policy of insurance against loss, must be considered in fixing the rate of return.

The construction of a going plant converts capital in the economic sense into capital in a physical or engineering sense. From the point of view of the business concern, physical capital

thus consists of the productive instruments which comprise the going plant. Each one of these productive instruments must be replaced from time to time so that the concern may render continuous service. Only a going plant has the capacity for continuous service. Units of physical property must be replaced because certain natural and social causes make them unfit for continued service. This phenomenon has been called depreciation.

In the sense in which the term is used here depreciation refers to the capital cost which accrues when productive instruments become unfit for service. If they could continue to render satisfactory service indefinitely, capital goods, once produced, would not need to be replaced. Saving or the accumulation of capital would then be a very much less important economic function. But capital as a whole must be replenished if production is to continue, and hence saving becomes a continuous process. Providing for depreciation is therefore one of the aspects of saving.

Each industry which undertakes to keep its productive instruments replenished is keeping its physical capital intact. But we must distinguish between physical and pecuniary capital. In the latter sense capital represents the investment of present purchasing power or of dollars. This is also the measure of capital in an accounting sense. One productive instrument, say an electric street car, may cost $6000. When the time arrives to replace this car it may be found that one of exactly the same design will cost $9000. In a physical sense capital is the same when one car replaces another, but in a pecuniary and accounting sense the capital has been increased from $6000 to $9000. It required an expenditure of $9000 to maintain physical capital while pecuniary capital would be maintained by the expenditure of only $6000. The $3000 additional expenditure is necessary so that the enterprise may have a going plant, but this involved increasing the capital of the concern by that sum. Depreciation from an accounting point of view relates only to the maintenace of capital in this pecuniary sense.

Sec. 2. **The Causes of Depreciation**

Engineers and accountants have examined into the various causes of depreciation and have classified them into groups. The first groupings brings these causes together under the heading of "age". A unit of property may become unfit for further service due to the action of the elements. Animated organisms and

processes such as rust, rot, heat, washing, and freezing may attack units of equipment causing them to become disintegrated, and thus unfit for further service. We may speak of them as the *weather factor* in depreciation. A second group of causes bring about depreciation due to the operation of properties. Friction, vibration, electrolysis, over-heating, etc., at once come to mind as illustrations in point. We may speak of them as the *wear factor* in depreciation. These causes operate concurrently and it is only by means of an abstraction that we distinguish them. For it is useful to remember that even if the plant is not being operated the weather factor in depreciation continues effective. When the going plant is being operated, the wear factor enters as an additional cause and depreciation accrues faster. The wear and weather factors are usually referred to collectively as *physical depreciation.*

Units of property may also become unfit for service on account of causes that have no relation to operation or to the action of the elements. They are said to bring about *functional depreciation.* This form of depreciation exists when there is a lack of adaptation to function of parts of the going plant so that the need arises for a retirement of the parts thus affected.

A unit of property may be physically fit for service but it may not be of the requisite size or capacity for efficiency in production. The population of the community and hence its service demands may have increased faster than was anticipated. These causes have been grouped together under the term *inadequacy,* and are suggestively described as the *market factor* in depreciation. It should be noted, however, that by some rearrangement of parts or a removal of the property to a new location the effect of these causes may often be overcome. This may involve the reconstruction, rearrangement or sale of parts of the going plant. In case of sale the parts will not be disposed of at scrap prices but at second-hand prices so that a larger amount of the original investment in them can be recovered and used in securing new units that are better adapted to the needs of the market.

Another group of like causes are embraced under the term *obsolescence.* A unit of property may be physically fit for service, it may be adapted to requirements so far as its capacity is concerned, yet the quality of its service or the costs involved in continuing its use may be such as to make the retention of the unit as a part of the going plant objectionable. Technical advances in the art may have produced an instrument which is in these respects superior. The requirements of good service

dictate that the old unit be replaced by a new one of more modern design. This is the *progress factor* in depreciation.

Closely akin to obsolescence as a cause of depreciation is one which has been given the name of *governmental requirement.* Public utility properties occupy the public highways and government, in caring for these highways, may require that alterations or improvements be made in public utility structures. Such alterations and improvements when not due to progress in the art but to the need of bringing about coördination between public utility uses and ordinary common uses of streets are occasioned by governmental requirements. Street paving is a common illustration.[1] This may be described as the *social factor* in depreciation.

Again we must call attention to the fact that these causes operate concurrently. So far as the ultimate need for replacement is concerned, their effect is non-cumulative. The immediate cause bringing about replacement may be of any one of the five types enumerated. It is then the limiting factor which conditions further production.

Assume, for purposes of illustration only, that one unit of property, like a boiler, is estimated to be fit for service in a given going plant for the following number of years if account is taken separately of those causes bringing about retirement under each of the five factors enumerated.

1. Weather factor	50 years
2. Wear factor	15 years
3. Market factor	10 years
4. Progress factor	5 years
5. Social factor[2]	12 years

In this arbitrary illustration obolescence will bring about replacement 5 years before inadequacy and 10 years before physical depreciation would have necessitated replacement. In practice, the estimating of service life does not necessarily embrace all causes, both physical and functional. All that is attempted is to set a life on the basis of physical depreciation and to make some reasonable allowance for functional depreciation. In the above illustration the difference between 15 years and 5 years represents what has been termed *fore-shortened life,* and is due to functional depreciation.

[1] We have refrained from giving illustrations of the operation of the other causes because ordinary experience and observation will supply them.

[2] Higher standards of safety may require that boilers be put out of service before their maximum useful life has expired.

The limiting factor in rapidly growing communities usually is inadequacy and in dynamic industries it is obsolescence. It should be noted, however, that to inadequacy or obsolescence is chargeable only the so-called foreshortened life. Some have contended that the increased cost of production represented by foreshortened life is properly chargeable against the rendition of service in the future. This argument has a true economic basis because the cost of the improved or increased service rendered in the future is represented by the physical deterioration of the new productive instruments plus the loss in investment necessitated by the premature discarding of the displaced productive instruments. Insofar as either the unit cost of production is reduced or the quality of service is improved in the future, it is also equitable that those who enjoy the cheapened or improved service pay the costs of obsolescence or inadequacy. In this way the cost of maintaining intact the capital of an enterprise is covered by charges which measure the cost of physical depreciation plus charges which provide for the cost of capital displaced by functional depreciation.

Sec. 3. **Maintenance and Depreciation**

Thus far the subject of ordinary maintenance or repair has not been mentioned. It is a matter of common knowledge that all productive instruments must be maintained in good operating condition by careful use and attention, and by a timely replacement of minor parts. The distinction between repairs and depreciation is difficult to draw and depends upon what one considers a unit of property. The unit may be so minute that the distinction becomes a practical absurdity. In the end expenditures to repair and to replace units of equipment serve the same purpose of maintaining the unit and indirectly the going plant in a state of operating efficiency. Engineering economy, which keeps in mind the cost of production as related to quality of service, will dictate the propriety and amount of such expenditures. Accounting expedience will dictate what may be considered as a unit of property. Nevertheless, all expenditures must be properly brought to book and their relation to present and future service output established. If this is not done, the economic nexus between cost and income will be lost and with it the economic basis for pricing. For this reason repair expenditures are charged currently as an operating expense while depreciation expenditures are distributed over the period of time

during which the unit of property was in service. The two are, however, interdependent. If repairs are made when needed the productive instrument will remain in service longer than when repairs are delayed. The estimate of the length of useful life of a unit of property thus depends upon a definite standard of maintenance. If this standard is not attained, the service life of the unit is shortened. Such shortening has been called depreciation due to *deferred maintenance.*

Sec. 4. **Other Causes of Loss of Capital**

The operation of causes of insecurity discussed so far is tolerably certain, although quantitatively difficult to predict. All productive instruments with the exception of land [3] are definitely and irretrievably on the way to the scrap heap. However, there are other causes of loss of capital dependent more largely upon chance. Some forms of physical capital like small tools, materials and supplies of all kinds in store-rooms, are subject to wear, loss, theft, breakage or spoilage. Such capital costs are sometimes spoken of as "contraction in inventories". Provision against these losses is usually made currently by charges to special accounts. They are not so important in amount nor so irregular in occurrence that current charges to operation or construction can not be made to cover them adequately. They represent, however, a form of depreciation, and must not be overlooked.

More important are those chance causes of capital loss due to unforseeable contingencies. We need only mention explosions, fires, floods, earthquakes, sleet and wind storms to call to mind the not infrequent and costly catastrophes which have brought large capital losses in their train. The Dayton and Mississippi Basin floods, the Galveston hurricane, the San Francisco earthquake and fire, the Baltimore fire, stand out as instances of extraordinary destruction. Wars, strikes and riots have resulted in infrequent but severe property loss. Against most of these contingencies provision may be made through the various forms of property insurance. Premiums paid are charged as an operating expense. The larger companies undertake to carry their own insurance, particularly upon property where the hazard is a remote one. Uninsurable losses may be covered by means of contingency reserves.

[3] For agricultural purposes, land, that is to say its soil fertility, is also subject to depreciation.

Sec. 5. The Purpose of Depreciation and Insurance Charges

The ultimate objective of this procedure is to charge against consumers the cost of maintaining intact the capital fund of a going concern. Insofar as such losses are provided by systematic insurance plans, and these costs are treated as a part of the cost of production, the industry has been relieved of the risk of loss. A residuum of risk may remain but it is in practice so attenuated as to be in effect negligible. Thus depreciation and insurance charges are the practical devices for shifting the incidence of risk from owners to consumers. A sound public policy has recognized the validity of such practices in order to afford the going concern security of investment. Whether capital is contributed by bondholders or shareholders, they are thus protected against the risk of impairment of investment. Bondholders are protected in law, it is true, by the requirement that the going concern must pay both principal and interest, whether the corporation has exacted depreciation charges from its customers or not. Such protection may, however, turn out to be an illusory safeguard where the capital contributed by shareholders is small in amount or non-existent. Certainly the better policy is for management and regulation to unite in fixing rates upon a basis of cost which will include insurance and depreciation charges.

Properly understood, there is no conflict between the utility and its customers with respect to this procedure. Their interests are reciprocal. The customer is interested in securing continuity of service while the company is interested in preserving its credit, that is, continuity of investment. Both objects are accomplished by means of such charges. By so doing the utility preserves its productive instruments for continuous service, thus insuring a continuous flow of income. It preserves its physical assets and its business relations with customers so that the assets may continue to function as security for the repayment of debt. With a reasonable margin of investment by stockholders similarly maintained, and with the assurance that any accretions in the capital fund due either to increased cost of replacements or to new capital expenditures for extensions and improvements will be protected by the same rate-making and depreciation policies, the financial credit of the enterprise can be continuously maintained.

A depreciation charge does not signify that capital has been lost; it merely means that provision has been made to keep the capital fund unimpaired. If less than an adequate charge is

made, it means that the fund has been impaired. If depreciation charges are more than adequate, the fund has been increased.

Sec. 6. **Some Misconceptions Analyzed**

Depreciation should not be confused with mere price changes. We shall presently see how the accountancy of depreciation always relates depreciation charges to the cost of property. Under the going concern theory of regulation, where property is committed to a definite use and competition is largely eliminated, price changes need not affect the security of investment.

Land, however, has certain peculiarities of its own. A parcel of land which has been devoted to a public utility use, being a durable instrument of production, is not subject to physical depreciation, although it is subject to functional depreciation. Its cost is represented by capital investment which remains the same so long as the land remains a part of the going plant. If the land is ultimately sold a proper interpretation of depreciation would require that such sale price be interpreted as salvage value. The particular parcel of land has been retired from public utility service because it has become subject to inadequacy or obsolescence. If less than the cost has been recovered, the difference is a capital loss which should be covered by depreciation. It may happen that land can be sold for more than it has cost. In that event the excess salvage recovery should be treated as an incidental revenue from operation.[4] Price changes should therefore have no effect upon the economic capital of the concern. To say that a drop in prices records depreciation or that an increase in price records appreciation is a common but nevertheless erroneous conclusion arising out of a mistaken view of the objectives of depreciation policies.

Another misconception arises out of the failure to distinguish between depreciation and amortization. Amortization is a financial process by means of which a business unit repays a debt. In its essence the process consists of taking net income which is available for dividends and devoting it instead to the repayment of a debt. The practical effect of the operation is to *decrease* the amount of economic capital that the business has available. But since amortization usually takes place at the expense of dividends it is capital which the business does not need for produc-

[4] It may be more convenient to impound these recoveries in a special salvage account.

tion purposes. In the end, productive capital remaining the same, the business has simply substituted more capital contributed by shareholders for less loan capital. This debt-repaying process cannot be brought into play when stockholders desire, but it must take place either at the time the debt matures or at definite times agreed upon beforehand between the creditor and the business and in accordance with fixed conditions. If the debt can only be repaid at maturity the business may follow the practice of gradually accumulating the amount needed and temporarily investing it in securities readily convertible into cash. For a time, therefore, the business will show an accumulation of capital over and above its requirements for production purposes. When the debt is repaid, this accumulation vanishes, but there is no reduction in its productive capital. Depreciation and amortization charges, therefore, serve different purposes.

Sometimes depreciation is treated as if it were the equivalent of the process of amortization or debt-repayment on the partial payment plan. Depreciation charges are said to represent funds returned to the investor and thereby *decreasing his investment* by the same amount. It is nothing of the kind. If a company were operating exclusively on borrowed funds, the collection of depreciation charges from customers would not reduce one iota of the debt. Neither would it reduce the investment made by shareholders if the capital were all contributed by them. Nor would it be safe to use these funds for debt-repaying purposes because they will be needed in order to help finance the purchase or construction of new properties. We may assume that an investor buys ten shares of stock for which he pays the company $1000. The company, in turn, purchases a piece of equipment with the proceeds. As the company collects depreciation charges from its customers, its investment has not to that extent been diminished. Business is not organized nor can it be efficiently conducted upon such a theory. It is true that the company has extra funds available, impounded in a depreciation reserve, which it may put to some use pending the primary use for which these sums have been collected. If these surplus funds are devoted to the purchase of new fixed property, as they usually are in growing enterprises, then the money to insure replacements will have to be borrowed. The additional fixed property and the income it produces will serve as security for the new loan. It will be conducive to correct reasoning, however, if these sums, obtained from new loans, are considered as if they were loans which should be returned to the depreciation reserve.

Sec. 7. The Financing of Depreciation

We begin with three conclusions: (1) that depreciation is a cause of insecurity of investment against which some systematic provision must be made; (2) that such provision must be considered as a part of the cost of operation and not considered as coming out of net income; (3) that depreciation must be charged as an operating expense and must not be considered as a reservation of surplus.

The position here taken is that net income does not appear until depreciation is deducted from operating revenues. There is a real danger that the duty of providing for depreciation will be regarded as an obligation of the corporation rather than as an obligation of consumers in paying reasonable rates. In advertising the sale of securities, it is not unusual for corporations to publish figures of net income which are claimed to be available to meet interest, dividends *and depreciation.* In this way an extra margin of net earnings above that required to meet either interest or preferred dividend requirements upon particular bond or preferred stock issues can be shown. Depreciation when considered as an operating expense reduces the net income available for interest and dividends as shown in these statements. Justification of the practice is based upon the fact that interest must be paid while property renewals may be deferred. It is true that, temporarily, this can be done, but if the practice continues, the property which is security for the loan becomes physically impaired, service deteriorates, and the earning power of the concern diminishes. Under normal conditions, the policy should thus be to consider depreciation as an operating expense.

The first step in financing depreciation is to measure its amount. We have seen that under the going concern theory of regulation the function of depreciation is to keep the investment intact. From a financial point of view depreciation relates to the economic capital and not to the physical capital of the concern. Therefore, the financial problem involved is not that of insuring the replacement of one unit of property by another unit. That would be interpreting capital in the physical sense. Rather it involves collecting enough funds from customers through rates to replace the cost of the retired unit. The basis of the calculation for depreciation therefore is the cost of property installed, not its cost of reproduction.

Although property may be unfit for service, it is not neces-

sarily valueless. Retired units may have a scrap value or a salvage value which, when recovered, reduces by that much the depreciation. The difference between the total cost and the salvage recoveries is the amount of capital cost chargeable against the service output during the time that the property was a part of the going plant.

This brings us to a consideration of the time factor in depreciation. Over how long a period will units of property remain in service? At the moment of retirement, dictated by reasons of engineering economy, there can be no questioning the time factor. With adequate accounting for fixed capital the service life can be definitely ascertained. The difficulty in the situation is that this period must be *estimated beforehand* if advance provision is to be made systematically through the current cost of the service. It has been the practice to estimate life expectancy by means of life tables on the analogy of life insurance. At this point opinion on the subject generally divides. We cannot enter into all the refinements of detail here, but we will try to draw some conclusions upon the subjects of controversy.

Three methods of providing for replacements stand out, each of which is designed to meet the financial problem. The first is the so-called "renewal method". When a unit of property is retired the cost of the new unit installed is charged to operating expenses. The method is best exemplified in the practice of steam railways.

Let us note the effect of this procedure. Presumably the cost of the first unit of property remains in the fixed capital account. Whether the cost of replacement is greater or less, the customer pays for replacements. The objection at once comes to mind that the new unit may be one of greater capacity or of a more modern design. This will be particularly true where inadequacy or obsolescence is the limiting factor in depreciation. Accountants have, therefore, sought to correct the procedure by estimating the cost of the improvement and charging that to the fixed capital account, a difficult matter in any event. However, if this is not done, the fixed capital accounts will bear no relation to the actual cost of the property in service. An appraisal of the physical property at any time upon the basis of its actual cost will reflect both higher and lower replacement costs together with the cost of uncapitalized improvements.

Another result of the renewal method is that depreciation becomes a cost of operation only as it matures. A stretch of track completely renewed in any one year becomes a part of the cost

of operation for that year alone. This is obviously contrary to fact. The practice is defended on the statistical ground, however, that in the case of large and seasoned plants the amount and cost of track renewed remains approximately the same from year to year. This is true to some extent where large plants are composed of many units with varying ages and life expectancies, but this generalization is not always applicable.[5]

The second method, which may be called "the retirement expense method", while not definitely based upon an estimate of the length of property life, does make some allowance for retirements in advance of their actual occurrence. A reserve is accumulated by means of arbitrary charges to operating expenses which exceed in amount the cost of current retirements. After the reserve has accumulated to an amount which will take care of all fluctuations in the cost of retirements, it may be kept at a safe figure by means of periodical depreciation charges. This method avoids the difficulty of a fluctuating cost of operation due to uneven retirements. It is well adapted to properties of a diverse character where individual units of property represent, however, so large a part of the total cost of the property that their retirement would unduly distort operating expenses unless the retirement is spread over a period of years. It is best illustrated in the new uniform classification of accounts for gas and electric utilities.

The third, or sinking fund method, proceeds by way of a detailed calculation of life expectancies for all the different classes of properties and accumulates a reserve out of operating expense charges which, together with salvage recoveries, is estimated to provide for the full cost of the replaced items. If the estimates as to lives and salvage values have been correctly made, the reserve will be more than adequate at all times to provide for the financing of replacements upon a basis exactly equal to the original cost of the displaced physical capital. The last two methods have essentially the same objectives, their differences arise entirely out of differences in procedure.

Let us assume that a unit of property costing $1000 has no salvage recoveries and is estimated to have a life expectancy in service of 10 years. If this estimate proves correct then $1000 ought to have been collected from customers by the end of the ten year period. The so-called "straight-line method" of accu-

[5] *Cf.* Allison, J. E., *Should Public Service Properties be Depreciated to Obtain Fair Value in Rate or Regulation Cases*, Report to St. Louis Public Service Commission, Sept., 1912.

mulating depreciation collects this sum in equal annual installments of $100. The sinking fund method, however, is based upon the fact that these sums will not be immediately required for the purpose of replacing this physical asset. The funds so credited may therefore be used for some other purpose in the meantime. However, since they are being collected from customers in advance of need, for reasons of operating convenience, it has been deemed equitable, in order to justify such advance collection, that public utilities be required to use these funds in a productive way. Investment in extensions is such a productive use which eliminates the necessity of borrowing outside capital and paying interest thereon. The sinking fund method impounds these savings in interest and converts them to the advantage of customers by reducing the total amount collected from them in proportion to estimated interest savings. It is simply a mathematical device for making the estimate. Customers will contribute equal annual amounts but they will be less than $100 by the amount of the estimated interest accumulations. It is equitable as well as economically possible to require that the public utility add the calculated interest accumulations to the customers' direct contributions because it enjoys the use of these funds as capital additions in the rate-base upon which the rate of return is predicated. The higher earning power—that is to say, the difference between the fair return and the rate of interest accumulation—which the utility enjoys upon these increased capital additions is its return for risks assumed and for managerial services.

It is necessary to warn once more against the common misconception that depreciation means lessening the investment or impairment of capital. The causes of physical depreciation depend upon such a multiplicity of conditions that no one would have the temerity to say that after the expiration of five years the unit of equipment is, let us say, one-half used up. But wise property management will insist that with a probable life of ten years the company ought to have collected from customers directly and indirectly such an amount as will, if the same method is continued for the remainder of the life term, equal the cost of the unit. If, after the lapse of ten years, the estimate proves false and a longer period ought to have been predicated, the necessary correction may be made.

The estimating of lives should therefore be done by experts who are familiar with the different classes of physical property, the local climatic and operating conditions, the standards of

maintenance, etc., and who are in a position by periodical inspections and by current observation of the retirement process to make the necessary adjustments in life expectancies and hence in the depreciation rates.

We may summarize by saying that the phenomenon of economic depreciation is based on the one hand upon engineering economy which controls the rate at which retirement costs accrue and on the other hand upon sound financial management so that customers, through service rates, will be certain to bear an equitable proportion of these accruing costs. By means of this procedure a going concern will maintain its going plant and thereby insure continuity of service and of investment. The capital fund of the enterprise is kept intact and investors are secured as to one class of risks.

Sec. 8. **The Accountancy of Depreciation**

The next step is to provide for a proper procedure in accounting for depreciation. We will assume the simple case of a property unit with an estimated life of five years and a cost new of $1000, no salvage recoveries. In order to demonstrate the interrelation between the accountancy of fixed capital and depreciation, and the cost of the service, we will trace the necessary accounting entries through to the final retirement of the unit.

At the beginning of the first year, assuming that the funds were originally obtained from the sale of eight-year notes at par, the balance sheet will show the following entries:

Assets		*Liabilities*	
Fixed capital	$1,000	Notes	$1,000

At the end of the first year, assuming for the sake of simplicity that depreciation is accumulated upon the "straight line" basis, operating expenses will have been charged with $200, at the end of the second year with $200 additional, and so on until at the end of the fifth year the full $1000 has been accumulated through equal annual charges to depreciation. At the same time that the depreciation account is charged, the depreciation reserve account is credited, so that at the end of the fifth year that account will stand credited with the full cost of the property unit. Since these sums were specifically reserved for the purpose of financing in the same amount the purchase of a new unit, we will next assume that an identical unit can be bought for the

same amount. For this purpose a depreciation fund may be set up among the assets and the cash, as it is received from customers, does not remain in the Cash Account but is transferred periodically to the Depreciation Fund Account. At the end of the fifth year these transactions will be shown in the balance sheet as follows:

Assets		*Liabilities*	
Fixed capital	$1,000	Notes	$1,000
Depreciation fund	1,000	Depreciation reserve	1,000

The retirement will now be made and the new unit installed. The accounting entries for this transaction are a credit to fixed capital for the full cost of the old unit retired and a concurrent debit to the depreciation reserve. This reduces the fixed capital account and the depreciation reserve account to zero. The cost of the old property has thus been systematically charged off to the cost of the service. Now comes the financing operation. $1000 is credited to the Depreciation Fund and $1000 is debited to Fixed Capital. The new unit has taken the place of the old. The security of the notes has never been weakened, because the physical property has always been in existence and kept in serviceable condition. When retirement was imminent, financial provision had been made to purchase new property at a cost equal to the cost of the old.

The advantage of this method of accounting for depreciation and for fixed capital appears when the cost of the new properties differs from the cost of the retired properties. The fixed capital accounts are always credited with the full cost of the property retired, while the depreciation reserve is correspondingly debited. The depreciation reserve account thus records the turn-over of the cost of fixed capital. As prices change the provision for depreciation changes, because it is always based upon the cost of the active property. Yet the change comes only as property purchased at higher or lower prices enters the fixed capital account and thereby becomes a part of the basis upon which future depreciation charges are calculated.

Certain criticisms have been made of these so-called theoretical estimates of depreciation. It is contended that it is impossible to forecast the life of property accurately and that therefore estimates of depreciation are worse than useless. The writer's opinion is that this opposition to depreciation estimates is based rather upon the valuation or rate-base angle of the problem than upon the angle which relates to determining the current

cost of the service. We will discuss the valuation aspect of the matter later. It must be admitted, however, that depreciation cannot be estimated with accuracy; neither can the life of an individual and yet a great business has been built upon this foundation. Only the renewal method would eliminate the need for some estimate of reasonable depreciation rates. The fact of the matter is that *accuracy* is not the essence of the problem. The real purpose of the depreciation procedure is to make some provision for currently charging the cost of capital retirements to the cost of the service. These charges should be as correct as possible and the estimating should be brought to increasingly higher standards of accuracy.[6]

In a recent dissenting opinion Justice Brandeis accepts this interpretation of depreciation.[7] After criticizing the rate-making rule of *Smyth* v. *Ames* as applied in the instant case, and particularly the way in which the subject of depreciation had been handled, he says:

"It was settled by *Knoxville* v. *Knoxville Water Co.*, 212 U. S. 1, that every public utility must, at its peril, provide an adequate amount to cover depreciation. A depreciation charge resembles a life insurance premium. The depreciation reserve, to which it is credited, supplies insurance for the plant against its inevitable decadence, as the life insurance reserve supplies the fund to meet the agreed value of the lost human life. To determine what the amount of the annual life insurance premium should be is a much simpler task than to determine the proper depreciation charge. For life insurance is a coöperative undertaking. The premium to be fixed is not that required by the probable duration of the life of a single insured individual, but that required by the average expectancy of life of men or women of the given age. Moreover, for human lives, mortality tables have been constructed which embody the results of large experience and long study. By their use the required premium may be fixed with an approximation of accuracy. But, despite the relative simplicity of the problem, it was found that the variables leave so wide a margin for error that premiums fixed in accordance with mortality tables work serious injustice either to the insurer or to the insured Although the purpose was to charge only the appropriate premium, the transaction resulted sometimes in bankruptcy of the insurer; sometimes in his securing profits which seemed extortionate; and rarely, in his receiving

[6] This question of reasonable depreciation rates is an unsolved problem. It would be unscientific to write as if there were no problems involved and as if the opposition were motivated by ill-will and were lacking in common sense. Those who favor making systematic provision for depreciation are indebted to their critics for many searching comments and corrections. In the writer's view regulation will be confronted with great difficulties if it abandons the depreciation concept. If depreciation as here interpreted is to remain an element in the reasonable cost of the service there is great need for research into depreciation rates, and for further experimentation with administrative details.

[7] *Pacific Gas and Electric Co.* v. *City and County of San Francisco*, 265 U. S. 403 (1924).

only the intended fair compensation for the service rendered. Because every attempt to approximate more nearly the amount of required premium proved futile, justice was sought by another route. Ultimately, strictly mutual insurance was adopted. Under it, the premium charged is made clearly ample; and the part thereof which proves not to have been needed enures in some form to the benefit of him who paid it. Compare *Penn Mutual Life Insurance Co.* v. *Lederer*, 252 U. S. 523, 525.

"Legal science can solve the problem of the just depreciation charge for public utilities in a similar manner. Under the rule which fixes the rate base at the amount prudently invested, the inevitable errors incident to fixing the year's depreciation charge do not result in injustice either to the utility or to the community. If, when plant must be replaced, the amount set aside for depreciation proves to have been inadequate, and investment of new capital is required, the utility is permitted to earn the annual cost of the new capital. If, on the other hand, the amount set aside for depreciation proves to have been excessive, the income from the surplus reserve operates as a credit to reduce the current capital charge which the rates must earn. If a new device is adopted which involves additional investment (to buy a new plant or a patent right) the company's investment, on which the return must be paid, is increased by that amount. If the new device does not involve new investment, but the innovation involves increased current payments (like royalties for the use of a process) the additional disbursement is borne by the community as an operating expense. The cost of a scrapped plant is carried as part of the investment on which a return must be paid unless and until it has been retired, that is fully paid for, out of the depreciation reserve. Thus, justice both to the owners of the utility and to the public is assured."

Sec. 9. **The Requirements of Public Policy with Respect to Depreciation**

Before 1900 depreciation charges were, generally speaking, within the realm of managerial discretion, as they are in competitive industry. In fact the problem was but imperfectly understood. The sciences of engineering and of accounting had not made more than a beginning in providing the means for the proper handling of depreciation. Consequently, there was little or no discussion of its public aspects. The decision in *Smyth* v. *Ames*, for instance, has nothing to say upon the subject.

When the commission system of regulation was introduced, it was necessary first to secure recognition of the fact that depreciation is an operating expense and that some provision must be made to insure property renewals. Here as elsewhere we are in danger of losing a sound footing unless we make the distinction between competitive and monopolistic industry. Under competition a private undertaking is permitted to fix as high prices for its products as can be obtained in view of the option its customers have of buying elsewhere. Any profits above ordinary operating

expenses and taxes belong to the owners of the undertaking. In the absence of statutory or other restrictions, they may parcel profits out in the form of dividends or keep them on hand in the form of surplus. The surplus may be used to create depreciation reserves, but there is nothing sacred about these depreciation reserves. The directors are empowered to use them in any manner that may promote the best interests of the undertaking. Some limitations upon this discretion may arise on account of the interest of creditors as we shall see in the following chapter. When no provision is made for depreciation reserves, and the entire surplus is paid out in dividends, there will be on hand no funds wherewith to provide against the deterioration of capital assets. Such dividend payments, therefore, are said to have been made out of capital. The inevitable result will be impairment of service. Under competition, however, where the necessity for self-preservation will prevent the quality of the service from falling below that standard fixed by the trade, good business management will provide for keeping the capital assets intact. Under regulation, on the contrary, depreciation charges have been made compulsory. It is a precaution taken in the interests of good service. Since public utility consumers do not have the option to get service elsewhere, there exists no automatic check upon deterioration in service.

All this is now tolerably self-evident. That the nature of depreciation was not so well understood in the past appears from the following excerpt from a judicial opinion:[8]

"We see no reason why plaintiff, in addition to operating expenses, repairs and other ordinary charges, should be allowed to reduce the apparent profits by deductions for a restoration or rebuilding fund. The setting aside of such a fund may be good business policy, and, if the company sees fit to devote a portion of its profits to that purpose (though, as we understand the record, no such fund has yet been created) no one can complain; but it is in no just sense a charge affecting the net earnings of the works. To hold otherwise is to say that the public must not only pay the reasonable and fair value of the services rendered, but must, in addition, pay the company the full value of its works every forty years—the average period estimated by plaintiff—for all time to come."

Fortunately, the Supreme Court of the United States has definitely settled the question whether under regulation the consumers must provide for the continuation of the service in the prices paid.

[8] *Cedar Rapids Water Co.* v. *Cedar Rapids*, 118 Iowa 234, 263; 91 N. W. 1081, p. 1091 (1902).

"It is not only the right of the company to make such a provision, but it is its duty to its bond and stock holders, and, in the case of a public service corporation, at least, its plain duty to the public. If a different course were pursued, the only method of providing for replacement of property which has ceased to be useful would be the investment of new capital and the issue of new bonds or stock. This course would lead to a constantly increasing variance between present value and bond and stock capitalization, a tendency which would inevitably lead to disaster either to the stockholders or to the public or both. If, however, a company fails to perform this plain duty and fails to exact sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon over-issue of securities, or of omission to exact proper prices for the output, the fault is its own."[9]

The theory of the earlier of the above decisions goes back to a decision of the United States Supreme Court in the Kansas Pacific Case in 1878.[10] In that case the court frowned upon the practice of establishing reserves through periodical charges to operating expenses holding that "only such expenditures as are actually made can with any propriety be claimed as a deduction from earnings". This was in accordance with the time-honored practice of railway accounting to charge only additions and extensions to capital while replacements were charged to operating expenses. In recent years with the extension of commission regulation to local utilities the United States Supreme Court has been asked to pass upon the propriety of the method of providing for depreciation in advance of renewal. The method was first approved in the Knoxville case quoted above and has been given even more specific approval in later decisions.[11]

If the policy is adopted of making provision for depreciation currently, the difficulty of estimating the correct amount calls for a treatment of depreciation reserve balances which keeps these depreciation reserves inviolate, and dedicated only to the purpose for which they were intended. The amounts charged to operating expense as a part of the cost of service must not be regarded as a part of the free surplus of the concern, much less as a part of operating profit. These sums are set aside in order to recompense the utility for loss of capital as evidenced by capital retirements. The reserve is susceptible to over-reservation and under-reservation and hence adjustments may become

[9] *Knoxville* v. *Knoxville Water Co.*, 212 U. S. 1, p. 13 (1909).
[10] *U. S.* v. *Kansas Pacific Railway Co.*, 99 U. S. 455 (1878).
[11] *Louisiana Railroad Co.* v. *Cumberland Telephone and Telegraph Co.*, 212 U. S. 414 (1909); *Lincoln Gas & Elec. Light Co.* v. *City of Lincoln*, 223 U. S. 349 (1912); *Kansas City Southern Ry.* v. *U. S.*, 231 U. S. 423 (1913).

necessary. It is, therefore, important to preserve strictly the inviolability of the reserve.

This requirement was not recognized by the United States Supreme Court in the recent New York Telephone Co. case.[12] The Company appears to have followed the procedure outlined above, except that depreciation was set up on a straight line basis. On Dec. 31, 1923, the depreciation reserve stood at $16,902,530 for a property valued at $76,370,000 as of June 30, 1924. The reserve was not segregated in a separate fund but was invested in the going plant. The commission found that the reserve was excessive by $4,750,000 and directed that this amount (quoting the United States Supreme Court) "be used by the company to make up deficits in any year when earnings are less than a reasonable return as found by the board. . . . The effect of the order is to require that if total operating expenses deducted from revenues leaves less than a reasonable return in 1925 or a subsequent year, there shall be deducted from the expense of depreciation in that year and added to the net earnings a sum sufficient to make up the deficiency; then, by appropriate book entries, the resulting shortage in depreciation expense is to be made good out of the balance in the reserve account built up in prior years." The company contended that depreciation charges in prior years were not excessive and that the company could not be compelled to make up deficits in future net earnings out of past accumulations of depreciation reserves. It seems that the company had not been earning an excessive return in the past. Upon the question thus raised the Court said:

"It may be assumed, as found by the board, that in prior years the company charged excessive amounts to depreciation expense and so created in the reserve account balances greater than required adequately to maintain the property. It remains to be considered whether the company may be compelled to apply any part of the property or money represented by such balances to overcome deficits in present or future earnings and to sustain rates which otherwise could not be sustained.

"The just compensation safeguarded to the utility by the 14th Amendment is a reasonable return on the value of the property used at the time that it is being used for the public service. And rates not sufficient to yield that return are confiscatory. *Wilcox* v. *Consolidated Gas Co.*, 212 U. S. 19, 41; *Bluefield Waterworks & Improv. Co.* v. *Public Service Commission*, 262 U. S. 679, 692. Constitutional protection against confiscation does not depend on the source of the money used to purchase the property. It is enough that it is used to render the service. *San Joaquin & K. R. Canal & Irrigation Co.* v. *Stanislaus County*, 233 U. S. 454, 459; *Cedar Rapids*

[12] *Board of Public Utility Commissioners et al* v. *New York Telephone Co.*, 271 U. S. 23, April 12, 1926.

Gaslight Co. v. *Cedar Rapids,* 144 Iowa 426, 434, affirmed in 223 U. S. 655; *Consolidated Gas Co.* v. *New York,* 212 U. S. 19; *Ames* v. *Union Pacific R. Co.,* 64 Fed. 165, 176. The customers are entitled to demand service and the company must comply. The company is entitled to just compensation and, to have the service, the customers must pay for it. The relation between the company and its customers is not that of partners, agent and principal, or trustee and beneficiary. *Cf. Fall River Gas Works Co.* v. *Gas & E. L. Commissioners,* 102 N. E. 475. The revenue paid by the customers for service belongs to the company. The amount, if any, remaining after paying taxes and operating expenses, including the expense of depreciation, is the company's compensation for the use of its property. If there is no return or if the amount is less than a reasonable return, the company must bear the loss. Past losses cannot be used to enhance the value of the property or to support a claim that rates for the future are confiscatory. *Galveston Electric Co.* v. *Galveston,* 258 U. S. 388, 395; *Georgia R. & Power Co.* v. *Railroad Commission,* 262 U. S. 625, 632; and the law does not require the company to give up for the benefit of future subscribers any part of its accumulations from past operations. Profits of the past cannot be used to sustain confiscatory rates for the future. *Newton* v. *Consolidated Gas Co.,* 258 U. S. 165, 175; *Galveston Electric Co.* v. *Galveston, supra,* 396; *Monroe Gaslight & Fuel Co. v. Michigan Public Utility Commission,* 292 Fed. 139, 147; *Minneapolis* v. *Rand,* 285 Fed. 818, 823; *Georgia R. & Power Co.* v. *Railroad Commission,* 278 Fed. 242, 247; affirmed in 262 U. S. 625; *Chicago R. Co.* v. *Illinois Commerce Commission,* 277 Fed. 970, 980; *Garden City* v. *Garden City Telephone, Light & Mfg. Co.,* 236 Fed. 693, 696.

"Customers pay for service, not for the property used to render it. Their payments are not contributions to depreciation or other operating expenses or to capital of the company. By paying bills for service they do not acquire any interest, legal or equitable, in the property used for their convenience or in the funds of the company. Property paid for out of moneys received for service belongs to the company just as does that purchased out of proceeds of its bonds and stock. It is conceded that the exchange rates complained of are not sufficient to yield a just return after paying taxes and operating expenses, including a proper allowance for current depreciation. The property or money of the company represented by the credit balance in the reserve for depreciation cannot be used to make up the deficiency."

With all due respect for the opinions of the United States Supreme Court, this conclusion does not appear to be sound. It may be conceded that the board was in error when it sought to divert depreciation reserve credits in order to make up expected deficits in future net earnings, particularly when there was dispute as to whether the depreciation rate was excessive and when the property had not been earning a fair return in the past. But for the court to conclude that excessive depreciation reservations are the company's property so that no equitable adjustment can be made in the *depreciation rates* in the future is equally unsound. The criticism here made is not

directed against the practical result achieved by the decision but against the inference that depreciation reserves are the unqualified property of the company. Such a conclusion will make unworkable the reserve method of providing for property retirements.

This case illustrates the disadvantages of the straight-line method of estimating current depreciation requirements. If the sinking fund method is used, accumulation in the reserve, not currently needed, can be made to pay an interest return which supplements the current reservation through operating expense charges. It opens the way for equitable treatment of both the company and its consumers and provides a method whereby uncertain accruals of property retirements may be financed. If accumulations in the reserve prove to be excessive, they may be gradually diminished by reducing depreciation rates in the future or vice versa. Continuous accounting is, however, necessary, and this can not be done unless the reserve is kept inviolate. The relationship of the reserve to the question of accrued depreciation in its effect upon the rate-base will be considered later.[13]

This question of depreciation reserve accumulations and their status under commission regulation is well discussed by L. R. Nash in a recent article under the title "Public Utility Depreciation Accounting."[14] Nash treats the subject from the point of view of providing a "retirement reserve" as a substitute for the "depreciation reserve". This is "intended to equalize the cost of writing off property elements when they cease to be useful. This reserve may be accumulated through charges to operating expense or appropriations from surplus, or both, and the charges or appropriations need not be uniform". The writer points out the difficulties involved in estimating property lives, the unnecessarily large reserves accumulated under the straight line method and comes to the conclusion that "some flexibility in the accumulated reserves and in the appropriations thereto are consistent with the fundamental uncertainties of the problem and are essential to maximum financial stability and usefulness of the utility." The danger that such flexibility may be abused is recognized, but it is contended that "safeguards may be embodied in a definite program under which utilities will undertake to accumulate reserves within certain defined limits appropriate to the character of their property, and to maintain

[13] See Chapter XXII, p. 501.
[14] *Journal of Land & Public Utility Economics*, Vol. II, p. 369, Oct., 1926.

such reserves by annual or other appropriations made in the light of existing accumulations, current business conditions, the credit standing of the property, and otherwise in the interests of its users and owners."

It may well be doubted whether this alternative procedure can be equitably carried out and made a part of a scientific procedure for rate-making purposes, if commissions are not given a free hand in working out a definite policy (within the limits, of course, of reasonableness), and if retirement reserves are not treated as inviolate. The line which the United States Supreme Court attempts to draw between the interests of consumers and the interests of owners can not but appear illusory to any informed and unbiased student of the depreciation problem.

CHAPTER XVI

SECURITY OF INVESTMENT AS RELATED TO CONTROL OF THE MARKET

In the preceding chapter we dealt with those causes of insecurity that arise out of the vicissitudes of operation. It was shown that, while these causes of insecurity are inherent in the process of production, managerial policy and public policy will seek to counteract them by making adequate financial provision to meet capital losses.

Sec. 1. **Meaning of Control of the Market**

Other causes of insecurity arise out of the fact that a public utility may not have complete economic or legal control over its market. The franchise or charter authorization to do business is pivotal in considering this question. From an economic point of view a utility may be so intrenched in a particular market that even if it did not have an exclusive franchise its financial power to meet competition through rate reductions, its record of having rendered adequate service at reasonable rates, its prior ownership of the best and strategically located properties, may deter effective competition from entering a field not legally closed to a newcomer. The history of public utility expansion is full of illustrations where construction was undertaken in order to preëmpt the field against possible competition.

Where economically strong properties have thus been built up and such economic control of the market is reënforced by the possession of an exclusive long-term franchise, or by one of indefinite tenure, a utility's control of the market is well-nigh complete. It is sufficient at this point to refer to what has been said upon this subject in preceding chapters, particularly in regard to security of tenure derived from the various types of franchises including the indeterminate permit. Particular attention is directed to the way in which the state, by means of anti-duplication laws and legislation controlling the grant of certificates of convenience and necessity, exercises control over ex-

tensions into new market areas. By this means it seeks not only to prevent competition but to restrict investment to market areas possessing reasonable promise of remunerative business. We must also refer again to the peculiar use made of such certificates by administrative authorities in preserving the economic advantages of legal control of the market, as guaranteed under the indeterminate permit, to only those public utilities which will and can render efficient service at reasonable rates. Investments in public utilities operating under such legal safeguards are protected from the operation of market competition which tends to make investment insecure. Public regulation is depended upon to secure reasonable service at reasonable rates, and in this sense only is regulation to be interpreted as a substitute for competition.

Control of the market under proper safeguards should be strengthened. It is unfortunate if the political psychology of some states does not favor the adoption of similar measures. Such antagonism may be well founded if regulation,—either state or local or both—, cannot be relied upon to control the utilities. Their financial and political power is, indeed, so great that it must be matched by an efficient and independent regulatory organization that is financially well supported and that has the backing of the community. If there is added the further safeguard that the public may take over these enterprises at a just compensation, an exclusive permit terminable by exercising such a purchase option has much to commend it.[1] Security of investment is not jeopardized by purchase provisions which make due allowance for the payment of a fair purchase price.

We take this position advisedly because the concept of public utility should not be expanded to include those industries that the state is not ready to undertake at any time as a public function. We thus make *monopoly* and *necessity* the two anchors by means of which this working concept of public utility is held upon secure ground. Insofar as it is possible to predict the future, the services rendered by public utilities will always be in demand. As necessities of life they are as permanent as civilization, as permanent indeed as the state itself.

[1] In this connection we must not overlook the problem raised by the fact that the boundaries of cities are as often determined by political and social considerations as by economic. The dismemberment of a public utility extending beyond these boundaries as a consequence of municipal acquisition results in substantial costs on account of severance damages. Nor should we overlook the problem of financing public purchase in cities already bonded to the legal limit.

It is true that legislatures hesitate to take this position. Let us use the service of transport as an illustration. The steam railway, the interurban electric railway, the interurban motor bus and motor truck are all agencies of land transportation. Yet the two last-named types of common carriers are not yet fully recognized as public utilities and fitted into the regulatory scheme of things. To protect themselves the predecessor carriers have been going into these lines of business. It is a situation characteristic again of transitions. Yet the security of investments is imperilled by such delays in making public policy conform to economic developments. An element of risk thus arises out of this very retardation. If, as is conceivable, a transport utility can be empowered to render all forms of transport service under proper regulatory safeguards, then the largest measure of insecurity of investment arising out of the use of unregulated, substitute services will disappear. Certainly, the flexibility of corporate organization and the expanding power of scientific management to solve problems of organization and of technique, are such as to permit extending the concept of monopoly to its ultimate generic meaning: namely the parcelling out of control of the market to a single transport monopoly within as large an area as public authority deems expedient. The essential thing is not the territorial scope of monopoly power but the intensity of monopoly so that it may include all competing and substitute forms of service. A residuum of substitute competition will always be present in the case of those consumers able and willing to supply themselves.

There is another aspect of the matter to which attention must be directed. By treating transport service, for example, in its generic sense the last element of competitive risk can be eliminated. In the urban electric railway field, where the motor bus and electric railway are contending for supremacy in at least our smaller cities, the communities can be assured continuous use of some transport medium. As technical and operating progress develops the superiority of one means of conveyance over another, a scientific and sensible conversion program may be worked out. This will minimize the losses in fixed capital, provide security of investment while effecting the needed changes, and will permit a scientific balancing of the social costs of progress and the social advantages to be derived from the changed technical utilization of capital. It must be admitted that such a proposal is somewhat revolutionary. Can regulation be so perfected as to meet these enlarged responsibilities? Will the com-

munity not become restive under monopoly and sigh again for the unregulated extravagances of competition? The American Telephone and Telegraph Company comes close to attaining this concept of monopoly and its problems are therefore very interesting to economists. Holding companies, generally, are taking steps in this direction. Should a dynamic social philosophy admit defeat in the presence of a dynamic world-conquering technique?

Sec. 2. Competition a Preventable Cause of Insecurity of Investment

If the position taken above is sound, competition as a cause of insecurity of investment may be entirely eliminated. If only financially strong companies operate in given market areas, competitors are not likely to appear. While competition was, perhaps, the principal cause of insecurity earlier, the consolidation movement among local utilities has tended to remove much of the difficulty. At the present time the tendency is for strong companies to offer to buy out the weaker companies instead of undertaking, under commission authorization, to make an end of them by competition.

One type of competition, however, is not as readily eliminated, that is, the competition of publicly owned with privately owned utilities. For a time a municipally owned street railway divided the territory in Detroit with the private company. The same situation still obtains in San Francisco. It also exists in the electric utility field in Cleveland, Los Angeles, Winnipeg, and Seattle. From an economic and regulatory point of view it would certainly be better if either the publicly owned or privately owned utility were given a complete monopoly so that the needless duplication of facilities could be eliminated and standardized city-wide service provided.

Sec. 3. Administrative Aspects of Control of the Market

It is important to distinguish two aspects under which permission is granted to begin operation. Before the recent statutes were passed relating to local utilities, certificates of convenience and necessity had already been required in the case of steam railways. Under these statutes administrative authorities were not required to look into the question whether a given improvement was economically necessary, but they were merely required to pass upon the question whether legal requirements in regard

to safety of operation and adequacy of equipment had been complied with. The certificate did not prevent carriers from competing with each other. The collateral inquiry was directed toward determining the character and financial competency of the agent. At the same time, in the case of the local utilities, the permit to operate was the franchise granted either by the state or by the local governing units. Here again, control of the market might nevertheless include actual or potential competition if the franchise was not exclusive. At best, exclusive control might be limited to a specific term of years.

(a) *Control of competition for local utilities.*

An entirely new aspect appeared when the commissions were required to determine whether public convenience and necessity required a competitor alongside of the existing company. The question arose whether commissions should jeopardize the control of the market by permitting competition. The answer was that such action should only be taken if the existing company failed in its duty adequately to serve the public. But what if the existing company, in spite of its lapses in the past, promised to remedy matters in the future? Should it be given another chance? The California Commission took the position that its power to grant or withhold the certificate depended for effective use upon the degree of threat that such potential competition represented. It announced, therefore, that it would decide the question upon the basis of facts as they existed at the time the rival application was made, and not upon the basis of future promises. To do otherwise would not serve as an inducement to render adequate service and would deter potential competitors from offering their services.

Upon this specific question—when and under what circumstances a certificate shall be issued to a competitor—the policy of commissions will necessarily vary depending upon the evidence that is offered in support of the application. It is, we believe, a fair statement that commissions will be loath to grant the certificate if the existing company can show to the satisfaction of the commission that the causes of past failures can and will be removed, and if the commission is convinced that, under its power to order improvements and with the company's new willingness and capacity to put them into effect, the situation is capable of improvement. The resurrection of competition is so serious a drawback to efficient conduct of the business that the power will be very sparingly used.

(b) *Certificates of convenience and necessity under the Transportation Act of 1920.*

An outstanding defect in our national system of railway transport has been the existence of "weak roads" which could not earn a fair return under any conceivable basis of competitive rates which are calculated to yield a fair return upon the aggregate fair value of an entire group of strong and weak lines. In order to relieve this situation Congress provided that in the future no interstate carrier might extend its line or construct a new line without first securing from the Interstate Commerce Commission a certificate of public convenience and necessity. This provision extends also to lines which may not now be engaged in interstate commerce but may in the future undertake to do so. A certificate is likewise required in those cases where an independently constructed extension is to be acquired by another mainline carrier. In considering applications the federal commission has taken into account the amount of traffic that might be diverted from existing lines, the probable earning capacity of the new venture as based upon estimates of traffic, the benefit to the surrounding territory, and the risk to those who might have to depend upon the continuance of operations. This provision is another of the important elements of a complete regulatory program which the Transportation Act has added and which serves to put federal regulation upon a basis of effectiveness approaching that of the regulation of local utilities. Control of competition and of extensions in the railway field was a much needed element in federal regulation.

Sec. 4. The Control of Abandonments of Service

Closely associated with the foregoing are the proceedings by which public utilities request permission to abandon operations in whole or in part.[2] These abandonment applications arise, for instance, in the case of railways originally constructed in order to market some natural resource like lumber or mineral products. When these are exhausted such roads lose the economic basis of their support. Other applications for abandonments have come from urban and interurban electric railways,

[2] The Transportation Act provided that "no carrier * * * shall abandon all or any portion of a line of railroad or the operation thereof unless and until there shall first have been obtained from the commission a certificate that the present or future public convenience and necessity permit of such abandonment.

and from the branch lines of steam railways, all alike suffering from motor vehicle competition.[3]

Upon the question of abandonments, the authorities are divided. No more difficult problems arise than these because, in working out a solution, one must go to the borderland of regulation. Some companies contend that they may surrender their charter, cease operations, and sell their properties without securing the consent of public authorities. A Connecticut court,[4] however, held that a corporation had no right to abandon a public service enterprise against the will of the state. The court concludes: "Upon principle it would seem plain that railroad property, once devoted and essential to public use, must remain pledged to that use, so as to carry to full completion the purpose of its creation; and that this public right, existing by reason of the public exigency, demanded by the occasion, and created by the exercise by a private person of the powers of a state, is superior to the property rights of corporations, stockholders, and bondholders."

The foregoing does not imply that public utilities may not abandon unprofitable undertakings; it merely means that the consent of the state must first be secured. This conclusion harks back to the fundamentals of the public utility as a legal institution. Although the obligation to serve the public is voluntarily assumed, future conduct with respect to these duties is subject to public regulation.[5] This includes regulation of the right to slough off obligations assumed under charters. Abandonment of service is thus not made to depend merely upon the consent of two-thirds of a company's stockholders; otherwise, as one commission said, a "State's economic structure would be on a shallow foundation." It was also felt that protection should be given to bondholders who had taken the bonds upon the faith that service would be continued. In this connection attention is always called to the public aid afforded these enterprises in the past, their use of the taxing power and of eminent domain.

It would seem that the weight of authority has settled this question so that there can be no doubt that public utilities may not abandon operations without public consent. But the further

[3] MacDonald, T. H., "Commercial Vehicles on Free Highways," *Jour. of Land & Pub. Util. Econ.*, Vol. 1, p. 385, Oct., 1925. See also, Trumbower, H. R., "Abandonments of Railway Service," *Journal of Political Economy*, Feb. 1926.

[4] *Gates v. Boston & N. Y. Air Line R. R. Co.*, 53 Conn. 333, p. 343 (1885).

[5] *Re. Lima Honeoye Elec. Lt. & R. Co.*, P. U. R., 1915-C, 871.

question must be decided, whether administrative commissions may decide what abandonments are proper, or whether the legislature must be consulted. This problem has not arisen heretofore because abandonments were very rare and hence statutes were silent upon the subject. In one case, the Georgia Supreme Court held that since the Railroad Commission of Georgia did not have *express statutory authority,* it did not have the *implied power* to permit abandonments. Legal obligations to serve under a charter are different from merely determining the quantity and quality of the service.[6]

The Ohio Commission[7] and the New York Commission have taken the stand that the question is one which must be settled by a court. Kansas, on the other hand, through its Supreme Court, takes the position that service may not be abandoned without commission consent.[8] In a few states this power is directly conferred and the courts have there upheld it. In other states the power to control abandonments is inferred from the power to control service, and in these its constitutional validity is in doubt.

Sec. 5. Economic Limitations upon the Power to Control Abandonments

We see in such moot questions the workings of legislative and judicial empiricism as these agencies experiment with the best mode of developing the public utility institution. Certainly, if these industries perform public functions and have undertaken them voluntarily, they can be coerced to continue rendering service either until the community is willing to undertake the service itself or until there has been time for some other adjustment.

Yet the economic nature of public utilities involves risk since the demand for service may decline. The question is who shall assume it? The community does not underwrite this risk. There are also economic limitations upon the assumption of such risk by private companies. So long as the entire market within which the utility has a monopoly can economically sup-

[6] *Railroad Com.* v. *Macon Ry. & Lt. Co.*, P. U. R., 1921 C. 540.

[7] *Re Lake Erie B. G. & N. R. Co.*, P. U. R., 1916 F. 553; *cf. Day* v. *Tacoma R. & Power Co.*, P. U. R., 1915 C. 593; *Re. Charleston Interurban R. Co.*, P. U. R., 1916 F. 338.

[8] *State ex. rel. Caster* v. *Kansas Postal Teleg.-Cable* Co., P. U. R., 1915 E., p. 222. Other States are Cal., Colo., Ill., La., Me., Mont., Neb., Utah, Va., and Wis.

port the enterprise, abandonments over a part of the field of service become a matter of public convenience, that is to say, of discrimination. These questions ought to be decided by a public body. If the entire enterprise becomes unprofitable the question is primarily one of restricting the amount of economic loss which the private agent should be made to suffer in view of a superior public interest. In the long run the state can not compel uneconomic service. Its credit would be destroyed long before this came to pass. Though it be true that the question of abandonments should be decided by public authority, economic reasons alone would compel abandonments after stockholders had lost their entire equity. In the end, therefore, public authority must balance private losses to stockholders resulting from continued operation against the public inconvenience and loss arising out of complete abandonment. An answer in general terms is impossible. Certainly, it would be impossible to compel stockholders to invest additional sums in order to maintain unremunerative service. Only a concrete analysis will reveal when, from a social point of view, further losses to stockholders should be prevented by authorizing abandonment of service.

Security of investment or risk of loss, we have seen, is intimately associated first, with the instrumentalities for acquiring control of the market when public utilities begin operation; second, with the conditions by means of which tenure becomes exclusive or non-exclusive; and third, with the instrumentalities which determine the extent of the duties that remain to be performed before control of the market may be surrendered.

CHAPTER XVII

CORPORATE FINANCIAL POLICIES

One central difficulty runs through the entire history of public service enterprises. It is the failure of the state to control adequately the security issues of public service corporations. Given the state of the law and the state of public opinion at the time when these enterprises were in the formative stage, such laxity is not surprising. Yet this neglect must be remedied if the interests of consumers and investors are to be given adequate protection.

Sec. 1. **Early Conditions of Corporate Financing as Affecting the Security of Investment**

The power to borrow money was conferred in corporate charters. It was exercised by the board of directors after an affirmative vote by the stockholders. In the absence of statutory restrictions only such safeguards attended these borrowings as the creditors themselves insisted upon. Within the rather wide limits of charter authorizations the corporations were likewise free to use their own discretion as to the *amount* of capital stock issues and the *consideration* for which they were issued.

It is a general rule of corporation law that funds derived from stock and bond issues may be used only for corporate purposes. This rule operates merely to render "*ultra vires*" the most palpable diversion of funds to non-corporate purposes. It does not affect the discretion lodged in boards of directors to determine whether the issuance or sale of securities is in return for adequate and valuable consideration.

The courts did their best to curb some of the evil results of financial manipulations. In order to protect the interests of *creditors* they evolved what has been called the "trust fund" doctrine. According to this doctrine, in the event of receivership, the receiver may seek to recover by suit from the stockholders the amount of the difference between the par value of

the stock and the amount which had actually been paid in money, services or property. In the view of the courts this difference constituted a trust fund for the benefit of creditors which was in the hands of stockholders but which was available to be levied upon in case of insolvency. This method of procedure was not very effective. It was an expensive and difficult process, benefiting only creditors, and often doing an injustice to stockholders unaware of such legal consequences.

For the reasons set forth, corporations have been free to adopt financial policies which,—while they enabled corporations to finance the original promotions, to extend their properties, and to consolidate and reorganize them—would in time raise the question whether such latitude in financing was not reacting unfavorably upon the security of investment and hence upon the credit of these enterprises. Public opinion answered the question in the affirmative by conferring the power of regulating security issues upon administrative commissions. We will discuss the outstanding features of security control in the next chapter. Here an examination will be made of important economic considerations involved in public utility financing and of the forms, methods, and policies adopted in the financial administration of these utilities independent of restrictive legislation.

Sec. 2. **What is a Reasonable Capitalization?**

Public utilities obtained their original capital fund by selling shares of stock and by borrowing. If all the capital thus obtained had been in the form of cash, the financial history of these utilities would have been quite different. The fact is that securities were also issued to pay for physical property as well as for promotional services and other forms of intangible property. In negotiating these transactions boards of directors had to appraise on the one hand properties and services and on the other hand the present value of the securities offered in payment. On account of the difficulty of gauging the *consideration* which passes in such transactions the evils attendant upon *over-capitalization* have arisen.

Over-capitalization can only be understood if we know what reasonable or sound capitalization is. An economically sound capitalization [1] is based not upon the cost of the property but upon the prospective earning power. The determination of a

[1] The term "capitalization" is here taken as the equivalent of "fixed capital liabilities."

reasonable capitalization is therefore the result of an economic analysis and is not a matter of accounting. It is true that, initially, and in the absence of fraud, capitalization will bear some relation to the cost of the fixed property, but such correspondence does not render a capitalization necessarily sound. If earnings are inadequate the company will be in financial difficulty. A better approach to the determination of reasonable capitalization is the financial ratio indicating turnover of capital. If in a particular industry we may assume a ratio of investment cost to gross earnings of 5 to 1,—that is, $5 invested in fixed properties are estimated to bring in $1 in gross earnings,—we may use this reasonable relationship of capital cost to revenue yield experimentally as a starting point. From an accounting standpoint it is true that capital cost and par value of capitalization need not be identical. Assuming, however, that they are identical, it is necessary next to get an expression of the reasonable relationship between gross and net operating earnings, that is to say a reasonable operating ratio. We may assume that a reasonable operating ratio is 60 per cent—out of each dollar of gross revenues 60 cents go for operating expenses, leaving 40 cents as the net operating income.

Now arise questions such as these: Do these assumed ratios apply in the case of the enterprise in question? Is the demand for service such that rates yielding such gross revenues may be put into effect? Or will rates have to be reduced so that gross revenues are likely to drop? Or, again, are operating expenses likely to rise without affording the utility an opportunity to increase rates? Under regulation the situation is further complicated by the question, what is the reasonable rate of return which public authority will apply to the rate base in gauging reasonable earnings. If all these questions are answered favorably, so that the assumed ratio of capital turnover and the operating ratio represent a reasonable expectancy, the rate of return actually earned upon the investment may be 8 per cent.

This enables us to answer the initial question as to reasonable capitalization in terms of this hypothetical case. A par capitalization of five dollars will yield a financial return of forty cents. Without considering the different classifications into which security issues may be divided, the question is, Can securities yielding in the aggregate a return of eight per cent be sold at a price equal to par, where par also equals the cost of the property? If the securities can be sold at par the corporation is correctly capitalized; if they can be sold at a premium

it is undercapitalized; if they must be sold at a discount it is overcapitalized.[2]

The above analysis uses the investment cost merely as a point of departure for initial capitalization. A standard of valuation based upon earnings, that is, upon the net income available as a return upon the securities taken collectively, will simply record the variation from this original bench-mark. Over a period of time the question of what is a reasonable capitalization thus depends upon the net income producing power of corporate assets as limited by regulation. The capitalization of net income is therefore the proper standard of valuation to be applied *by investors* in buying public utility securities or in estimating the commercial value of the entire going concern *as an investment opportunity*. The government in fixing rates or in controlling capitalization will use the investment standard because its object is the determination of that reasonable earning power which investors later capitalize when they choose between different investment opportunities.

Sec. 3. **Classifications of Public Utility Securities**

In disposing of its securities a corporation can sell to different classes of investors by varying the investment appeal. Insurance companies, savings banks, endowed institutions and trust companies are looking for *security of principal* and *certainty of income return*. This is also true of many individual investors. Such owners of capital can only be induced to invest as creditors and consequently they are offered securities like bonds and notes that are *secured* both as to principal and interest. In order to offer them security of investment only a limited amount of the total capital requirements can be raised by the sale of such securities. In return for such security the corporation receives these funds at a lower interest rate than the estimated rate of earning power.[3]

Another group of investors prefer to give the use of their capital to the corporation in return for rights to income at a somewhat higher rate. In their minds security of principal and

[2] This test assumes that accounting entries have been properly made and that the judgment of investors is generally sound and fully informed. Conceivably, facts might be suppressed or warped so that investors would pay a premium when in reality a premium was not justified.

[3] How much lower the interest rate may be set as less and less capital is raised by secured borrowings will depend upon how much these investors are willing to pay for security.

certainty of return, while important, are subordinated to a higher income yield. This group constitutes the stockholders whose capital, taken as a whole, is irrevocably committed to the business. Less security of principal and less certainty of return is accepted in return for the possibility of higher income yields in the shape of dividends and of an increase in the amount of the principal.

Corporation finance distinguishes a sub-group within this group that is willing to accept less uncertainty regarding the return and the principal. These investors become the preferred stockholders of the enterprise. Although their capital contributions are definitely committed to the business they are given a preference in the payment of a fixed dividend rate, usually higher than the interest contracts then outstanding, and a preference in the sharing of the capital upon the dissolution of the corporation. In order to make these preferences practically effective, the preferred stock certificates name definitely the amount to which preferred stockholders are entitled when the corporation is dissolved and also the dividend rate at which they may be compensated.[4] Usually, they are accorded no voting rights so long as these preferences continue to be effective.[5] The common stockholders, representing the other sub-group, thus accept the *remaining* insecurity of principal and of return and are the residual claimants of the remaining profit and capital assets. These different considerations represent the principal theme upon which corporation finance has executed complex variations.

Sec. 4. **The Financial Plan of Public Utilities**

The manner in which promoters and bankers, in their efforts to secure capital funds and to compensate themselves for services and property which they may have furnished, have parcelled out

[4] There may be further classifications of the degree of preference into first, second, and third preferred shares, also classifications into participating and non-participating shares. Non-participating preferred stock is limited to the stipulated rate of dividends with respect to the profits of a certain period, while participating preferred stock shares in the further distribution of dividends. Both participating and non-participating preferred stock may be either cumulative or non-cumulative. In case it is cumulative the certificate provides that dividends not paid when due or not paid in full become an obligation which must be met before further dividends may be paid upon the common stock.

[5] *Cf.* Hahn, Margaret, "Voting Provisions in Public Utility Preferred Stock Issues of 1925," *Journal of Land and P. U. Econ.*, Vol. III, p. 100, Feb., 1927.

the securities of a public utility corporation to different classes of investors constitutes the *financial plan* or the *financial structure* of the corporation. In its essence the financial plan consists of the amount and classifications of stocks and bonds which the corporation proposes to issue at the time of organization. This is a very important step because, as Professor Dewing says, the "promoter-banker is here the architect of the new corporation. The form of the financial plan with which he endows it determines the lines which its whole future financial policy must follow". The general principles in accordance with which the financial plan should be constructed may be summarized as follows: Bonds should only be issued when the prospective earnings promise to be substantial, reasonably certain and constant in amount from year to year. Preferred stock may be issued when prospective earnings, although promising to be irregular, nevertheless amount to so much that when averaged over a period of years they provide a fair margin above the fixed dividend requirements set forth in the preferred stock certificates. If the earnings promise to be both uncertain and unpredictable the safest policy is to issue only common stock.

Sec. 5. **Methods of Public Utility Financing in the Past**

In order to appreciate the major problems of present day financial policy, it is necessary to review briefly the methods used in the past for financing public utilities.

The original method of financing appealed chiefly to the stockholding group of investors. Comparatively few people provided the funds for the original construction of public utilities, and these few were stockholders. Where the utilities were badly needed the state and its political subdivisions often subscribed to shares of stock, or loaned the utility public funds secured through public credit, or made contributions in the form of land grants. In order to expand the scope of operations earnings were very largely reinvested in the business. The original owners were content to receive a limited present income and to accept as a substitute for higher present yields an increased future value of their holdings and the promise of higher returns.

As the demand for extensions increased and as existing facilities had to be abandoned to make room for improvements, the original sources of capital supply proved inadequate. At this point these industries began to resort more extensively to borrowed funds. The mortgage bond, secured by the creation of

liens upon the existing physical property, was introduced as a method of corporate financing. This created the class of securities having a prior lien upon property and earnings and relegated the capital stock to a subordinate place as junior securities. With its potentially wider distribution the mortgage bond gradually became an important vehicle of corporation finance.

The next important step in the financial history of public utilities came with the consolidation of connecting properties in the case of railroads and of connecting and competing properties in the case of the local utilities. These consolidations usually involved the discarding of considerable amounts of old property, its replacement by new property of an improved character, and the extension of service into new territory. This meant that many of the junior securities had to suffer large losses in their equity, some of the financial structures collapsing under these cumulative burdens.

The original financial plans had not foreseen the large amounts of capital that would be required in order to meet the need for expansions, improvements, and replacements. The early bond issues were usually limited to definite and often relatively small amounts. The funds which could be borrowed under these closed mortgages were exhausted before the need for improvements and extensions had been fully met. Because the enterprises often had not yet attained maturity and a settled earning power, such increased capital requirements could not be met by the public sale of stock. As the need for consolidations became more pressing, the fact that additional funds could not be obtained by the old means led to the introduction of new types of securities. The refunding bond and extension bond were an outgrowth of this condition. The latter became a second mortgage, with a lien junior to the lien of the underlying bonds. Wherever possible the outstanding closed mortgage obligations were eliminated by paying off the bonds. When this was impossible provision had to be made in the new mortgages for refunding these securities as they matured. Because these refunding bonds offered only the security of a second mortgage, inducements had to be held out to give them a wider marketability. The era of consolidations thus brought new issues of preferred and common stock, in addition to the refunding bond, which were offered to prospective purchasers of refunding bonds. In some cases refunding mortgages provided for the deposit of bonds of underlying issues in escrow thus giving refunding bonds partial first liens.

At this juncture the holding company appeared as a vehicle of public utility financing. Its characteristic mode of financing is the issue of collateral trust bonds. By combining the bond and stock issues of subsidiaries and offering them as collateral security, the bonds of holding companies could be sold to investors. Large amounts of capital were thus acquired from foreign sources, particularly England and Germany.

With the object in view of securing the advantages of unified operation, holding companies sometimes paid more for the stocks of subsidiaries than was warranted by their earnings or the value of their physical assets. If such excess purchase price properly measured the advantages which might accrue in time by introducing economies in operation, that is to say if the income yield of the securities purchased would increase, the capitalization of the holding company was not inflated. Otherwise, the excess represented nothing in the way of hoped-for economies except the desire of a financial group to extend the range of its power or to rid itself of costly and irksome competition.

As a result the financial plan of public utilities has become very complex. On all sides one meets the contention that the great need of public utility finance is simplification of financial structures. Yet comparatively seldom is a corporation free to work out its financial plan, unhindered by all the entanglements that are legacies of the past.

Sec. 6. **Present-day Problems in Public Utility Financing**

Some present-day conditions of public utility finance raise special problems. We may take, for example, the question to what extent safety of principal and assurance of income is provided by means of mortgage bonds. Properly drawn mortgages attain these results by providing a lien upon specific property of the corporation. This lien is evidenced in a contract (called a mortgage or trust deed) which contains the specific terms under which the money is loaned. The terms usually include the specific nominal interest rate, the character of the lien, the date of maturity of the bonds, the conditions under which the bonds may be redeemed, conditions governing the issuance of additional bonds, provisions relating to maintenance of the property including therein depreciation, the legal remedies available to bondholders in case of default, and so forth.

Safety of principal depends very largely upon the proportion of the loan to the value of the property which is pledged as se-

curity. A sufficient margin of value or equity above the face value of the bonds should always be maintained. Thus, a common provision is that bonds may not be issued in excess of 80% of the cost of the property. As new property is added, additional bonds may only be issued up to the stipulated percentage of the cost of the new additions, and then only when earnings available for interest bear a specified relation to interest requirements as explained in the next paragraph.

Assurance of income depends upon the net earnings available. They are a measure of the ability of the corporation to meet its interest obligations. The necessary protection to bondholders is therefore secured by incorporating in the mortgage certain provisions which prevent the issue of bonds unless the net earnings for the previous year had exceeded the annual interest requirements by a certain amount, say by 100%. This is the same as saying that annual net earnings should always equal twice the interest charges. Sometimes the protective provision is set forth in terms of gross earnings as well as of net earnings by providing that gross earnings and net earnings must each be equal to amounts which bear certain definite relations to the bond interest requirements. The following computation illustrates the principle upon which such provisions rest:

Example illustrating how investors by means of mortgage provisions will restrict the issue of additional bonds

Assume that the mortgage requires as follows:

(a) That gross earnings must be 6 times interest charges.
(b) That net earnings must be 2 times interest charges.

Let interest requirements equal 100. The following statement then represents the relationships which the pertinent items must bear to one another:

(1) Gross earnings must not be less than.....	600
(2) Operating expenses must not be more than....	400
(3) Net earnings must not be less than.....	200
(4) Bond interest will be	100
(5) Balance available for dividends must not be less than	100

When bond interest accrues at the rate of 6 per cent., a total bond interest requirement, protected as above, implies an issue of 1666.67 of bonds $\frac{100}{.6}$ or 2.77 times the gross earnings. Operating expenses may equal 66⅔ per cent. of gross earnings (an operating ratio of two-thirds). Thus operating expenses may,

without increase in gross earnings, increase by 100 or 25 per cent. and still leave net earnings sufficient to meet interest charges. This is a conservative margin of safety. The operating ratio would then be 83. Only by increasing gross earnings without correspondingly increasing operating expenses (that is, by lowering the operating ratio) can net earnings become available to meet further interest charges and thus provide a credit basis for a further increase in borrowed capital. Capitalization, in this illustration, is made to depend upon earning power.

The purpose of the above provisions is to limit the indebtedness of the companies to some reasonable proportion of the value of their properties and to limit the interest requirements to a similar proportion of revenue-producing capacity. The need for such a limitation of borrowing power has arisen because, in recent years, the tendency has been in the direction of financing more by means of bonds than by the sale of stocks. Table XV, p. 381, shows this tendency for the more important classes of public utilities.

Another important feature of mortgages is the provision that an adequate depreciation reserve be set up to which all renewals and repairs may be charged. It has been the custom to include with depreciation all expenditures for upkeep as well as renewals. This means that the reservation must be greater than if renewals alone were to be so charged. This joint reserve for depreciation and upkeep may be set up on a percentage of gross revenues, the amount varying between 15 and 25 per cent. according to local conditions or it may be set up in terms of a specific percentage of the cost of the fixed property.

At an earlier date it had been the practice to provide for sinking funds in connection with mortgages. Under sinking fund provisions the utility obligated itself to accumulate funds by means of periodic appropriations of net revenues sufficient in amount, together with interest earnings obtained from temporary investment of such funds, to enable the utility to redeem the bonds when they became due. The use of sinking funds is, however, declining, because it is argued that public utility investments may become permanent in character if the fixed properties can be permanently maintained by means of a proper renewal policy. This is particularly true when the physical condition of the property for operating purposes is safeguarded by proper provision for financing maintenance and depreciation.

Collateral trust bonds, secured by the deposit of stocks or

TABLE XV

PROPORTION OF FUNDED DEBT AND CAPITAL STOCK TO TOTAL NOMINAL CAPITALIZATION FOR TYPES OF PUBLIC UTILITIES

	Capitalization	*Capital Stock*	*Ratio of Stock to Total Capital*	*Funded Debt*	*Ratio of Debt to Total Capital*
Steam Railway Utilities					
Year 1902	$12,134,182,964	$6,024,201,295	49.6%	$ 6,109,981,669	50.4%
1907	16,082,146,683	7,356,861,691	45.7	8,725,284,992	54.3
1912	19,752,536,264	8,622,400,821	43.7	11,130,135,443	56.3
1917	21,092,072,245	9,058,682,733	42.9	12,033,389,512	57.1
1922	22,290,101,185	9,140,964,901	41.0	13,149,136,284	59.0
Elect. St. Ry. Utilities					
Year 1902	2,308,282,099	1,315,572,960	57.0	992,709,139	43.0
1907	3,778,831,901	2,097,708,856	55.5	1,681,123,045	44.5
1912	4,714,665,386	2,379,346,313	50.5	2,335,319,073	49.5
1917	5,532,223,818	2,473,846,651	44.7	2,058,377,167	55.3
1922	5,432,999,229	2,329,173,090	42.9	3,103,826,139	57.1
Commer. Lt. & Pr. Utilities					
Year 1902	627,515,875	372,951,952	59.4	254,563,923	40.6
1907	1,341,995,182	741,317,497	55.2	600,677,685	44.8
1912	2,062,675,595	1,154,587,016	55.9	908,088,579	44.1
1917	2,872,807,705	1,560,251,265	54.3	1,312,556,440	45.7
1922	4,389,945,312	2,125,316,139	48.4	2,264,629,173	51.6
Telephone Utilities					
Year 1902	372,218,407	269,676,741	72.5	102,541,666	27.5
1907	758,122,214	456,788,725	60.3	301,333,489	39.7
1912	992,426,407	586,763,879	59.1	405,662,528	40.9
1917	1,169,074,870	665,944,471	57.0	503,129,399	43.0
1922	1,738,326,105	1,001,428,084	57.6	736,898,021	42.4
Telegraph Utilities					
Year 1902	162,946,525	117,053,525	71.8	45,893,000	28.2
1907	220,293,575	155,089,575	70.4	65,204,000	29.6
1912	226,386,810	163,645,810	72.3	62,741,000	27.7
1917	229,087,786	167,260,237	73.0	61,827,549	27.0
1922	248,597,778	177,203,778	71.3	71,394,000	28.7

bonds, are another common type of public utility borrowing, especially of holding companies. If secured by stocks, such bonds are no more secure than the stocks they represent and in addition pay only a limited interest return. When secured by the deposit of other bonds, collateral bonds are materially strengthened.

When interest rates are high, or, occasionally, when the credit of an enterprise is poor, but when there is prospect of its being improved, *short term* notes or bonds may be issued. These may be secured by the pledge of long-term collateral mortgage bonds in an amount exceeding the par value of the short term notes or bonds. This is the favorite method of meeting an emergency situation or of shortening the term during which high interest rates need to be paid. By this means, in the case of strong companies, the selling of ordinary bonds at heavy discounts is avoided.

Other common types are debenture or income bonds and equipment trust certificates. The latter are a convenient means of financing the purchase of rolling stock. Equipment trust certificates are a safe form of security because the equipment which secures the loan has a high exchange value. Rolling stock, being movable, can be readily transferred to other localities if it fails of remunerative employment in its original location. Moreover, equipment trust certificates are protected by a clause which makes a trustee the owner of the mortgaged property until the conditions of the trust have been fulfilled. They are further protected by depreciation provisions and by the added feature of installment payments which accrue faster than the equipment wears out. Yet from the point of view of the borrower, the installment payments are burdensome, because the debt must be repaid in a comparatively short time.

Sec. 7. **Stock Without Par Value**

In 1912 New York authorized the issuance of stock without par value. Since then a large number of other states have enacted similar legislation.[6] This form of common stock was deemed to be advantageous to investors because it removes the uncertainty and risk of stockholders being called upon to pay into the corporation any unpaid balance on the certificate,

[6] These states are Maryland, Pennsylvania, California, Delaware, Maine, Virginia, Massachusetts, New Jersey, Rhode Island, West Virginia, Wisconsin, Alabama, Colorado, Idaho, Kansas, Michigan, Missouri, North Carolina, Utah.

since the certificates carry no face value. The laws also provide that this stock is to be considered as "full paid" and non-assessable. The value of such shares may be determined by dividing the accounting equity of the common stock by the number of shares outstanding. Dividends are not declared at a specific rate but at a specified number of dollars per share. It was argued that this form of stock would automatically eliminate the "water" from the corporate assets, and would put the investor on guard as to the true value of the securities he is purchasing, particularly since safeguards assuring full publicity accompany these authorizations.

From the point of view of the regulation of public service corporations this form of security, while not inherently objectionable, does not lend itself to some of the major purposes of public control. It has on this account been criticized by some writers.[7] In the first place it gives no assurance on its face of the amount of capital which has been contributed by shareholders, nor does it define the limit of their liability in accordance with the trust fund doctrine in case of failure or fraud.[8] In the second place, and this is a consequence of the first consideration, it makes impossible the easy ascertainment of the rate of dividends or of earnings.

From the point of view of stabilizing investment relations for the future by reducing the scope of speculative interest in public service securities, and of providing an approach to equivalence between accounting assets and accounting liabilities, no-par value stock certainly is a step in the wrong direction. Granted that there exists only a formal equivalence between book entries at the present time in the case of old properties, the significant question is nevertheless whether the accounts of public service corporations, particularly those of our monopolistic local utilities, should not be brought into reasonable accord with the investment standard of valuation. No-par value stock suits well the purposes of those who favor the appraisal method of determining the rate-base under the inchoate rule of Smyth v. Ames.[9] Those who favor the ultimate adoption of an investment standard

[7] *Cf.* Ripley, W. Z., "Railroads, Finance and Organization," pp. 89-94, also Bonbright, J. C., "No-Par Stock: Its Economic and Legal Aspects," *Quarterly Journal of Economics*, Vol. 38, p. 440.

[8] Ripley, W. Z., *Main Street and Wall Street*, p. 194 et seq. This entire volume should be consulted for a criticism of corporate financing. Valuable supplementary readings in public utility finance may be found in Lagerquist, W. E., *Public Utility Finance*, A. W. Shaw Co., 1927.

[9] *Cf.* discussion, Chapter XIV, *supra.*

are inclined to view with disfavor the extension of no-par value stock authorizations to *operating* public service companies.

Sec. 8. **Financing by the Sale of Stock**

For the past decade and even longer there has been discernible a note of criticism that public utilities are not using sufficiently the mode of financing by the sale of stocks, both common and preferred. At one time it was the common practice in connection with promotions to issue stocks as an aid in the sale of bonds. It was out of this practice, among others, that the charge of "watered stock" had arisen. This term has been defined as "an increase of nominal capitalization of a corporation without a commensurate additional investment of funds." Another favorite form of "stock watering" was the declaration of a "stock dividend". When the earning power of a public utility corporation was so great as to invite public criticism if the earnings were paid out in the form of a cash dividend, a stock dividend would provide for a more generous distribution of dividends in the future without materially increasing the rate.

In order to provide additional capital for public utilities which might at the same time serve as an equity upon which further borrowing could be based, the utilities hit upon the idea of directly selling preferred stocks to customers and employees. It was at first believed that this mode of financing would meet opposition from the normal channels of investment, the investment bankers. This opposition did not materialize. The reason why investment bankers favor such local distribution appears from a report of the Committee on Public Utility Securities of the Investment Bankers Association of America:[10]

"During the development of the utility systems, the centers of finance have been appealed to for provision of the large investment funds required, and this has resulted largely in disassociating local communities and the customers of utilities from financial interest in utilities. The public served has felt little or no responsibility to absentee owners and local antagonisms to efficient utilities have often resulted. It is in the public interest that the securities of utilities be owned in large part by the communities served, so that the public need for adequate and efficient service may be supported by the self-interest of the individual owner of local securities."

The committee points out other reasons for encouraging the

[10] *Cf. Proceedings of Investment Bankers Association*, 1920, p. 125.

local distribution of public utility securities, particularly of stock. It tends, they say, to make "the public responsible, to the extent of the local distribution, for the fair treatment and the prosperity and success of these enterprises; it encourages thrift and affords an investment opportunity not usually open to small investors; it affords local critics of managers and operatives tending to alert regard for the interests of both the property and the public; it improves the morale of the employees by keeping them in touch with the real owners of the property; and it is in effect a form of modified public ownership under private control and operation which is probably the most efficient status of all utility enterprises."

Particularly in the case of electric railway securities was it felt that the sale of preferred stock locally would prove beneficial. Traction securities had been in ill-repute in the very quarters that composed the clientele of investment bankers. The hardships of electric railways during the war period and their incessant political entanglements had created uncertainty as to their credit standing. For this reason the market for their securities was limited almost to the vanishing point. It was the belief of those responsible for the financing of these properties that the only investor who continued to have faith in the traction companies lived in the home town. With the advent of regulation and the consequent stabilization of the property values, it was thought that an avenue had been opened to the purse of the small saver who would be influenced by this consideration. An executive officer of a company which has had a large experience with this mode of financing puts the case in an interesting way:[11]

"Experience has proved that these factors are of far greater influence with the home town investor than with the outside investment market. Value of physical property is of more interest than market value (of securities), past reputation for paying all obligations on the due date is of more significance than interest cover, margin of safety, investment rating privileges, tax exemptions, special restrictions, and all of the other special enticements that have grown up as integral parts of the general security investment market. The home town investor is interested in simplicity, and the usual so-called 'window dressing' is a detriment, rather than an advantage. The language and talking points of the highly specialized bond salesman are as Greek to his ears."

Table XVI on page 386 gives some idea of the growth of the movement for direct financing by electric utilities operating also

[11] S. B. Way, President and General Manager of The Milwaukee Electric Railway and Light Company.

TABLE XVI

DIRECT FINANCING OF SECURITIES BY ELECTRIC LIGHT AND POWER COMPANIES [a]

Year	*Number of Companies Adopting Plan*	*Shares of Stock Sold* *	*Stockholders Obtained*
1914	7	92,310	4,044
1915	3	57,103	4,357
1916	4	38,057	3,681
1917	8	79,348	7,470
1918	7	30,783	4,115
1919	12	166,096	20,840
1920	30	416,089	62,885
1921	36	802,845	118,177
1922	49	1,750,707	198,018
Total	156	3,433,338	423,587

[a] *National Electric Light Association Bulletin*, April, 1924, p. 206. "Report of Customer-Ownership Committee," 1924. These companies serve about 40% of the population and collect about 51% of the total gross revenues of all electric light and power companies of the country.
* On basis of $100 par value per share.

electric railways, and the extent to which the number of stockholders, both preferred and common, has been increased. Table XVII gives more recent figures for central electric stations only.

At first the securities sold were notes maturing in a few years. Later, long-term bonds, but more particularly, preferred

TABLE XVII

AMOUNT OF SECURITIES SOLD BY ALL ELECTRIC LIGHT & POWER COMPANIES [a] 1920–1926

Year	(000 omitted)		
	Total Amount of Securities Sold	*Amount Sold by Investment Companies*	*Amount Sold Direct by Company*
1920	$ 369,374	$ 326,374	$ 43,000
1921	538,917	458,917	80,000
1922	719,961	589,961	130,000
1923	922,722	747,722	175,000
1924	1,236,438	982,421	254,017
1925	1,279,785	982,223	297,562
1926	1,390,000	1,143,000	247,000

[a] *Electrical World*, Vol. 89, No. 1, Jan. 1927, p. 53. Central Station Companies only.

and common stocks, were the favorite types. In order to meet the requirements of small as well as large investors bonds and notes in denominations of fifty, one hundred, five hundred, and one thousand dollars have been offered. Since the distribution is to a class not accustomed to deal with investment houses, the sale is made "across the counter" or by company salesmen. Timid investors and those buying for the first time are made to understand that the selling of securities is as much a routine function of the operating company as the sale of its service. In order to retain the confidence of the investor a continuous market for the securities is maintained, the companies undertaking to resell securities for customers, if possible at the original purchase price.

Sec. 9. **Yield to Investors and Cost of Capital Distinguished**

Before leaving the subject of financial policies, several matters relating to bond interest should be understood. The rate of interest is stated in the bond and usually also in the mortgage which accompanies the bond. When the mortgage does not name the interest rate it is contemplated that bonds will be issued from time to time, that is, in series. Each series of bonds will then name the interest rate in accordance with what is the "going rate" of interest at the time of sale. These rates are the nominal rates because they are applied to the par value of the bond. But the bonds may be sold above or below par, that is, at a premium or at a discount. The effective or actual rate of interest may thus vary from the nominal rate being greater if sale is at a discount, and less if sale is at a premium. The effective rate or *yield rate* to the investor is figured upon the amount which he pays. The interest rate which is actually paid by the borrower and received by the lender will be the same if the bond is purchased directly from the corporation. If the bond is purchased through an intermediary like an investment banker, the brokerage charges of the banker reduce the amount which the public utility receives.

We may take the case of a corporation selling its bonds at a discount. It nevertheless agrees to pay par value upon maturity. The discount thus represents an advance payment of interest. The *effective* annual rate of interest or the annual cost of capital to the public utility thus is the nominal rate paid currently plus an annual proportion of the discount suffered. When bonds are sold at a premium the cost of capital to the utility selling the

security is less than the nominal interest paid currently, by the proportionate amount of the premium. To the effective interest rate should also be added the annual pro-rata share of expense incurred in selling the security, in order to get the true annual cost of borrowed capital to the utility. An example will help to make clear the relationship. Let us assume that the bonds are for a term of twenty years, that the interest rate is 6 per cent. and that the bonds are disposed of to the public at a price which is 95 per cent. of their par value. Under these conditions of sale the interest yield to investors is 6.45 per cent. But if the costs incidental to the sale of the bonds have amounted to $5.00 per bond, so that the company actually has cash available for its purposes amounting to only 90 per cent. of the securities, the *cost of the capital* to the company is increased to 6.93 percent. This conception of the cost of borrowed capital becomes important in determining the reasonable rate of return as we shall see in Chapter XIX.

CHAPTER XVIII

PUBLIC CONTROL OF SECURITY ISSUES

The development of public regulation of security issues has been the outstanding event in the recent history of public utility finance. To discuss briefly the influence of governmental control of security issues upon public utility financing will be the object of the present chapter. This discussion will also serve the further purpose of making clear the intimate relation between the control of security issues and the control of the investment bargain as a whole.

Sec. 1. Financial Practices Leading up to the Regulation of Security Issues

The need for *new industries* in a *new* country gave to promotion activities in the United States that optimistic impress which has made America a by-word for "unlimited possibilities." In view of such opportunities and the undeveloped state of corporation and public utility law, it is no wonder that abuses crept in, especially the abuse of over-capitalization. The loose financing methods, practiced from the earliest days of the development of the corporation, ultimately created a demand that the state should step in and set limits to private initiative.

The first opportunity to overcapitalize came during promotions. New enterprises were usually speculative. With respect to them "nothing was certain except uncertainty." In the first place they were capitalized without regard to the monetary cost of the fixed plant. It is a matter of common knowledge that the construction cost was financed by means of bond issues with shares of stock issued as a *bonus* to those who purchased the bonds. Franchises and the services of promoters and financiers were appraised by agreement among the promoters and financiers themselves and paid for in terms of bond and stock issues. Under such circumstances there was no correspondence between the *par values* of security issues and the *cost* of the fixed properties.

Another inducement to overcapitalization was the failure to distinguish between capital and income. In order to pay some return upon the outstanding securities, particularly upon the bonus stock, maintenance was neglected, and little or no provision was made for property renewals. When the time for making replacements came rather suddenly due to the rapid growth of the country, or when it became necessary to take care of the deferred maintenance, funds for these purposes had to be secured by more security issues. Indirectly, dividends were thus paid out of the proceeds of security issues.

The rapid development of the arts of production offered a third opportunity for excessive security issues. In order to keep the properties abreast of the times, old plants had to be abandoned faster than their cost could be written off as an operating expense. Additional securities were thus issued in order to secure funds for rehabilitation and modernization.

Where the constituent companies had done something in developing the earning power of their properties it would seem as if, in promoting consolidations, it might be assumed that future prospects would be less uncertain. Still, as we have seen, the advantages and costs of consolidations could not be completely foretold. Moreover, the consolidations were prompted by the need of modernizing the plants in many respects. Consequently, these promotions as well were fraught with much uncertainty, and faced the need of scrapping much old property. Security issues for consolidation purposes, when based upon these future estimates, were also likely to prove excessive. Even if security issues were held down to consolidation costs, the figures were often excessive, because prices paid for the constituent properties were based upon over-sanguine prospects of net earnings. Consolidations were thus a fourth occasion for overcapitalization. If we add to these a fifth occasion, when enterprises which had gone into receivership emerged again with a greater load of security issues, we have enumerated the principal historical factors which led to overcapitalization. They constitute the reasons why capitalization and reasonable investment cost have so often parted company in the United States.

This should not be interpreted as an extenuation of the practices of promoters. Unfair schemes of promotion with the view of exploiting the ignorant and the gullible were resorted to only too often. Usually, however, their motives were less reprehensible but nevertheless founded in ignorance. Where enterprises were badly needed, responsible parties in the end always took

hold of the properties and developed them. The peculiarly American vice, however, of looking for immediate and large profits by unloading securities upon the public was in marked evidence in the promotion of utility enterprises.

Sec. 2. The Purposes of Security Regulation

The chief aim of security regulation, certainly the aim that appealed to the popular imagination, was to protect consumers by putting an end to overcapitalization and stockwatering. It was believed that high rates or poor service were a direct result of such practices. This belief was certainly widespread. Nor was it altogether unjustified in the days before the valuation doctrine had been put forward as a basis for legislative rate fixing. The recent extension in many states by means of so-called "blue sky" laws of the regulation of security issues is for the purpose of protecting private investors against financial loss in other industries as well. It was undertaken with the view partly of conserving the capital fund of the country and partly of encouraging habits of thrift and industry. This particular result is merely a by-product, however, of public utility security regulation.

The real purpose of security regulation of public utilities is the preservation of public utility credit. This means that security of investment must not be unnecessarily endangered by financial malpractices which may lead to at least two unfortunate results. The first of these is the increased cost of capital arising from unsound security issues. This, we shall see, has a very direct effect upon the rate of return and hence upon the cost of service. It is a sad state of affairs when a public service enterprise must sell its bonds at heavy discounts or finds its stocks quoted at merely nominal figures. Another unfortunate consequence is that these malpractices lead inevitably to unsatisfactory service. In order to pay interest and dividends upon overissues of securities, a constant inducement is set up to divert earnings from maintenance and improvements.

The need for security regulation is now conceded. There are still some who insist, however, as did the Federal Railroad Securities Commission of 1910, that the remedy is publicity rather than strict control. The objection voiced is that the state should not be put in the position of guaranteeing the soundness of the securities which it approves as investments. The Securities Commission warned against this danger particularly.

"We are told," they report, "that if it was possible to standardize food by a pure food law, it ought to be possible to standardize railroad securities by a securities law. It is possible —to the same extent and no more. The pure food law enables a man to know what he is buying. It does not certify that the thing he buys is good for him. That is left to his intelligence. The government cannot protect the investors against the consequences of their unwisdom in buying unprofitable bonds any more than it can protect the consumers against the consequences of their unwisdom in eating indigestible food." This is certainly good advice and wise comment. But it is not a valid argument against security regulation, for public service commissions generally disclaim all implications that their authorizations are a guaranty. In spite of misrepresentations, they feel it is safer to trust in the intelligence of investors appreciating that no guaranty can be implied when securities are issued under governmental sanction, than it is to permit security issues to go unregulated. Investors are unable to determine for themselves whether securities, although issued with due publicity, are for economic purposes and hence reasonably safe investments. Only the grant of certificates of convenience and necessity and the approval of security issues by the state commission give them such assurance.

Sec. 3. **Important steps in the Movement for Public Control**

In order that the par value of security issues may bear some relation to economic value, the hitherto unrestricted power of corporations to issue securities was at first restrained by pious injunctions that shares of stock should only be issued for money, labor done, or property actually received. The proceeds were to be used only for the lawful purposes of the corporation. In this primitive stage of security regulation it was believed that a general statutory provision would be sufficient and that capital stock alone should be made subject to regulation. The issuance of bonds continued unrestrained.

Massachusetts merits recognition as the first state to undertake seriously the task of publicly controlling capitalization. Since public utilities in Massachusetts were financed largely by means of stock issues, its policy centered upon controlling the issue price of capital stock. The aim was to make the par value of securities equal approximately the invested capital. Legislation was early enacted to prevent the issue of bonus stock. Se-

curities had to be issued at not less than par. Even subscription at a premium was prohibited. This was the situation up to 1871. After that date the Massachusetts law provided that stock be sold at public auction. This violated the traditional rights of stockholders to preference in subscribing for new capital. It also opened the way to contests for control between rival interests. Finally, in 1894 it was provided that share capital be issued at a market price as ascertained by regulating commissions. At the same time, the bonded debt was limited to a figure not in excess of the par value of the share capital. With this legislation the regulation of security issues entered upon the modern phase. It may be stated, parenthetically, that these provisions served measurably to restrict the financing of urban electric railways whose stock could not be sold at par.

Meanwhile, the state of Texas in 1893 had likewise undertaken to control security issues, restricting itself, however, to railroad corporations alone. Its objective also was to stop overcapitalization. The law forbade the issue of securities—bonds as well as stock—without the approval of the railroad commission. Such issues, the law provided, should be held down to the reasonable value of the property as determined by the commission. Future increases in securities were limited to the amount by which the capital investment was increased, including in such amount reinvested earnings and increases in the valuations resulting from price changes.

Wisconsin passed a stock and bond act in 1907, but the provisions were weak and ineffectual. A more effective law was enacted in 1911 and further amended in 1913. Its distinctive provisions will be described presently. New York also did valuable pioneer work in bringing about effective regulation of public utility security issues.

Sec. 4. **Typical Provisions of State Statutes**

New York undertook the regulation of security issues as a part of its program of rate regulation in 1907.[1] The administration of the New York law has been most effective and is typical of many others.

The statute specifically laid down the purposes to which the proceeds of security issues could be applied. It made no attempt

[1] Other states following the New York example were Ohio, Missouri, Indiana, New Hampshire, Michigan, Nebraska, Kansas, Arizona, California, Vermont, New Jersey, Colorado, Georgia, Illinois, Maine, Maryland, and Pennsylvania.

to specify the price and manner in which securities should be disposed of. The public service commission was given the powers necessary for realizing the objects of the legislature. It was given the power to examine into and give publicity to all the facts surrounding each issue. The law left to the discretion of the commission only the details of form and procedure. If securities were reasonably required for the purposes specified in the statute, the commission was required to authorize them. Unauthorized issues of securities were declared by statute to be void. Personal penalties of fine or imprisonment were inflicted upon those who caused unauthorized securities to be issued, who diverted the proceeds to other purposes than those authorized, and who made false statements or representation in hearings, or who filed incorrect statements.

Security issues subject to regulation were defined as "stocks, bonds, notes, or other evidences of indebtedness payable at periods of more than twelve months after the date thereof." This definition excludes the floating debt of corporations from such public control. The purposes for which such securities may be issued are as follows:

1. For the acquisition of property.
2. For the construction, completion, extension, or improvement of the plant, distribution system, or other facilities.
3. For the improvement or maintenance of service.
4. For the discharge or lawful refunding of obligations.
5. For the reimbursement of moneys actually expended from income and used for the above purposes.

The authorization or certificate of the commission generally states the purposes to which proceeds may be applied. It should be noted that the enumeration of purposes does not include the payment of dividends.

Another type of security regulation relying, however, upon publicity is best illustrated by Pennsylvania legislation. In that state public utilities, before issuing stocks or bonds, must file a certificate of notification giving full information as to the amount, terms, and purposes of any proposed security issue. It is required also to account for the disposition of the proceeds. The commission may publish these facts in its discretion, but they are available without formal publication to interested persons upon application to the commission.

Recent amendments to the Massachusetts law have brought it more nearly in line with other states pursuing a more liberal policy. The limitation introduced in 1894, whereby security

issues had to consist of an equal amount of stocks and bonds, resulted in the practice of incurring large floating indebtedness. A later amendment accordingly fixed the ratio of bonds to stock at two to one. Stock issues to cover promotion expenses and working capital were prohibited. In 1908 the law was again amended to permit the issue of shares at a premium but not at less than par, the issue price to be determined by the stockholders but approved by the commission.

The Wisconsin law applies to all classes of public utilities. As in New York, the statute names the purposes for which securities may be authorized by the commission. These purposes include: (1) Organization expenses, construction, and improvements; (2) the refunding of its legal obligations; (3) security issues in the form of stock, bond, or scrip dividends which will bring the par value of securities to a parity with the value of its fixed properties as determined by the commission (correcting a case of under-capitalization). It likewise provides that no stock or bonds shall be issued except in consideration of money, labor, or property, the value of such labor and property to be fixed by the commission.

The law does not undertake to fix the price at which the securities may be sold, but it fixes the *minimum* price which in the case of stock is the par value and in the case of bonds is 75 per cent of their face value. With respect to the relative amounts of stocks and bonds that may be issued, the law merely provides that the bonds shall bear a reasonable proportion to the stock, thus leaving the determination of the relative quantities to the commission after an investigation of the facts in each application. This provision was designed to prevent undue burdening of the properties with bond issues and to bring about a situation under which ownership and management is based upon a substantial financial interest in the property.

The failure to distinguish between preferred and common stock in this connection has tended somewhat to defeat the intent of the law. Recent sales of preferred stock to customers and employees constitute a borrowing of funds in all but in name. It may be questioned whether, under a strict construction of the statute, the commission will be able to insist upon maintaining a reasonable relationship between preferred and common stock as well as between the general classification of bonds and stock.

In making an application to the commission for authority to issue securities, the utility must set forth the amount, character,

and terms of the issue, the purposes for which the proceeds are to be used, and a complete statement of its financial condition in such detail as required by the commission. The use of the proceeds is limited to the purposes authorized by the commission, and the utility is required to show how the funds have been applied. It is clear, therefore, that the principal immediate purpose of the law is to protect the interests of investors by preventing the overcapitalization of the properties and the diversion of funds to unauthorized purposes. This undoubtedly has the beneficent indirect result of strengthening the credit of the utilities.

The Railroad Commission of Wisconsin has also been authorized by statute to control the reorganization and consolidation of public utilities by limiting security issues to a value as fixed by the commission for this purpose. As Commissioner Erickson explained: [2]

"Another evil fostered by the unlimited right to issue securities, is the unnecessary and economically unwise consolidation of public utility plants under one management. Consolidations of operating properties are sometimes a very prudent and economical move, but there are times when consolidations are effected with a view solely to profit on the part of those promoting the consolidation, and it is schemes such as this that are now referred to. The opportunity to combine two corporations and issue securities exceeding the combined value of their properties, is so tempting that, in the absence of the regulation of security issues, public utility managers have often availed themselves of it in the past, much to the detriment of the public."

The commission has contended that the specification in the statute of a *minimum* price below which securities may not be sold has rendered the issuance of securities somewhat inflexible. Stock, particularly, can not always be sold at par. It has been urged that authority be given the commission either to fix or to approve a price at which securities may be sold in each case. This would permit sales at both reasonable premiums and discounts.

Sec. 5. **Federal Regulation of Security Issues**

Control of securities by the states provides also for the control of security issues of interstate carriers. Although the regulation of capitalization was increasingly successful in the case

[2] Erickson, H., "Regulation of Public Utilities," *Journal of the Western Society of Engineers*, Vol. 18, p. 414.

of those utilities whose scope of operation has not gone beyond state lines, this was not true of interstate carriers. Here security regulation was more often perfunctory than otherwise. This has been due very largely to the impotency of state governments in dealing with public utilities carrying on interstate commerce. The conflict in state statutes, and the variety of jurisdictions presuming to regulate the issuance of such securities, had engendered an intolerable situation, which was further aggravated by the delay and confusion attending the securing of permits from several states by the same interstate carrier. It seemed, therefore, that it would be in the interests of both the public utilities and their customers if control were vested in a single authority, the Interstate Commerce Commission, so that the character of regulation might become uniform and the administration effective.

We have already shown in Chapter XII how the increasing amount of interstate traffic forced the federal government to take a controlling hand in the regulation of rates and service. The need of undertaking the regulation of railway security issues was equally imperative, but its consummation was unduly delayed. After much agitation the *exclusive power* to regulate the issuance of such securities was finally vested in the Interstate Commerce Commission by the Transportation Act of 1920. It is significant that control over securities was assumed in the same act which placed in the hands of that body not only the preponderant power to fix rates, but also complete responsibility for a reasonable return and no more. For the first time in their history railroads were made subject to a thorough-going control which comprehends both rates and service, and joins up in one organic process control of consolidations, control of rates and earning power, the duty to fix a valuation or rate base, and control over the issue of credit instruments. Control of the rate base and of rate-making gives control over earning power (within the limits, of course, of traffic flow), while control over security issues creates responsibilities so far as the maintenance of railway credit is concerned.

The credit of the railroads is sorely in need of rehabilitation.[3] The ebb and flow of traffic on account of seasonal variations and cyclical changes in business conditions makes it appear imperative that some measures be taken looking toward a stabilization of earnings. Certainly, the delays in granting needed rate in-

[3] Recently there has been a marked improvement in the credit standing of railroads, but the situation is not yet what it should be.

creases during the period of rising costs of operation were not calculated to improve the confidence of investors. But apart from these failures occasioned by imperfections and stallings in the machinery of rate regulation, the belated assumption of control over security issues also had bad effects upon credit. A series of financial scandals during 1914 and 1915 associated with important railroad systems did much to destroy confidence. Where the wrecking of railroads associated with the early promotion stage had failed to impress the community as a cause for action, such disclosures of financial manipulations in the end set public opinion in motion.

The evidence has been gathered in official reports of the Interstate Commerce Commission. In its report upon the "Frisco" in January, 1914, that body condemned the sale of securities through respectable banking houses "at a time when every appearance indicated the insolvency of the issuing company."[4] Later in the same year in its report upon the debacle of the New Haven it stressed the financial manipulation made possible "by a tangled web of intercorporate relations drawn up by lawyers expressly retained for the purpose of concealment or deception."[5] Early in 1915 in its report upon the affairs of the Louisville & Nashville it stressed the way in which permanent improvements made out of earnings were subsequently charged to the capital account in order to provide a basis for security issues.[6] In the report upon the Rock Island Company of the same year it charged the directors with misrepresentation of assets in reports to stockholders. In this instance the holding company device had served as a cover for transactions financially remunerative to promoters but detrimental to the interests of the operating property. As the commission said in its report: "The property of the railway will be called upon for many years to make up the drain upon its resources resulting from transactions outside the proper sphere in which stockholders had a right to suppose their moneys were invested."[7]

Similar transactions by fiscal agents of the Pere Marquette were criticized by the Commission in its report upon that road and upon the Cincinnati, Hamilton and Dayton. In this connection direct reference is made to the failure of the then existing system of state control of security issues. One paragraph from the report will suffice:

[4] 29 I. C. C. 140.
[5] 31 I. C. C. 32.
[6] 33 I. C. C. 172.
[7] 36 I. C. C. 56.

"The exploitation in 1903, 1904, and 1905 of the Pere Marquette and the Cincinnati, Hamilton and Dayton was not an incident of railroad construction. The properties had long been established. Whatever control or regulation of the issue of railroad securities was exercised by the state in which these roads operate was inadequate to prevent the exploiting, or to forestall subsequent hasty and unwise reorganization. To the extent that these flotations ultimately lodged in the hands of innocent investors, whether here or abroad, the public was deeply wronged. Whatever control or regulation was had of the properties and operations of the two roads was not sufficient to keep them in condition to satisfactorily serve the population dependent upon them. The result has been the same with each, financial disaster to the carriers, serious loss to the holders of their securities, deterioration of their physical properties, and a marked impairment of ability to perform their functions as public servants."[8]

Under the spur of these "revelations" the regulation of security issues was begun by the federal government. It is not the purpose of this survey to treat in detail the administrative aspects of this task nor the intricate problems of public utility finance which the commissions have encountered and will encounter in their work. A brief account of the substance of the new legislation appears, however, to be necessary.

Federal legislation follows in the main the provisions of state laws. It is made unlawful for a carrier to issue securities or to assume obligations as lessor, lessee, or guarantor except as authorized by the Interstate Commerce Commission. Such authorizations are required even though a similar authorization has already been granted by a state in which the carrier was incorporated. The state authorities concerned, the Governor and the regulating commission must be notified and these parties may make such "representations" as they deem important in conserving local interests. In granting applications the commission is authorized to grant a certificate in whole or in part, to deny it in whole or in part, and to modify it in a supplemental order. The commission's discretion as to the purposes for which securities may be issued is limited by statutory provisions which are, however, very general in character. The security issues or the obligations assumed must be for a lawful, corporate purpose, compatible with the public interest, necessary and appropriate for or consistent with the proper performance of the public service of the carrier, must not impair its ability to perform that service, and be reasonably necessary and appropriate for the purpose. In thus couching these limitations in general language Congress very evidently built upon the experience

[8] 44 I. C. C. 147, 222.

gained by state commissions in administering the more effective of recent state statutes, and which gave these commissions wide powers of interpretations.

The carriers must also specify the use to which the proceeds are to be put. Thereupon the commission defines and limits the use of funds in the certificate of authorization. Penalties for disregarding the authorization include voiding of the issue, and fine or imprisonment or both for the agent of the carrier. Carriers are required to report in detail upon the disposition of securities and the application of funds. By this means the entire process of carrier financing is brought under the surveillance of public authority.

The control of intercorporate relations is an important aspect of the general subject of the financial policies of public service corporations. Control over intercorporate relations of railways is exercised under provisions in the Transportation Act making it unlawful after December 31, 1921, for the same person to be an officer or director of more than one carrier without express authority from the commission. Such permission may be obtained, however, by showing that neither public nor private interests will be jeopardized by such interlocking of directorates. It is also provided that no officer or director may benefit, either directly or indirectly, from the sale or hypothecation of securities, nor may he share in the proceeds. This prohibition is aimed at what has been called "banker-management," since it will automatically exclude banker representation from the boards of directors. Although the step was urged upon Congress, the new legislation does not draw holding companies within the sphere of commission control.

The recent opinion of the Interstate Commerce Commission in the Nickel Plate Merger case [9] throws a good deal of light upon how such financial control will affect consolidations. The proposal to bring together the Nickel Plate, the Chesapeake and Ohio, the Hocking Valley, the Erie, and the Pere Marquette into a single system, was approved by the Commission as a consolidation in the public interest from the transportation point of view. It was, however, disapproved from the point of view of the financial policies which were involved in the proposed plan. Although the merger was not in accord with the tentative railway consolidation plan of the Commission, that was not deemed to be ground for refusing to approve the merger and

[9] *In re. Control and Stock Issue by N. Y. C. & St. L. Ry.*, Finance Docket No. 4671.

to authorize the issuance of securities. The commission did, however, object to some of the financial terms and conditions, affecting particularly certain minority stockholders. Upon this point the commission says:

"With respect to the reasonableness of the proposed terms of stock exchange, it is evident that inadequate consideration was given to the terms from the viewpoint of the stockholders of the Chesapeake and Hocking. The president of those two companies was not asked to submit any information or figures bearing on the matter while the plan was under consideration, and had no part in fixing the terms beyond a few general suggestions as to the factors to be considered. He first learned of the proposal from the newspapers and voted to approve it without change. Other directors acted principally on the basis of the balance sheet and income account annexed to the plan and a general inspection of railway and financial manuals and annual reports. They could produce no memoranda or data actually considered by them or by the respective boards although data used by the Erie and Pere Marquette boards were produced. It brings forcibly to mind what we said in *Financial Transactions*, C. R. I. & P. Ry. Co., 36 I. C. C. 43:

"'This record emphasizes the need of railway directors who actually direct. There are too many passive directors who acquiesce in what is being done without knowledge and without investigation. A director of a railroad is a quasi public official who occupies a position of trust.'

"The boards of the Chesapeake and the Hocking appear to have acted as boards of ratification rather than authorization or direction with respect to these matters."

Sec. 6. **Judicial and Economic Interpretations**

In the first case brought up for review, the new powers of the New York Commission were upheld by the Court of Appeals of New York. That court's interpretation of the legislation providing for securities regulation is as follows:

"The paramount purpose of the enactment of the public Service Commission Law was the protection and enforcement of the rights of the public. . . . For a generation or more the public has been frequently imposed upon by the issues of stocks and bonds of public service corporations for improper purposes, without actual consideration therefor, by company officers seeking to enrich themselves at the expense of innocent and confiding investors. One of the legislative purposes in the enactment of this statute was to correct this evil by enabling the commission to prevent the issue of such stock and bonds, if upon an investigation of the facts it is found that they were not for the purposes of the corporation enumerated by the statute and reasonably required therefor. . . . It was designed to make the

commissioners the guardians of the public by enabling them to prevent the issue of stock and bonds for other than the statutory purposes." [10]

The right of public service corporations to secure authorization for security issues from commissions is safeguarded by giving them an opportunity to appeal to the courts. Where an applicant can prove that he has in all respects complied with the law, he is entitled to get the commission's approval. In construing the Indiana statute [11] the Supreme Court of that state said: "From the provisions of this act it is apparent that the Public Service Commission is required to hear and determine the facts upon which the application is based, and the facts thus determined are the foundation upon which its orders shall be based. If the facts thus found are such as to entitle the utility to a certificate of authority to issue and sell bonds in a given amount, it is the duty of the Commission to issue such a certificate. Under such circumstances the act required is *ministerial and not discretionary.* (Italics ours.) . . . A duty is none the less ministerial because the person who is required to perform it may have to satisfy himself of the existence of a state of facts under which he is given his right or warrant to perform the required duty." Commissions have little discretion in handling security issues.

From an economic point of view the purpose of securities regulation is to bring about coöperation between the commissions and the utilities in getting capital on reasonable terms. In doing so they must protect and develop public utility credit. Legislation points the way by specifying in general terms the limits within which the companies are free to act. The maintenance of elasticity and of bargaining power requires that these limits be rather wide. Coöperation is enforced by providing that the commissions must first approve the issues and this approval must be forthcoming unless the proposal is to issue securities in amount greater than are reasonably required to accomplish the purposes of the corporation. It has not been deemed wise, therefore, to surround security issues with stringent and precise regulations. In order that companies may finance themselves advantageously it is necessary that considerable elasticity as to procedure and form be provided. The companies must be free to bargain, to take advantage of favorable opportunities by act-

[10] *People ex rel. Delaware & Hudson Co.* v. *Stevens*, 197 N. Y. 1, 9 (1909).
[11] *Pub. Service Com.* v. *State ex. rel. Merchants Heat & Lt. Co.*, 184 Ind. Rep. 273, 277 (1916).

ing quickly, and to choose different expedients in meeting favorable or unfavorable situations.

The commissions are thus placed in a position where they may exert an indirect influence upon corporate financial policies. They may approve or reject a particular financial plan. They may not initiate policies of their own and require the companies to accept them, yet in rejecting or approving applications they may, if not too closely restrained by the courts, exercise a wholesome restriction upon financial vagaries. It has thus become a common practice for commissions to suggest amendments of applications presented to them for approval, which the corporations usually incorporate. But the commissions may not *order* the issue of more bonds or stocks, or in any different proportions, or for any other purpose than those which directors or stockholders have authorized or approved.

It was, perhaps, unavoidable that conflict should develop as to how far the authority of commissions should extend in these matters. In outlining the statutory limits and the scope of this authority, the commissions have, broadly speaking, said that security issues should have for their object obtaining funds for *capital* not *income;* that *capital* may only be secured for the *specific purposes enumerated in the statute;* that the amount of capital must not be more than is *reasonably required;* that in thus limiting security issues they are empowered to act "with comprehensive knowledge of the financial, physical, operating, and traffic conditions pertaining to the property sought to be charged with new capital." By degrees commissions are also presuming to pass upon the *character* of the securities as well as their amount, the security or lien upon which they are based, and the terms of proposed sale or exchange. Even though the proceeds are to be devoted to a purpose authorized in general terms by the statute, the commissions are nevertheless asking whether "any proposed construction or extension is likely to create unhealthful conditions or otherwise constitute a public nuisance, infringe upon the vested rights or impede the necessary operations of other public service corporations, or interfere with the flow of water in a navigable stream to the extent of impairing its public use." [12]

While some commissions protest that security regulation is not designed to make them guardians of investors' interests, others deem it to be within their discretion to inquire "whether there

[12] *Cf.* Ignatius, M. B., *The Financing of Public Service Corporations,* Ronald Press, 1922. Especially Chapters XIII to XV.

is any reasonable prospect of a fair return upon the investment proposed, to the end that securities having apparent worth but actually little or no value may not be issued with our sanction." [13]

Such expansion of the power of commissions is unavoidable. The regulation of securities was undertaken at a time when billions of dollars of securities were already outstanding and in the hands of the public. The commissions had to deal not only with conservatively capitalized properties but with those also that "presented difficult conditions and pressing necessities." The vestiges of credit remaining to badly situated properties could not be wantonly or arbitrarily destroyed. The public need of getting service out of these properties in the future had to be safeguarded, wherever possible. The law very wisely does not lay down any hard and fast rule as to the valuation of properties for purposes of capitalization. It leaves that to the discretion of the commissions. Interpreting the duty of the New Jersey Commission, the New Jersey Court of Appeals [14] said that it must pass "not only upon the legality of the financial proposition advanced, but upon the very merits of the subject matter itself from the standpoint of a wise public policy."

The question of the extent of the Commission's power becomes important in those cases where the financial structure of corporations shows the bad effects of past practices. May commissions seek to correct past maladjustments, especially those growing out of overcapitalization?

This question must be answered in the negative. Commissions do not have the power to reduce present capitalization merely because the securities were issued in accordance with practices not now approved, or because the present value of the assets is proved or believed to be less than the par value of securities outstanding. Certainly such a power might upset the entire credit structure of the industry. The Federal Railroad Securities Commission, in considering this subject, calls attention to the effect which such action might have: "An attempt to scale down old securities is clearly out of the question. Apart from the obvious constitutional difficulties [15] of such a course, considerations of public expediency of themselves forbid it. The direct loss over

[13] *Re. Hudson River Elec. Power Co.*, 1 Pub. Service Com. Reports, 2nd Dist. N. Y. 51, 67 (1907).

[14] *Interstate Tel. & Tel. Co.* v. *Public Utility Board* 84 N. J. L. Rep. 184, p. 187 (1913); 86 Atl. Rep. 363, p. 365 (1913).

[15] Provisions of the federal constitution prohibiting states from passing laws which impair the obligation of existing contracts.

the unsettlement of legal and equitable relations would be very great. The indirect loss from the withdrawal of confidence in American railroad investments would be immeasurable."

The commission points out further that if the issue of new securities were prohibited until the value of the assets equalled outstanding securities many railroads would be prevented from obtaining the new capital needed to serve the community. If we recall that earnings are alone the true test of reasonable capitalization,[16] it can be seen that the question of whether the investment in tangible and intangible property equals, exceeds, or is less than the outstanding capitalization is purely academic. It may well be that investments were greater than required by the market; in that case overcapitalization would exist, which, under rate-making valuations, would have no effect upon earnings. Overexpansion is one of the risks which attended investments in the past and must be borne by the investor. In the end risks fall not upon the bondholders but upon shareholders. The situation only is serious for the former when the earning power declines to such an extent as to reduce the stockholders' equity to zero. The par value of stock has only an historical importance, and stockholders must be brought to think, not in terms of par value but in terms of the value of their equity. If misrepresentation has resulted in credit inflation, the corporation itself becomes the victim.

A transient remedy for the difficulties arising from existing overcapitalization is publicity based upon correct accounting in the future. With earnings controlled by means of a rate-base which is independent of both capitalization and past accounting entries, the level of future earnings will show how much, if anything, of the margin of safety has disappeared. Corporations which care for their good credit in the future should be willing to correct past mistakes if regulating commissions do not make their situation impossible.

In working toward a final solution the commissions should insist that accounts continue to show the true state of affairs. In this respect the New York Commission has put its finger upon a danger residing in security regulation. "This company seeks to obtain money by the sale of bonds and stocks at a time when its accounts are untrue to a very large and material amount. The value of such stock and bonds is in very great measure to be determined by the truthfulness of those accounts. No one can determine whether to invest in these securities without rely-

[16] See Chapter XVII, p. 372.

ing upon those accounts. Knowing the facts, it would be impossible for the Commission to justify itself in allowing these securities to be placed upon the market to be sold upon the faith which the buyer must repose in the correctness of the company's balance sheet." [17]

In considering applications, the commissions have not permitted themselves to be drawn into endless and complicated investigations of past transactions, with the view of meeting out meticulous justice as to past wrongdoing. On the other hand, they have not permitted the companies to escape entirely the evil results of past mistakes. They have regulated security issues keeping in mind the need for continuous service and with the view of effecting improvements in the future. This need not imply a continuation of the practice of overcapitalization. When security issues are for the purpose of applying the proceeds to the purchase of property which is to replace existing property that ought to have been retired out of past earnings (that is, charged to depreciation reserves), the commissions have steadfastly refused to give such authorization. In order to protect future service they have approved issues as temporary expedients but with the express condition that future earnings be put back into the property instead of being paid out in dividends until credit is reëstablished. Or they have required that stocks instead of bonds be sold in order to hold down fixed charges and increase the bondholders' margin of safety. In financing consolidations, the New York Commission, for instance, has insisted upon amortizing the difference between the appraised value of the physical property purchased and the higher price actually paid. On the other hand, commissions have been liberal in granting permission to issue securities for working capital purposes, or to pay for promotion and development expenses. Also, where a public utility had invested earnings in extensions and improvements, they were free to concede that such expenditures might be reimbursed through the issue of stocks or bonds.[18]

The question has arisen whether capital additions that are unproductive of gross revenues, such as expenditures for eliminating grade crossings, should be paid for through sales of securities. There is a tendency to check this practice in the interests of conservative finance. Similarly, the practice of paying

[17] *Re. Binghamton Lt. Ht. & Pr.*, 2 P. S. C. Rep. 2nd Dis., N. Y. 171, 202 (1909).

[18] 1 N. Y. P. S. C. Rep. 2nd D. 238 (1912).

for improvements through the expansion of floating debt is disapproved.

In short, we may say that commissions have interpreted their duties strictly so far as the issuance of new securities is concerned, and they have attempted to follow correct accounting and financial principles. Professor Ripley well describes their position. "They stand," he says, "between two fires; on the one hand, they cannot lawfully adopt so strict and narrow a policy as to throttle enterprise. On the other, they must not be so liberal as merely to 'rubber stamp' promoters' schemes." So far as the past is concerned, when that was necessarily involved in an application for new security issues, they have exercised a wise discretion in preserving continuity of service and credit, adopting such financial expedients in each special case as would lead that particular utility out of its financial wilderness.

CHAPTER XIX

THE RATE OF RETURN

The two ideas of a "fair value" and of a "fair return" are interdependent. If the rate-making rule as laid down in *Smyth* v. *Ames* is to secure for public utilities a reasonable earning power, reasonable rates should yield, in addition to reasonable operating expenses, a fair rate of return upon the fair value. The question therefore arises: What is a fair rate of return?

Sec. 1. **Analysis of the Rate of Return**

A fair rate of return must have reference to what some economists have called the "wages of capital." According to the present analysis the fair rate of return must have reference to the several types of investment bargains which going concerns make in financing themselves. There are first of all interest bargains with those who have loaned capital funds to the concern. The going concern must meet the costs assumed under these contracts out of its earnings after paying operating expenses. If most of its capital is borrowed, most of the net earnings from operation go out as interest charges. The balance available after paying interest is the profit of the corporation in a legal and accounting sense. Thus, the fair return must include an allowance for interest and an allowance for profit.

The interest rates which public utilities must pay for capital depend upon the "going rate" for loans involving similar risks. We have seen in our discussion of security of investment that this "going rate" depends, at least in part, upon the risks which attend investment. If by means of certain institutional arrangements these risks are eliminated or reduced, the "going rate" of interest ought likewise to be reduced. In order to pass these benefits on to customers the rate of return must reflect these reductions. The same considerations apply to the profits element of the return. There remain, however, certain risks which must be borne by stockholders, particularly the common stockholders. The reasonable or fair rate of return should

therefore be fixed with reference both to risks which may be eliminated or absorbed in operating cost and the risks which can not well be eliminated or absorbed on account of their nature but which must be borne by shareholders.

It has become customary to fix the rate of return without specific reference to the way in which net earnings are applied by public utilities in compensating investors in accordance with investment bargains. Some estimated allowances for the "cost of capital," not necessarily related to the actual transactions of the business, are usually the criteria for fixing the fair rate. This practice has a tendency to put the return upon a basis which is not related to the conditions of security or insecurity of investment which obtain in a concrete case. Only by analyzing the rate of return in terms of the financial structure of a business unit can these allowances be brought into relation with the actual financial transactions and the risks attending each concern.

An example will make clear that the fair rate of return upon the fair value only has meaning when we analyze what it represents in *distributable* earnings. Let us assume that the "fair value" of an enterprise has been fixed at $10,000,000; that there is an ideal correspondence between such fair value of the assets and the economic capitalization (stocks and bonds at par) as shown by the liabilities. Let us say the various bond issues represent $6,000,000, the preferred stock outstanding $2,000,000, and the common stock outstanding $2,000,000. Let us further assume that the fair rate of return has been fixed at 8 per cent. per annum and that the rates exactly yield this return. $800.000 will thus represent the reasonable annual earning power over and above operating expenses. Now we will assume that the average interest rate which must be paid upon bond issues is 6 per cent. Interest payments will then aggregate $360,000, leaving $440,000 to be divided as a profit among stockholders. We will next assume that the preferred stock certificates provide for a cumulative dividend rate of 7 per cent., aggregating $140,000. This leaves $300,000 available for dividends upon $2,000,000 of common stock, or an earning power of 15 per cent. Not all of this amount can be declared as a dividend. Some part of the $300,000 should be retained in the business as a surplus to equalize fluctuations in earning power and to act as a buffer against contingencies.

This hypothetical illustration lays bare a situation which has frequently given rise to misunderstandings. Where a utility

uses borrowed capital as well as owned capital, it is usually able to borrow at an interest rate which is less than the rate of return earned upon the total capital. This increases the return earned upon owned capital as appeared from the illustration. This practice is known as "trading on the equity." The principle may be extended so that a corporation in making its investment bargains will not only be able to keep down its interest charges but the preferred dividend requirements as well, with the result that a very much larger rate of return is earned upon the equity of the common stock. Trading on the equity is a modern device of corporate financing. Its effect upon the financial return to stockholders should not be surprising since these financial arrangements merely give effect to a division of economic functions within the going concern. Owners as primary risk bearers contribute their capital under conditions which make them the residual claimants of remaining profits or assets. The function of the pure capitalist (the creditor) is separated off from the entrepreneur in the corporate form of business organization. The fair rate of return should therefore be discussed in terms of the *differentiated* return to creditors and owners.

Administrative commissions when specifying the rates of return used in their rate calculations have not been sufficiently explicit in saying what they regard as a reasonable *differentiated* return. They have vaguely indicated that stockholders who bear the risk are entitled to a higher return than are bondholders but this higher return was buried quantitatively in the inclusive "return" upon the total "fair value". There was a reason for this procedure. On account of the widespread belief that all public utilities were overcapitalized, the capital structure could not be used as a rate-base. There was thus no reliable basis upon which a differentiated return could be predicated. So commissions followed the eminently human course of least resistance and set up a single undifferentiated return which was based upon an undifferentiated rate-base. Quite often this method of calculating the return served to some extent to protect the credit of public utilities. Instances are by no means few where practically the entire undifferentiated return upon the fair value was needed to pay interest charges, leaving owners only the bare control with power to keep themselves in executive positions. Until capital structures are made to conform to the rate-base, the rate of return can not be differentiated and hence the question of earning power will also continue to remain more or less

confused. Students of the subject should, however, be familiar with this practice.

Sec. 2. General Principle Applicable in Fixing the "Fair Return"

Economists have classified wealth under the two categories of capital and income. Wealth as income has been further classified in accordance with the factors of production (nature, capital, labor, and management) to whose coöperation in the productive process income may be attributed. This is the classification of the classical school of English economists. But there are practical difficulties in separating the flow of income in accordance with this classification. Modern accounting has not followed it, but has, instead, followed the legal classification which distinguishes merely between owners and creditors. All creditor incomes, whether called rent, interest, wages, or salaries, become costs because they are based upon contract. All incomes in excess of costs accrue to owners and are called profits. But in the legal classification profits may cover forms of income which classical economists consider interest, rent, or wages of management, because the capital, land or managerial services contributed have an alternative price which might have been obtained elsewhere as a creditors' income.

In order to show that owners and creditors assume different degrees of risk it may be better to classify productive services as working, saving, and risk-bearing. The difference in these classifications arises merely from a difference in point of view. If we look at the productive process from an engineering point of view, the factors of production are nature, capital, labor and management. From the point of view of economic functions, however, the classification would have to be working, (including management) saving, and risk-bearing.

The legal organization of the business unit and the accounting classifications fit this functional classification better, but we must not fail to recognize that working, waiting, and risk-bearing always tend to run together. The business corporation recognizes and tries to harmonize these functions in its internal organization and in the distribution of powers, duties, and responsibilities. Owners contribute capital but they are also the chief risk-bearers and therefore have the power of management. As the risks assumed by other classes of capital contributors decrease, managerial powers are likewise decreased, as was ex-

plained in connection with mortgages. The management function is carried out by risk-bearers or it may be left to hired employees. Even ordinary employees have certain supervisory powers. Only a conceptual line can thus be drawn which will separate working, saving, risk-taking, and management.[1] It will thus conduce to clearness if the fair return upon the rate-base be determined from an accounting point of view, because commissions and courts have defined it as an amount in excess of operating expenses, including therein depreciation and taxes, which represents a "fair" rate upon the "fair value" of the property.

From an economic point of view, the fair compensation for a given employee may include wages, interest and profits. Therefore, in determining what is a "fair return" upon the "fair value", the question of salaries paid must be considered. Payments are made to executive officers for management functions and from an accounting standpoint classed as operating expenses. The high salaries usually paid to executive officers of our larger public service companies often include an element of income which might properly be considered a portion of the fair return. On this account, when dividends or pure profits to the principal risk-taking element—the stockholders—are considered, commissions must carefully look into the salary situation because a lack in the one is sometimes made up by a surplus in the other. Yet from a legal standpoint salaries must be paid before even interest is paid to bondholders.

Under the holding company form of organization some management services are performed by the holding companies and charged against their subsidiary operating companies as a fee. The fee becomes an operating expense of the subsidiary. Yet the question of a reasonable profit may be involved because risk-taking and management services are rendered by the same agency, the holding company, and payments for one service are separated only with difficulty from the other.

In recent years a type of company has been created which undertakes to perform managerial services for operating public utility companies and from whom it exacts a fee for managerial services alone. The risk-taking and capital-supplying functions are still performed by the stockholders of the operating companies for whose account the property is being managed. We

[1] A similar analysis has been made by Prof. Raymond T. Bye in a recent discussion of "The Nature and Fundamental Elements of Costs." *The Quarterly Journal of Economics*, Vol. XLI, p. 30, Nov., 1926.

have here an illustration of an almost complete segregation of managerial services and their compensation on a contractual basis.

In a prevailingly *competitive* organization of economic society, *saving* or the accumulation of capital is largely an individualistic function. Such a society must be induced to save by means of the stimulus of interest payments. At any rate this is recognized as the all-embracing and most durable incentive. We may call this payment "pure interest". In order, however, to induce investment in one industry as compared with another, or in one business as compared with another, the loan contract provides for special differentials over and above "pure interest". The interest paid upon certain government bonds and savings-bank deposits represents perhaps the nearest approach to pure interest that is practically possible. By the time a corporation such as a public utility estimates its "cost of money", this interest rate will include pure interest and the differential payment peculiar to the enterprise, together with costs for operating the financial machinery of the company which markets the securities of the corporation. Thus public utilities, like other enterprises, in bidding for capital in the open market must pay some competitive rate of interest which depends upon many complex factors.

If that is true of a corporation's borrowed capital it is not less true of its share capital. The prospects of an income must lure the owners of capital to subscribe to stock. There is this difference, however, that stockholders' capital may not be collectively withdrawn so long as the concern preserves its legal life. The individual owner may, of course, seek to sell his stock upon the exchanges. But his desire to sell must then find its counterpart in the offer of some one else to buy at a price mutually agreeable. It is by such operations that good credit or the degree of credit failure is best established.

In this country public utilities have been constantly in need of more capital. Not all of this could be borrowed; substantial amounts had to be subscribed. Thus there has been a continuous inflow and outflow of investment funds with respect to this particular market. In view of the indefinite life of public utilities it must be recognized that public utility finance is based upon a *continuing inflow of investments* in order to balance the outflow and to provide for new and increased capital requirements. Public utility credit should therefore be in the forefront of legislative solicitude, because it reflects the financial

health of going concerns whose supreme duty of service to customers is dependent upon securing the willing coöperation of all its members, not the least important of which are its investors.

The commissions have, therefore, rightly adopted this general standard in fixing the fair rate of return. *The rate of return should be high enough but not higher than is necessary to attract capital and the necessary managerial ability into the industry and to hold it there.* In applying this standard regulation pulls the teeth of monopoly. By making the reasonableness of the return depend upon the willingness of investors, owners and hired managers to continue their work in production, no unreasonable coercion is practiced upon consumers.

Sec. 3. **Determinants of the Necessary Rate of Return**

The rate of return necessary to attract capital will vary, (1) with general conditions of the money market, (2) with the risks that accompany investment, (3) with the character of special burdens. We will discuss each of these in detail.

(a) *The rate of interest in general.*

It is a familiar observation that in the world's history the supply of capital as compared with the needs of man has been very limited. One might almost say that this condition, in view of the seemingly unlimited capacity of man's wants to increase in variety and intensity, is chronic. Long periods of peace and of industrial activity favor the rapid accumulations of capital. Thus there was a time, at the close of the nineteenth century and the beginning of the twentieth, when capital was relatively plentiful. This is reflected in the ruling rates of interest in the chief money center of the world, as appears from Chart XXV, p. 506. Interest rates on British consols declined to less than 2.5 per cent. Other interest rates followed the same course. It was at this time that many major improvements in public utility plants of the United States were made, notably the subway constructions in metropolitan cities, the railroad consolidations, and the expansion of interurban electric railways.

However, the other side of the shield must not be overlooked. The state of the industrial arts, particularly new discoveries and inventions, create a plenitude of alternative investment opportunities which may make it necessary for an established investment demand to bid higher for its supply. At any given time

foreign investment fields, extensive government loans, the rapid development of a single industry like the automotive industry, may exert a demand upon investment funds hitherto relied upon by public utilities as their main source of supply. We conclude, therefore, that the necessary rate of return will tend to vary with the general interest rate.

(b) *The risks which accompany investment.*

The necessary rate of return will vary also with the risks that accompany investment. We can best appreciate this by surveying the kinds of risks which investors take into account.

The first of these risks relates to the character of the industry, that is, to the place it occupies in our social economy. The danger of loss of investment or of having an expectancy of return disappointed arises primarily because the demand for the service may abate. The demand may fail because customers make less use of the service or cease being customers altogether. Seldom is the service entirely dispensed with. Much will depend upon whether there are available substitutes. Water utilities are in an entrenched position because they supply the most fundamental of all needs. From these the risks grade up until we reach electric railways and motor bus lines. The electric railway industry is now suffering from the effect of the competition of substitute services, the private automobile and unregulated or independent bus carriers. The electrical industry competes to some extent with the gas industry. Interurban electric railways and trucking companies compete with steam railways on short hauls.

There are also risks arising out of the construction and operation of utilities. Fires, floods, strikes, sleet and wind storms, earthquakes, earth slides and washouts are cases in point. Hydroelectric plants are peculiarly susceptible to floods. Street railways have high costs due to payments for injuries and damages because they operate in crowded public thoroughfares. Gas plants have suffered from explosions. These risks are not so serious, however, that good management may not counteract them in large part, as we have seen. Nevertheless, they represent an element of risk which investors take into account in placing their investments.

A third class of risks relates to the historical conditions surrounding any one industry or any one plant. They arise out of circumstances surrounding a particular business unit. We must always remember that investors make their contributions to

particular companies, at a particular time and in particular localities. Interest rates and expected returns will be higher when a business unit is young and not yet established on a going basis. The situation is aggravated, of course, if the industry itself is young, its processes unstandardized, and its niche in the economic structure uncertain. Old, well-established enterprises with a good record of interest payments and of regular and substantial dividend payments can secure capital on lower terms.

A business may be located in a community where the population is stationary or declining. New plants in growing communities are at least surrounded with the potentialities of success. On the other hand, plants which have been built to supply communities upon the hypothesis of a growth which fails to materialize are overexpanded in relation to their markets and will experience difficulties in refinancing. A peculiar hazard attaches to investments in single-industry towns, especially when these industries are dependent upon a natural resource which is easily exhausted. Oil and lumber towns are familiar illustrations. Cities with diversified manufacturing or commercial pursuits offer the most stable market for public utility services. Utilities serving a population which is sober and industrious, with a high purchasing power, are preferred as investments over others where these factors do not obtain. Communities where residence and employment is highly seasonal, as in summer resort communities, offer another variation of circumstances in which an element of risk inheres.

There are few industries which have more roots in local soil than public utilities. In marketing and labor relations the contacts are purely local. Even in purchasing supplies the utilities have intimate relations with home industries. In financing, absentee ownership is being counteracted by home-town financing, as we have seen. The stupendous capital requirements, now estimated to equal more than two billions per annum, will probably always require wholesale distribution of securities through investment houses; nevertheless, substantial financial interests can be created among local investors. It is therefore very important that a utility have the confidence of the local community and that it be able to enlist the community's coöperation in its endeavors. Risks which arise out of mal-adjustments in local public relations are thus reduced to a minimum. Service and labor difficulties are more easily adjusted, the cost of operation can be reduced, and resistance to rate increases can be lessened.

Minute as some of these risks may appear when regarded by themselves, their effect is nevertheless cumulative. Moreover, they usually put in a concerted appearance and become the subject of more or less publicity and exaggeration. In their concrete form they thus exert a marked influence upon the judgment of investors in selecting securities for investment.

One of the functions of management in coöperation with the state and the community is to minimize risks. Here a manager performs best his obligations to stockholders. As holders of an equity, they are the economic buffer of creditors' interests. To this end management must have technical knowledge. It must be apt in judging men and have tact in dealing with them. It must possess the ability and foresight to develop and carry through a coördinated commercial and financial policy. It must possess organizing ability which implies ability to plan comprehensively, to deputize the execution of the plan, and to supervise its realization. To such management, if it does not already command financial resources, investors will lend a willing ear and purse.

(c) *Special burdens.*

The necessary rate of return will vary also with the character of special burdens. These burdens may be financial and psychological in character. The most common type of special burdens to which public utilities are subjected are certain special tax burdens. These burdens may affect the industry directly as when taxes are assessed the incidence of which is upon the *corporation;* or they affect the industry indirectly but the *security holder* directly, as when certain special taxes are assessed upon his particular form of income. It must not be inferred from what has been said that public utilities should be a preferred class so far as taxes are concerned. They should carry their just share of the cost of government. What is said here has reference rather to certain *peculiar* forms of taxation that have been levied and which have the effect of creating additional burdens or of penalizing certain forms of organization or certain types of securities. Even just taxation may have collateral and incidental effects that hamper utilities in their financing.

The best illustration of such a burden is the operation of the federal income tax and the federal excess profits tax. The schedule of tax rates which was at one time paid by income receivers is shown in Table XVIII, p. 418. Examination of this table will show that holders of public utility securities whose

TABLE XVIII

COMPARISON OF EQUIVALENT INCOME FROM TAX-FREE AND TAXABLE SECURITIES UNDER FEDERAL INCOME TAX RATES AFFECTING 1919 INCOME[a]

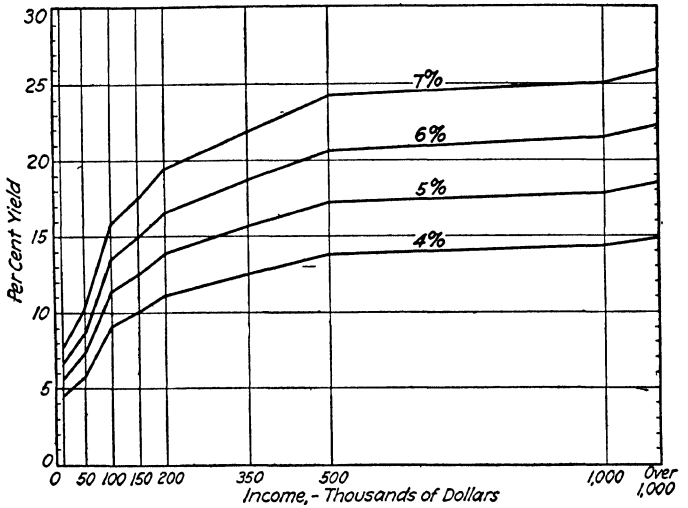
Amt. of Income Invested	*Income Tax Rate*	*Yield from Tax-free and Taxable Securities*							
		Tax-free	Taxable	Tax-free	Taxable	Tax-free	Taxable	Tax-free	Taxable
$ 10,000	11%	4%	$ 4.49	5%	$ 5.62	6%	$ 6.74	7%	$7.87
15,000	14%	4%	4.65	5%	5.81	6%	6.98	7%	8.14
20,000	16%	4%	4.76	5%	5.95	6%	7.14	7%	8.33
25,000	19%	4%	4.94	5%	6.17	6%	7.41	7%	8.64
30,000	21%	4%	5.06	5%	6.33	6%	7.59	7%	8.86
35,000	24%	4%	5.26	5%	6.58	6%	7.89	7%	9.21
40,000	26%	4%	5.41	5%	6.76	6%	8.11	7%	9.46
45,000	29%	4%	5.63	5%	7.04	6%	8.45	7%	9.86
50,000	31%	4%	5.80	5%	7.25	6%	8.70	7%	10.14
60,000	36%	4%	6.25	5%	7.81	6%	9.38	7%	10.94
70,000	41%	4%	6.78	5%	8.47	6%	10.17	7%	11.86
80,000	46%	4%	7.41	5%	9.26	6%	11.11	7%	12.96
90,000	51%	4%	8.16	5%	10.20	6%	12.24	7%	14.29
100,000	56%	4%	9.09	5%	11.36	6%	13.64	7%	15.91
150,000	60%	4%	10.00	5%	12.50	6%	15.00	7%	17.50
200,000	64%	4%	11.11	5%	13.89	6%	16.67	7%	19.44
300,000	68%	4%	12.50	5%	15.63	6%	18.75	7%	21.88
500,000	71%	4%	13.79	5%	17.24	6%	20.69	7%	24.14
1,000,000	72%	4%	14.29	5%	17.86	6%	21.43	7%	25.00
Over 1,000,000	73%	4%	14.81	5%	18.52	6%	22.22	7%	25.93

[a] Adapted from a Tabulation Prepared by William R. Compton Company.

income falls in the upper brackets of the income tax must receive an interest or dividend rate very much in excess of that actually paid in order that they may continue holding these securities and not lessen the income available for their own use. These tendencies are further illustrated in Chart XIX, and in Chart XX, p. 420. This does not mean that the taxes paid by security owners should be added to interest rates. It merely means that so long as tax-exempt securities are available to be purchased, investors can afford to sell their public utility

Chart XIX

YIELD REQUIRED FROM TAXABLE INCOME TO EQUAL RETURN FROM TAX EXEMPT BONDS OF VARIOUS YIELDS AFFECTING 1919 INCOME.

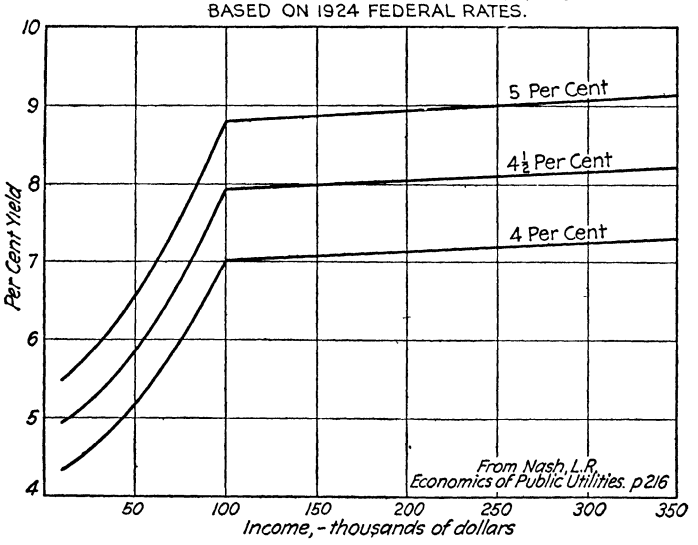


securities and invest the proceeds in tax-exempt securities. On the other hand, investors with free capital cannot be induced to buy new public utility issues. This handicap creates difficulties in financing which force public utilities to raise interest rates in order to get the needed supply of capital. The influence of the superior credit of public bodies combined with the effect of tax exemption appears clearly from a comparison of interest rates paid by the City of Milwaukee and those paid by The Milwaukee Elec. Ry. & Lt. Co. Chart XXI, p. 421, shows the comparative yield of these bonds and Chart XXII, p. 422, shows the disparity in rates paid by these typical public and private borrowers.

Where the federal income and excess profits taxes constitute a burden upon some classes of investors, certain other taxes levied upon the industry in the shape of privilege taxes have added to the normal tax burden. The chief ones have been franchise taxes, car license taxes, bridge taxes, etc. Because public utilities appear often to have been singled out for these special burdens, they have had to contend with an added risk element in the minds of investors.

Chart XX

YIELD REQUIRED FROM TAXABLE INCOME TO EQUAL RETURN FROM TAX EXEMPT BONDS OF VARIOUS YIELDS BASED ON 1924 FEDERAL RATES.



(Chart XX used through courtesy of McGraw Hill Book Co.)

A similar effect is produced when communities require capital expenditures which serve neither to increase revenues nor to lessen costs. These have usually crept in under the guise of compensation for franchises. The most prominent have been the so-called paving obligations, street-opening and street-widening obligations with which the street railway industry has been particularly beset. Street railways have even been required to provide sewage facilities for streets over which they were seeking a franchise. Similar in character are expenditures imposed upon electric utilities for ornamental posts for street-lighting and to remove poles and put wires underground before the useful life of the poles has expired. Transportation utilities have been

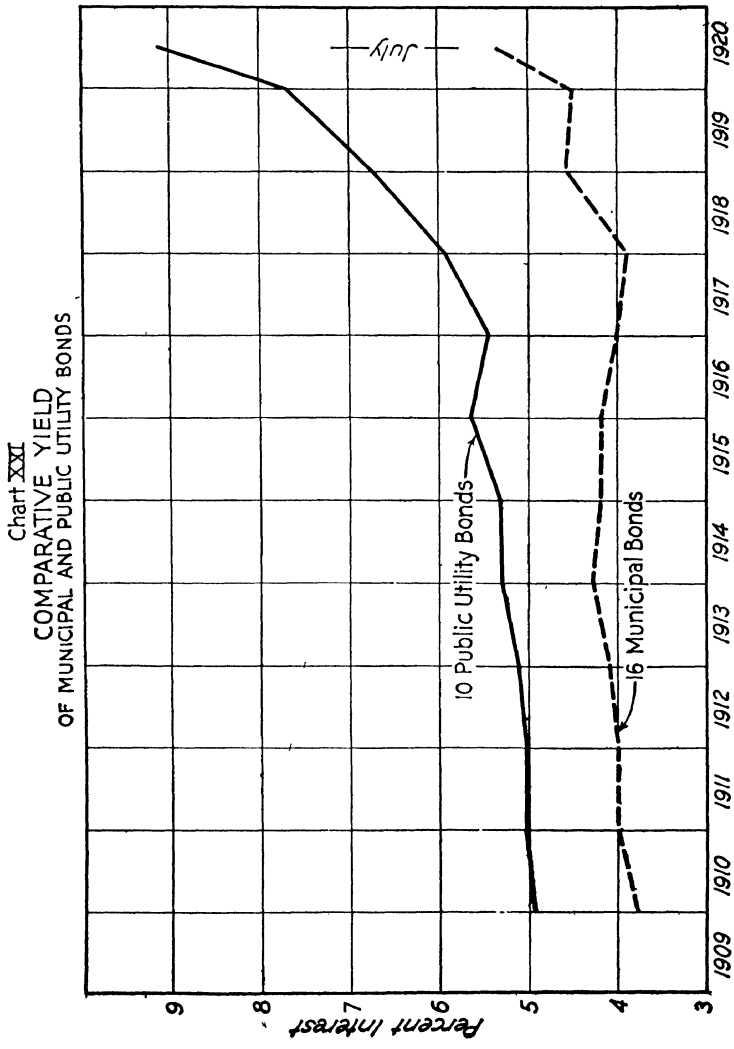
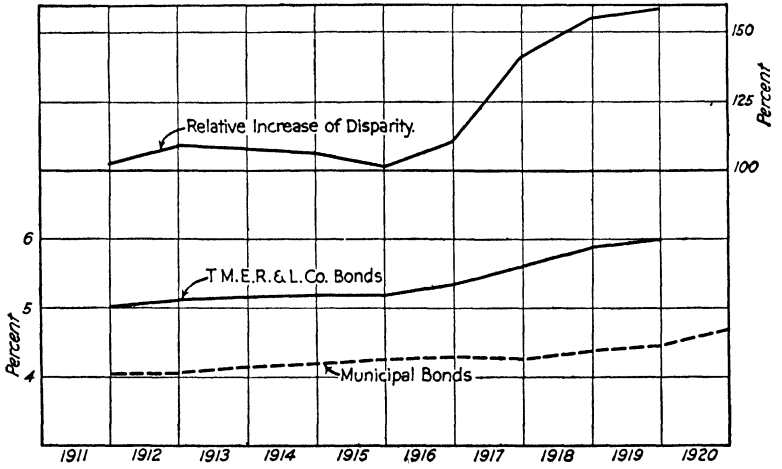


Chart XXI
COMPARATIVE YIELD
OF MUNICIPAL AND PUBLIC UTILITY BONDS
Percent Interest
9
8
7
6
5
4
3
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
July
10 Public Utility Bonds
16 Municipal Bonds

peculiarly affected by the modern safety movement, requiring them to elevate or depress their tracks and to protect or eliminate their grade crossings. While such expenditures have not been without advantage to the companies in cutting down accident costs and have been made in the public interest, they were nevertheless onerous and investors have often felt that they have made operation unduly expensive.

The burden of free services, usually arising as franchise obligations, is another element of risk. Carrying city officials and employees free, supplying free current to light public buildings

Chart XXII
COMPARATIVE AVERAGE RATE PAID BY THE CITY OF MILWAUKEE AND THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY. 1911 - 1919



and swing bridges, although minor in character and partaking more of the nature of nuisances than of special burdens, have, nevertheless, called investors' attention to the exposed position that public utilities occupy.

If the feeling becomes general that a particular industry or a particular business unit is being politically harassed, or is involved in franchise difficulties, or has to contend with a legacy of public ill-will, it will be difficult to float security issues upon a favorable basis. The credit position of public utilities and hence their cost of capital may thus depend in part upon the prejudices or fears of investors. Capital is proverbially timid. There are also times when security markets will not readily ab-

sorb stocks. At other times it may be difficult to sell bonds. The character of the offerings must therefore be attuned to the rhythm of the security market. In fine, the task of affording public utilities an assured credit position is an art which must be practiced under expert guidance, must have the full coöperation of public authorities, and must give due weight to imponderables of public opinion and subtle intangibles. In selecting the kind of security which will sell best in the security market, financial management must take into account these psychological traits of the investment market.

Sec. 4. Quantitative Measures of the Necessary Rate of Return [2]

The foregoing analysis of the necessary rate of return has taken account primarily of the qualitative aspect. Quantitative measures of the necessary rate of return are best obtained from the markets themselves. When the pioneer commissions first set about fixing reasonable returns they used the rather slender basis of fact obtained from competitive industry, where the degree of risk was supposed to be comparable to that of public utilities. It was a purely experimental method. Given the interest rates paid in the past, the practical question was: How much more must be added to afford a differential for management and risk-taking?

To begin with it was recognized that governmental standards of earning power were not applicable. Because governments can borrow funds at lower costs and are unwilling to make public utilities a source of profit, it was felt that a rate of return for privately owned public utilities equal to that which governmental enterprises were earning would fail to keep capital and management in the field. Nor were public enterprises sufficiently numerous to provide a safe guide. Comparison was therefore made with returns earned in the past in competitive industry. In this way the reasonable expectations of investors were prognosticated. In the end the rate of return actually used was based upon an administrative judgment.

We may, by way of illustration, take the results of an investigation based upon office records, by a firm of public accountants

[2] The quantitative aspects of this problem of cost of money is being investigated as a doctoral dissertation and as a research project by H. B. Dorau, Research Associate in the Institute for Research in Land Economics and Public Utilities.

having a wide practice.[3] This disclosed the following state of affairs as to returns earned in competitive industry. Taking the facts only for 1913, a year of normal business conditions, thirty-six manufacturing companies showed a return upon the invested capital (assets in the accounting sense) varying between 1.37 per cent. as a minimum and 112.09 per cent. as a maximum. The list included companies with invested capital as low as $95,395 and as high as $22,131,599. The following table summarizes the returns:

Manufacturing Companies	*Number*
Return not more than 10%	15
Return more than 10% but not more than 20%	11
Return more than 20% but not more than 30%	3
Return more than 30% but not more than 40%	3
Return more than 40% but not more than 50%	2
Return in excess of 50%	2

A similar study of the returns for nineteen companies in mercantile or trading enterprises showed a variation between 2.54 per cent. and 31.13 per cent. The entire range was as follows:

Trading Companies	*Number*
Returns not more than 5%	2
Returns more than 5% but not more than 10%	6
Returns more than 10% but not more than 15%	2
Returns more than 15% but not more than 20%	3
Returns more than 20% but not more than 25%	4
Returns more than 25% but not more than 30%	1
Returns more than 30%	1

Trading companies with a low fixed capital investment and high rate of turnover are obviously less comparable than manufacturing companies with a higher fixed capital investment and slower turnover. At best there is such variation in the competitive situation of different companies, and in the elements of business risk attending different enterprises, that cross-comparisons between these businesses on the one hand and public utilities with their monopolistic or semi-monopolistic positions on the other are difficult.

We may contrast this way of looking at the problem with another which assumes an investor who has not yet made his choice but is at the point of making one. Only such a person

[3] *Cf. American Economic Review*, Mar., 1916, p. 4. Figures obtained from exhibit introduced as evidence and on file with the Railroad Commission of Wisconsin.

is free to choose between two investment opportunities, one of them a competitive undertaking, the other a public utility. He alone has the true logic of choice. If he decides that a regulated public utility with the prospect of earning say 8 per cent. upon the investment is to be preferred as an investment opportunity over a competitive business without a specifically limited return, he has exercised a free choice which can stand as a functional test of the adequacy of the regulated return. His decision to invest at 8 per cent. does not answer the question, *how much less* can the regulated return be and still induce favorable action on his part. Yet a beginning had to be made somewhere. Public service commissions proceeded to answer the question along the only lines which made an answer possible. Administrative empiricism fixed upon a return well within the lower ranges of competitive returns as an experimental starting point. If capital and managerial skill continue to enlist under the colors of regulation, the experimental return constitutes a pragmatic solution of the problem of fixing quantitatively the necessary rate of return.

So much for the past aspects of the problem. What of the future? There has been a tendency for the particular regulatory standard to become the customary standard. Other commissions have followed in the footsteps of the pioneers. Monopolistic conditions, where the service is indispensable, constitute a fair field for the flowering of custom. May not a regulated return, protected by the sanctions of "use and want", be in excess of the *necessary* return upon which a true economy is built? Again only the free choice of the investor can answer the question.

A provisional answer may in some circumstances be obtained from the behavior of the price for public utility securities on the exchanges. If a bond with a fixed return sells for less than par it is an indication that this particular investment has become less desirable in the eyes of investors.[4] The same holds true in the case of the price of capital stock, dividends upon which are quite predictable under regulation. If the common stock of a public utility sells in excess of par it is theoretically correct to assume that there can be some recession in the rate of return. With interest rates fixed by contract, with dividends upon preferred stock fixed in the certificate itself, the earnings available upon the common stock become the critical nexus of credit. A

[4] In making this statement we are leaving out of account for the sake of simplicity the fact that the actual cost of capital differs from the coupon interest rate.

regulatory policy directed toward maintaining the price of common stock at par has as clear an economic objective as a dynamic economic environment affords.

There are difficulties in the way of applying this standard. Often the financial structure of corporations is so complex, intercorporate relations are so confused, and the disparity between rate base and capitalization is so great that the bench mark of a maintained market price for common stock at par defeats the very purpose of regulation. Where financial reorganization can not clear away the difficulties, public utility commissions might nevertheless select some market price which shall be the par of regulation.

Sec. 5. Judicial Standards as Affecting the Rate of Return

Since rate regulation may so limit earning power as to render the return confiscatory, the courts have attempted to define the boundary line of confiscation. The view of the courts is that any legislative limitation of earning power which escapes being confiscatory is a legitimate exercise of the police power of the state. It may be unwise but it is not confiscatory. The utility has not been deprived of its property without just compensation. It may be questioned whether the fifth amendment of the federal constitution was designed to control the limitation of property under the police power. But the courts have certainly opened up the way for an interpretation whereby eminent domain begins where the police power leaves off.

The problem of extending constitutional protection to public utility property could be treated in another manner. Private property is owned and used subject to the police power. If the legislature in protecting the public interest limits and restrains the use of private property it must do so in accordance with due process of law. Due process of law involves defining what is private property. But we have seen that private property in public utilities is of a different character from other classes of private property. Hence its definition must be in terms which will, *economically considered,* afford equal protection of the law to all owners of private property. The same definition of property can therefore not be applied in the two cases. The courts must define public utility property in terms of the *entire process* of rate regulation under the police power. If this process yields an earning power which does not place public utilities at a disadvantage in bidding for capital, the limitation is in accord with

the due process clause. If the legislature permits more than what the courts would hold to be a fair return, that is within the exercise of legislative discretion. The court is concerned merely with establishing a minimum standard under the due process clause.

The United States Supreme Court has definitely said that reasonable rates need not provide a return under all circumstances.[5] There may have been extravagant expenditures in operation and poor judgment in the location and construction of the property. The court is clearly willing to recognize abnormal circumstances. In another connection[6] the court held that water rates yielding a return of 6 per cent. were not confiscatory. The best judicial statement of what is regarded as a fair return is in *Wilcox* v. *The Consolidated Gas Co.*,[7] where a return of 6 per cent. was again approved. The court says: "There is no particular rate of compensation which must in all cases and in all parts of the country be regarded as sufficient for capital invested in business enterprises. Such compensation must depend greatly upon circumstances and locality. Among other things, the amount of risk in the business is a most important factor as well as the locality where the business is conducted and the rate expected and usually realized there upon investments of a somewhat similar nature with regard to the risk attending them." A lower federal court has given a more detailed statement of the considerations which should govern the return: "In fixing the measure of return upon property devoted to public use, regard should be had to the character of the business, the locality and the risk, whether the return will be uniform and secure; whether the patronage is steady or fluctuating and quickly responsive to financial and commercial changes, interest rates legal and contractual and the rates customarily sought and required in like investments in the locality; if a railroad, the character of the traffic, whether largely of a kind dependent upon certain conditions or so diversified that causes affecting part will not greatly affect the whole."[8]

It is naturally not the function of the courts to make quantitative determinations; they merely pass upon the work done by

[5] *Reagan* v. *Farmers Loan & Trust Co.*, 154 U. S. 362, 413 (1894).

[6] *Stanislaus County* v. *San Joaquin & Kings River Canal & Irrigation Co.*, 192 U. S. 201 (1904). See also *Knoxville* v. *Knoxville Water Co.*, 212 U. S. 1 (1909), and *Cedar Rapids Gas Light Co.* v. *Cedar Rapids*, 223 U. S. 655, 670 (1912).

[7] 212 U. S. 19, 48 (1909).

[8] *Missouri, Kansas & Texas Ry. Co.* v. *Love*, 177 Fed. 493, 501 (1910).

commissions. For purposes of computation courts have sometimes used the legal rate of interest as a basic test of the reasonableness of rates.[9] Yet it is fair to state that the courts do not regard the problem as one capable of exact solution.

It is also necessary to bear in mind when considering expressions of opinion by courts that the non-confiscatory rate is determined upon in the light of the rate base. Thus Justice McReynolds recently said in a case where the manufacturing plant and the distribution system of a gas utility had been appraised at reproduction cost new less accrued depreciation: "We think the evidence supports the finding that a net return of seven per centum was necessary in order to avoid confiscation."[10]

Sec. 6. Rates of Return as Fixed by Administrative Commissions

So much of the energy of commissions has gone into the determination of the rate-base that the question of the fair return has received relatively little attention. In practice commissions were forced to commit themselves to certain definite figures. For the period from the beginning of state regulation to the outbreak of the World War in 1914 the rate of return varied between 6 and 10 per cent., the usual range being between 7 and 8 per cent. The lowest returns were fixed by commissions in the West. Some states, notably Pennsylvania and New Hampshire, made no distinction between utilities in their return allowances. Most of them recognized some differences, varying from ½ to 3 per cent. But the variation does not appear to have followed any fixed principle. Municipally owned and mutual companies appear to have been given lower returns. This is true also of water utilities taken as a class. With the outbreak of the World War an effort was made to induce commissions to increase their allowances. This effort was only partially successful, as shown by allowances actually made during the period from 1915 to 1918. The most noticeable difference seems to have been that the range of variation was

[9] *Louisville & N. R. Co.* v. *Brown et al*, 123 Fed. 946 (1903).
Central of Ga. Ry. Co. et al v. *Railroad Com. of Ala.*, 161 Fed. 925 (1908).
Penna. R. R. Co. v. *Phila. County*, appellant, 220 Pa. St. 100; 68 Atl. 676 (1908).
People ex. rel. Jamaica W. S. Co. v. *Tax Com'rs.*, 196 N. Y. 39 (1909).

[10] *Pacific Gas & Elec. Co.* v. *City and County of San Francisco*, 265 U. S. 403 (1924).

eliminated and that all utilities were more nearly given the maximum rate. In the post-war period from 1919 to 1924 the same tendency continued. A few states increased their allowances by ½ of 1 per cent., but more often the single uniform rate was introduced. In short, we may say that no definite policies have guided state commissions in these matters.

Under the rule of rate making in the Transportation Act of 1920 the Interstate Commerce Commission is required to establish rates which will earn a fair return upon the aggregate value of carrier property. Congress itself fixed this return at 5½ per cent. until March 1, 1922, but authorized the Commission to allow an additional ½ of 1 per cent. to be used for improvements and betterments. In its first rate decision under the act, dated July 29, 1920, the Commission fixed the rate at 6 per cent. Due to severe industrial depression which began in the fall of 1920 and continued during 1921 the carriers actually earned only about 3.3 per cent. during 1921. In a later decision, dated May 16, 1922, the Commission fixed the fair return at 5¾ per cent., allowing however, for a deduction of federal income taxes. This return is appreciably lower than that allowed by state commissions for local utilities. The reason for the difference is very largely that railroads have been able to secure borrowed funds at lower interest rates than have the other utilities. It has been estimated that 1926 will be the first year when actual earnings will equal or exceed the administrative standard. The commission's determination that 5¾ per cent. is adequate is now before the courts.

Sec. 7. A Flexible Rate-of-Return Formula

If the "rate of return" is to constitute one of the elements in the total cost of service, and if this rate is to be adequate at all times to compensate capital already invested, and to enable the enterprise to secure additional funds, it is obvious that a fixed *rate of return* is subject to the same criticism as were the fixed rates provided for in term franchises. In order to remove this defect it is necessary that the rate of return, like the rates themselves, be made flexible. This can be accomplished by devising a formula governing the rate of return which shall give effect to changes in current cost of capital funds. Such a formula was embodied in the proposed Milwaukee Operating Agreement [11] and will serve to illustrate the principle.

[11] Compare Chapter XXXII, especially pp. 720 et seq., and Appendix A, pp. 768 et seq.

According to this formula the rate of return varies with the average interest rate which the concern must pay for borrowed capital. We may speak of this as loan capital and thus distinguish it from capital contributed by shareholders, which may be called risk capital. The formula recognizes that risk capital must earn a higher rate of return. The higher rate is controlled by means of a differential which is a definite function of varying interest rates. An index interest rate is computed quarterly which is made up of the weighted average cost of financing the various classes of secured and unsecured indebtedness. (See Table XXXVIII of Chapter XXXII.) The cost of capital is defined by the formula to include in addition to the nominal, annual interest rates, the pro-rata share of the accrued cost of amortizing bond and note discount plus the expense incidental to selling the securities, together with taxes absorbed and paid by the borrowing utility.

The first step in the determination of the formula involved reaching an agreement what the initial rate of return should be. This agreement was based upon the experience of the company in marketing its securities. Table XIX gives the facts as to actual earning power under regulated rates, together with the changes in the cost of borrowed capital for a period of sixteen years. It had been the policy of the commission to permit a rate of return of 7 per cent. upon the rate-base as determined for the railway department and of 8 per cent. for the electric and heating departments. There had been a considerable increase in the proportion of the total capital which was invested in the electric utility. The composite rate of return presumptively reasonable is shown in the fourth column. Actual earning power is shown in the fifth column. The difference between the composite rate of return and the cost of debt capital is the differential as shown in the last column. Only during 1920 and 1921, years of high interest rates, did this differential fall below 2 per cent. It was therefore *agreed* that a basic differential of 2 per cent. would enable the company to sell its securities. The average index interest rate at the time was approximately 5.7 per cent. The scale on page 432 illustrates the principle upon which the rate of return was to be computed.

It should be noted that as interest rates rise, the rate of return increases, but the differential rate falls. A continuous inducement is thus held out to management to secure loan capital at lower rates. It was provided, however, that if the interest rate should rise above 6.3 per cent., an emergency condition should be

TABLE XIX

COMPARISON OF ANNUAL COST OF DEBT CAPITAL, RATE OF RETURN, AND DIFFERENTIAL ON RISK CAPITAL
THE MILWAUKEE ELECTRIC RAILWAY & LIGHT CO.

Year Ending December 31	*Average Cost of Debt Capital*	*Per Cent of Total Capital*		*Rate of Return Computed on Wis. RR. Com. Basis* *	*Rate of Return Actually Earned*	*Wis. RR. Com. Differential*	*Actual Differential*
		Railway	Electric & Heating				
1907	4.94%	75.00%	25.00%	7.62%	7.85%	2.68%	2.91%
1908	4.95	75.00	25.00	7.62	8.01	2.67	3.06
1909	4.94	74.70	25.30	7.63	8.42	2.69	3.48
1910	4.94	73.00	27.00	7.64	7.90	2.70	2.96
1911	4.94	72.00	28.00	7.64	7.70	2.70	3.76
1912	4.99	69.00	31.00	7.66	7.70	2.67	2.71
1913	5.01	66.70	33.30	7.67	7.33	2.66	2.32
1914	5.02	65.40	34.60	7.67	6.78	2.65	1.76
1915	5.02	63.60	36.40	7.68	6.66	2.66	1.64
1916	5.02	61.80	38.20	7.69	7.51	2.67	2.49
1917	5.24	59.80	40.20	7.70	7.32	2.46	2.08
1918	5.58	58.00	42.00	7.71	5.92	2.13	.34
1919	5.68	56.00	44.00	7.72	7.65	2.04	1.97
1920	5.89	54.20	45.80	7.73	7.05	1.84	1.16
1921	6.26	53.40	47.60	7.74	7.36	1.48	1.10
1922	5.65	52.20	47.80	7.74	8.12	2.09	2.47
Average	5.25%			7.68%	7.45%	2.43%	2.20%

* Railway 7.50%
Electric and Heating 8.00%

Index Interest Rate	*Differential Rate*	*Rate of Return*
6.00%	1.85%	7.85%
5.90	1.90	7.80
5.80	1.95	7.75
5.70	2.00	7.70
5.60	2.05	7.65
5.50	2.10	7.60
5.40	2.15	7.55

deemed to exist which justified fixing an emergency rate of return by agreement or, if the parties failed to agree, calling upon the Wisconsin Railroad Commission to make an emergency determination.

In order to illustrate what this return means in terms of dividends upon the stockholders' equity we may assume a rate base of $10,000,000. Of this amount $6,000,000 is represented by borrowed capital upon which the average interest payments accrue at the rate of 5.70 per cent. The total return thus equals (10,000,000 × 7.7%) the sum of $770,000. Out of this amount the utility must pay capital charges of $342,000 (6,000,000 × 5.7%) leaving $435,000 as a return upon the stockholders' equity of $4,000,000 or 10.87 per cent. If a portion of the stockholders' equity consists of capital furnished by preferred shareholders who are paid a preferred dividend rate which is less than the rate of return, common shareholders will earn an even higher return upon their proportion of capital. It must be borne in mind, however, that a reasonable surplus must be maintained in order to stabilize dividend payments in the event of a reduction in gross revenues and otherwise to provide against contingencies.

Sec. 8. **Reward for Efficient Management**

Off-hand it may seem as if a variation in the rate of return should be recognized according as the commission is confronted with a well-managed or an inefficiently managed property. But the details of these matters are so inchoate that no definite policy has evolved. While commissions have given lip service to the principle that efficiency should be rewarded, they have in practice failed measurably to recognize it. There seems to be a good deal of truth in the charge sometimes made that regulation has a tendency to treat all management as of the same level of efficiency. In rare instances have commissions had the courage to

recognize exceptional management. In a few instances of bad management the rate of return was actually reduced.

A peculiarity of commission regulation probably accounts for this. Rates once fixed by a commission remain the lawful rates until again changed. If, in the meantime, costs have declined because of efficient management or for other more general causes, the well-managed enterprises have not been disturbed in their enjoyment of an increased earning capacity through the deliberate act of the commissions; on the other hand, customers being satisfied with the treatment accorded them, have failed to make applications for rate decreases.

We must not leave this subject without quoting from an early opinion of the Wisconsin Supreme Court in which this matter of profit as an inducement to good management was discussed. In *Milwaukee, St. Paul, and Sault St. Marie Railway Co.* v. *Railroad Commission* [12] the court in considering the question whether certain highly questionable improvements in service ought to have been ordered by the commission, refers to this aspect of the problem in this significant language: "In determining whether or not the order of the Commission is unreasonable, it must also be considered that every unnecessary burden imposed upon the railroad impairs its net receipts and diminishes that margin, if there be one, between the amount sufficient to assure a fair return on the value of its property, plus the amount of its fixed charges and operating expenses and its gross receipts. In this margin the public and the railroad are interested, because it is only when this exists that betterments in construction or in rates, will ordinarily be voluntarily made by the railroad or can ordinarily be ordered or enforced by the Commission. We are not now speaking of those extreme cases where the public duty must be discharged whatever the financial consequences to the railroad. (*Covington & L. T. & R. Co.* v. *Sanford* 164 U. S. 578.) But in ordinary cases to waste this margin is to waste the fund in which the whole public is interested. This should never be done for the benefit of the few as against the interests of the many. It is also to be considered that this margin ought not ordinarily to be exhausted or swept away by orders or requirements of the Railroad Commission as fast as accumulated, because human nature or railroad nature is such that no one will long economize on operating or other expenses if his economy only furnishes a larger basis for further exactions." Thus far very little attention has been paid to the question of incentives.

[12] 136 Wis. 146, p. 164 (1908).

Sec. 9. General Summary

The risk theory of profits is generally accepted by economists.[13] Does this theory apply in the case of public utilities which have a monopoly of the market? We have reference, of course, only to the amount of the return which should be allowed upon risk capital. In a freely competitive industry risks are inherent in the very organization of production. It can not be said that the greater the risk the greater the necessary profits. But it can be said that the greater the risks the fewer the competitors who are willing to assume them. The assumption of risks is thus automatically rewarded.

Let us take the street railway business as an example. When street railways were first established the risks were: (1) Would the business grow to be a remunerative enterprise? (2) Would competition cut down the profits? (3) Would management have to contend with difficult operating conditions increasing the cost of production? With street railways once established in our growing cities, the first element soon disappeared, the second was gradually eliminated, and the third was provided for by improvements in organization and technique. At the present time, although the competitive situation of electric railways with respect to one another has improved, although risks inherent in management have been overcome by a better technique, no one will deny that the risks of the business as a whole have increased on account of the development of substitute services and the consequent falling off in demand. Electric railways are being abandoned and sold for junk. Investments once promising have passed away. According to the risk theory public authorities should now allow electric railways a higher return. This is clearly an impossibility. In fact, a higher rate of return is being earned and allowed in a business which has become less venturesome, the electric power industry.

These considerations lead to the conclusion that, although risk justifies profits, fixing the amount of profits which a utility may earn under monopolistic conditions must be either by express agreement between the public utility and the community (as in franchise or service-at-cost regulation) or it must be determined from time to time by administrative authority. In fixing the level of earning power and hence the rate of profits, reasonable expectations, which take the past into account, must be con-

[13] Knight, F. H., *Risk, Uncertainty and Profit*, Houghton-Mifflin Co., 1918.

sidered. Incentives for operating efficiency must be recognized, so that exceptional efficiency may be rewarded and inefficiency penalized. In return for this element of profit the industry must agree to bear residual risks.[14] Unless this course is followed only three alternatives remain: (1) public utilities must be freed from all regulative restrictions as to price; (2) all losses of public utilities must be guaranteed by the state though they may be managed by private corporations for a management fee; or (3) public utilities must pass over into public ownership so that profit or loss belong to the community.

[14] But compare also, Bauer, John, *Effective Regulation of Public Utilities*, The Macmillan Co., 1925, Chapter X.

CHAPTER XX

APPRAISALS AND THEIR USES

Sec. 1. The Place of Appraisals in Public Utility Valuations

A distinction must be drawn between appraisals and valuations. Appraisers are persons who are expert in the determination of questions of fact or of opinion. Their findings are accepted as *evidence* in official proceedings, or else it is agreed that their findings will be accepted by parties under arbitration arrangements.

Public utility appraisals were first used in connection with the public purchase of water utilities. This fact has influenced the development of the entire appraisal process. The appraised price in a condemnation proceeding was easily confused with a valuation for rate-making purposes. This led readily enough to the notion that an appraisal and a valuation are identical.

An appraisal consists of three operations: (a) the making of an inventory of units of property; (b) the determination of unit prices; (c) the ascertainment of a final appraisal figure which is the sum of the products of the number of units and unit prices.

An inventory is primarily the work of the engineer. It consists of the marshalling of the tangible elements of property in accordance with some convenient and logical classification of items. The listing often follows the classification of fixed capital accounts. Intangible or non-physical elements are not strictly engineering in character, but information with respect to them may be available to the engineer, trained as an economist or as a business man. The determination of the unit prices is the joint contribution of the engineer and the accountant, functioning as statisticians and price analysts. The final collation of the appraisal figure is, in part, a purely arithmetical operation in which statistical and engineering experience are combined.

An appraisal is thus a complex affair, involving a variety of experience and training. The engineering profession has recognized this and a class of engineers and of engineering organi-

zations has been developed to specialize in such work. Because an appraisal is in large part the determination of a fact or what would be a fact under certain assumptions, it is often possible to reach agreements between parties whose interests might otherwise be opposed. Reputable engineers who live up to the ethics of their profession are able to reach conclusions regardless of their clients. It is possible for joint boards of appraisers to present a joint report upon which the parties can agree.

Great divergencies often appeared in the figures offered by appraisers hired by the public utility companies and those hired by cities or by consumers. This induced many public utility commissions to organize their own expert staffs for appraisal purposes. Their findings were used in order to check up on the appraisals submitted by parties as evidence, as well as to conduct appraisals of their own. It was assumed, and the assumption is largely true, that official appraisers occupy an unbiased position. Accordingly, their appraisals have been given great weight by commissions in fixing the rate base.

To speak of an appraisal as if it were a valuation tends to confuse an expert estimate or an evidentiary fact in the process of valuation with the final result of that process. Yet this is exactly the mistake made by earlier appraisers. In one of the first books upon the subject Floy writes:[1] "The object to be attained is a definite, logical one—namely to *ascertain a fair value* at a given time, for particular specific property." He then goes on to say—and the promiscuous use of the term "value" should be noted:—"From an engineer's standpoint, it would seem as if the making of an appraisal would result in but one set of figures, and that the engineer is not interested in the purpose for which the valuation is undertaken. To a limited extent, this is correct, but . . . value has several modifications of meaning, and the particular value as determined by the purpose of the appraisal, must be clearly understood and appreciated by the individual in charge of making the valuation. There can be but one value, one set of figures truly representing original cost, reproduction cost at a given time, or present worth of property in a given condition, but while there is one set of figures for each value there may be several values."[2]

[1] Floy, H., *Valuation of Public Utility Properties*, McGraw-Hill Book Co., 1912, p. 49.

[2] In view of the chaotic state of the terminology of this subject at that time (1912), and, indeed, continuing up to the present time, this citation should not be considered as reflecting upon the author so much as indicating two things,—first, how lack of definition of terms may delay the solu-

According to this view the engineer is a self-sufficient unit in valuation work and it is his duty to find a previously existing value, as he finds a fact. That this fact may be different according as he comes upon it in his search for a rate-making value, a selling value, a tax value, etc., does not lead him to suspect that the significance of appraisals and of valuations themselves is merely procedural and that appraisals have meaning only in the process of which they are an integral part.

Sec. 2. The Purpose and Cost of Appraisals

Why, it may be asked, are appraisals required if public service corporations are controlled in their accounting practices? The chief reason for making appraisals has been to get an estimate of the present cost of construction. Appraisals of this character are the so-called appraisals of the cost of reproduction new. They have been the most important lines of evidence submitted in rate and purchase cases.

In the days preceding commission regulation the accounts of public utilities were seldom, if ever, so kept as to lend assurance that investment costs could be determined. Thus appraisals were undertaken in order to check investment costs. To some extent they took the place of accounting records where these were wholly unreliable. Upon the basis of such appraisals, properties were consolidated, securities were issued and accounting systems reorganized. Sometimes appraisals served only the purpose of supplying particular deficiencies in accounting records. It was possible by means of appraisals to test the adequacy of the depreciation reserves of old properties. When property was purchased or constructed without detailed records of cost, an appraisal could supply this deficiency. Sometimes appraisals were necessary in order to clear property accounts of entries that ought not to have been made. For instance, in the days before correct accounting principles were widely known and applied, a company, desiring to show a high net income, might charge renewals that ought to have been charged against the depreciation reserves to the property accounts; or it might

tion of economic problems, and second, that many, if not most, of the writings on the subject of valuation must be read bearing in mind that their authors may have been employing a technical vocabulary, either indefinitely or inaccurately or both. For an interesting and generally sound discussion of the terminology of valuation see the report of the Valuation Committee of the American Electric Railway Association, *Proceedings of the American Electric Railway Association*, 1924, p. 205.

charge a part of the cost of maintaining property to the property account instead of treating it as an operating expense. Similarly in growing properties it often happened that costs were incorrectly charged to operating expense instead of to capital.

In reorganizing an accounting system appraisals will provide the basis for the apportionment of property in accordance with a detailed classification of property accounts. Usually this also involves apportionments by political subdivisions and by departments of the business. By this means the way is cleared for the installation of cost accounting records as an aid in rate-making. The segregation of the property by political subdivisions assists in the apportionment of taxes, which are assessed upon the corporation as a whole under the "unit rule". Such taxes must be subdivided and apportioned to those local units in which a portion of the property is located and where it conducts a part of its business.

The cost of making appraisals varies with the extent of the properties and with the detail that a particular appraisal is designed to show. Appraisals for rate-making purposes and in condemnation proceedings are usually very detailed and hence more expensive than appraisals conducted to validate securities. Where plants are large and consist of properties of uniform types, the inventories are brief and the unit prices few. But where properties are complex, widely scattered, and of many classifications, the procedure becomes involved and time-consuming.

On this account appraisals ought to be resorted to only infrequently. Not only must the direct expense to commissions and the litigants be considered but the disorganization incident upon the public utility is reflected in the cost of the service. The time consumed in preparing appraisals, in hearings before commissions and courts, have slowed up the process of regulation. And yet the accounting and record-keeping activities of the companies can not be dispensed with. Therefore, from the standpoint of the over-all efficiency of regulated industry, appraisals should be subordinated to accounting and should be resorted to only under exceptional conditions. Regulation could also be simplified and its processes made more readily understandable to the layman if the accounting records and the capitalization of the companies were made to conform to the results of a thorough-going appraisal and the subsequent finding of fair value. The mystery of a rate-base divergent from accounting records

According to this view the engineer is a self-sufficient unit in valuation work and it is his duty to find a previously existing value, as he finds a fact. That this fact may be different according as he comes upon it in his search for a rate-making value, a selling value, a tax value, etc., does not lead him to suspect that the significance of appraisals and of valuations themselves is merely procedural and that appraisals have meaning only in the process of which they are an integral part.

Sec. 2. **The Purpose and Cost of Appraisals**

Why, it may be asked, are appraisals required if public service corporations are controlled in their accounting practices? The chief reason for making appraisals has been to get an estimate of the present cost of construction. Appraisals of this character are the so-called appraisals of the cost of reproduction new. They have been the most important lines of evidence submitted in rate and purchase cases.

In the days preceding commission regulation the accounts of public utilities were seldom, if ever, so kept as to lend assurance that investment costs could be determined. Thus appraisals were undertaken in order to check investment costs. To some extent they took the place of accounting records where these were wholly unreliable. Upon the basis of such appraisals, properties were consolidated, securities were issued and accounting systems reorganized. Sometimes appraisals served only the purpose of supplying particular deficiencies in accounting records. It was possible by means of appraisals to test the adequacy of the depreciation reserves of old properties. When property was purchased or constructed without detailed records of cost, an appraisal could supply this deficiency. Sometimes appraisals were necessary in order to clear property accounts of entries that ought not to have been made. For instance, in the days before correct accounting principles were widely known and applied, a company, desiring to show a high net income, might charge renewals that ought to have been charged against the depreciation reserves to the property accounts; or it might

tion of economic problems, and second, that many, if not most, of the writings on the subject of valuation must be read bearing in mind that their authors may have been employing a technical vocabulary, either indefinitely or inaccurately or both. For an interesting and generally sound discussion of the terminology of valuation see the report of the Valuation Committee of the American Electric Railway Association, *Proceedings of the American Electric Railway Association*, 1924, p. 205.

charge a part of the cost of maintaining property to the property account instead of treating it as an operating expense. Similarly in growing properties it often happened that costs were incorrectly charged to operating expense instead of to capital.

In reorganizing an accounting system appraisals will provide the basis for the apportionment of property in accordance with a detailed classification of property accounts. Usually this also involves apportionments by political subdivisions and by departments of the business. By this means the way is cleared for the installation of cost accounting records as an aid in rate-making. The segregation of the property by political subdivisions assists in the apportionment of taxes, which are assessed upon the corporation as a whole under the "unit rule". Such taxes must be subdivided and apportioned to those local units in which a portion of the property is located and where it conducts a part of its business.

The cost of making appraisals varies with the extent of the properties and with the detail that a particular appraisal is designed to show. Appraisals for rate-making purposes and in condemnation proceedings are usually very detailed and hence more expensive than appraisals conducted to validate securities. Where plants are large and consist of properties of uniform types, the inventories are brief and the unit prices few. But where properties are complex, widely scattered, and of many classifications, the procedure becomes involved and time-consuming.

On this account appraisals ought to be resorted to only infrequently. Not only must the direct expense to commissions and the litigants be considered but the disorganization incident upon the public utility is reflected in the cost of the service. The time consumed in preparing appraisals, in hearings before commissions and courts, have slowed up the process of regulation. And yet the accounting and record-keeping activities of the companies can not be dispensed with. Therefore, from the standpoint of the over-all efficiency of regulated industry, appraisals should be subordinated to accounting and should be resorted to only under exceptional conditions. Regulation could also be simplified and its processes made more readily understandable to the layman if the accounting records and the capitalization of the companies were made to conform to the results of a thorough-going appraisal and the subsequent finding of fair value. The mystery of a rate-base divergent from accounting records

could thus be resolved into a clear recognition of basic relationships which would further good will and mutual understanding between the going concern and its customers.

Sec. 3. **The Inventory**

For most purposes the inventory should represent a *complete* listing of *all* the tangible property which the corporation owns. In certain cases it may also become important to know what property the concern leases. For rate-making purposes, however, the inventory should, strictly speaking, be limited to property used in public utility operations. This is usually accomplished by setting up two classifications, (a) operating property and (b) non-operating property. In passing upon appraisals submitted to them as evidence in rate proceedings courts and commissions have set up the standard that the inventory should include only *property used and useful in the service of the public.* The words *used and useful* were chosen in order to make clear that the inventory should include not only property that is used *continuously* but also property used *intermittently* or held for use in the immediate future.

In applying this standard to concrete situations many problems have been encountered. The more important of these center around the following:

1. Non-operating property.
2. Property retired from service but not yet sold or otherwise retired from the capital account.
3. Improvident acquisitions of property.
4. Engineering mistakes.
5. Reinvested earnings and donated property.
6. Omissions and contingencies.

(a) *Non-operating property.*

This class of property includes, for instance, facilities and appliances of merchandise sales departments. The line between operating and non-operating property is, of course, difficult to draw. The principal reason for drawing one in this case is that the trade in these appliances has developed upon a competitive basis. The same is true of wiring and installation services rendered by electric utilities. Where prices for incidental services are determined by competitive forces, properties used and useful in these services should not be included in the rate-base, and must, therefore, be excluded also from the inventory of

operating property. An exception may be made of those services which are merely a by-product of public utility operations.

Another illustration of excluded property is afforded by amusement parks, acquired and operated (sometimes under lease) in order to stimulate the use of suburban and interurban transport facilities. The line has been drawn against their inclusion because the operation of amusement parks is no necessary by-product of the need of securing full utilization of a plant acquired in the first instance for public utility purposes. The plea of revenue stimulation could be urged in favor of going into many other lines of business.

Necessary by-product operations are illustrated by machine shops, car shops and foundries which have been organized in order to facilitate building and maintaining structures and equipment. Where a utility manufactures its own equipment, outside work may be performed at competitive prices in order to secure a better utilization of the manufacturing facilities. The principle involved is that by-product operations are economically feasible where the major operations are conveniently associated with, and an outgrowth of, the rendition of service. Public utilities may not ordinarily engage in enterprises foreign to their public utility character.

Office buildings sometimes raise difficult problems. The major part of such a building may be used for commercial purposes, although it was erected for public utility purposes and to provide room for future expansion. In such cases the inventory usually assigns a portion of the building to the non-operating category. A convenient basis for the apportionment between public utility and commercial uses is the floor space occupied.

(b) *Property retired from service but not yet sold or otherwise retired from the capital account.*

Old and established utilities, that have passed through periods of considerable changes in the art and in the development of their markets, will often have on hand property which has been discarded or which should be discarded from service. The best illustrations are afforded by horse-cars which have been superseded by cable-cars and these, in turn, by electric cars. The rapid changes in the type of electric car equipment has added further items to the list of discarded properties. The question arises: Should such property be excluded from the inventory as property no longer used and useful? Viewed from the standpoint of service alone, the property is certainly no longer useful.

It should be and usually is eliminated from the inventory unless some equitable claim can be made that it be included. If the utility, for instance, on account of the rapidity with which the property has become obsolescent or inadequate, has been unable to set aside sufficient funds with which to provide for the retirement of such discarded equipment, then on equitable grounds, it may be included in the rate base as property used and useful. This would certainly be proper if the utility has not earned more than a reasonable return. Each instance would have to be judged in the light of its own special facts. In such cases provision has sometimes been made for the gradual elimination of such elements from the rate-base by suitable amortization payments. In any event no general rule can satisfy all circumstances.

(c) *Improvident acquisitions of property.*

Public utilities must stand ready to supply service when and as the demand for service arises. They will, therefore, anticipate these demands by having spare facilities ready. Forecasting the future demand and making provision for it, is ordinarily not difficult where facilities may be had upon call. However, in purchasing land in strategic locations the cost may be unduly enhanced, unless utilities are forehanded in the matter and make their purchases in advance of need. Other illustrations of facilities which give difficulty are surplus stocks of materials and supplies (especially under war and strike conditions) and extra capacity for future needs in tunnels and conduits. Within reasonable limits such spare facilities may be included in the rate-base. Sometimes, however, these transactions may savor of speculations in commodities or real estate. In doubtful cases some utilities have adopted the commendable policy of applying for commission approval of such contemplated purchases. This has served to protect them against criticisms if reasonable calculations as to future need or future price proved later on to have been illusory.

Planning for the future is peculiarly difficult under conditions when investments are contemplated during periods of boom, or in communities whose economic livelihood depends upon a wasting natural resource. An element of administrative discretion must necessarily enter in the determination of such questions by commissions. The hazard is inherent under a social policy where the duty of providing and maintaining these facilities is not assumed by government but is left to private initiative.

Reasonable expectations may not materialize and the utility may fail to establish a paying business. Under such conditions substantial portions of property may have to be excluded from the inventory. Regulation must protect consumers against improvident investments made by public utilities.

(d) *Engineering mistakes.*

Closely akin to the problem just discussed is that which has to do with property in the acquisition of which some engineering mistakes have been committed. The general standard applied in all such cases is that the management is required *to use ordinary care and foresight.* Property may prove to be useless due to faulty design. Or the difficulties may arise out of faulty construction or mistakes in location. All of these may lead to premature obsolescence or inadequacy. Each case must be examined in detail and a decision reached whether or not the investments represent palpable engineering blunders.

(e) *Reinvested earnings and donated property.*

Disputes have arisen over two classes of property items on account of the source of the funds with which they were acquired. Instead of borrowing funds to extend its property, a utility may use surplus earnings and reinvest them in extensions and improvements. Where dividend payments by utilities have been so substantial that a claim would be set up that property so purchased has come out of excessive earnings, commissions have been urged to exclude such property from the rate-base. Courts and commissions have, however, uniformly ruled that even excessive earnings become the property of the company and that plant acquired with these funds must be inventoried as property used and useful. The second class relates to donated property. Land development companies and others have frequently donated lands, poles, labor, cash, or other aids to construction. In this case also the rule is that donated property must be included.

(f) *Omissions and contingencies.*

The chief requirement in preparing a classified inventory is that it be *accurate* and *complete.* The classification should be so detailed as to make the inventory useful in as many directions as possible. This is most likely to be accomplished if the appraisal is the work of an experienced and well co-ordinated organization. Even the best organization, however, will make

errors and omissions in an inventory. In order to correct this defect, a percentage addition is usually made to cover "omissions and contingencies." From 3 to 5 per cent. has usually been added on this account. In an appraisal of the properties of the Milwaukee Electric Railways and Light Company the Railroad Commission of Wisconsin in 1910 made an allowance of 3 per cent. A reappraisal under better conditions in 1914 showed errors and omissions equal to an estimated allowance of 7.75 per cent., the difference amounting in this case to $1,521,662.

Sec. 4. **Unit Prices**

The inventory gives details regarding the number of units of each class of property items. These may be, for instance, cubic yards of gravel, or pounds of copper wire, or number of units of a particular type of turbo-generator. For each a unit price must be determined. The composition of the unit price is such as to include (a) the cost of material and labor (sometimes called specific construction) and (b) the cost of the units in place (sometimes called specific overhead). Little need be said here as to the method of ascertaining these prices. Appraisers have special facilities for the ascertainment of manufacturers' prices and their special discounts, and they organize this statistical information so that an appraisal may be made at prices prevailing over a wide range of time and area. Local prices and wage rates are important. Much information is derived from the accounts and records of the company and from the cost records of other similar enterprises. The specific overhead allows for freight, storage, handling charges, in fact all supervision and overhead cost that can be definitely allocated to specific units of property.

If the work has been done through a general contractor who may in turn employ subcontractors, the unit price will include the contractor's profit which has sometimes been fixed at 10 per cent. of direct costs. Much dispute surrounds this element in unit costs. It is generally conceded, however, that the contract system of construction is economical because the accumulated experience of contractors and their use of special facilities enables them to do the work more cheaply than when it is done through a utility's own construction organization. It is therefore important to distinguish between unit prices which include an allowance for contractors' profit and unit prices for so-called "piecemeal construction." The advantages of the contract system are

greatest in the wholesale construction of public utilities and less significant, so far as concerns the smaller annual additions or reconstructions. In piecemeal construction unit costs are generally higher but no allowance is necessary for contractors' and subcontractors' profit.

The question of unit prices and their influence upon appraisals and thus upon rate-base determinations is so important that we shall return to it again later on.[3] At this point it is only necessary to make clear what unit prices are, how they are arrived at and how they are combined with other elements into a final appraisal figure.

Sec. 5. General Overhead Charges

After the physical property has been inventoried and the proper unit prices have been applied to the unit-quantities, the resulting figure is called the specific construction cost. It then becomes necessary to make certain additions to the specific construction cost in order that the appraisal may embody all elements that go to make up the completed plant. The significant phases in the life history of a going concern were sketched in Chapter V. It was there shown that the first period is one of preliminary organization during which the legal, financial, and industrial plan of organization of the going concern are set up. Since the appraisal is in essence an attempt to recapitulate the costs, either original costs or reproduction costs, which have been or would have to be incurred, it must not confine itself to construction costs alone.

The additional items of cost are so various and have been so differently classified by commissions and other appraisal organizations that it is difficult to outline what has been the common practice. Some of these so-called overhead items of cost arise during the period of preliminary organization; others arise during the period of construction but have not been included in the unit prices; still others arise during the period of acquisition of a going business; and finally a new crop of these expenditures occur when the original going plant is expanded. Reconstruction of the plant should not, in theory at least, bring new overhead costs. Presumably, under proper accounting, overhead charges associated with units of property retired have been charged to the depreciation reserve along with the cost of the old units and have consequently disappeared. The new over-

[3] See Chapter XXI, p. 457.

head charges associated with the new units of property have taken their place in the accounts.

There is some difference of opinion also as to what should be considered a proper *general* overhead charge. From an economic and accounting point of view it does not appear to be correct to consider uncompensated costs incurred during the period of building up the business as overhead charges. According to accepted accounting principles, all costs involved in solicitation of new business are charged to operating expense accounts. If revenues do not cover the operating outlay plus the necessary fixed charges, the result is a *deficit from operation,* which certainly should not be charged as *capital.*. If stockholders have been obliged to forego dividends during the early years of operation, that is a risk which they have assumed, and no process of accounting legerdemain should raise these failures of early returns to the level of *capital costs.* If in the process of rate-regulation these losses are to be recognized, it must be by means of an accounting process which is *independent* of the accounting arrangements set up for the business as an economic entity. In this way alone can accounts serve their fundamental purpose of disclosing what is the balance between cost and income, that is to say, whether costs exceed income or vice versa. It is, therefore, proposed that all costs, incurred during the period when business is being built up, be rigidly excluded from the category of "overhead charges." This would eliminate the so-called "going value" from consideration at this point.

There remain the following classifications of cost:

1. Preliminary expenditures associated with the going plan. These include promotion expense, expenditures in financing, expenditures in preliminary engineering, expenditures incurred in effecting a legal organization, and in attending to all other legal matters appropriate during this period of preliminary organization. The last named item includes costs in securing franchises, examining and drawing up contracts, securing permits and consents from public authorities and private owners.

2. Expenditures during the period of construction. The purpose of these is of so general a character that they can not be associated with particular units of the plant, but must be associated with the going plant as a whole. These include all salaries and expenses of the administrative, legal, clerical and engineering staff during the period of construction. The allowance covers such functions as the general supervision of con-

struction, inspection, accounting, testing of apparatus, etc. No exhaustive enumeration is necessary or desirable for our purposes. There can be no questioning the propriety of allowances so calculated in each case as to be consistent with the conditions, actual or estimated, under which the work is assumed to have been done. Here again there is danger of confusion and duplication. If all or a part of the work is performed by the utilities' own organization, these overhead charges will be higher than when the work is performed under a general engineering contract. Such additional costs are involved in higher fees to consulting engineers and to architects, and special costs for design.

A word should be added in explanation of certain items of overhead construction cost. These items include property insurance, injuries and damages, taxes and interest during construction. They are designed to cover losses or insurance against losses due to personal injuries, floods, fires, accident and other causes. Taxes are assessed against land, buildings, structures and equipment, even though the plant has not yet commenced operation. The conditions of financing are usually such that interest-bearing bonds are immediately sold to cover a substantial part of the construction cost. Some allowances for interest should therefore be made for capital tied up in construction whether the capital was derived by borrowing or from stock subscriptions. These items of cost may be *capitalized* during the construction period because they are as much a part of the completion of the going plant as the physical cost of construction. Approved accounting classifications of both federal and state commissions include these items of cost under "Miscellaneous Construction Accounts."

One further item, already alluded to in the discussion of the inventory, is included under general overhead charges in conventional appraisal practice, namely, the item of "omissions" from inventory. This is combined with a similar item called "contingencies." These are not found in the accounts under the heading of miscellaneous construction costs because they arise out of the peculiar character and purpose of appraisals. Accounts show the *facts* as to expenditures, appraisals are *estimates.* For this reason a percentage allowance is made for omissions from inventory and another for "contingencies" which represents, in a sense, omissions from unit prices. Since the books of account are usually missing or faulty and the actual

character and conditions of original construction can no longer be learned, appraisers make allowances for material failures, unforeseen difficulties during construction, labor difficulties, losses due to storms, floods, etc. It would obviously be better if such elements of cost founded upon probability could be eliminated and the actual facts substituted. In any case, engineers of wide construction and appraisal experience agree that such allowances constitute good practice and commissions have approved them. The nature of this item serves well, however, to illustrate the difficulties and uncertainties of the appraisal method and is an added reason why the more accurate processes of property accounting, under *continuous* regulatory supervision, should be relied upon more largely in the future.

The best practice in dealing with general overheads is to apply varying percentages to the several primary classifications of property in the inventory. In the case of omissions and contingencies, for example, there is not likely to be any omission in the case of land, and relatively small omissions and contingencies in some types of properties as compared with others. It has not always seemed advisable or possible to go to such lengths in refining the process. This was particularly true of earlier appraisals and it is still customary to make allowance for overhead charges by general percentage additions to the total "specific construction." On account of the divergence in classification and practice it is difficult to illustrate the magnitude of these allowances. The following classification which has been used shows the probable limits within which these percentage allowances fall.

Classification of Overhead Charges	*Range of Allowance*
1. Interest, taxes and insurance during construction..	6% to 12%
2. Engineering, superintendence and administration..	3% to 10%
3. Organization and legal expenses	3% to 5%
4. Omissions and contingencies	1% to 3%
	13% to 30%

Cases in which the allowance will be as low or lower than 13 per cent. or as high or higher than 30 per cent. are rare and unusual, but the range indicates how construction and other conditions will affect the size of the allowance. Appraisals of large properties tend to show lower percentage additions than appraisals for small properties. A conventional percentage is 15. It is well to call attention also to an error which must be guarded

against. Care should be exercised that there is no duplication of allowances, first in unit prices and again in the general overhead.

Sec. 6. **Ascertainment of the Final Appraisal Figures**

Ascertainment of a final appraisal figure consists primarily of the arithmetical process of multiplying the number of units of each class of property by the relevant unit price in order to get the total appraised price for each class of property. If general overheads have been determined by property groupings, overhead allowances must be added up, in order to give the total appraised price including the overhead. If the general overhead has been fixed for the property as a whole, the appraised prices may first be added and the general overhead allowance computed as a total. The two will then represent the grand total appraised price of the tangible property which has been classed as operating property.

The foregoing considers the tangible property as if it were new. It may also become necessary to determine, by means of an appraisal estimate, the annual rate at which the units of property depreciate both by classes and for the property as a whole. For this purpose appraisers have set up certain concepts that are of a mixed physical and financial nature. The first of these is "scrap value." Scrap value is an engineering *estimate* of what might be the value of each unit of property in a disintegrated condition, after its useful life in service has expired. The "scrap value" is deducted from the total appraised figure and the difference is called the "wearing value" or the depreciable part of the appraised figure for that class of property.

It is true of course that some properties are durable in character. From the standpoint of their own inherent physical or chemical qualities they may render service indefinitely, so long as they constitute a part of the "going plant." They therefore have neither a scrap value nor a wearing value in the appraisal sense of these terms. Other properties have only a limited "service life." During this period it is assumed that the wearing value is dissipated. Old properties may thus be said to have a wearing value (a) which has already been dissipated, and (b) which still remains as a future service life "expectancy." The ratio of unexpired life to total life expectancy is sometimes called the "condition per cent." of the unit. Borrowing certain accounting terminology, we may speak of the expired life as the

accrued but unmatured depreciation, and of the unexpired life as the *unaccrued and unmatured depreciation.* When the full service life has expired the depreciation has matured. We may thus set up two equations which exhibit the relationship of these concepts in the case of new and old properties. (1) In new properties the cost new equals the estimated wearing value plus the estimated scrap value. (2) In old properties the cost new equals the accrued depreciation plus the remainder of wearing value plus the estimated scrap value.

It may also be necessary to show the proportion of the grand total of the appraised figure which is assignable (a) to different geographical locations and (b) to the different departments of a given enterprise. This is known technically as the process of "apportionment." The latter is particularly important in the cases of corporations rendering more than one class of public utility service. Convenience and the purpose for which the figures are being compiled will dictate the degree of refinement and character of the apportionment. The following is a rough illustration of the detail in which a particular appraised figure can be shown:

I. The Inventory
   1. Number of units
   2. Description of units

II. Unit Prices
   1. Price per unit
   2. "Scrap value," per unit

III. Ascertainment of Appraisal Figure
   1. Cost new
   2. Scrap value
   3. Cost new less depreciation

IV. Apportionment of Appraisal Figure
   1. Cost new, and
   2. Cost new less depreciation assignable by designated locations (cities, villages, towns) to
      a. Railway Dept.
      b. Electric Dept.
      c. Heating Dept.
      d. Gas Dept.
      e. Joint Operating Uses
      f. Non-Operating Uses.

In steam railway operation it may be desirable to apportion the appraised figure to properties used exclusively for passenger train service, freight train service, and these in turn to properties used in "terminal" operations and train movement operations. Properties jointly used can be separately shown, and the nature and basis of apportionment will depend upon the purpose of the appraisal.

Sec. 7. The Appraisal of Accrued Depreciation

We have noted above that appraisers have defined certain concepts which are useful in their work of estimating accrued depreciation. They assume, for instance, that non-durable property may command a certain price in the open market—when such property is in a disintegrated condition. They call this scrap value and it represents the minimum beyond which property does not depreciate. Some non-durable properties like ties, concrete foundations, etc., have little or no scrap value. In fact, the cost of removal and transportation of these materials to scrap markets may make the scrap value a negative figure. Such properties will therefore depreciate by the amount of their entire costs.

Let it now be assumed that appraisers have picked out the properties that are depreciable, and that they have assigned to them an estimated "scrap value." In any given plant, however, the properties, though no longer new, may still be in good working condition. Nevertheless, as units of property combined into a working whole, they are *in time* nearer the date when they will have to be retired *as units* and new units of the same or different description substituted. The accrued depreciation is this estimated accrued cost of a future liability to replacement—not in terms of the cost of new units but in terms of the cost of existing units.

The first step in the ascertainment of accrued depreciation, therefore, must be the specification of an assumed length of life for each unit. This life expectancy must be based upon experience with such property units under actual operating conditions. It should be recalled that this length of service life is premised upon a policy with respect to repair which will keep the units in good working condition. Failure to make repairs in season creates a condition of under-maintenance and shortens the service life. Again, *local* operating conditions must be taken into account in the assessment of service life. In many instances, units of equipment will be found whose years in service have exceeded the estimated life. Perhaps, easy operating conditions, a careful maintenance policy, a few improvements or rearrangements have made it economical to retain the unit in service. The determination of accrued depreciation is, in consequence, not a matter of mathematical accuracy, although it uses mathematical formulæ. Any provisional determination of life ex-

pectancy upon the basis of life tables ought, therefore, to be tested out as to its applicability in the individual case by an actual inspection and survey of the entire property from a service standpoint. Only engineers, thoroughly familiar with such properties, and using their best judgment, can make a final assignment of lives. Complete accounting and statistical records showing dates of installation, operating data indicating past, present, and prospective intensity of use, important events in the life history of the units, will give the requisite background for the exercise of a sound engineering judgment. From time to time as operating conditions change or as additional experience is gained as to length of useful life, the estimated remainder lives may have to be changed.

One mode of procedure is to ascertain the condition of the property by a score card method assigning to property in *good* condition, 100 per cent. of the estimated remainder life, to property in *fair* condition 90 per cent, to property in *poor* condition 80 per cent. If, then, the finally assigned life of a unit is taken to be 25 years, its age is ascertained to be 5 years, and the condition of the unit at the time of inspection is scored at 100 per cent., its remainder life is assumed to be 20 years, indicating that 20 per cent. of the wearing value has become accrued depreciation. The unit is said to be in 80 per cent. condition, and that proportion of the wearing value plus the estimated scrap value is its cost new less depreciation. Without discussing at this time the bearing that these estimates have upon the final valuation of properties for rate-making or purchase purposes, we should note that the weakness of the procedure is again the lack of certainty that the prospective life will be attained. And yet some estimate of the accrued liability for replacement of the units should be made in order to test the adequacy of the financial provision that has been made. To condemn the entire procedure as theoretical, impractical, and academic seems, to the writer, to be running away from inevitable facts, and, ostrich-like, burying one's head in the sand.

Sec. 8. **The Appraisal of Working Capital**

In addition to the tangible elements thus far considered a utility must have working capital in order to conduct its business. We have seen that the going plant is not complete until it is fully constructed, an operating organization assembled, and operating materials and supplies provided. Working capital

consists primarily of these *materials* and *supplies*. A distinction must be recognized here between materials and supplies which are needed for plant extensions and those required merely for continuous operation of the existing plant. Continuous operation means that there must be on hand coal, coke, oil, ties, rails, poles, meters, small tools, and other equipment, an endless list of commodities. These materials are in part consumed in the very production of service, in part they are needed to keep fixed properties in good state of repair, and consequently they must always be kept in stock. Materials and supplies are also required for new construction and reconstruction. Insofar as they are required for the latter purpose, they represent true working capital because continuity of operation in a broad sense is dependent upon a policy of timely plant renewal. It will be difficult in practice to separate materials for new construction from reconstruction. Still the distinction is one that exists at least theoretically and ought in practice to be approximated.[4] Since capital will be continuously employed for these purposes, working capital in the shape of materials and supplies constitute a proper addition to the rate base. Appraisal engineers have accordingly included materials and supplies in their inventories and priced these along with other physical items.

Public utilities also distribute their product to customers in advance of payment. Only in the transportation of passengers do they perform a cash business. In the sale of street-car tickets the street-railway actually performs a cash-in-advance business so that some funds are obtained from customers in advance of actual expenditures. In other lines compensation for service will not be collected until from thirty to sixty days later. An allowance is therefore made which in the judgment of the regulatory commission constitutes the amount of capital thus continuously tied up in unpaid bills or in advance expenditures. The determination is a difficult one and in comparison with other items in the rate-base not very important. As rough measures the average balance of accounts receivable may be taken or two months' normal operating expenditures. In strict theory some allowance ought, however, to be made for non-interest bearing accounts payable, because enterprises of established credit are in turn "carried" for short periods by producers from whom they buy.

[4] New construction materials can be definitely earmarked and included in the base upon which an allowance for interest during construction may be made.

Little need be said in regard to the claims put forth that the operating organization constitutes an element of intangible value for which a separate allowance must be made in the rate-base. It is freely admitted that an operating organization does not spring up over-night; that a qualified personnel must be assembled and *trained* to the task; that business forms, procedures, methods of doing work must be perfected by experiment; that such an organization is more efficient after it has been attuned to its functions; that the cost of operation will perhaps be higher during the early period than later. These considerations address themselves to the question whether early losses should or should not be recognized in the process of future rate-fixing. The costs, whatever they may be, are properly chargeable to operating accounts and have usually been so charged. With all due respect to the accomplishments of public utility organizations in these directions, a line must be drawn between those functions, the costs of which are properly chargeable to capital, and those operating functions the costs of which are charged to operating accounts. A public utility's legal right to reasonable compensation should certainly cover some services of a managerial character. It is entirely proper that superior performance be recognized by means of differentials in the rate of return.

CHAPTER XXI

A CRITIQUE OF VALUATION STANDARDS

The present status of regulation in the United States is a matter of long growth. The different legislative enactments by which the power to regulate was gradually extended and perfected came in response to a very well defined public sentiment and they were based in most cases upon a very tangible public need. We have said that public utilities are best distinguished from other industries by this criterion that they render services which are necessities of civilized life under monopolistic conditions. It has taken a long time to wring this conclusion out of the confused historical circumstances which have attended the development of these enterprises. The Granger movements were regulatory movements; but they were based only upon a recognition of the fact that railroads were necessary instrumentalities of economic life, and not at all that they should be organized as monopolies. The common law and statute law expressed this repugnance to monopoly by encouraging competition.

An era of consolidations has now brought about a change in the public point of view, and the public utility operator who still advocates competition is, indeed, the exception. With it has come a general recognition that public regulation must more and more do the work of competition and resistance to a social policy of regulation has very nearly abated. The lion and the lamb are willing now to lie down together.

The only forms of competition which still remain are historical remnants of this competitive past and substitute services.

At a half-way point in this development the doctrine of "fair value" was announced by the court. It came at the close of the prevailingly competitive period and at the beginning of the newer era of consolidation and monopolistic combination. The contradictory nature of the standards of valuation which the rule of rate making embodied bears testimony to the transitional character of the period of its origin. We must not expect, therefore, that it can be readily adapted to a condition in which these industries have become public utilities in the true sense of that term.

At the same time it must also be recognized that the valuation or rate-base problem has two aspects, one of which arises out of the historical conditions and another which has to do with conditions that obtain at the present time and those which are to obtain in the future. One aspect takes account of competitive origins, the other aspect looks forward to monopolistic developments. The entire policy of regulation, and the valuation problem in particular, must give heed to the need of erecting a bridge whereby these industries may pass under equitable circumstances from old conditions to new conditions.

Sec. 1. **The Focal Points of Conflict**

It is not surprising that there should be conflict in making this transition. As public utilities are surveyed one by one, there are, first of all, varying historical antecedents. Next there are situations where, on account of the failure of its leadership, the public has failed to protect its own interests. There are also situations in which the human element of error has played its part. Under these conditions the broad inquiry into historical circumstances which the rate-making rule of *Smyth* v. *Ames* enjoins is well calculated to provide a basis for remedial adjudications.

(a) *Past and future aspects of the valuation problem distinguished.*

But the rate-making rule of *Smyth* v. *Ames* must be restated in terms of the future. From the point of view of the past the fair value doctrine will, when reasonably applied, give that room for administrative discretion in applying principles to concrete cases, which is necessary when conflicting equities must be disentangled, weighed, compromised, and adjudicated. On the other hand, if account is taken of the future, the adoption of a new rule of rate-making founded upon the investment principle, seems necessary. In a general work of this kind we can not attempt to deal with the varying circumstances under which the fair value doctrine has been applied by commissions, or to explain the expedients adopted, or the compromises proclaimed. Enough will appear in the following chapter to indicate the economic basis upon which these determinations should rest. The present chapter will be restricted in the main to what interests us most, namely, the standard of valuation and the rate-making rule which should be adopted for the future.

If we eliminate for the time being the minor conflicts which arise in adjusting the rate base to the past history of a particular utility, there remains the major conflict over what shall be the rate base for the future. The focal point of this conflict is the question whether the cost-of-reproduction standard or the investment standard shall be the basis of measuring the rate-base. This question is, in fact, comprehended under the more inclusive question whether or not the going concern theory of rate regulation shall be made effective for the future. This will appear as the analysis proceeds.

(b) *The conflict between the investment and cost of reproduction standards.*

The conflict between the investment and cost of reproduction standards runs like a red fibre through the entire historical fabric of regulation. The phenomenon that both explains and motivates the opposing contentions is the *general price level,* as statisticians now call it. In Chart XXIII is shown the course of wholesale commodity prices in the United States by means of index numbers. Beginning in 1865, the trend of the price level was steadily downward until 1897, followed by a gradual rise until 1914. In 1915 the price level began to mount in successive sharp increases attaining a maximum peak in May, 1920. During 1920-1921 came a sharp recession reaching its lowess point in October, 1921. Since then prices have again risen slightly but are still about 60 per cent. above the 1914 level and 130 per cent. above the 1897 level.[1]

As was pointed out in a preceding chapter, commissions used the reproduction cost in such a way as to give it preponderating influence. This was due to the difficulties of determining the actual investment and the influence exerted by the rule of *Smyth* v. *Ames.*[2] However, in doing so they came upon a host of perplexing questions. The courts had ruled that the fair or reasonable value must be the value *at the time of the inquiry in regard to the rates.* Appraisers accordingly applied this rule by inventorying the property as of a date close to that of the rate application and by applying the unit prices ruling as of the date of inventory. Those who opposed applying the cost of reproduction standard in this literal sense pointed out that the

[1] A price index of engineering materials used in construction follows the general level of prices with important but minor variations.

[2] Public service commissions as well as the lower courts have been very human in this respect. The fear of reversal or of having the case remanded has prevented a good deal of independent analysis.

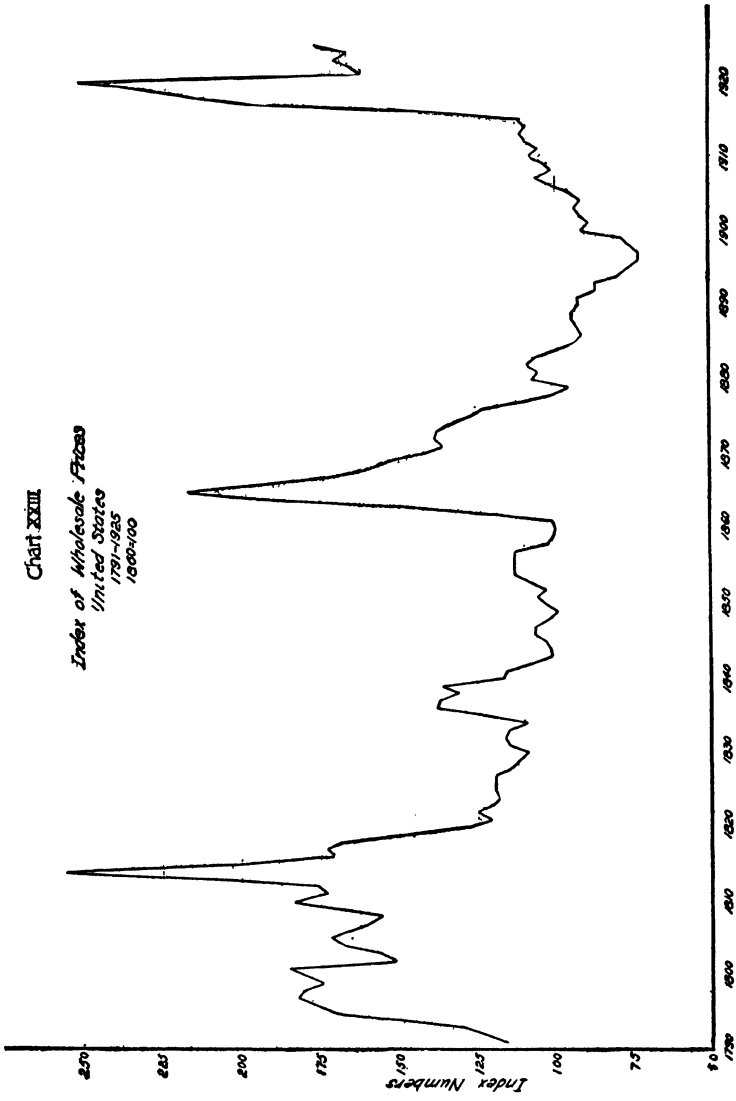


Chart XXIII
Index of Wholesale Prices
United States
1791-1925
1860=100
Index Numbers
Time in Years
270
225
200
175
150
125
100
75
0
1790
1800
1810
1820
1830
1840
1850
1860
1870
1880
1890
1900
1910
1920

assignment of a definite date for the inventory was merely an integrating device; that one must, in fact, assume a construction period. As a consequence, it was maintained that unit prices ought to be *average unit prices for an assumed construction period.* Next, it was objected that the level of prices for even a construction period might turn out to be abnormally high or low or subject to extreme fluctuations. Out of these criticisms grew the practice of averaging prices *over a period of years,* usually five. For some time the five- and three-year average was common because it was supposed to smooth out the range of price fluctuation of important commodities occasioned by the business cycle.

This average price was called a normal price and identified with the "normal value" concept used by economists. Cost of reproduction based upon "normal prices" was believed to afford a stable standard and be akin to the normal exchange value of competitive economics. As a result of further digging into the course of commodity prices, it was believed that for some commodities a ten-year average price would more nearly approximate the "normal conditions" under which these commodities were produced. Soon the discovery was made that some commodities like lumber and its products, in view of our gradually receding supply of the basic natural resources, were increasing in price and that this increase was likely to continue. On the other hand the prices of many manufactured commodities showed a decided downward tendency. In these cases the "trend price" (*i.e.* the price computed as a moving average for the date of the inventory) was taken. These appraisals were usually called "normal cost of reproduction appraisal."

The recent *general* price increase attributable to the Great War suggested that the "normal value" might in future be reflected in a "new plateau of prices." Efforts were thus directed toward ascertaining future "price trends" and toward forecasting the "future level of prices." [3] Because this work of applying unit prices was very generally done by engineers without the requisite background in the economics of price movements, the normal cost of reproduction theory resulted in a fanciful and uncertain mingling of price considerations looking both into the past and into the future. Finally, as a means of eliminating the inflation arising out of the application of war prices under the cost of reproduction theory, a compromise procedure was worked

[3] Fisher, Irving, "Are Prices Coming Down," *Review of Reviews,* Vol. 59, p. 595 (1919).

out called the "split inventory appraisal." The inventory was prepared in two parts, one part containing properties constructed before the war and the other part listing war-time and post-war construction. To the former were applied unit prices based upon the normal pre-war cost of reproduction and to the latter unit prices based upon the higher war and post-war prices. Very frequently the method adopted was one which combined the investment standard with the cost of reproduction standard by adding to the normal cost of reproduction inventory of pre-war construction the actual book-cost of property additions for each year beginning with 1916.[4]

Before the war-time increase of prices had focussed attention upon the divergence of investment and cost of reproduction as measures of "fair value," the normal cost of reproduction appraisal was defended against the attacks of those who favored the investment standard on the ground that it would throw light upon and afford a check upon investment. These more moderate protagonists of cost of reproduction argued that the judicial doctrine of "fair value," as first announced in *Smyth* v. *Ames* and as elaborated upon in later decisions, did not require the use of cost of reproduction as the *sole* measure of the rate-base; that the process of valuation was one of taking *evidence,* was "not controlled by *artificial* rules," was "not a matter of *formula,*" but was "a matter of *reasonable judgment* having its basis in a proper consideration of all relevant facts." The broad inquiry thus opened up was hailed by them somewhat as the "rule of reason" had been hailed in the field of anti-trust legislation. The inner inconsistency of the rule did not become apparent until recently. For the past ten years the cost of reproduction has served less and less as a check upon the investment in old properties. The issue between cost of reproduction and investment as a basis for rate-control is again squarely raised, not as a matter now of technical convenience merely, but as an issue involving economic principles and constitutional law.

What is the effect of this rise in the level of prices upon the divergence between the investment and cost of reproduction standards? Except in the fields of transportation, gas, and water supply, investments in other classes of utilities were either

[4] With appraisers hired by conflicting interests, the appraisal process became a forecasting contest as to the future course of prices. *Cf.* Superior Purchase case, 26 W. R. C. R. 1. Also *Waukesha Gas & Electric Co.* v *Railroad Com. of Wis.*, 194 N. W. 846 (1923).

non-existent or relatively unimportant before the close of the Civil War. From 1865 to 1897 during the period of falling commodity prices, with land values slowly increasing or declining, depending upon location, with relatively constant wage rates, and steadily increasing efficiency in the technique of construction operations, successive investments in fixed plant were made upon successively lower cost levels. Improvements in manufacturing technique exerted an influence in the same direction. It is a fair inference that under such conditions "fair value" based upon cost of reproduction would be considerably below "fair value" based upon historical cost.

The segment of the price index which exhibits a downward trend fell within a period when valuations for rate-making were as yet infrequent. But the cleavage of interest between producer and consumer is apparent in the literature of the time. *Smyth* v. *Ames,* decided in the very trough of the price level, shows the psychological motivation nicely. Mr. W. J. Bryan, appearing for the State of Nebraska, contended plausibly that cost of reproduction should be the standard upon the analogy of tax assessments. Railroad counsel contended that investment in terms of the outstanding securities should be the measure of "fair value." The court, as we have seen, accepted neither view, but contented itself with a Solomonic judgment.[5]

Until about 1910 this opposition of views continued, public utilities generally sponsoring investment and representatives of consumers sponsoring cost of reproduction. The reason is apparent. The longer the composite life of the properties, the lower is the cost of reproduction as compared with the historical cost. Similarly, the greater the proportion of the plant erected in the past when costs were lower (i.e. if construction had not been piecemeal) the greater is the disparity between the two figures. For a time, coinciding roughly with the period during which state regulation of local utilities was developing, there did not seem to be so much divergence between the two standards because cost of reproduction based upon five- or ten-year average prices tended to approximate the investment. Beginning in 1910, however, a shift of opinion is noticeable. The utilities are now inclined to emphasize the cost of reproduction and consumers the investment standard. Under present circumstances it is apparent that adjudications by commissions, in applying

[5] For a curious misinterpretation of these historical developments and their significance see Ransome, W. L., "Some Aspects of the Valuation of Private Property for Public Uses," *Journal of Land & Public Utility Economics,* Jan., 1926, p. 1, 10.

the fair value doctrine, will be arbitrary compromises, because the evidence is basically irreconcilable.

Sec. 2. Illustrations of the Effect of Price Changes on Appraisals

The effect of using cost of reproduction among the "relevant facts" to be taken into account in arriving at "fair value" appears quite clearly from an appraisal made during the period of rising prices. This appraisal is from the Report of the Engineers' Valuation Board in re Pittsburgh Railways Company, dated August 6, 1919, and submitted to the Public Service Commission of Pennsylvania. The board was composed of five members, two representing the company, two representing the city of Pittsburgh, and the chairman representing the Commission who was its chief engineer. The result of this investigation is set forth on pages 5 and 6 of the report:

"With the purpose of providing these measures of value specified in the Public Service Company Law[6] the Board has had prepared a statement of the historical cost as determined from the records, and *estimates* of the reproduction costs of the physical property based upon *several interpretations* of the fair average price of materials, property, and labor.

"We find the cost of the physical property as determined from the records and if reproduced upon the various bases of pricing to be as follows:

Basis No. 1—Historical cost as determined from the records, with scrutiny of engineers and accountants, representing the *actual investment* in physical property placed in the service of the public	$59,069,382
Basis No. 2—Estimated cost of reproduction new *at prices ruling when each part of the existing property was constructed* and under original conditions of construction	49,324,791
Basis No. 3A—Estimated cost of reproduction new at *average prices of the period 1906 to 1915,* incl., and under original conditions of construction	56,148,398
Basis No. 3B—Estimated cost of reproduction new *at prices indicated for 1913 by the trend of prices for 20 years previous to 1916,* and under original conditions of construction	60,832,200
Basis No. 3C—Estimated cost of reproduction *new at average prices of the period 1914 to 1918,* incl., and under original conditions of construction	73,560,300
Basis No. 3D—Estimated cost of reproduction new *at the estimated average prices of the period from 1918 to 1922,* incl., and under original conditions of construction	84,191,300
Basis No. 4—Estimated cost of reproduction new *at prices and under the conditions ruling at the date of valuation, viz., April 1. 1918*	102,842,274

[6] The Public Service Commission Law copies practically verbatim the rate-making rule of *Smyth* v. *Ames.*

"These figures include real estate and rights of way, organization and development cost prior to construction; engineering, legal and administrative expenses; interest and taxes during construction; cost of financing; materials and supplies and working capital necessary for operation. . . .

"The historical cost as found includes superseded property in the following amounts:

Horse Car System	$1,542,178
Cable System	3,778,639
Early Electric Equipment and Construction..	5,950,641

"A large portion of this property was superseded when in good operating condition and in particular the cable systems were in operation for only seven years.

"We find the accrued depreciation of parts of the physical property as of April 1, 1918, to have been as follows:

Prices Used in	
Basis No. 2	$12,039,600
Basis No. 3A	12,733,100
Basis No. 3B	12,869,700
Basis No. 3C	16,845,200
Basis No. 3D	19,364,000
Basis No. 4	23,775,500

"These estimates are based upon detailed inspection of condition with consideration of elapsed and of estimated remaining life. They include such overhead charges as enter into the cost of replacements."

Other illustrations of the effect of price changes upon the cost of reproduction are shown in Table XX, p. 464, by means of annual index numbers for typical utilities. These index numbers are a composite of other index numbers and have been weighted in accordance with the importance of the physical quantities in the make-up of a typical plant. This table and Chart XXIV, p. 464, based upon it afford an approximate picture of the way in which cost of reproduction would fluctuate with changing price levels.

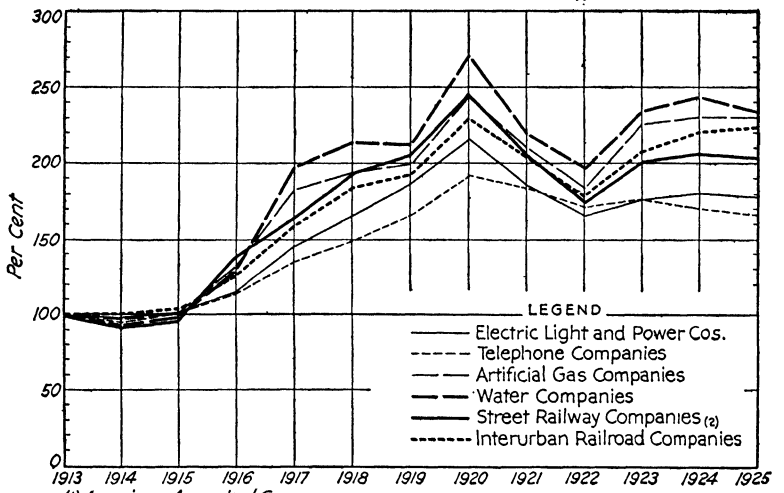
Sec. 3. **The Doctrine of "Fair Value" Challenged**

Recent decisions of the Courts and the impending final valuations by the Interstate Commerce Commission have served to put the valuation problem once more into the foreground. The first of these recent decisions was by a District Court of the United States in *St. Joseph Ry. Lt. Ht. & Pr. Co.* v. *Missouri Public Service Commission.*[7] The Missouri Commission had based its

[7] 268 Fed. 267 (1920).

Chart XXIV

COMPOSITE INDEX OF CONSTRUCTION COST FOR PHYSICAL PROPERTY OF TYPICAL PUBLIC UTILITIES (1)



(1) American Appraisal Co.
(2) Maltbie, W.H., Elec. Ry. Jour. Vol. 66, Oct. 10, 1925. p

determination of "fair value" upon a hybrid of investment costs and average war-time unit prices, the investment element being the more important. The court held that the commission

TABLE XX

COMPOSITE INDEX OF CONSTRUCTION COST FOR PHYSICAL PROPERTY OF TYPICAL PUBLIC UTILITIES [a]

Year	*Electric Light & Power Co.*	*Telephone Company*	*Artificial Gas Company*	*Water Company*	*Street Ry. Co.*[b]	*Interurban Railroad Company*
1913	100%	100%	100%	100%	100%	100%
1914	99	96	97	95	94	100
1915	102	191	100	99	97	103
1916	117	114	132	129	138	126
1917	146	135	182	197	163	158
1918	166	149	193	213	192	183
1919	187	166	199	212	205	192
1920	216	192	243	271	245	229
1921	186	184	210	220	205	204
1922	166	171	183	197	175	178
1923	177	177	216	234	200	207
1924	180	170	230	243	205	220
1925	178	167	230	233	202	222

[a] Basic data obtained through courtesy of the American Appraisal Company.
[b] *Electric Ry. Journal*, Vol. 66 (Oct. 10, 1925), p. 584.

was in error. "It is my judgment that the great weight of authority is against the adoption of a standard of original cost as a controlling basis for determining value," said the court. The decision further showed that the court was influenced by the decreased purchasing power of the dollar.

(a) *The Southwestern Bell Telephone Company Decision.*

In 1923, however, the Supreme Court of the United States in the Southwestern Bell Telephone Co. case [8] had to pass upon evidence which induced two members of the bench, Justices Brandeis and Holmes, to question the workableness of the rate-making rule.[9] The state commission had fixed the fair value in this case at $20,400,000. This finding was based upon appraisals of constituent properties in 1913, 1914, and 1916, prepared by the commission's engineers, plus the actual cost of additions subsequent to these dates. The company produced evidence purporting to show that the property inclusive of working capital had cost $22,888,943. The company's engineers estimated as of June 30, 1919, that the cost of reproduction new of the physical property inclusive of working capital was $29,506,052 and the cost of reproduction new less depreciation was $25,760,859. The majority opinion accordingly criticized the commission's finding because "the commission undertook to value the property without according any weight to the greatly enhanced costs of material, labor, supplies, and so forth, over those prevailing in 1913, 1914, and 1916. As a matter of common knowledge, these increases were large. Competent witnesses estimated them as 45% to 50%." Thus the issue presented by the facts was this: Ought the commission, in accordance with the valuation rule of *Smyth* v. *Ames,* to have ascertained the present (that is, June 30, 1919) cost of construction and used it as an evidentiary fact in making up its mind as to the fair value? It is upon this question that the court divided.

We shall first give the view of the majority. "It is," they say, "impossible to ascertain what will amount to a fair return upon properties devoted to public service without giving consideration to the cost of labor, supplies, and so forth, at the time

[8] *State of Missouri ex rel. Southwestern Bell Telephone Co.* v. *Public Service Commission of Missouri et al.,* 43 Sup. Ct. 544 (1923).

[9] It does not clearly appear from Justice Brandeis' opinion whether he is making the distinction between a rule for the past and a rule for the future. If applied to the past the prudent investment standard suggested by him presents many difficulties, but the shortcomings of the old rule as applied to the future are certainly well portrayed.

the investigation is made. An honest and intelligent *forecast of probable future values* made upon a view of all the relevant circumstances is essential. (Italics are ours.) If the highly important element of present costs is wholly disregarded, such a forecast becomes impossible. Estimates for tomorrow cannot ignore prices of today."

The above can be interpreted in only one way: that the cost of reproduction must be ascertained in every rate proceeding in order to test the validity of rates applicable to the future by referring their prospective revenue yield to present-day costs of construction and operation. In fact, it would not be amiss to point out that a new evidentiary fact has been injected into the situation when the court says that "an honest and intelligent forecast of probable future values . . . is essential". This gives to the concept of "fair value" an aspect of futurity. It is not the "fair value" as determined by a consideration of price levels in their present or past aspects, but future price levels should cast their shadows before.

The court does not refer to the leading cases. It finds support for its contention that present costs should be considered by referring to *Wilcox* v. *Consolidated Gas Company* [10] where the sentence occurs: "If the property, which legally enters into the consideration of the question of rates, has increased in value since it was acquired, the company is entitled to the benefit of such increase." It also quotes with approval from the Minnesota Rate Cases [11] that "the making of a just return for the use of the property involves the recognition of its fair value if it be more than its cost. The property is held in private ownership and it is that property, and not the original cost of it, of which the owner may not be deprived without due process of law". In this view fair value becomes an attribute of property objects held in private ownership. It makes no difference what the objects of property may or may not be used for; it is enough that they be held in private ownership in order to make a universal rule of property law applicable that the owner is entitled to have them valued as they stand in the markets of the world.[12]

The minority seems to start from an entirely different premise. Although the valuation doctrine is accepted as the *starting point in calculations* made for the purpose of determining whether rates are constitutionally compensatory, the analysis of

[10] 212 U. S. 19, 52 (1909). [11] 230 U. S. 352, 454 (1913).

[12] See also *Board of Public Utility Commissioners et. al.* v. *New York Telephone Co.*, 70 L. Ed. 436.

the problem of fair or reasonable valuation of public utility property does not proceed upon the analogy with ordinary private property. By implication, at least, it goes back to the common law rights and duties of public utilities toward those whom they serve. Justice Brandeis, after stating that he regards the so-called rule of *Smyth* v. *Ames* as "legally and economically unsound", gives his own interpretation of a rule of rate making which will afford private owners the protection of the Federal Constitution:

"The investor (*i. e. the private owner*)[13] agrees, by embarking capital in a utility, that its charges to the public shall be reasonable. His company is the substitute for the State in the performance of the public service; thus becoming a public servant. The compensation which the Constitution guarantees an opportunity to earn is the reasonable cost of conducting the business. Cost includes not only operating expenses, but also capital charges. Capital charges cover the allowance, by way of interest, for the use of the capital, whatever the nature of the security issued therefor; the allowance for risk incurred; and enough more to attract capital. The reasonable rate to be prescribed by a commission may allow an efficiently managed utility much more. But a rate is constitutionally compensatory, if it allows to the utility the opportunity to earn the cost of the service as thus defined."

In this view what becomes of the concepts of private property and of its value for ordinary purposes? Justice Brandeis answers this question in a distinctly modern fashion. A public utility is no longer a medieval wagoner, or ferryman, devoting his carriage or his ferry to a use in which the public has an interest, but it becomes a corporation empowered to raise money to carry on a business in which the public has an interest. He says: "The thing devoted by the investor to the public use is not specific property, tangible and intangible, but capital embarked in the enterprise". Of course, this capital is protected against an unreasonable exercise of the police power of the State in the act of rate regulation by the operation of a rule such as that explained above. But he continues:

"The Constitution does not guarantee to the utility the opportunity to earn a return on the value of all items of property used by the utility or of any of them. The several items of property constituting the utility, taken singly, and freed from the public use, may *conceivably* have an aggregate value greater than if the items are used in combination. The owner is at liberty, in the absence of controlling statutory provision, to withdraw his property from the public service, and, if he does so, may

[13] Italics inserted by author.

obtain for it exchange value. (Cases cited.) But so long as the specific items of property are employed by the utility, their exchange value is not of legal significance." [14]

The divergence in the legal premises from which the argument of the majority on the one hand, and that of the minority on the other hand, proceed is too deep-seated to be explained by subjective differences. If the legal profession is to be helpful in molding our regulatory institutions it must treat this controversy upon its merits and not jump to the easy and self-evident conclusion that the law now is as the majority states it. Granting that there are difficulties in the solution of this vexed problem if we proceed upon the authority of *Smyth* v. *Ames,* are the difficulties lessened if we apply the "prudent investment rule" for which the minority contend? All who have studied valuation practices since the advent of administrative commissions must have been aware of the shortcomings which Justice Brandeis so well elucidates in the remainder of the opinion. He appears, however, to have been the first to raise the standard of revolt in a judicial opinion. What shall be done with his challenge and that of Justice Holmes?

Sec. 4. Valuation under the Going Concern [illegible]y employed in] of Regulation

It is clear that at the inception of an enterprise *subject to regulation* the charges must under normal conditions be so fixed as to yield, in addition to operating expenses, the interest on its funded and floating indebtedness and a fair return in the shape of dividends upon that proportion of the utility's pecuniary capital contributed by stockholders. The exact amount will depend upon conditions surrounding the enterprise. Additional investments must be treated likewise.

As investors owners of capital are not interested in the reproduction cost of commodities at some future time. The real concern of the investor is with the security of his principal and the annual rate of return. If interest rates increase during the

[14] Abandonments of service for which the permission of the state must be obtained, are the "provisions" which the Justice has in mind as controlled by statute. This is one of the "loose ends" in the development of regulatory institutions. The right to abandon service and to devote *fixed* and *specialized* capital to other uses is wholly illusory. Some more definite agreement must be reached as to who shall bear these losses in the rare cases when public utility services are no longer necessary. It is clear, however, that piecemeal abandonments are not involved. Under the going concern theory they are a necessary accompaniment of operation.

period for which he has accepted a fixed return he must await the end of the period before a readjustment in interest rates can be made.[15]

Let us assume a case in which the long-term debt is 70 per cent. of the total amount invested in fixed capital, while the preferred stock represents 15 per cent. and the common stock the remaining 15 per cent. With the dividend rate fixed in the preferred stock certificates, (that is to say in the case of non-participating preferred stock) 85 per cent. of the return is upon a definite contractual basis. The remaining 15 per cent. of the capital depends for its return upon the balance of net income available. Thus the holders of 85 per cent. of the amount of the utility's invested capital accept a fixed return and are interested in maintaining at par the security of their investment. They forego all chance of gain and ought therefore to be protected from all chance of a speculative loss.

By permitting replacement costs to enter into the determination of the rate-base, the door is opened to a speculative risk which it is the primary aim of regulation to eliminate.[16] If public utilities have built or expanded their plants during periods of high prices, it would require only a decline of approximately 15 per cent. to jeopardize the investment of bondholders and preferred stockholders. It would also wipe out the pecuniary investment of common stockholders. No conservative investor would be willing to furnish money to purchase equipment, construct track, build power houses and transmission lines at high prices if his investment might be reduced in the future to conform with the replacement costs of these properties ten years hence. The only satisfactory solution is to treat a corporation as a going concern, requiring continuous investments of capital and not as a concern which must constantly refinance itself and reshape its financial plan in accordance with the cost of reproduction of an "identical plant" or of some mythical "substitute plant".

[15] Unless, perchance, his interest return has been fixed in accordance with a rule (Prof. Irving Fisher's tabular standard for instance) which gives effect to the changing purchasing power of money. (See Publications of the Stable Money League.) In this connection attention should be called to the fact that investors do take changes in purchasing power of fixed income returns into account and try to anticipate them. The term of the bonds and "call privileges" enabling companies to finance themselves upon a better basis are peculiar expedients adopted by companies as "insurance features" against a fall in interest rates.

[16] *Cf.* Mathews, G. C., "Undepreciated Investment as a Utility Rate Base." *The Journal of Land and Public Utility Economics*, July, 1925, p. 257.

Certainly, this is what the monopoly principle means and requires if regulation is to be satisfactorily applied. Although it is true, as the court said in *Smyth* v. *Ames*, that "the corporation may not be required to use its property for the benefit of the public without receiving just compensation for the services rendered by it," it is also true, as the court apprehensively put it in the same opinion, that the ascertainment of what is just compensation "will always be an embarrassing question," in fact a speculative one, unless it is recognized that the "property" whose value serves as the "basis of the calculation" should *not* be taken as disintegrated units and that its aggregate value is not the present exchange value of these units "in the markets of the world".

(a) *The fallacy of cost of reproduction.*

The cost of reproduction theory of valuation crept into the discussion due to the erroneous application of a rule of valuation applicable to fixed capital engaged in competitive industry, whose income yield fluctuates with the price of its products. The capitalized value of an income under competition *tends* to correspond with the cost of replacing the physical property which produces the income.[17] But this is true only if new property, purchased at current prices, is free to compete with the old property. The relation between income and the value of the property producing it, is always primary and determinative; while the relation between the cost of reproducing the property and its value is secondary and dependent upon competitive conditions. When competition is eliminated the relationship between reproduction costs and value is also eliminated. Where the yield is controlled by prices established in a competitive market, the cost of the plant devoted to such service is constantly brought into comparison with the current cost of assembling a new plant which renders the same service.

The cost of reproduction based upon the assumption of an

[17] The way in which this fallacy captures the imagination is again well illustrated in Judge Ransom's article, where the analogy of the rent laws is introduced. It must be admitted that rent regulation, where monopoly does not exist, if attempted at all, can only be carried out upon the basis of the cost of reproduction standard. The other illustration, the case of vessels in water transportation, adduced by Judge Ransom is afflicted with the same infirmity. The present writer is willing to concede "due weight" to cost of reproduction in these instances. In strict theory, he would rather conclude, however, that we are dealing here with something which is either not a public utility at all, or at least is one in an inchoate state. Ransom, W. L., *op. cit.*

identical plant has less logical justification. The shift from the substitute plant to the identical plant represents a tacit admission that the cost of reproduction standard has no place in public utility valuation. The identical plant assumption eliminates competition but results in a hybrid valuation which is neither fish nor fowl. It is not investment because cost of reproduction of the identical plant imputes a value based upon changes in unit prices. It is not an estimated competitive cost because a utility is not free to erect a new going plant taking advantage of current progress in the art. Neither conception of cost of reproduction can serve as a standard of valuation where the public utility is a monopoly and produces service under regulation.

(b) *Judicial approval of the going concern theory of regulation.*

The Supreme Court of Wisconsin in *Waukesha Gas and Electric Co.* v. *Railroad Commission* has set itself apart from other courts by deciding that where public utility investments are made under the indeterminate permit law, the rule in *Smyth* v. *Ames* is susceptible of an interpretation which gives the prime weight to investment costs.[18] The issue, whether *normal costs of reproduction* or *investment costs* should control, was squarely raised in that case.

The language of the Court is significant enough to merit extensive quotation. This case[19] involved the question whether a public utility should get the benefit of any increase in the cost of reproducing its property. The Commission had fixed the fair value of the utility in 1913 at $156,800. In subsequent rate proceedings the Commission had adopted the procedure of bringing the 1913 valuation down to date (1920) by adding the cost of the additions made in the interim. This resulted in a finding of $424,868. Engineers for the utility made an appraisal upon the basis of the cost of reproduction new, using five-year average prices. They reported that the value fixed ought to have been at least $595,904. The court stated the issue as follows: "It is contended that the present fair value of the property used or useful in affording the public service is the measure of the reward to which the owner of that property is entitled for the service rendered, such value to be established as of the time when the inquiry in regard to the reasonableness of the rates charged by the utility is under investigation."

[18] But see also p. 478 *infra*.

[19] *Waukesha Gas & Elect. Co.* v. *Railroad Commission of Wisconsin*, 194 N. W. 846, p. 848 (1923).

Judicial determination of the present fair value is regarded by Justice Rosenberry, who wrote the opinion, as "the most complex and involved subject with which the courts are called upon to deal." Accordingly he enters "with hesitation upon a discussion of a subject which is so highly controversial. All agree that the rate base is the present fair value of the property used and useful for the convenience of the public in rendering the service which the utility undertakes to perform. The question is how shall the value be ascertained?" It should be noted that the court is attempting to fix a value of its own.

After citing certain recent decisions of the Supreme Court of the United States, among them the case of the Southwestern Bell Telephone Co., the court concludes that "these decisions have not entirely clarified the situation." The court's criticism is that there is no indication of the weight to be accorded to the cost of reproduction new less depreciation factor. *"It cannot be that the repetition of a mere legalistic formula* before the declaration of the trial court's final determination is *sufficient to bless and sanctify the result, no matter what it may be."* (Italics are ours.)

The Court next reviews the legal conditions under which public utilities operate in Wisconsin. These conditions are the following: (1) that the property of the utility is held under an indeterminate permit; (2) that by its terms the municipality has a concurrent right to take the property of the utility upon paying just compensation; (3) that under the public utility law a company is required to furnish adequate service for a reasonable charge and that it may therefore be required to make additions to its property by public authority "without regard to past, present or future price levels"; (4) that the state guarantees a monopoly to the utility by prohibiting the competition of both municipalities and private corporations, except it be established upon a public hearing that public convenience and necessity require a second utility.[20]

[20] With this splendid start toward an independent analysis the Court reverts to the language of the cases by accepting on authority the fundamental principle as stated in the Minnesota Rate cases that it is property held in private ownership whose fair value is to be determined. There appears to be in what follows a curious mixture of real historical analysis and of merely formal legal statement. "It should be noted that it is the property which the constitutional guaranty protects and not a particular theory of valuation. Before the jurisdiction of the court can be successfully invoked it must appear that the property of the plaintiff is being taken, not that it is deprived of the benefit of market fluctuations in the value of materials and labor. With all due respect, the proposition that the cost of reproduction new less depreciation, although it should no doubt be considered, is

In giving his reasons why the cost of reproduction should not be given controlling weight the Justice argues as follows:

"In the first place, it ignores the fact that under *Munn* v. *Illinois*, 94 U. S. 113 (1876), when a person dedicates his property to a public use by investing it in a public utility, he divides with the people the right to control the use of the property so dedicated and thereafter the public has an interest in the use of the property which it may within constitutional limitations assert. That so investing his property the investor has given to it a status is now well established and recognized in the law. He withdraws it from the great mass of property not so situated and subjects it to a degree of public control from that time on.

"Second: Cost of reproduction new can be established only theoretically. Even in the case of a structure about to be erected, every-day experience confirms this. When applied to the property of a public utility, purchased under conditions which no longer exist, and incorporated into the property of a public utility under circumstances that cannot be reproduced, it is not only theoretical, but highly speculative.

"Third: *The property of a public utility cannot be valued as is other property, not devoted to the public use, which is subject to the laws of competition and therefore is in an entirely different class.*" (Case cited.) (Italics are ours.)

"Fourth: In the competitive field the cost of reproduction new is given minor consideration in fixing the value of property because in that field the value is determined largely by its usability. For instance, would any one claim that the cost of reproduction new is even a guide to the present value of a defunct brewery plant? In the valuation of an office building the amount which it earns is a much larger factor in determining its value than cost of reproduction new. The usability or earning capacity being in a competitive field a dominant factor in the ascertainment of present fair value and the cost of reproduction new being at least a minor factor, how can it be said that it is entitled to great weight in valuing the property of a public utility when the earning power is limited by law. (Case cited.)

"Fifth: If the cost of reproduction new is to be accorded any considerable weight when the price level rises, it must be accorded the same weight when the price level falls. Utilities in Wisconsin, however, are not permitted, except within very narrow limits, to consider price levels, but are required to furnish an adequate service when and as needed irrespective of price levels. It would seem to be a rank injustice to compel a public utility to make an investment and then after the investment is made hold

---

entitled to controlling or even considerable weight under present abnormal conditions, appears to us to be unsound."

It is apparent from the above statement that the court is constrained by the rule in *Smyth* v. *Ames*, as later modified. Justice Rosenberry appreciates that there can be, under the fundamental conditions of public utility operation in Wisconsin, no organic relation between investment and cost of reproduction. Cost of reproduction is a competitive concept and fits with difficulty into a background where regulated monopoly dominates. However, instead of boldly attacking this theoretical inconsistency, the Justice reverts to the distinction between normal and abnormal conditions. The remainder of the Court's analysis is superb. There are some minor points where one might feel disposed to pick flaws, but, on the whole, the court brings out the essentials.

that although the public compelled the utility to make the investment when prices were high, prices having fallen, the utility is entitled to earn a return only upon the present cost of labor and material. Utilities must grow and expand with the needs of the public. They have very little if any option in regard to the matter.

"Sixth: If a public utility which has during a twenty-year period earned and distributed a reasonable return upon the investment value of its property, is permitted to increase its rates by reason of the fact that labor and materials have advanced in price in the open market, the earnings derived from such increase in rates will constitute an addition to its prior earnings and the utility will thus be permitted to earn more than a reasonable rate upon its investment. . . .

"Seventh: The materals—brick, stone, copper, etc.—which enter into the construction of the plant of a public utility lose their identity as such and become a part of a new whole and must be valued as such. It does not seem reasonable to say that the value of a cast iron pipe in a water main rises and falls in value with market fluctuations of pipe which is offered for sale in the open market. After material is incorporated into a public utility plant, its value must be determined as a plant, not as material not so incorporated.

". . . None conceive that it was one of the fundamental objects of the public utility act not to stabilize investments in public utility property, in the interest of the public primarily, and secondarily, in the interest of the investor, so that the public would not be subjected to the hazards and exactions of a speculative enterprise in a field where it undertook to furnish a monopoly. The rates were to be just and reasonable. If the public wishes to purchase the property, it must pay just compensation therefor.

"Under our statute, it may be well argued that with increasing prices, increasing interest levels, increasing cost of operation, the utility investor is in justice entitled to a larger return than formerly, but this argument is more properly urged to secure an increase in the rate of return rather than in the rate base upon which the return is to be computed."

Then follows a discussion of the "prudent investment" theory from the point of view that it is administratively best calculated to afford owners a reasonable return, that it will best enable the Commission to perform some of its other functions such as the control of security issues, that it will tend to stabilize investments, reducing risks and lowering capital costs to consumers.

The conclusion of the court is reached in the following:

"In determining the present fair value of a public utility operating under our public utility law, it is our view that justice as well as sound economic practice requires that controlling weight should be given in the valuation of the plant of a public utility to the investment cost, where the investment has been prudently made. In determining the present fair value of the property of a public utility for rate-making purposes, but little, if any, weight can be given to capitalization of earnings, or to stock and bond values for the reason that these are dependent almost entirely upon the rates charged, the reasonableness of which is the very subject under investigation. . . ."

Justice Rosenberry is very evidently in substantial agreement with Justice Brandeis in that he feels that regulation must proceed upon the theory (1) that public utility property is not like other private property, (2) that the property which the owner devotes to the public service is not the physical thing but the beneficial relations growing out of the supply of free capital and the assumption of risks. He warns, for instance:

"We should scrutinize with great care a determination which found the present fair value of the physical property of a utility plant in this state to be less than its actual cost, providing the investment had been prudently made, and we should scrutinize with even greater care a finding which would impose upon the public a schedule of rates which would earn a reasonable return upon $170,000, which the utility never invested."[21]

Sec. 5. The Present Position of the Supreme Court of the United States

The above decision represents the high water mark of legal analysis upon the moot question of valuation. But the law on the subject is otherwise. The cost of reproduction standard is receiving more and more emphasis in the decisions of courts and commissions. The United States Supreme Court has again affirmed its previous position regarding the rate-making rule of *Smyth* v. *Ames*.[22] In fact, all recent decisions of this court serve to bring this standard into the foreground again.

[21] The balance of the discussion upon this point apparently represents a relapse from the clear position taken earlier. In the following, for instance, the court is clearly attempting again to reconcile the irreconcilable. "Nor do we wish to be understood as saying that the actual cost of the physical plant of a public utility, even when the investment is prudently made, should be absolutely controlling. We should not attempt to deduce a formula. If, however, we were to accord rank to the various factors in accordance with the weight which is to be given to each in determining present fair value for the purpose of establishing a rate base, it would be as follows:

(1) Actual cost of the plant when the investment has been prudently made.
(2) Under normal conditions, cost of reproduction new less depreciation. When conditions are abnormal, cost of reproduction new less depreciation should be fourth. (In specifying "normal conditions" the court has in mind conditions of economic stability—peace, the absence of monetary inflation, no revolutionary changes in the supply of monetary metals or of their legal tender quality.)
(3) Going concern value.
(4) Working capital.
(5) Other elements of value which may be presented in a particular case."

[22] *John W. McCardle et al* v. *Indianapolis Water Co.*, 47 Sup. Ct. Rep. 144. Nov. 22, 1926.

In the latest discussion of this subject in the Indianapolis Water Company case, the United States Supreme Court, speaking through Justice Butler, criticizes a valuation of this outstanding private water utility as fixed by the Indiana Commission. The appraisal in this instance was based upon the following interpretation of unit prices by the commission: "Considering all the facts, including all the appraisals and the other evidence concerning the trend of prices, the Commission is of the opinion that in this case the average of prices for the 10-year period ending with 1921, the last full ten years available, most nearly represents the fair value of petitioner's physical property." [23] Commenting upon this conclusion Justice Butler says: "But in determining present value, consideration must be given to prices and wages prevailing at the time of the investigation; and, in the light of all the circumstances, there must be an honest and intelligent forecast as to probable price and wage levels during a reasonable period in the immediate future. In every confiscation case, the future as well as the present must be regarded." This language is strongly reminiscent of the majority opinion in the Southwestern Bell Telephone Company case. Later on in the opinion Justice Butler makes his special contribution to interpretations of the "fair value" rule.

"It is well established," he says, "that values of utility properties fluctuate, and that owners must bear the decline and are entitled to the increase. The decision of this Court in *Smyth* v. *Ames*, 169 U. S. 466, 547, declares that to ascertain value 'the present as compared with the original cost of construction' are, among other things, matters for consideration. But this does not mean that the original cost or the present cost or some figure arbitrarily chosen between these two is to be taken as the measure. The weight to be given to such cost figures and other items or classes of evidence is to be determined in the light of facts of the case in hand. By far the greater part of the company's land and plant was acquired and constructed long before the war. The present value of the land is much greater than its cost; and the present cost of construction of those parts of the plant is much more than their reasonable original cost. In fact, prices and values have so changed that the amount paid for land in the early years of the enterprise and the cost of plant elements constructed prior to the great rise of prices due to the war do not constitute any real indication of their value at the present time. Undoubtedly, the reasonable cost of a system of waterworks, well planned and efficient for the public service, is good evidence of its value at the time of construction. And such actual cost will continue fairly well to measure the amount to be attributed to the physical elements of the property so long as there is no change in the level of applicable prices. And, as indicated by the report of the Commission, it is true that, if the tendency or trend of prices is not def-

[23] P. U. R. 1923-D, p. 514.

initely upward or downward and it does not appear probable that there will be a substantial change of prices, then the present value of lands plus the present cost of constructing the plant, less depreciation, if any, is a fair measure of the value of the physical elements of the property. The validity of the rates in question depends on property value January 1, 1924, and for a reasonable time following. While the values of such properties do not vary with frequent minor fluctuations in the prices of material and labor required to produce them, they are affected by and generally follow the relatively permanent levels and trends of such prices. The fact that original cost was probably 12 to 20 per cent less than the estimate of the Commission's engineer based on the average of prices for the ten years ending with 1921—two years before the rate order became effective—does not tend to support the Commission's adoption of that estimate. The cost of reproduction on price levels prevailing January 2, 1923, was found to be 30 to 35 per cent or from $4,500,000 to $5,000,000 more. The average of prices in the ten years ending with 1923—the effective date of the rate order—was shown by the testimony of the Commission's chief engineer to produce a result nearly 14 per cent higher than the figure adopted; and, on the basis of prices prevailing on the effective date of the order, cost of reproduction less depreciation would be about 32 per cent higher than that taken by the Commission. The high level of prices and wages prevailing in 1922 and 1923 should be taken into account in finding value as of January 1, 1924, and in the years immediately following. Moreover, there is nothing in the record to indicate that the prices prevailing at the effective date of the rate order were likely to decline within a reasonable time—one, two or three years—to the level of the average in the ten years ending with 1923. And we may take judicial notice of the fact that there has been no substantial general decline in the prices of labor and materials since that time. The trend has been upward rather than downward. The price level adopted by the Commission—the average for ten years ending with 1921—was too low. And it is clear that a level of prices higher than the average prevailing in the ten years ending with 1923 should be taken as the measure of value of the structural elements on and following the effective date of the rate order complained of.''

We have quoted at length from this opinion because it seems that this decision will surpass in importance the Southwestern Bell Telephone Co. case in its effect upon the development of the valuation problem. The decision has already been hailed by the press of the country as a decision establishing the ''spot cost of reproduction'' as the measure of fair value.[24]

[24] Justice Brandeis dissented from the decision. Justice Holmes concurred in the result but presumably did not agree with the theory advanced. In his minority opinion Justice Brandeis significantly remarks: "Nor do I find in the decisions of this court any support for the view that a peculiar sanction attaches to "spot" reproduction cost, as distinguished from the amount that it would actually cost to reproduce the plant if that task were undertaken at the date of the hearing. "Spot" reproduction would be impossible of accomplishment without the aid of Aladdin's lamp. The actual cost of a plant may conceivably indicate its actual value at the time of completion or at some time thereafter. Estimates of cost may conceivably approximate what the cost of reproduction would be at a given time. But

Even the Supreme Court of Wisconsin, unfortunately for the development and eventual solution of the valuation problem, has felt that it must conform to this ruling of the United States Supreme Court. In *Waukesha Gas & Electric Company* v. *Railroad Commission of Wisconsin*,[25] it reversed the Circuit Court of Dane County which had upheld a valuation by the Commission of the gas properties of this company in accordance with methods analogous to those previously upheld by the Wisconsin Supreme Court in the opinion written by Justice Rosenberry. Contrasting strangely with the clear reasoning based upon economic facts in the earlier opinion, the decision in the later case is a legalistic argument from authority. After quoting from the Indianapolis case the court says:

"In the McCardle case a valuation made substantially like that of the Commission in the present case was set aside by the court, because in view of the great advance in prices during and after the war it did not correctly reflect the actual value of the property as of the time the valuation is made, which is the date of the order fixing the rate and the probable value for some years to come. A valuation which does not as to the tangible property substantially reflect the then cost of reproduction less depreciation does not meet the requirements. The utility is entitled to the present fair value of its property as a basis for rate making. Hence, where there has been a period of rising prices for many years original cost plus cost of additions do not correctly measure the present value. Such a method may form the main basis of a valuation during a period of fairly stable prices, but it does not as applied to prices from 1912 and earlier down to 1922. Since the basic result to be reached is the present and near future fair value of the property any method that will accomplish that result is a proper method. It is doubtful if any method will accomplish such result unless it substantially reflects or agrees with present or recent reproduction cost less depreciation. The method employed by the Commission in the instant case does not do so, and under the federal rule referred to must be set aside as confiscatory and unreasonable. Expressions to the contrary in *Waukesha Gas and Electric Company* v. *Railroad Commission*, 181 Wis. 281, are modified to conform to the rule announced in *McCardle* v. *Indianapolis Water Co.*, 47 Sup. Ct. Rep. 144."

---

where a plant would require years for completion, the estimate would be necessarily delusive if it were based on "spot" prices of labor, materials and money. The estimate, to be in any way worthy of trust, must be based on a consideration of the varying costs of labor, materials, and money for a period at least as long as would be required to construct the plant and put it into operation. Moreover, the estimate must be made in the light of a longer experience and with due allowances for the hazards which attend all prophesies in respect to prices. The search for value can hardly be aided by a hypothetical estimate of the cost of replacing the plant at a particular moment, when actual reproduction would require a period that must be measured by years."

[25] 191 Wis. 565, Jan. 11, 1927.

From an economic point of view it would seem that it is necessary to distinguish between capital invested in businesses which are not public utilities and the capital of public utilities. The former sell their commodities or services in the open market where they are subject to competition. The latter sell their services in a controlled market, where competition is either entirely absent or subject to governmental restrictions. A competitive enterprise can only be valued on the basis of its earning power, present and prospective. The value of its productive capital as a going concern reflects this flow of net income and therefore value is, as economists say, *price determined.* For public utilities whose prices are fixed by governmental authority the productive capital is *price-determining.* The former capital gets its value in the markets of the world under conditions where competitors are free at any time to bring new capital into competition with capital already in the field. This new capital will, of course, come in at a cost which reflects present prices. Under these conditions there is bound to be some correspondence between the cost of construction of new plants and the capitalized value of the net earning power of old plants because both types of plants sell their services in competition with each other. However, for public utilities conducted as monopolies, cost of reproduction is entirely inadmissable.

The most-telling argument which has been brought forward by those who champion cost of reproduction, either as the sole standard of value or as an important element in fair value, takes this form. Unless cost of reproduction is taken into account in rate-base determinations, the owners of public utility properties will be deprived of a fair return. Periods of high prices, particularly those induced by war and reconstruction disturbances with their attendant monetary inflations, usually are accompanied by a fall in the purchasing power of that return. A constant monetary return under these conditions represents, in fact, a declining return which is the complement of the decline in its purchasing power. This argument has unquestioned economic merit. It addresses itself, however, to the question of what is an adequate return under such circumstances. Everyone, even the economically illiterate, have learned that the economic value of money resides in its purchasing power, its power in exchange for commodities and services. The rate of return should therefore be made flexible to correspond with some index of purchasing power. If the choice is between a relatively fixed rate of return which is applied to a rate-base varying with the

cost of reproduction, and a rate of return varying with some index of purchasing power which is applied to a fixed rate-base, it is easier to choose the latter alternative. To commit regulation to the cost of reproduction standard is sure to have consequences that are far-reaching in unsettling the machinery of regulation and in disturbing the accounting and credit structures of going concerns.

Administrative commissions should, therefore, take steps to make the rate-of-return flexible, and, particularly, to make the amount available as a return upon the risk capital of public utilities bear some constant relation to the varying purchasing power of the most fundamental of all standards of pecuniary value; the dollar.[26]

[26] For additional critical discussions of valuation standards see: Bauer, John, *Effective Regulation of Public Utilities*, The Macmillan Co., New York, 1925, and Clark, J. M., *Social Control of Business*, University of Chicago Press, 1926. See also for a review of these books, Glaeser, M. G., "Is Public Utility Regulation Effective?" *Journal of Land and Public Utility Economics*, Vol. III, p. 86, Feb., 1927. Also Richberg, Donald R., "Value by Judicial Fiat," *Harvard Law Review*, Vol. XL, p. 567, Feb., 1927.

CHAPTER XXII

RETROSPECTIVE VALUATION

In order to bring about a condition where public utilities will be operated under a definite rate-making rule, it will be necessary to fix an initial rate-base as a point of departure. This will involve what are here called retrospective valuations. These valuations must take account of the historical conditions under which the properties were developed and will therefore have to be guided by the rate-making rule of *Smyth* v. *Ames*. This will involve administrative determinations by Commissions, supplemented, it may be, by agreements between representatives of different interests. At the same time it must be recognized that a new rule must be laid down for the future, else the work will be incomplete in its most important aspect.

How a rate-base may be determined by applying in a reasonable manner the valuation standards suggested in *Smyth* v. *Ames* is explained for a representative local utility in Chapter XXXII. In this instance a rule was agreed to between the three parties —the public utility, the municipality as representative of consumers, and the state regulating commission—whereby rates were to be fixed. The standard of valuation adopted for the future was the investment. In the future all costs were to be subjected to continuous scrutiny by a local commission. The rights and duties of the parties under this agreement were, so far as possible, defined and agreed upon in advance.

Sec. 1. Necessary Reconciliations in Adopting a Rate-Making Rule for the Future

In adopting a definite rate-making rule for the future certain reconciliations are necessary. Whether administrative standards of valuation should be laid down in a statutory rule is an open question.[1] It may well be that a piecemeal procedure can be

[1] The "fair value" rule seems well adapted to the exercise of some discretion by administrative commissions. In a searching article entitled "Railway Valuation and the Courts," 33 Harvard Law Rev. 902 and 1031, p. 1051, Gerard C. Henderson comes to the conclusion that founding the

adopted in the case of local utilities whereby the establishment of an initial rate-base and the drafting of a rate-making rule for the future is merely authorized by statute, but carried out under commission supervision by means of working agreements between public utilities and consumers' representatives. Whatever method is adopted, the method of agreement or of statutory determination, it will be necessary to secure the coöperation of public service industries.[2] It is highly probable that this coöperation cannot be secured in the case of going concerns without certain necessary reconciliations in the initial rate-base. Only the more important questions involved in fixing an initial rate-base will be discussed here.

Sec. 2. **Franchise Value**

The first question is whether an adjustment should be made for the value of the franchise. In earlier discussions of franchises it was usually contended that substantial allowances should be made in rate cases. It was argued, since franchises were property and taxed as such, that their value should also be included in the rate base. This argument was not accepted by commissions. It is now current practice to include expenditures in se-

basis of rate regulation upon the valuation doctrine was a mistaken policy of the courts. What he says regarding the ineffectiveness of the "fair value" rule is correct enough as applied to the future. He says in part: "The whole doctrine of *Smyth* v. *Ames* rests upon a gigantic illusion. The fact (value) which for 20 years the court has been vainly trying to find does not exist. 'Fair value' must be shelved among the great juristic myths of history with the Law of Nature and the Social Contract. As a practical concept from which practical conclusions can be drawn it is valueless."

It is hoped that the brief analysis thus far presented has placed the valuation doctrine in a different light. According to this, value is not to be "found." The process of determining a rate-base is merely an incident in the larger process of rate-making, which is valuation of public utility *services*. The problems involved in fixing a rate-base must in some way be faced if we are to continue public regulation of rates. Almost a generation ago the first state undertook the task of ascertaining what was then called the "physical value" of its railways. In the course of time certain working hypotheses were set up and a scientific terminology was worked out. The accountant, the engineer, and the statistician have contributed of their art in order to reduce the voluminous detail to simple and understandable uniformities. And from day to day, in the monotony of the hearing rooms and in the workshops of the commissions, the work of fact-gathering, of systematizing, and of weighing arguments toward a reasoned conclusion is going forward. Far from thinking that this undertaking is in vain, it is believed that out of these years of labor can come a foundation of fact, an adjudication of equities, and a basis even of compromise, upon which a regulatory structure can be based that will serve its purpose with increased efficiency in the future.

[2] Editorial, "The Supreme Court Boosts Public Ownership," *New Republic*, Jan. 5, 1927, p. 181.

curing franchises in organization expenses. They are thus included either by way of a specific allowance or included in the general overhead percentage. The position of commissions has been well stated by the Railroad Commission of Wisconsin.[3]

"The contention often made that the value of franchises should be included as an element for consideration in determining the present fair value of the active property of a public service corporation for rate-making purposes, though supported by judicial sanction in certain jurisdictions, does not appeal to us as either sound or practical. The only measure of franchise values recognized by the courts is the earning capacity of the property to which the franchises give vitality. Earnings are dependent upon the rates that are exacted, and, hence, the higher the rates the more valuable are the franchises, and *vice versa.* Obviously, therefore, it would be futile to attempt to determine the reasonableness of a rate by any standard which is at all dependent upon franchise values for its dimensions. Such a method of establishing rates would only lead to conjecture and result in no reliable or satisfactory conclusion. . . . The concession that a franchise has value and is the subject of property rights does not at all militate against the principle that a franchise is not capable of capitalization for the purpose of exacting of the public charges in excess of what would be required to pay a reasonable return upon the actual reasonable investment. To permit the grantee to capitalize the franchise as against the grantor, would be similar in effect to adding to the consideration for service an additional sum based upon the value of the contract to the party rendering the service."

Under the system of franchise regulation rates were fixed by contract. Upon this premise it was logical to speak of the value of the franchise as if it were the value of a contract. But this system of regulation had to give way for the most part to one in which the rate provisions of the franchises were made more flexible. Such were franchises of the indeterminate type whose rate provisions are legislative acts interpreted and enforced from time to time by orders of an administrative commission. Or they were franchise contracts of the service-at-cost type.[4]

[3] *Appleton* v. *Appleton Water Works Co.*, 5 W.R.C.R. 215, 281 (1910).

[4] In this connection the criticism should be recalled that regulation in the past failed to take a stand upon the only ground that makes rate control at all defensible, namely, that these industries are performing public functions. Although there are some developments in this direction in a few outstanding court decisions the contract theory of the franchise remains on the whole unchallenged.

The influence of this transition from the contract theory of regulation to commission regulation manifested itself in a certain inconsistency and uncertainty of treatment when the question was raised before the courts what allowance should be made for franchise value in rate cases. Judges who considered franchises to be delegations of public functions attached no value to franchises. The following statement is typical of this point of view: "In determining the fair value of complainant's property on which it is entitled to earn a fair return, it is not entitled to any allowance for the value of its franchise to use the streets, etc., where such franchise was granted by the city without compensation".[5] Judge Hough in the Consolidated Gas case stated his conclusion in picturesque language: "For these reasons I believe that on principle a franchise should be held to have no value except that arising from its use as a shield to protect those investing their property upon the faith thereof; and that considered alone and apart from the property which it renders fruitful, it possesses no more economic value for the investor than does an actual shield possess fighting value apart from the soldier who bears it."[6] Nevertheless, he felt that in obedience to precedent an allowance for franchise value would have to be made.

The New York Public Service Commission Act provided that "the Commission shall have no power to authorize the capitalization of a franchise in excess of the amount (exclusive of any tax or annual charge) actually paid to the state or any political subdivision thereof as the consideration for the grant of such franchise right".

The older view of franchise value goes back to a rule quoted by Justice Brewer in a Federal Supreme Court case.[7] "The latter [franchises] can no more be taken without compensation than can its tangible corporeal property (of a Bridge company). Their value depends upon their productiveness. If they yield no money in return over expenditures they would possess little if any present value. If, however, they yield a revenue over and above expenses they possess present value, the amount of which depends in a measure upon the excess of revenue". (110 Pa. 54, 58.) This rule, adopted in a purchase case, was also applied under the entirely different circumstances of rate adjudication. Innumerable decisions could be quoted in which the old view of franchise persisted but in which the new element was combined

[5] *Lincoln Gas & Elec. Co.* v. *City of Lincoln*, 182 Fed. Rep. 926 (1909).
[6] 157 Fed. Rep. 849, 874 (1907).
[7] *Monongahela Nav. Co.* v. *U. S.*, 148 U. S. 312, 329 (1893).

as a modifying factor.[8] This is a situation characteristic of transitions.

Those who contended that something should be allowed for the value of franchises in rate cases were perhaps misled by the analogy of their value in purchase cases. The Monongahela case, usually cited as authority, was a purchase case that arose under the charter system of regulation. When commissions first sought to reduce rates below franchise levels, their efforts were met by the claims of companies for franchise values. The utilities raised the issue that a contractual obligation was being violated which involved also the confiscation of property. If these values had been allowed, they could have been estimated only upon their true basis, the capitalization of current and expected net income. Such a procedure would have defeated all attempts at rate reductions. This point was seized upon by commissions in their rebuttal, as in the decision from which we have quoted above. If the contention of the companies had been accepted, commission regulation would have been rendered as inflexible as its predecessor had been. During the war it became clear that an unprofitable franchise is a liability instead of an asset. Then it was the turn of consumers to contend for the validity of franchise rates. The whole procedure of limiting the regulating power by fixing definite rates by long-term contracts was an evident impossibility. The record of the past ought to convince even the most skeptical that if a change to a new system of regulation is to be accomplished, Judge Hough's conception of a franchise must be substituted. This implies adopting the definition that a public utility represents a quasi-public function in the hands of a separate administrative agency, but that this agency sells services at a price which must be kept compensatory at all times.

Sec. 3. **Good Will**

The question has been raised whether public utilities are entitled to an allowance in the rate base for "good will". The value of good will may be tersely defined as that portion of the

[8] R. H. Whitten in his work, *Valuation of Public Service Corporations*, Banks Law Publishing Co., N. Y., 1914, p. 640, summarized these decisions for us in the following: "There can be no doubt that a franchise is property and as such has value. This principle has the best legal authority and sound economic basis. There are two distinct functions of a franchise. *One is to guarantee the integrity of the investment; the other is to make it possible for the investor to secure a reasonable reward for his enterprise in establishing the plant or railroad*" (Italics are ours).

total value of a business undertaking which may be imputed to the patronage that the particular business enjoys. Ordinarily, in purchase and sale transactions, the element of good will—the disposition of customers "to return to the old stand"—is paid for as a distinct property right. The seller is usually placed under some reasonable restraints as to his right to engage in the same line of business. In the case of public utilities, however, courts and commissions have repeatedly refused to recognize good will as a proper element to be included in the rate base. They agree that, economically and legally considered, good will is present in commercial undertakings, is property, and has value, but that it is premised upon the existence of competition. When the consumer is confined to the service of a single public utility there exists no real economic ground upon which the value of good will may be predicted. As Judge Hough said in *Consolidated Gas Co.* v. *City of New York:*[9]

"There is nothing in the nature of its business enabling it to acquire good will in the property sense or indeed in any other. It is required by law to furnish gas to all demanding it within certain distance of the mains; and it owns the mains, service pipes and meters. What induces a customer to remain with this company, its successor or vendee? Nothing that I can imagine, except a desire to avoid the nuisance of street digging in front of his house; a digging, however, entailing no expense to him. Yet even this nuisance is in all human probability impossible of occurrence, because of the beneficially monopolistic character of defendant's present occupancy of the streets of this city. . . . Finally this claim of good will seems to forget that for many years the price and distribution of complainant's gas has been regulated by law. A citizen is entitled to have a clean street before his house because he pays taxes, *inter alia*, for that purpose. He is much more plainly entitled to have complainant's gas in his house because the Company must give it to him if he pays for it. I think it apparent that the conceivable good will of a gas company in this city is about equal to that of the street cleaning department of the municipal government."

This conclusion was affirmed by the United States Supreme Court. The crux of the matter is that good will, being "the fixed and favorable consideration of customers, arising from an established and well known and well conducted business", has no place in the rate-base because customers are legally entitled to be efficiently and adequately served. If a legislature or a commission desires to stimulate and reward exceptional skill in developing markets and in maintaining good customer relations, it may do so by making a suitable allowance therefor in the rate of

[9] 157 Fed. Rep. 849, 872.

return. The determination of a non-confiscatory rate-base under the Fourteenth Amendment, or of a reasonable rate-base under the police power, does not require that good will be recognized as a property right.

Sec. 4. **Going Value**

No other single subject within the precincts of the valuation problem raises more unanswered questions as to the fundamentals of regulation than does "going value" (often also called "going concern value"). On this account it is one of the most disputed elements in valuation litigation.

(a) *The Wisconsin concept of going value.*

The treatment of "going value" by the Railroad Commission of Wisconsin is a good starting point. In the case of *Hill* v. *Antigo Water Co.*[10] the commission dealt with a situation where it was possible to reconstruct a complete financial history of the company from the books. On this account the commission was able to rely largely on actual costs rather than on estimated costs in order to reach a conclusion. In this opinion the Wisconsin Commission first formulated its "going-value" concept and a method for quantitative measurement which is distinct from other formulations and which has since been relied upon by a number of other commissions.[11] There is no better way of explaining this concept of "going value" and the reasons why it should be considered in rate cases than in the words of the commission itself:

> "The cost of developing a business of waterworks may be made up of many different kinds of expenditures. It may include the cost of advertising, soliciting, demonstrations showing the advantages of having water under pressure in the houses, or making free connections, of the granting of lower than the regular rates, and of many other outlays of this character in order to secure customers. It may also include losses to the investors because of the fact that the plants in their earlier years failed to earn enough to meet all the requirements for operating expenses, including depreciation and reasonable return upon the investment. If the direct outlays for securing business are charged to operating expenses, as they should be, instead of to the capital account, then the cost of acquiring a paying business would be represented by the deficits, or by the amounts by which the gross earnings fall short of covering the cost of operation, as stated, including fair returns to the investors.

[10] 3 W. R. C. R. 623, p. 709 (1909).

[11] Maine, Indiana, Illinois, California, West Virginia, Arkansas, and others.

"Such costs or deficits are, generally speaking, unavoidable. Few, if any, plants are paying from the start. The only way in which many, if not most of them, can be made paying concerns at the start is apparently by having the city or taxpayers foot the deficit. Private customers cannot always be made to foot them, for the rates required to yield reasonable returns at the start, or while the business is light, are more than likely to be so high that rather than pay them the consumers would forego the service. Both of these methods of making up the deficits, therefore, would seem to be impracticable. It would seem to follow from this that early losses will have to be met by the investors. There is apparently no way in which this can be prevented.

"But while such losses will have to be met by the investors, it is not expected that these sacrifices will be anything but temporary. The investors fully expect, and in most cases rightly so, that these losses will be made good as soon as warranted by the business of the plant. They usually regard such deficits as an additional investment upon which, unless the whole amount is refunded to them in some form, they are entitled to the same return as on the rest of their capital. Unless they are so compensated, it is manifestly clear that no money from private sources is likely ever to be invested for such purposes, except, perhaps, in a few rare instances, for philanthropic reasons. If there is not a reasonable assurance of reasonable returns upon the cost of the plant, it is manifestly clear that private investors will seek other fields. It is upon this basis only that such plants will be built at all, at least by private capital. Communities that are not willing to bear this expense are also likely to have to do without such conveniences as water under pressure, excepting in cases where the functions of the investors are assumed by the taxpayers through the construction of municipal plants. Even in the case of municipal plants it is necessary that the costs in question should be covered if permanent losses to the taxpayers are to be avoided.

"There are obligations and rights on the side of both the investors and consumers. It is the duty of the investors to furnish a reasonably efficient plant and management and reasonably adequate service. When these obligations are fulfilled, they are ordinarily entitled to a reasonable return upon their investment and services. It is the duty of the consumers to pay reasonable rates for the services they obtain, and they have the right to demand an efficient management and a reasonably adequate service. These matters are measured by the total investment made by the service as a whole. These elements should be considered together.

"It thus appears that the cost of building up a business of a plant is in most cases as unavoidable as the cost of the construction of the plant itself; that such reimbursement is equitable as between investors and consumers; and that this is a just method of dealing with such costs for other reasons. If this is sound, it also follows that the cost of the business must also be taken into consideration in determining the value of the plants for rate-fixing purposes. This would seem to apply with special force where by law the rates are limited so as not to yield more than reasonable returns upon the investment. While such legislation may not be a guaranty against losses of any kind, it is clear that if the rates fixed under these laws should not include anything for the cost of building up the business, there would be no way in which these costs could be made good to the investors. In that event, these costs would become a permanent loss to them; and the consumers, in turn, would be relieved from paying a reasonable return on a

part of the investment or on the capital that is devoted to furnishing them with the service in question. This is a situation of which the investors are taking due notice, and which is entitled to due consideration. If not taken into account, it will tend to keep new capital from entering this field as well as to prevent exact justice to capital which has already entered the same. The former would result in hardships or inconveniences to the consumer; the latter would apparently be unjust to at least many of the present investors in such utilities.

"Just how long it takes for a properly adapted and reasonably well managed plant to become self-sustaining is not entirely clear. Some reach this point within the first few years; others, again, require as many as ten or even more years, before they approach it. There are also those which never reach this point at all. Much depends upon the local conditions by which each plant is surrounded, and which vary from one place to another.

"In order to determine the situation in this respect, it is therefore necessary to make a separate study of each particular plant, and of the conditions under which it was established and is operating. Where conditions are not favorable, the plants may never become paying enterprises. There are many reasons why, even under favorable conditions, it takes time to develop a paying business. The town, while growing, may not be large enough at the time. It may lack sewers and street-sprinkling systems. It may require less water for fire protection than was expected. It may have good wells for domestic purposes which the people are slow to abandon. These and many other conditions of a similar character often tend to keep the earnings of plants on a lower than normal basis for several years after they have been put into operation.

"As to whether the cost of building up the business should be included in the value of a plant or gradually charged off from the earnings when these earnings become large enough to warrant it; or rather when they have so increased as to cover operating expenses, including depreciation and a reasonable return upon the investment, and, besides this, leave a surplus, may not be entirely clear. When added to the original capital upon which interest and profits should be earned, it becomes a permanent charge upon the consumers. This charge, however, is low; as low, in fact, as it very well can be made. When gradually written off, it results in a high annual charge that will terminate when the cost has been wiped out. Either plan may be feasible. As to which one is preferable is a question that depends upon the circumstances in each particular case."

(b) *Judicial opinions upon going value.*

The judicial opinion which gave the going value concept its first formulation was, as in the case of franchise value, an opinion in a purchase case.[12] The pertinent part of the opinion is: "Nor would the mere cost of producing the waterworks plant be a fair test, because that does not take into account the value which flows from the established connections between the pipes and the buildings of the city. It is obvious that the mere cost of purchasing the land, constructing the buildings . . . —in other words, the cost of reproduction—does not give the value of the

[12] *National Water Works Co.* v. *Kansas City*, 62 Fed. 853 (1894).

property as it is today. A completed system of waterworks, such as the company has, without a single connection between the pipes in the streets and the buildings of the city, would be a property of much less value than the system connected, as it is, with so many buildings and earning in consequence thereof the money which it does earn. The fact that it is a system in operation, not only with a capacity to supply the city, but actually supplying many buildings in the city,—not only with a capacity to earn, but actually earning, makes it true that the fair and equitable value is something in excess of the cost of reproduction. The fact that the Company does not own the connections between the pipes in the streets and the buildings—such connections being the property of the individual property owners —does not militate against the proposition last stated, for who would care to buy, or at least give a large price for a waterworks system without a single connection between the pipes in the streets and the building adjoining? Such a system would be a dead structure rather than a living and going business. The additional value created by the fact of many connections with buildings, with actual supply and actual earnings, is not represented by the mere cost of making such connections. Such connections are not compulsory, but depend upon the will of the property owners, and are secured only by efforts on the part of the owners of the waterworks, and inducements held out therefor. It (the City) steps into possession of a property which not only has the ability to earn, but is in fact earning. It should be paid, therefore, not merely the value of a system that might be made to earn, but that of a system which does earn."

It seems that the contention of the Company was to secure some compensation for its efforts in building up the business. Whether there were uncompensated deficits in the Wisconsin sense does not appear. The language of the case strongly suggests that the Court's underlying motive in this case was to compensate the owners for "disturbance"—as the British put it —in the continued enjoyment of a developed income.

Meanwhile the courts had ruled that all methods of calculating value were inapplicable, certainly in rate cases, which were based upon earning capacity. If going value is conceived of as a flow of revenues, the amount of revenue depends upon existing rate levels which, in a rate case, are the very subject of investigation. Any method, therefore, of measuring going value based upon net income was under a cloud at the outset.

Moreover, a certain vagueness surrounded the very concept

of going value as used by the courts which militated against the ready acceptance of this element. Space does not permit giving in detail the nuances of meaning with which the term was used. It was often confused with franchise value and good will. It was quite an accomplishment when, due very largely to the Wisconsin formulation, going value was distinguished from good-will and franchise value. These had been quite generally disallowed. Yet there was a common-sense appeal in the contention that a property with an established and profitable business should be valued at a higher sum than its structural or physical elements. Hence we get such definitions of going value as "the difference between a dead plant and a live one," as "the value which flows from the established connections between the pipes and the buildings of the city, "as compensation for "disturbance" in the ownership and possession of income-producing property, and others of like tenor. Most of them were not much better than clever figures of speech.

Sec. 5. **The Measurement of Going Value**

Equally varied and hypothetical were the methods employed in measuring or proving the amount of going value. They varied all the way from crude applications of the capitalization of net income concept to refined estimates of cost incurred in building up patronage. We have already described the Wisconsin method. Another method, which is, perhaps, most responsible for bringing the going-value concept into disrepute, was designed by engineers. It measures, on the analogy of the Wisconsin net deficit basis but using the cost of reproduction concept, the cost of reproducing the *existing business* by reference to a so-called "comparative plant".[13] Discriminating commissions were quick to point out the arbitrary character of the assumptions this method entailed.

Instead of being based upon the financial history of a given utility, the cost of reproduction standard assumes a comparative plant which is identical with the existing plant but which must as yet develop a market for its product equal to that of the plant which is being appraised. Until the utility has done this, operating costs including a fair return will exceed operating revenues. The difference will be the cost of reproducing the existing business. Appraisers, when computing the going value on this

[13] *Cf. T. M. E. R. & L. Co.* v. *City of Milwaukee*, 10 Wis. Railroad Com. Rep. 1, p. 147 (1912).

basis, generally assume that the business will grow more rapidly than the financial history of these enterprises shows has been the case in the past.[14]

There is still a third method, (if it may be called such) which is put forward by some writers. Instead of being based upon a cost concept, it is based upon the probable *exchange value* of the existing plant. Since a prospective purchaser would pay more for a going plant with a going business attached to it than he would pay for a plant which must as yet develop its market, the difference is the purchaser's estimate of the going value. This method harks back to the first definition of going value made by the court in the case which gave currency to the concept of the "going concern." According to this view going value might also inhere in the going plant as distinguished from the "going business". Since the element of going value is not referable to an objective standard of cost, it is incapable of determination in any other way than by appraiser's fiat—his expert judgment—, or by reference to evidence of the purchase price actually paid for similar plants.

A typical illustration of the result to which this method of procedure leads is taken from a decision of the Montana Commission.[15] ". . . there can be no question of our duty to make an allowance for going concern value. . . . While, so far as we know, no student of the problem has suggested a rational device for translating 'established business' value into dollars as units of value, we shall follow the rule more or less definitely discernible in the decisions, of adding 10% to the determined physical value."

The Wisconsin Commission has never placed any reliance upon the two last named methods. It received estimates of going value based upon the second method as evidence, but accepted them always with reservations and criticisms.

The cost of reproduction method as applied to going value was effectively criticized in a decision of the New Hampshire Commission:[16]

"The conditions which would exist if the prosperous communities of Lebanon, White River, and Hanover were suddenly deprived of electricity . . . are unthinkable. No such thing has ever happened. And yet engineers do not hesitate to testify as to just how long it would take these same

[14] On the other hand, this method will yield a going value in every case whether there were actual net deficits or not.

[15] *Re. Baker Natural Gas Utility*, P. U. R., 1921-E, 609, pp. 623-624.

[16] *Re. Grafton County El. Lt. & Pr. Co.*, P. U. R., 1916-E, 879, 887.

people, if it did happen, and the plant were reconstructed, to make up their minds that electricity would be a good thing for them, and by intricate calculations to show the exact amount which the company would lose during the time required to 'educate' the intelligent citizens of these towns up to that point of appreciation of the value of electricity to which they have already attained. And this it is claimed must be allowed as 'going value'.

"Of course, the fact is that while the theory of cost of reproduction rests upon the assumption of present conditions in every respect except for the non-existence of the plant to be reproduced, when it comes to estimating going value on the basis of deficits from operation in early years the engineers turn their backs on their own fundamental hypothesis, and assume that the inhabitants of these towns are as completely ignorant of the use of electricity as they were twenty or twenty-five years ago, when it was first introduced to them.

"There is another absurdity in the reproduction theory which is suggested by the consideration of the developmental period. It is assumed that the plant is to be reconstructed complete as at the present day, with every extension, not merely to the premises, but into the very houses, including the actual installation of meters, for people who are not going to use the electricity for a period of three or four years after the construction is completed. Such a thing has never been done, and never would be done by sane men."

The Indiana Commission is delightfully frank in stating it allows going value in all cases only because the courts seem to require it. In a recent opinion [17] this authority said:

"This Commission has held that the major purpose of an allowance of going value is to cover out-of-pocket money expended by the utility during the period of construction and development for invisible capital assets which are not susceptible of physical appraisal, as, for example, the cost of establishing the business.

"The courts, however, have held that regardless of historical considerations a utility property has a going value in excess of the value of its physical property for the reason that the business is established and the property is a going concern.

"If the actual expenditures for such unappraisable assets are disregarded, as the best measure of the amount of going value to be allowed, then the determination of the amount becomes purely a matter of speculation. (Re Lafayette Telephone Co. P. U. R. 1920 A, 422.) That the fixing of the amount of going value is almost entirely speculative and arbitrary is concretely shown by the conclusions of one of the ablest minds in the field of regulation. In his argument on the principles and methods governing the value of railroad property, before the Interstate Commerce Commission on Jan. 7, 1920, Judge C. A. Prouty, Director of the Valuation Bureau of the Commission, said:

" 'How are you going to get at it? (going value.) How are you going to determine how much to add? I have tried to demonstrate to the Commission that there was no way in which you could satisfactorily determine the amount of appreciation (of land value), and I think that is so.

[17] *Re. Laporte Gas and Electric Co.*, P. U. R., 1921-A, 824, p. 865.

I do not know of any way in which it can be done. Going value might be even more difficult. How are you going to determine what shall be added? The fact that a thing is difficult does not excuse you from attempting to do it, and *you also enjoy this advantage, that if you will just simply do it, without undertaking to say precisely how you did it, nobody can ever find any fault with it. That will absolutely end it.*'

"So it is in the case now before the Commission. There is no intelligent basis by which one may measure the amount of going value to be allowed. There are no peculiar or local facts or conditions which throw any light on the matter. In this situation the Commission, in keeping with the decisions of the courts, will allow the sum of $40,000 for going value."

In comparison with these methods, the Wisconsin method is clearly preferable. By projecting the assumption into the past that the utility was entitled at all times to a reasonable return and no more, an estimate may be obtained, based upon historical evidence, of the amount of the uncompensated loss which the owners assumed in developing the *present paying business.* The net deficits may be negligible or even entirely absent. These estimates may then be used as evidence in determining whether on equitable grounds some additional allowance should be made in the rate-base.

Even in Wisconsin, however, the originally clear formulation has become befuddled on account of contrary court opinions and the confusion of principles between purchase and rate cases.

In the Appleton Water Works case [18] the commission dealt with a property which had never been profitable. As distinguished from the Antigo case this was a valuation to determine "just compensation". The commission fixed the compensation at $255,000, without naming a specific sum as the allowance for going value. From internal evidence it is clear that the allowance was little more than nominal. It should be borne in mind that the amount of custom which the business had was inadequate to pay even the interest on a mortgage of $250,000. Hence the company was in the hands of a receiver. The case was carried, on appeal, to the Supreme Court of Wisconsin, the company contending, among other things, "that the going value determined by the commission and included in the amount fixed by it was based upon improper considerations and was inadequate in amount". The court agreed with the commission that the final sum was adequate compensation, but in the course of the opinion it used language which has tended to some extent to divert the commission into new and different paths in its handling of the problem.

[18] 154 Wis. 121 (1913).

After reviewing the various methods of measuring going value then in vogue the court said:

"It is quite apparent that the result reached by either of the suggested methods could hardly be considered as anything more than suggestive, and that its persuasiveness would necessarily depend upon many other facts which must enter into the general problem of value. The actual original cost of establishing the business of the existing plant is very clearly unsatisfactory to the last degree as a test of going value, because it may have been wasteful and extravagant, and because, also, it is well known that the building up of the business of a water plant thirty years ago before sewage systems (private) had become discredited was a much slower process than at the present time, when in such a city as Appleton the population has been educated to use the public supply of water.

"However, the fundamental difficulty with the attempt to set a definite sum as the measure of going value is that it is an attempt to divide a thing which is in its nature practically indivisible. The value of the plant and business is an indivisible gross amount. It is not obtained by adding up a number of separate items, but by taking a comprehensive view of each and all of the elements of property, tangible and intangible, including property rights, and considering them all not as separate things, but as inseparable parts of one harmonious entity, and exercising the judgment as to the value of that final result, but it would be difficult for even an expert to say how many dollars of the result represent it."

The result of this decision, as indeed of the entire trend of court opinions, appears to have been to induce commissions to conceal the basis upon which their going value determinations rest. In this way the "fair value" becomes, indeed, a final indivisible result in which conflicting evidence is merged. No one can then tell with certainty upon what basis final determinations rest or of what elements they are composed.

Sec. 6. **A Definition of Going Value**

At this point, a suggestion as to terminology seems pertinent. We are dealing here with a problem of value not in the commercial or competitive sense, but in the sense of value as a process by which the legislature determines rates for a public utility. In applying appraisal concepts in such a process, it is necessary that they recapitulate the operations by means of which these enterprises come into being. Therefore, it seems desirable for valuation purposes to distinguish the periods in the life history of a going concern, which were described in Chapter III, and derive therefrom the following concepts: (1) The period of preliminary investigation, legal and financial organization, and so forth. This provides the future utility with

what may be called the "going plan". (2) The period of actual construction with its incidental expenditures of engineering supervision, interest, and taxes during construction and so forth. This provides the future utility with its "going plant". (3) The period during which the going plant acquires its market. We may call this the "going business".[19] The "going concern" would then be an enterprise which has evolved through all these stages. All necessary expenditures chargeable to capital may then be determined for the first and second stages. Expenditures during the third period are operating expenses. Deficits incurred can only be considered as capital by an act of legislative discretion. If "going value" is measured only upon the basis of uncompensated deficits it becomes the duty of the legislature to say whether past losses should be taken into account in future rate-fixing. Certainly, the owners of these enterprises would have taken them into account if they had been left free in their rate-fixing powers. The definition of going value, and its measurement seems, therefore, to be very largely a matter of determining what were the *reasonable expectations* of investors as to earning power.

Sec. 7. **Going Value and Confiscation**

Even if the propriety of exercising legislative discretion in allowing going value is granted, the question remains whether some constitutional right is involved which makes a determination necessary in all cases. This specific question, whether the Wisconsin formulation of going value and its quantitative measurement is necessary in order that rate-making shall not be confiscatory, was squarely raised in *Galveston Electric Co.* v. *City of Galveston et al.*[20] In this case, rates fixed by ordinance of a local council were attacked by the company as confiscatory. Experts for the company had made two estimates of going value, one of $575,300, another of $2,000,000. The city's expert had calculated a going value of $212,452. All of these calculations were based upon a capitalization of the net balance of past deficits. A special master, appointed to make advisory findings, had included the sum of $520,000 for development cost. Justice Brandeis, who wrote the opinion, carefully distinguished this item from another of $202,000 which was allowed to cover the so-called overhead costs of construction. The latter included

[19] *Cf.* Commons, J. R., *Legal Foundations of Capitalism*, Macmillan, 1924, Chap. V.

[20] 258 U. S. 388 (1922).

also $73,281 for "expenses of organization and business management". He said these expenses were "to cover the cost of establishing the system *as a physically going concern.*" The former item, he therefore concluded, must be an allowance to cover the cost of developing the railway "into a *financially* successful concern". (Italics ours.)

The court then showed that these sums were the result of calculations going back in one case 39 years when the original horse-car line was built, in another case fifteen years when the present owner purchased the property as a going concern. In both cases the calculations deduct from net income 4 per cent. as a depreciation annuity and an annual rate of 8 per cent. compound interest upon the value of the property. The net deficits constitute a measure of the going value, and the question was whether an allowance based upon such evidence should be included in the rate base *in order to test whether the rate prescribed in the ordinance was confiscatory.*

(a) *Significance of the Galveston case.*

As we interpret the decision, the court ruled that going value, so conceived, is not a proper element to be included because, if going value were included, that would imply that rates would be confiscatory unless they yield continuously a full 8 per cent. return upon the prudent investment. The decision does not imply that it would be wise or equitable for a *legislative body* to leave such considerations out of account in fixing a rate-base for the purpose of fixing the rates in the first instance. The court merely ruled that it need not do so in order to render the rates *non-confiscatory.*

The issue, it seems, comes to this: Is going value a legislative or a judicial concept? According to the Wisconsin method, going value is a *legislative concept,* within the range of legislative and, hence, of administrative discretion. If, on the other hand, it is a *judicial concept* (that is to say, an element in the judicial definition of public utility property) it would set the legislative rate-making power in motion to correct the earning-power situation. The inference is that the court, in the Galveston case, ruled out going value as a judicial concept. Where the utilities are monopolies rendering a necessary service, such a view of "going value" in its relation to the rate-making function would take an element of risk out of the business and "would imply substantially a guaranty by the community that the investor will net on his investment ultimately a return of 8% yearly,

with interest compounded on deferred payments; provided only that the traffic will, in the course of time, bear a rate high enough to produce that amount." Should the constitutional limitations protecting private property invested in public utilities be so interpreted as to force legislatures in fixing rates to take deficits into account? We shall come back to this question later.

The implication of this ruling may be extended further. As the court says: "A company which has failed to secure from year to year sufficient earnings to keep the investment unimpaired and to pay a fair return, whether its failure was the result of imprudence in engaging in the enterprise, or of errors in management, or of omissions to exact proper prices for its output,[21] cannot erect out of past deficits a legal basis for holding confiscatory for the future, rates which would, on the basis of present reproduction value, otherwise be compensatory." This statement reënforces what was said before. Any deficit, whether incurred initially or after the enterprise has acquired a profitable business, may not become the basis for the allowance of an intangible property right which the legislative power must recognize in fixing rates. On the other hand, judicial rules of valuation do not preclude the conclusion that the legislature *may* recognize such deficits in its future rate-adjustments. What else can the court have in mind when in the concluding paragraph it refers to good-will and earning power as due to effective organization and insists that "they, like past losses, should be considered in determining whether a rate charged by a public utility is *reasonable.*" Note that the court says "reasonable," not "confiscatory". To make the point doubly sure the paragraph ends with this sentence: "Going-concern value and development cost, in the sense in which the master used these terms, are not to be included in the base value for the purpose of determining whether a rate is *confiscatory.*"

(b) *An allowance for going value is a matter of legislative policy.*

If the above interpretation is correct, the recognition or non-recognition of "going value" in the Wisconsin sense becomes a matter of public policy. This in truth was the point of view of Commissioner Halford Erickson, who, as chairman of the Wisconsin Railroad Commission, left the impress of his thought upon the policies of that commission during the years when these policies were in the formative state. No one can read the

[21] Judge Ransom makes a good point that such omissions may be due to legislative ineptitude in fixing rates in spite of protest from the utility.

excerpt from the Antigo opinion without appreciating that the aim was to build up a workable scheme of rate-control which would enable a commission to find a reasonable solution for past difficulties. Some one has well said that the definition of reasonableness is doing justice in hard cases. It is in this mood that the Wisconsin concept of going value finds a scientific application.[22]

Sec. 8. **An Economic Interpretation of Going Value**

An economic principle is involved in these considerations which has never been brought to bear upon the question at issue. It is perhaps unnecessary to demonstrate once more that public utilities, taken as a class, are subject to the law of decreasing costs, resulting in a periodicity in the flow of net income. It would be rare, indeed, if such an enterprise could be self-supporting from the beginning.[23] It would be equally rare if net income came as an even flow. The plant, as an original proposition or as a dynamic thing, has to be so designed as to provide a certain capacity. The exigencies of finding suitable locations, of long-run economy in construction and operation, are such that public utilities must anticipate a future demand. On this account the following statement of Justice Brandeis is not the whole truth: "The fact that a sometime losing business becomes profitable eventually through growth of the community or more efficient management tends to prove merely that the adventure was not wholly misconceived." That may be true enough in those instances where public utility plants were constructed during boom periods and where the community failed to develop to boom expectations. Receiverships and reorganizations have usually liquidated such losses, and legislative policy cannot be required to look back of that return.

But how about a mistaken legislative policy which insists upon dividing the business among competing plants? It is, of course, a risk inherent in all economic enterprises that they must conform to the all-embracing economic equilibrium which

[22] Early annual deficits may be overcome later by annual surpluses, so that there are no net deficits and hence no going value.

[23] A careful investigation by F. W. Doolittle in connection with a valuation of the elevated railways in Chicago disclosed that five years were required for the business to attain full development. The average degree of utilization of facilities during the first five years was approximately 80% of that attained during the sixth year. A claim for going value equivalent to one year's interest during construction was accordingly set up as constituting a measure of going value.

adjusts supply price to the demand. However, many situations will be found where public utilities were begun as a matter of public convenience and necessity but where a period of preliminary waiting—not to say of readiness to serve—accompanied by solicitation for increased custom, was necessary to develop the requisite demand. In such cases a legislative policy of rate-making would be economically unjust which would not permit some recoupment of early losses to investors through increased earning power at a time when full utilization had been attained. Such a procedure would, of course, require the exercise of judgment. It could not be reduced to a formula applicable in all cases. But this is no valid objection, because the whole policy of regulation is based upon the exercise of official judgment in economic matters.

Has proper weight been given to another consideration of importance? In this country we are building up a policy of regulation which was an unknown quantity twenty years ago. Certainly twenty-five and thirty-five years ago public utility managers were given a freer hand in the development of the earning capacity of their properties. The scope and rules of public utility regulation are in a state of flux. The entire valuation problem bristles with difficulties in which *ex post facto* considerations are being applied in finding current solutions. Franchise rates are being abrogated or the terms completely revised, because we are finding that the fixed-rate type of regulation is hopelessly inadequate to the task. Do not these modifications suggest the need for recognizing going-value so that reasonable expectations will not be disappointed?

If the rules of the game are thus to be revised by means of an all but omnipotent police power, ought not a wise public policy give discretion to an administrative commission with the responsibility for future service, so that it may round off the edges of these changes by means of a "going-value" concept which recognizes an equitable claim on account of past losses? Justice Brandeis' decision points the way by eliminating "going value" as a judicial concept which legislatures disregard at their peril. According to this view the definition and measurement of going value in each case are concerns of legislatures, and of commissions acting under legislative authority, not under the authority of judicial opinion. This will enable administrative commissions, in dealing with particular facts in special cases, to build that bridge from rate-control in an inchoate state, when the rule of *Smyth* v. *Ames* must be applied to one in which the

elements of rate-regulation stand clearly revealed, and when, consequently, a new rule of rate-making becomes feasible.

Sec. 9. **Accrued Depreciation and the Rate-Base**

Finally, we come to the treatment which should be accorded to accrued depreciation in the fixing of an initial rate-base. An adjustment may be necessary sometimes on account of accrued depreciation. Except in the rare case of a plant, constructed since commission regulation began, which has adjusted its depreciation policies along the lines of procedure outlined in Chapter XV, the public utility corporations are the owners of depreciated plants which may or may not have set aside out of earnings enough funds in order to provide for the retirement of the cost of property no longer used and useful. Obviously, this determination is closely bound up with the question of uncompensated losses, because a depreciation charge is an operating cost. It may, therefore, become necessary to determine whether, perchance, dividends or interest payments have come out of capital, and give recognition to this fact in a reduced initial rate-base.

The question whether estimates of accrued depreciation should be deducted from the cost new of the property in determining a rate-base is another focal point of conflict. As is so often the case, the conflict is due to a misunderstanding of the real purpose of depreciation charges, and this misunderstanding has in turn engendered practices which stand in the way of a return to correct principles. The difficulty again arises out of the failure of the contending parties to adopt the going concern theory of regulation.

Depreciation, we have seen, has two aspects: (1) The periodical allowance of an amount as operating expenses to cover the estimated periodical cost of the wastage of capital; (2) the balance remaining over from such allowances, after the wastage of capital has been "made good", which represents the estimated amount of accrued but unmatured depreciation. These at least are the aspects in which depreciation is the primary concern of the accountant and economist.[24] Recently there has been a disposition in some quarters to look upon depreciation from an engineering point of view. Expenditures required in maintaining a physical plant in proper operating condition—at so-called 100 per cent. efficiency—are not depreciation expenditures at all

[24] *Cf.* Kester, A., *Accounting*, Vol. II, Chapters VI to XI.

but maintenance. In accordance with this view depreciation sets in only when there is a failure to maintain operating efficiency. It is then called "deferred maintenance".[25] The economic hypothesis is that depreciation represents an annual charge necessary as part of the cost of service in order to keep the capital fund or investment intact. The hypothesis which underlies the engineering conception is that depreciation represents a failure to maintain efficient operating standards so that service has deteriorated and additional expenditures will be necessary to restore normal operating efficiency. Properly understood, there is no conflict between the economist and engineer.

Unfortunately, however, the subject has been further complicated by the laymen's view of depreciation as revealed in the usual dictionary definition of depreciation that it represents "the lessening of worth" of a commodity, something akin to "second-hand value". For this reason the courts, following earlier engineering practice, have taken the cost of reproduction new *less depreciation* as the "present value". It is this "present value" that courts sometimes have in mind in their valuation decisions. Even Justice Rosenberry in the Waukesha case, cited above, lists it among the evidentiary facts which must be considered. Curiously enough, upon further analysis an offsetting element was found, called "adaptation and solidification" or "seasoning". This was accordingly treated as appreciation or increase of worth. The same idea underlies the treatment of land values.[26] The present, imputed market value of a parcel of real estate above its cost has been called appreciation. All of these ill-assorted conceptions of appreciation and depreciation were then merged in the requirement laid down by our courts, that the "fair value" had to be the "present value" of the property at the time it was being used for the public service.

In conformity with this ruling the state commissions interpreted the "fair value" of *Smyth* v. *Ames* as "cost of reproduction new less depreciation," or "historical cost less depreciation," or some uncertain combination of the two.[27] The public utility companies soon protested, arguing that depreciation does not constitute a lessening of "fair value" because a sea-

[25] *Cf. In Re. Theoretical Depreciation*, a brief prepared by J. Allison, Valuation Engineer, and presented in evidence to the New York Public Service Commission, First District, by the Consol. Gas Co. of New York, (1923).

[26] See *Minnesota Rate Cases*, 230 U. S. 352, 434 (1913).

[27] Another confusion arises on account of the failure to distinguish between "fair value" in rate cases and "just compensation" in purchase cases.

soned utility, well maintanied, is capable of rendering at least as good service as a new plant.[28] Gradually the truth of this assertion dawned upon regulating authorities and they began using cost of reproduction new undiminished by depreciation. Each new conversion was hailed with satisfaction by the technical journals.

In the end the entire conception of depreciation was eliminated as unscientific or, at best, as theoretical. It was condemned as a device for the confiscation of property values under the guise of rate regulation. The final result of the agitation has been that the National Association of Railway and Utility Commissioners has recommended the adoption of a "retirement reserve" as a substitute for the "depreciation reserve" as standard accounting practice in its uniform classification of accounts for gas and electric utilities. The term depreciation has disappeared, and in its place we now have "retirement expense." The new procedure lays bare the functional purpose of these reserves, but *threatens* at the same time to slide over the primary object of depreciation charges, namely, to require the purchasers of service during an accounting period to pay for the estimated cost of that portion of the journey of physical capital on its way to the scrap heap, which is comprehended within the particular accounting period, even though its physical retirement may be many years distant.[29]

This explanation should make clear that the term "present value" in the sense of cost new less depreciation is entirely devoid of meaning and significance under regulation.[30] Accrued depreciation, under the going concern theory, should not be deducted from the cost new in determining the rate-base because these estimates of accrued depreciation were not made for valuation purposes but solely for the purpose of determining one

[28] The writer has often met the statement that the Railroad Commission of Wisconsin uses "present value" in this sense. This conclusion is based upon an erroneous interpretation of its decisions. The Commission until recently did use the appraised cost of reproduction new *less depreciation* but added the accrued depreciation reserve.

[29] It cannot be asserted that the annual depreciation requirement is something that can be estimated with exactitude. The assignment of lives is complicated, of course, by the difficulty of determining the "unit of property," by including obsolescence, municipal requirement and inadequacy among the factors controlling life, and by the practice of rebuilding units of property so that the life is prolonged. These problems can be adequately met by an accounting procedure which provides for detailed recording of property changes.

[30] Not "fair value" but "present value" is the judicial valuation concept which Mr. Henderson ought to have selected to be consigned to the limbo of forgotten concepts. Compare footnote p. 481.

element, namely depreciation, in the estimated cost of the service. The accumulated total of these annual estimates as derived by appraisal merely serves as a guide in testing the adequacy of the actual reservations, as shown by the books of account.

It may well be that a particular utility has failed to earn enough so that it could accumulate an adequate depreciation reserve. In that event an estimated annual allowance for depreciation will merely help in determining the amount of uncompensated losses which may or may not be taken into account in allowing going value. If rates and also earnings have been adequate so that an accounting reservation for depreciation might have been made, but the utility has instead paid out these amounts in dividends or kept them in its surplus account, it is a matter again within the discretion of commissions whether an amount equivalent to an adequate depreciation reserve should be deducted from the rate base. It may well be that a better remedy would be to require a gradual building up of the reserve out of surplus without requiring present or future consumers to bear this burden in higher rates. In this case the accrued depreciation should not be deducted. The objective should be that the utility be required to work toward a situation in which its depreciation reserves are again adequate.

Sec. 10. **General Summary**

Necessary reconciliations in adopting a scientific rate-making rule for the future may be summarized by saying (a) that no allowance is necessary for what has been called "franchise value" when an allowance has been made for the cost of acquiring franchises in the appraisal of the going plant; (b) that no allowance is necessary for good will because it has always been the duty of public utilities to render reasonably adequate service at reasonable rates; (c) that an allowance for going value may be necessary in those cases not representing abnormal conditions where clearly established uncompensated losses in the past have not been recouped by higher earnings, and where these losses would prevent owners from realizing that reasonable return which was within the limits of a reasonable expectancy; (d) that accrued depreciation should not be deducted unless other methods of again making depreciation reservations ample without burdening future consumers can not under the circumstances be adopted.

An alternative that suggests itself is that even these reconcil-

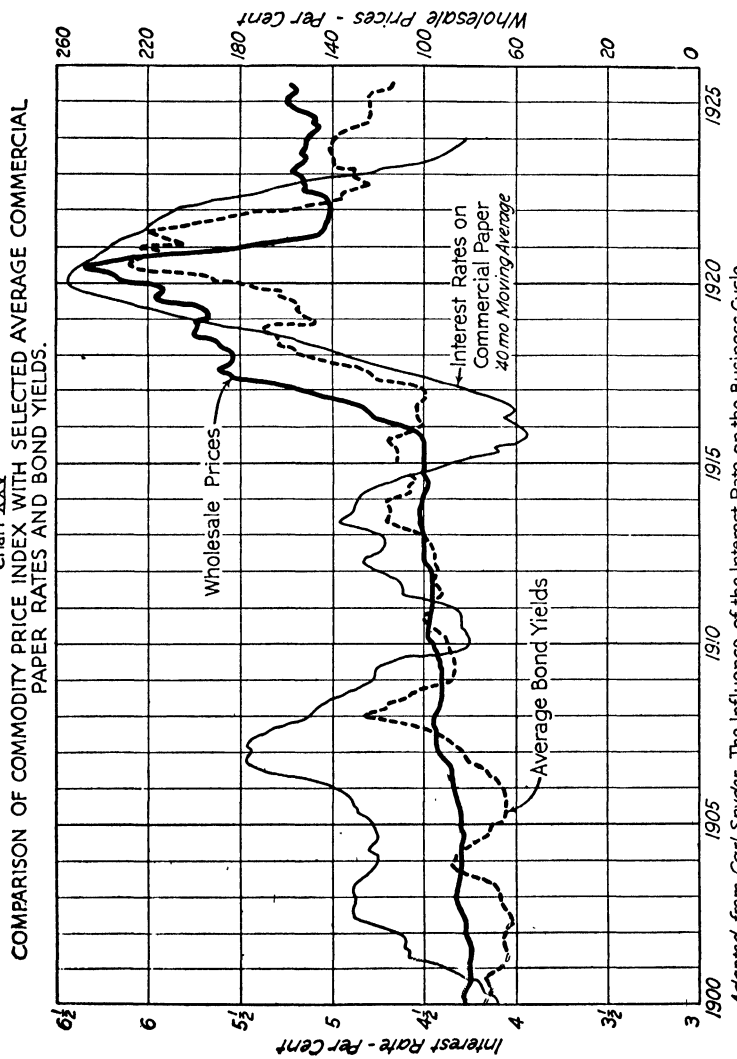
iations, such as an additional allowance for going value or a deduction for accrued depreciation, be regarded as temporary expedients. The going value may be amortized under arrangements which would not prove burdensome to consumers, and the deduction for accrued depreciation may be eliminated as actual depreciation reservations from future reasonable earnings again bring depreciation reserves up to a reasonable level.

Since public utilities render a service which must be supplied continuously they should be regulated upon a theory that they are or will become going concerns. They are secured in their market position by means of governmental grants which are either expressly monopolistic or tend to become such under the pressure of uneconomic competition. They have voluntarily invested their capital upon the implied assurance that they will be permitted to earn reasonable returns. Under modern conditions of regulation the investment of capital may even be compelled by governmental authorities or it is at least invested subject to governmental authorization and approval. Under these conditions of regulated monopoly, the true economic standard for determining the rate-base is the investment standard.

The rate-base consists of capital which has been contributed to the going concern by either owners or creditors. The rate of return must therefore be sufficient to cover interest upon the funded and unfunded debt as well as reasonable dividends upon the various classes of preferred and common stock. The rates should be so adjusted as to enable the utility to earn this reasonable sum. If the rates can not be so adjusted as to enable the utility to earn this return the enterprise is submarginal, even though it be a monopoly. The owners of the property will then be obliged to accept less than the reasonable dividend rate, because regulation does not constitute a public guaranty of the reasonable income.

The reasonable rate of return upon the rate-base must fluctuate with the average interest rates which the going concern actually pays upon its borrowed capital. This procedure will permit owners to earn at least an interest return upon their portion of the invested capital. This interest rate paid by a utility will tend to vary with changes in prices, because, as the general level of prices advances, the market rates of interest, as shown in Chart XXV, p. 506, advance also.

The reasonable rate of return must be in excess of average interest rates paid by an amount which properly expresses the degree of risk which attends the earning of a full interest return



Adapted from Carl Snyder, The Influence of the Interest Rate on the Business Cycle Amer. Econ. Rev. Vol. XV, p 693, Dec. 1925

upon the total capital invested in a particular enterprise. This additional return may be expressed as a differential rate allowed above average interest rates. The differential can only be fixed by agreement between government as representative of consumers and the public utility or by an agency such as an administrative commission which acts in a semi-judicial capacity. This differential may be so arranged as to offer an inducement to the company to keep its credit standing high by allowing a higher differential as the annual average interest rates decline.

Ordinary variations in prices and interest rates should have no effect upon the rate of return because public utility capital should be supplied from investment sources and not speculative sources. Emergency conditions may be recognized by providing that if average interest rates paid rise above a fixed maximum average interest rate, an emergency rate of return shall be fixed under a supplemental agreement or left to arbitration.

The price at which public utility securities must be sold in the investment market thus becomes the true economic index by means of which public utility investments of capital are compared with other applications of capital in competitive industry or government finance. The true economic standard of valuation of a monopolistic as of a competitive enterprise is the capitalization of its expected net income. It is, however, the function of regulation so to adjust the earning power of public utilities in relation to the rate-base that the rate of return allowed approximates the capitalization rate applied in the money market. By this means alone can the needed capital be secured upon the lowest possible terms.[31]

[31] The point of view presented accords with a recent opinion of the Interstate Commerce Commission in the O'Fallon case. *Excess Income of St. Louis and O'Fallon Railway Co.*, Finance Docket No. 3908, and *Excess Income of Manufacturers' Railway Co.*, Finance Docket No. 4026; decided Feb. 15, 1927. For further discussion of this case and the controversy over valuation, see article by the present writer entitled, "The Valuation Doctrine at the Crossroads," in *Journal of Land and Public Utility Economics*, for August, 1927.

CHAPTER XXIII

PUBLIC UTILITY LABOR POLICIES

In the development of the public utility problem investment relations have thus far been in the center of attention. In recent years, particularly since 1910, labor relations have come to the fore and are being made the subject of intensive study by economists, the public utilities, and government authorities. Such study has revealed that the labor or wage bargain contrasts markedly with the other bargains which are made within the going concern. It has appeared, for instance, that the labor bargain has been subjected to less regulation. Managerial initiative has, on the whole, been little circumscribed. The large element of volition in the labor contract was universalized by the 13th Amendment of the federal constitution (1868) prohibiting involuntary servitude, and the policy of the common law which seeks to maintain freedom of individual contract.

Management, however, has not been equally able to take advantage of these legal rights as have the employees because of the element of compulsion which rests upon the public utility corporation to give continuous service. No such obligation rests upon labor, except as it is recognized to be a moral obligation. In reconciling the freedom of the one with the compulsion of the other, labor relations of public utilities meet most difficult legal and psychological problems. The labor problem, therefore, represents one of the best illustrations of the need for that wise balancing of social and individual interests which is so important a procedure in the development of all public utility relations.

The chief reason for the recent interest in the labor bargain of public utilities is that, with the very rapid increase in the cost of living since 1916, rate increases, particularly in the case of transport utilities, have often been necessitated by wage increases, granted sometimes to the accompaniment of strikes and labor disturbances. On street railways, for instance, between 1907 and 1917 wages increased 31 per cent. With our entry into the world war, the increase was accelerated so that they stood

about 150 per cent. higher in 1920 than in 1907. In the gas industry increased material prices have been a more important cause of rate increases. In the electric industry coal costs have figured prominently because they constitute about 60 per cent. of the total cost of generating electric power. In all of them, however, labor costs have figured more largely in recent years than have increases in the cost of capital.

Sec. 1. The Importance of Wages in Operating Costs

It seems best to begin the discussion of the labor policies of public utilities with a few facts showing the importance of wages in the total cost of service. A detailed examination of available statistics shows that the wage bill varies among the different utilities, and that it differs also among organizations in each industry. Nevertheless, certain normal ratios express its importance for each industry. For steam railways wages and salaries now constitute about 60 per cent. of the operating cost. In recent years they have varied between 60 and 64 per cent. For electric railways the ratio varies between 51 and 55 per cent. The telephone industry is third, with a ratio varying between 40 and 54 per cent. Water utilities [1] show a ratio varying between 35 and 40 per cent., manufactured gas utilities between 20 and 24 per cent., and electric utilities between 19 and 30 per cent. The present tendency of the ratio is downward.

Although these approximations show roughly the relative financial importance of labor relations for the more important public utilities, the ratios do not take account of the large element of labor which is also in construction cost. No detailed estimates are available for both operation and construction. It is interesting, however, to observe the importance of the wage bargain in industry generally. Figures, showing how the total national income is distributed between wages, land rents, interest, and profit, indicate a distribution "approximately 68% to labor, 8% to land rents, 16% to interest, and 8% to profits in excess of a normal interest rate." [2] Labor relations, when thus placed under a common financial denominator with other business relations, are found to be of greater economic importance than any other single group.

[1] Based on estimates for Wisconsin water utilities.

[2] Rorty, M. C., *Some Problems in Current Economics*, A. W. Shaw Co., New York, 1922, p. 29.

Sec. 2. Fundamental Conditions Affecting the Public Utility Labor Bargain

Labor must not be considered as an undifferentiated thing. To regard all labor as essentially alike is a fundamental mistake which beginning students frequently make. The same mistake was made also by early economists. Modern students of the labor problem have approached it in a more realistic fashion by recognizing fundamental differences in the kinds of employment. What are the fundamental differences that distinguish public utility employments from other commercial pursuits?

(a) *Regularity of employment.*

The first condition to be noted is that public utilities offer more regularity of employment than do ordinary commercial enterprises. They can offer the employee a stability of income not generally found in competitive industry. Although the trade cycle, the ebb and flow of business activity, affects these industries, its influence upon them is much less marked.[3] The reason for this is that they get the benefit of market diversity by selling service to many different kinds of customers, to domestic consumers, governmental units and industrial enterprises. Governmental and domestic customers make a relatively constant demand. So do industrial users taken as a class. While some enterprises are languishing, others are in a prosperous condition. Although there is thus some variation in the demand for service, public utilities almost never experience a complete shut-down.[4] This means that a very substantial minimum of employment is available at all times, and that a large number of employees can enjoy almost complete regularity of employment. As to the remainder of the operating personnel, the policy obtains that public utilities will "pick up" personnel during periods of prosperity, and "sift" during periods of depression. However, with the certainty that business will improve, and

[3] In the case of electric utilities, however, the increasing amount of energy sold to industrial power customers is introducing greater sensitiveness in the dependence of operating revenues upon industrial conditions.

[4] It has been estimated that the seasonal fluctuation of employment for all employees of steam railways averages 10%. The greatest seasonal fluctuation exists for maintenance of way employees, somewhat less for employees concerned with maintenance of equipment, still less for those engaged in train movement, and least for those in clerical positions. Abnormal circumstances, such as the "contracting out" of repair work may disturb this stability however.

that, in the meantime, continuity of service must be maintained, the retention of a complete operating organization is an essential of public utility labor policies. Unemployment and employee turnover can thus be reduced to very low terms.

(b) *The social importance of public utility employment.*

Public utility employment is next to government employment from the standpoint of its social importance. The rendition of service should consequently be in the hands of a personnel of probity, dependability, and skill. Fortunately, liberality and certainty of payment are within the gift of these industries. When to such considerations are added these, that the daily tasks and the recurring problems possess a large technical interest, that unusual positions of power and trust are found at the apex of the "industrial pyramid," then it is easy to understand why public utilities have, on the whole, been able to attract and hold men of the requisite talent and training. Public utility corporations are large institutions, affording manifold opportunities for self-improvement and for pecuniary advancement. Scope is offered for the employment of a large variety of talents, from the "technique" of the specialist to the "capacity for detail" of the administrator, and the "constructive imagination" of the organizer and promoter.

Wage and salary scales have risen rapidly in recent years. Whether they have become adequate is as yet an unanswered question. It is significant to note, however, that the question is being raised whether some classes of public utility labor occupy unduly preferential positions on account of their strategic situation, and whether with the close coöperation between men and management in some cases, an alliance may not take place to the detriment of consumers.

As ownership of securities becomes more widespread, the "close corporation" is becoming a thing of the past. This fact, together with the increasing adoption of employee representation plans, is tending to place promotions upon a fairer and more competitive basis. Favoritism and corporate nepotism, which have so often characterized public utility employment in the past,[5] is thus being eliminated.

[5] There has been some criticism of the policy of public utilities in filling higher positions by "inside promotions" or upon the "seniority principle." "New blood" may stimulate the morale of an organization and overcome the tendency toward "frozen brains" which these policies incline to beget.

(c) *Regulation by government.*

On the other hand, public utilities are industries whose earning power is limited by government. A limit is thus placed upon the different forms of income. Unless management can secure an increase in its earning power, wage levels cannot be increased or they can increase only at the expense of income to stockholders. A proper appreciation of the dependence of wage levels upon what is a fair price to consumers and a fair return to other elements of the going concern is thus important.

No less important is the "public relations" element, which throws the service into the white light of publicity. Railway trainmen and electric railway carmen are always under public observation. The location of the plant on customers' premises and upon the public streets renders operation subject to public inspection and criticism. It is also one of the peculiar characteristics of certain utility jobs that they are performed out of touch with immediate supervision. "Dependability" thus means responsibility in the absence of supervision. This is what is referred to in the utility slogan, "To the public you are the company."

All these considerations make it necessary that labor be accurate, reliable, even-tempered, specially trained, and imbued with a spirit of team-play. In short it must be disciplined as well as coöperative. The field of public utility labor policies has consequently become one of the great experiment grounds for many of the latter-day experiments in industrial government.

(d) *Continuity of service.*

Public utilities also render services which can suffer no interruption of magnitude, for without them communal life would become ineffective, if not paralyzed. Thus the largest measure of public interest attaches to the need for continuous service. We may consider for a moment what interruption would mean. Industries supplying transportation, water, gas, electric light and power, are key industries. As individual consumption goods, they are no longer luxuries, but have become indispensable conveniences or necessities. We need but reflect upon the importance of public lighting for police protection, of a public water supply for fire and sanitary protection, of transportation and communication services in the protection of public peace and order, to appreciate that these communal services are the material basis of good government. Urban transportation sys-

tems are a necessary adjunct of city life. In our larger cities the "high resolve to walk" is out of the question. This situation, particularly, casts responsibilities upon public utilities which employees must take into account. Continuity of service *alone* makes necessary a labor policy in which the rights and duties of employees are as well defined as the law has defined those of owners, investors, and the consuming public.

On account of the nature of the service, or the non-storability of the product, production must be continuous. Practically all utilities now render twenty-four hour service, with Sundays and holidays constituting no exception. They are picturesquely described as businesses in which "the whistle never blows." This means that labor will be divided into day and night shifts, that jobs will exhibit a greater "spread of duty" than jobs in industries which are less at the beck and call of consumers. Public utility employments must be fitted into the community's general habits if the services which they render are to give complete satisfaction. Moreover, there are difficulties arising out of peak service, requiring a concentration of labor force at particular times. In some cases the hazardous nature of the employment needs also to be taken into account.

Sec. 3. **Methods of Bargaining**

The willingness of the employee to work can not be obtained by coercive means. He must be *persuaded* to join his labor with that of others in the accomplishment of common tasks. Labor relations consist of the ways and means which society has adopted for bringing labor power into a coöperative concern. Obtaining *coöperation* is thus the keynote of a public utility labor policy. Different labor policies may be judged by means of this criterion.

(a) *The individual bargain.*

Historically, the first labor policy was the traditional American policy of the individual bargain. Coöperation here, in theory, rests upon the mutual consent of the individual employer and the individual employee. In practice, this policy was often a complex of arbitrary rules put forth by the employer, and premised upon absolute recognition of the right "to hire and fire," with wages adjusted as closely as possible to market rates, especially for the unskilled. It was the commodity theory of wages in operation with wages regarded primarily as an oper-

ating expense.[6] Wages were low and the hours long. With rates fixed in franchises or by competition, profits to owners appeared to be dependent upon low wages and long hours. It was a period of large labor turnover, with resulting inefficiency and high cost of service. Strikes were brief, spontaneous, destructive, and uncontrolled. It was, generally speaking, a labor policy which is the natural concomitant of the competitive principle as applied to industry. The individual bargain was applied until the events of the Civil War engendered new industrial forces that inevitably brought about a transition to new policies and a new point of view.

The evils which accompanied the individual bargain may be grouped around (a) insecurity of employment, (b) insufficiency of income, (c) undue prolongation of the hours of labor, (d) insufficient regard for the health and safety of the worker.

The political enfranchisement of labor in the early nineteenth century, and the gradual emergence of labor from that servile state which persisted to the close of the eighteenth century, has enabled the working man to lay claim to certain minimum requirements. These grew, one after another, out of changing conditions. The industrial order, so the leaders of labor contended, should protect the life and health of the worker; it should enable him to support himself and his dependents in a state of comfort with security against old age, accidents, and other forms of disability; it should afford him regularity and certainty of employment, and a working day that will provide sufficient leisure for recreation and self-improvement; it should provide him with a protective apparatus of working rules that will insure just treatment and enable him to do his work with decency and self-respect; finally, it should enable the worker to participate in the increased product of industry by affording him progressive improvement in living conditions.

In recent years a new emphasis has appeared in these demands of labor. It is a demand *to help make* the working rules by means of which the employer has hitherto laid down the disciplinary conditions of employment. All along the line, industrial authority arising solely out of property relations is being questioned. Upon a theory that employees, as members of a going concern, are entitled to be consulted, they have asserted a claim to a measure of control and responsibility in the conduct of industry, certainly in so far as concerns the industrial scheme

[6] *Cf.* Commons, J. R., *Industrial Goodwill*, McGraw-Hill, New York, 1919, chap. 8.

of government under which they are working. They have raised questions of discrimination by employers as between workers, questions concerning wages, lay-offs and promotions, concerning fines and penalties, and concerning even the very basis of the employers' traditional right to discharge. These subject matters of the labor bargain are now customarily comprehended under the simple expression of "wages, hours, and working conditions."

(b) *The change to collective bargaining.*

With the view of accomplishing these ends labor embarked upon two courses of action: one was designed to bring results by joint action through the economic method of collective bargaining,[7] which implies labor organization; the other was designed to reach specific goals by the political method of labor legislation which implies participation in politics. In both cases labor appeals not only to the working classes upon the basis of the solidarity of their interests but also for the support of those who, though only indirectly affected, may be emotionally or intellectually sympathetic. We will discuss the method of labor legislation in the following chapter because this method is based upon criteria of welfare as they affect the community as a whole.

But the interests of employers may not be left out of account. Management has been impelled to resist these demands of labor because it felt that the realization of these aims would result in the undermining of the rights of owners and investors, as provided for in our modern economic institutions. It is the legitimate purpose of management to increase output, to reduce costs and to earn adequate profits. To this end productive efficiency must be maintained, and this implies the maintenance of disciplinary control by management. Management is also under the legal obligation to render to the public adequate and continuous service at reasonable prices. It claims therefore to represent the interests of consumers in dealing with labor, and consequently bids for consumers' support in these dealings, whether the method be economic bargaining or influencing legislation.

These opposing interests meet before regulatory authorities and ought to be recognized by commissions in their administra-

[7] Collective bargaining was not the first purpose of labor organizations, yet this has now become their chief function.

tive policies.[8] They meet also before legislatures and courts, and their conflicting claims must there be compromised, harmonized, and adjudicated. Not infrequently these conflicts lead to industrial warfare, to strikes and lockouts, with their costs in lessened and interrupted service, higher expenses of operation, and distress among the striking or locked-out employees. It is in such emergencies that the public interest will try to assert itself by securing a settlement of these controversies by methods which will shortly be described. The stage settings may indicate that the battleground is in conference chambers, legislative committee rooms, or the halls of justice. The initiated know, however, that the real battleground is public opinion, and that the controversy is a warfare of social ideals.

Collective bargaining substitutes the group agreement for the individual contract, and as such is the characteristic product of the modern labor movement. The primary function of this labor movement has been to redress the balance of power between labor and capital, and to rear a structure of trade unionism which will afford the individual worker protective institutions by means of which he can bargain upon equal terms with the employer. As the concentration of capital in corporations has put the employing function into fewer hands, so the laborer felt impelled to meet organization with organization. This was earliest and easiest of accomplishment in those occupations where common interest was strong, and where labor was performed by men in strategic situations. Public utility employments were among the first to be so organized. While their first organizations in the forties and fifties were sporadic, those that came into being during and after the Civil War were continuous and permanent.[9]

(c) *Public utility unionism.*

In essence, there are now two distinct types of organizations among public utility employees. The first type is represented by national trade unions which are the product of the struggle between the employer and the employee during the nineteenth century. The second type has been called the "company union" because it is not national, or industry-wide in scope, and because

[8] Commissions have been inclined to "side step" the labor bargain, leaving the problem of securing the coöperation of labor to management.

[9] Compare the interesting history of the Locomotive Engineers by Jacob Perlman, submitted as a doctoral dissertation at the University of Wisconsin, 1926, soon to be published.

it was often initiated by managements in order to help them in finding a solution of their labor problems.

NATIONAL TRADE UNIONS. The Brotherhood of Locomotive Engineers was first organized in 1863 (then called Brotherhood of the Foodboard), followed by a similar organization in 1868 of the Order of Railway Conductors of America. A third organization, the Brotherhood of Locomotive Firemen and Enginemen, was founded in 1873, and ten years later came the last of the four Brotherhoods, the Brotherhood of Railway Trainmen. In collective bargaining, great power is put into the hands of these trade unions, because they have successfully substituted the indispensability of the group for the indispensability of the individual engaged in a strategic and skilled employment in connection with an indispensable public service. Although their leadership was from the first conservative and intelligent, the trade union movement did nevertheless have to meet the opposition of the carriers.

The first objective of the Brotherhoods was to provide mutual insurance for their membership upon advantageous terms, and upon a generally sound financial basis. Later, when their activity was extended to the negotiation of trade agreements, opposition developed on the part of their more conservative membership and from the carriers. The conductors were particularly reluctant, going so far even as to forbid the strike. By 1890, however, all of them were fairly launched upon a policy of collective bargaining. Although disapproving of strikes, and using that weapon most sparingly,[10] they have nevertheless been successful in securing for themselves better hours, wages, and working conditions. This was accomplished by relying more upon skillful negotiation with the strike threat as a trump card. On account of their aloofness from the general labor movement,—the Brotherhoods are not affiliated with the American Federation of Labor,—and their sound financial strength, they have been called "the aristocrats of labor." With about 90 per cent of the eligible workers inside the organizations, they have definitely won recognition of the principle of collective bargaining, and their executives have also been accorded recognition as responsible agents in negotiations.

Until 1914 the Brotherhoods favored the idea of arbitration of disputes as a means of averting strikes. They have also been

[10] A recent agreement between the Electrical Workers and the Commonwealth Edison Co. of New York also embodies this "no strike" policy.

TABLE XXI

GROWTH IN MEMBERSHIP OF PUBLIC UTILITY TRADE UNIONS *
1914–1925

	1914	*1920*	*1925*
Big Four Brotherhoods			
Brotherhood of Locomotive Engineers	73,800	86,697	87,400[a]
Brotherhood of Firemen and Enginemen	86,800	125,862	118,000[a]
Brotherhood of Railroad Trainmen	126,100	184,500	178,900[a]
Order of Railway Conductors of America	49,100	56,000	60,000[a]
Other Railroad Unions			
Order of Railroad Telegraphers	25,000	48,700	39,200
Brotherhood of Railway Carmen of America	28,700	182,100	125,000
United Brotherhood of Maintenance of Way Employees and Railway Shop Laborers	4,100	154,060	37,400
Brotherhood of Ry. and Steamship Clerks, Freight Handlers, Express and Station Employees	5,000	18,600	91,200
Switchmen's Union of North America	9,800	14,000	8,900
Order of Railroad Station Agents	1,100	9,000	
Brotherhood of Railroad Patrolmen		2,600	
Order of Sleeping Car Conductors		1,200	2,300
Brotherhood of Railway Signalmen of America	700	12,300	8,000
General National Unions			
Internatl. Assn. of Machinists	75,400	330,800	71,400
Internatl. Brotherhood of Electrical Workers of America	30,800	139,000	142,000
Internatl. Brotherhood of Boilermakers & Iron Shipbuilders and Helpers of America	16,700	103,000	17,100
Internatl. Brotherhood of Blacksmiths, Drop Forgers and Helpers	9,600	48,300	5,000
Amalgamated Sheet Metal Workers International Alliance	17,800	21,800	25,000
Amalgamated Assn. of Street and Electric Railway Employees	54,500	98,700	101,000
Natl. Federation of Federal Employees		38,500	20,200
Internatl. Assn. of Fire Fighters		22,100	16,000
Natl. Assn. of Letter Carriers		32,500	32,500
Natl. Federation of Rural Letter Carriers		300	300
Internatl. Longshoremen's Association	25,000	74,000	31,800
Masters, Mates, and Pilots		7,100	3,900
Internatl. Union of Pavers and Rammermen	1,600	1,900	2,000
Natl. Federation of Post Office Clerks		16,200	23,700
Railway Mail Association		14,400	19,100
Internatl. Seamen's Union of America	16,000	65,900	16,000
Internatl. Union of Tunnel and Subway Constructors	1,500	3,000	3,000

* Annual reports of American Federation of Labor, giving the voting strength of affiliated unions.

[a] Figures are for 1923, taken from Wolman, Leo, *ibid.*, p. 113.

unusually successful in securing legislation against outstanding employment evils in train operation. They introduced and strengthened the principle of seniority in promotions, and then fought for uniform schedules of wage rates and standardized working rules for individual roads and for geographical groupings of roads.

Trade union organization has also been extended to certain other classes of railway labor. Unlike the Brotherhoods, these are affiliated with the American Federation of Labor and have, since 1909, been brought together into a special federation, the Railway Employees Department, in order to compose jurisdictional disputes among them, and to unify their policies and activities into a common plan of action against the carriers. Institutional differences must also be recognized by labor.

Another important national trade union affecting public utilities is the Amalgamated Association of Street and Electric Railway Employees, organized in 1892. In 1910 it comprised 160 local unions with 36,700 members, which grew to 187 locals by 1916, with 64,600 members, and to 328 locals by 1920, with 98,700 members. During the war period it claimed an increase in membership in excess of 40,000.

Competing organizations, based upon a different philosophy of labor organization, arose from time to time. The Knights of Labor, organized in 1869, aimed to bring within its fold all ranks and conditions of laborers, with the view of improving their general status, particularly that of the unskilled. The American Railway Union, created in 1893 under the guidance of Eugene V. Debs, aimed to combine all railway workers into one industrial union. After waging the unsuccessful Pullman strike in 1894, this organization disappeared.

The present extent and membership of railway labor organizations and of certain other public utility trade unions is shown in Table XXI. It is interesting to compare the extent of trade unionism in different lines of industry. In a recent study [11] it was found, upon the basis of figures for 1920, that of those eligible to join, industries concerned with the extraction of minerals were organized to the extent of 41 per cent., transportation industries 37.3 per cent., building trades 25.5 per cent., manufacturing industries 23.2 per cent. Industries comprised within the transport group show the following degree of organization for the last census years:

[11] Wolman, Leo, "Growth of American Trade Unions, 1880-1923," *National Bureau of Economic Research*, New York, 1924, p. 86.

	1910	*1920*
Water Transport *	28.9%	85.5%
Steam Railways	23.5	57.5
Electric and Street Railways	21.8	52.9
Telegraph and Telephone †	10.2	25.4
Post	31.6	24.8
Teamsters and Chauffeurs	7.0	11.9
Construction of streets	2.4	8.3

* Great increase in 1920 due to longshoremen and seamen.
† The number of railroad telegraphers was three times as large in 1920 as in 1910. Organization among commercial telegraphers was insignificant.

Some of the membership of the unions included in Table XXI is distributed in industries outside the railroad field, either in other public service industries, or in competitive industry.

The attitude of employers toward these developments in public utility labor policies was, at first, hostile. Essentially it was one of refusing to deal with the unions. This is still the attitude of an important group among them. Even after trade unions had been tacitly recognized by negotiating trade agreements, employers often proved unwilling to accept arbitration as a means of allaying conflict with the unions if agreements by direct negotiation could not be obtained. Trade unionism and arbitration were regarded by them as an encroachment upon their traditional right to be masters in their own house and to settle their own affairs. The attitude of one utility was typical. After a severe street railway strike in Milwaukee on May 4, 1896, the local company took the position: "We cannot under any circumstances yield the right of deciding for ourselves all questions as to the executive management and policy of the company." More recently, particularly since the close of the World War, the employer's attitude is one which, while accepting collective bargaining and the trade agreement as cardinal principles in a labor policy, is nevertheless antagonistic to a recognition of the "old line" craft union, having a national organization, and affiliated with the American Federation of Labor.

COMPANY UNION OR INDUSTRIAL REPRESENTATION PLANS. In taking this position, some employers are, however, willing to recognize the representatives of new organizations created for the purpose of collective bargaining but comprising only their own employees. These are, in effect, industrial unions, but of a peculiar type, since they include only employees within a single ownership group. Company unions may be distinguished from trade unions in that they usually include supervisory employees who belong in the salaried class, while trade unions exclude them.

In theory these organizations do not discriminate against employees who are members of national trade unions, but they refuse to accept the paid officials of such national organizations as accredited representatives with the capacity to make binding agreements for all employees, whether they are trade union members or not. On this account, these organizations have been called "company unions," and they thus constitute a new development.

It would unduly expand the treatment of this subject to present a description of the organization and functioning of company unions.[12] Outstanding illustrations are the "Employee Representation Plan" of the Pennsylvania Railroad, the "Philadelphia Plan for Collective Bargaining and Coöperative Welfare" of the Philadelphia Rapid Transit Co., and the "Employees Mutual Benefit Association" of the Milwaukee Electric Railway and Light Co. Of these three plans, the Pennsylvania plan of collective bargaining bears the closest resemblance to the methods adopted by "old line" trade unionism. The Philadelphia Rapid Transit Co.'s plan, in its present development, represents collective bargaining, modified by employee stock-ownership and representation upon the Board of Directors. It depends very much for its success upon the confidence which the membership reposes in President T. E. Mitten of the Philadelphia Rapid Transit Co., the originator of the arrangement. The Milwaukee plan is collective bargaining, modified by something approaching the gild form of industrial control. The aim is to amalgamate all the workers,—manual, mental, and managerial—into a single unit which is dominated by a common purpose, namely, to render reasonably adequate public utility service at a cost which will afford all elements of the producing group a reasonable income.[13]

Sec. 4. **The Collective Bargain or Trade Agreement**

We have thus arrived at a point in the development of labor relations where the collective bargain or trade agreement fixes

[12] For a description of some of these plans see Lauck, W. J., *Political and Industrial Democracy*, Funk & Wagnalls Co. (1926).

[13] The argument has been made that competitive conditions do not require national organizations in the case of public utilities not subject to such competition and operating in only a local market. This argument has some merit but it is also true that in the adjustment of wage rates, comparisons are made between rates paid in different localities. Competition in bargaining, is therefore present. For instance the Philadelphia Rapid Transit Co. until recently adjusted the wages of its platform labor upon the basis of

the terms and conditions upon which laborers perform their functions within the going concern. Many small concerns still have individual bargaining, but most of the large concerns bargain collectively.

It is also impossible, within reasonable limits of space, to discuss the concrete terms embodied in trade agreements except in a most general way. Collective bargaining is premised upon the idea of securing equality of bargaining power. It is precisely at this point that the individual contract system had broken down. The development of the corporate form of organization and its expansion into great systems held under common ownership had not only arrayed a single public utility but combinations of public utilities upon one side of the labor contract. Trade Unionism, particularly in the railroad field, developed first a system organization and later a national organization to cope with the organized strength of the employers. It is certain that a nearer approach to equality of bargaining power is gained when a national union of employees, protected by strike funds and a well-disciplined organization, bargains with the management of a large public utility corporation, which may be one of a group of syndicated properties. This, it seems, is the strength of the old-line type of trade union, and the particular in which the company union is weaker.

Another consideration involved in the collective bargain is that negotiations take place through representatives. The corporate form of legal organization, as we have seen, provides for this through the official personnel. In order to assure this right to employees under collective bargaining plans which are of the company union type, representatives who are fellow-employees are chosen by ballot. In the case of old-line trade unions these representatives usually are the hired agents of either the national or local organization. They are not fellow employees acting in the dual capacity of employees and negotiators. This, it is argued, is a source of bargaining strength for old line trade unions.[14]

If collective bargaining assumes organization on both sides,

average wage rates paid in Buffalo, Cleveland and Chicago. *Cf.* Saeger, H., "Company Unions versus Trade Unions," *Amer. Econ. Rev.*, Vol. XIII, p. 1.

[14] Proponents of the trade union claim that not enough opportunity for meetings and for free discussion is provided under the company union plan, and that management always keeps its finger upon the pulse of the organization. This is probably correct; yet some of the better established of company unions have developed a considerable tradition for independent action and may, in time, come to represent a very desirable form of collective bargaining.

it also assumes that the bargain ultimately agreed upon will be embodied in writing, analogous in form to contracts, which both parties are pledged to keep in good faith. Such working agreements are designed to serve as the basis for coöperation for a definite period of time. Reciprocal rights and duties are mutually recognized and provisions are made for securing, so far as possible, enforcement of the terms. The subject matter of these rights and duties are the terms upon which it is agreed that individual contracts shall be made and work shall proceed. We have grouped these terms around the three subjects of (a) standardization of wages, (b) standardization of hours, and (c) standardization of working conditions.

(a) *Standardization of wages.*

The most important terms of operating agreements relate to the schedules of wage-rates paid for the different employments. It became customary during the period of the World War to apply a wage scale which was designed to yield a necessary minimum income, related more or less definitely to the cost of living. But the schedules were in the form of classified wage rates that recognized differentials based upon skill, training, risk, seniority and other factors. Quite frequently, of late, bonus and profit-sharing became an integral part of the wage payment in order to stimulate efficiency. Employees are classified into groups according to class characteristics, and they are paid the wage-scale which applies to their classification. The collective bargain thus seeks to eliminate one grave defect of the individual bargain, the tendency toward arbitrary discrimination and favoritism.

The minimum wages specified may have been fixed by legislation for certain classes of employees regarded as needing legal protection. This is true, for instance, of wages fixed for women telephone operators in some states. Sometimes, when the representatives of management and of employees were unable to reach an agreement in the adjustment of new wage scales, this issue has been voluntarily submitted to a board of arbitration. In these cases figures compiled by the Bureau of Labor showing the changes in the cost of living have often been used as a guide. By the use of index numbers it was sought to calibrate wages with the cost of living, thus making either the existing standard, or an artificially selected standard the basis for wages. The War Labor Board and the Railroad Wage Boards during government operation of the railroads used this standard for the period

of rapid price changes. The procedure adopted usually was to make wage agreements subject to semi-annual revisions. Table XXII, p. 525, shows the variation in the average level of wage payment by census years since 1902.

(b) *Standardization of hours.*

In the days of the individual bargain the normal working day in public utility employment was unstandardized and inordinately long. From twelve to sixteen hours per day was not an unusual length for the normal working day of railway trainmen and electric railway carmen. These long working hours were reduced as a result of efforts of the trade unions. In 1907 Congress passed legislation fixing the maximum consecutive hours of service for employees having to do with train operation at sixteen. Thus it was recognized even in emergencies that undue prolongation of the working day endangers the safety of passengers and is injurious as well to the health and safety of the workers. At the present time the eight or nine hour normal working day is well-nigh universal, and the trade-union agitation for a maximum length of the normal working day, as specified in wage agreements, is no longer so significant. Efforts are now being concentrated upon securing time for rest and recreation in the Saturday half-holiday and annual vacation. All these considerations are in the interests of preserving the health and increasing the efficiency of the worker. We must, however, recall that in view of the character of the employment complete equalization of the working day is not always possible, that there must be day and night workers, and that periods of working time must be adjusted to the daily, weekly and seasonal peaks of traffic.[15] On electric railways, for example, there are provisions that the eight or nine hours of the normal working day must be completed within from 12 to 15 hours, this latitude being given in order to enable the schedule department to take care of the peaks of traffic.

(c) *Standardization of working conditions.*

Other terms of the agreement relate to working conditions. For our purpose we may group them under two headings, (1) the elimination of industrial hazards, and (2) the provision of a scheme of industrial government.

[15] *Cf.* Lescohier, D. D., "Labor Conditions in the Public Utilities of Wisconsin (doctoral dissertation), *Report of Bureau of Labor and Industrial Statistics*, 1908, pp. 841-1024.

TABLE XXII

WAGE RATIOS IN VARIOUS PUBLIC UTILITIES OF THE UNITED STATES

	Year	Total Operating Revenues	Total Operating Expenses	Total Wages	Number of Employees	Ratio of Wages to Revenue	Ratio of Wages to Expenses	Average Annual Wage per Employee
Steam Railroads	1902	$1,726,380,267	$1,116,248,747	$ 676,028,592	1,189,315	.392	.605	$ 568.41
	1907	2,589,105,578	1,748,515,814	1,072,386,427	1,672,074	.414	.613	641.35
	1912 *	2,744,342,277	1,898,662,465	1,209,716,686	1,642,119	.441	.637	736.68
	1917 *	4,014,142,747	2,829,325,124	1,739,482,142	1,732,876	.433	.614	1,003.81
	1922 *	5,559,092,708	4,414,522,334	2,640,817,005	1,626,834	.403	.598	1,623.29
Electric St. Railways.	1907	418,187,858	251,309,252	138,081,633	209,729	.330	.549	657.94
	1912	567,511,704	332,896,356	174,732,153	259,190	.307	.523	674.26
	1917	709,825,092	452,594,654	233,330,688	267,675	.328	.515	871.69
	1922	1,016,719,092	727,795,168	388,191,044	270,284	.381	.533	1,436.23
Commercial Central Light & Power Stations	1902	77,349,749	47,060,259	13,560,771	20,863	.174	.287	649.99
	1907	156,000,257	88,375,066	21,196,354	30,691	.134	.238	690.63
	1912	264,474,949	149,754,876	33,021,438	47,518	.124	.220	694.92
	1917	462,473,917	276,528,548	52,034,630	62,087	.112	.188	838.09
	1922	936,851,679	558,003,766	112,809,673	85,438	.116	.202	1,320.36
Manufactured Gas Utilities	1899	† 75,716,693	§ 38,315,152 ‡	12,436,296	22,459	.164	.320	553.73
	1904	125,144,945	72,966,357	17,057,917	30,566	.137	.233	558.06
	1909	166,814,371	93,580,187	20,930,697	37,215	.125	.222	562.42
	1914	220,237,790	134,498,941	26,801,664	43,792	.121	.199	612.02
	1919	329,278,908	258,370,978	53,758,628	42,908	.161	.204	1,229.57
Telephone Utilities ..	1902	81,157,509	55,743,075	26,369,735	64,628	.324	.473	408.02
	1907	173,637,970	115,404,115	46,466,730	108,851	.268	.402	426.88
	1912	242,404,644	168,039,952	63,359,059	144,608	.260	.377	438.14
	1917	363,831,921	255,078,301	123,088,197	199,785	.338	.482	616.10
	1922	637,468,630	458,755,689	247,531,589	232,569	.387	.539	1,064.33
Land and Ocean Telegraph Utilities ...	1917	106,989,743	78,860,799	24,008,347	31,297	.224	.304	767.11
	1922	146,805,215	113,139,825	47,342,928	46,562	.322	.418	1,016.77

* Class I roads only.
† Value of products.
§ Cost of materials plus rent, taxes, wages, and salaries.
‡ Rent and taxes not available.
▪ Figures compiled by H. B. Dorau, Institute for Research in Land Economics and Public Utilities.

THE ELIMINATION OF INDUSTRIAL HAZARDS. Industrial hazards are primarily of three types: (a) the hazard of death, accident, and sickness, (b) of unemployment, and (c) of superannuation.

Here, again, legislation may have taken over some matters which might otherwise be fixed by collective bargaining. Workmen's compensation acts provide compensation for physical injury and loss of life incurred in line of duty, and for care and restoration of the injured. Safety legislation, reinforced by factory inspection, is increasingly effective in preventing accidents. Workmen's compensation legislation places the burden of cost upon the industry affected, the theory being that when such expenditures are made a part of the cost of operation management will be stimulated to devise measures for accident prevention. Nevertheless, shop rules and voluntary coöperation between employees and operatives may do much to improve legal minimum standards.

Sickness insurance is now being provided extensively under mutual insurance plans, the companies contributing some portion of the premiums. With these plans are usually associated medical care and attention. The more thoroughgoing of these arrangements are, in effect, semi-public measures for the promotion of health and hygienic living, extending their benefits also to the families of the workers. From the point of view of management, the objects in view are the promotion of efficiency and the increase of the actual earnings of employees by reducing involuntary absence from duty on account of sickness. Mention may also be made of voluntary accident insurance through Mutual Benefit Associations, covering injuries *not* in line of duty, and providing compensation for the first week of injury. Company unions are effective in applying "welfare capitalism."

Legislation similar to workmen's compensation laws has been proposed in this country to provide a limited amount of insurance against unemployment. Public utility corporations are less opposed to such legislation because, as we have seen, employment conditions in public utility industries are quite regular. Contractual arrangements here sometimes make provision for the accumulation of "out-of-work benefit funds" for single concerns, and for working "short time," in order to spread the advantages of steadiness of employment.

Superannuation may be provided for on a large scale through legislation in accordance with which the State and industry join in extending maintenance allowances to the aged and infirm. This was the policy developed by pre-war Germany. In the

United States pension plans have been less ambitious.[16] Usually they are put into effect as company pension plans, paying only a small pension to employees attaining a certain age limit, usually 65 years, provided they have been in the employ of the company a prescribed number of years, usually 25. Quite a number of the larger public utilities have such plans in effect. They have proved, however, to be expensive in operation. Their object, in addition to caring for employees grown old in service, is to enable industry to cut down labor turn-over by setting up inducements for employees not to leave their work. It is also a device whereby the less competent or infirm may, in a humane manner, be made to give way to the more efficient.

In company unions these arrangements are part and parcel of a policy whereby management, conscious of the social mission of capitalism, is seeking to win labor away from the more radical policies of social amelioration proposed by socialism, anarchism, and unionism. If the loyalties and good will of the worker can be grouped around the business unit which gives him a livelihood, his loyalties to trade union or political party can be correspondingly weakened. A competition has thus been set up between the trade union movement on the one hand, and the new movement for company unions on the other, for the loyalty and support of the worker.

INDUSTRIAL GOVERNMENT. This brings us to a consideration of the second element in the standardization of working conditions, namely, the agencies and instrumentalities adopted within a single plant which constitute its scheme of industrial government. In this view employees are no longer mere "hands," but they are regarded as citizens of an industry having rights and duties toward each other, and toward consumers who are dependent upon the particular industry for essential services. In this view, also, employees are recognized as members of a going concern whose coöperation is necessary in order to maintain industrial good will. Such schemes of industrial government are usually embodied in collective agreements.

The trade union movement has steadily held in view several important objectives which it has sought to embody as principles in any scheme of industrial government. The leaders of trade unionism tried, first of all, to safeguard the employee's

[16] State pension laws have been passed in Pennsylvania (declared unconstitutional), Nevada, Wisconsin, Kentucky, and Montana. *Cf.* Epstein, Abraham, *Monthly Labor Review*, Vol. 19, p. 760, Oct., 1924.

right to engage in political activity. This is, of course, a constitutional right and usually secures ready acquiescence from management in theory. In practice, however, it has, at times, given rise to discrimination in employment relations arising out of the discretion exercised by management in hiring, promoting, and dismissing the worker. Very delicate problems arise when management is opposed to certain forms of political activity deemed by them to be "radical" or "subversive" in their tendencies. Toleration is the only principle upon which labor relations can be organized from this point of view.

A second objective has been to forestall any interference on the part of management with the rights of employees to affiliate with labor organizations of their own choosing. This principle would preclude exclusive labor contracts (so-called "yellow dog" contracts) whereby only those who are members of company unions would be recognized as entitled to employment. The leaders of trade unionism take the position that the old line trade union is the organization of the bona-fide labor movement. This principle thus raises a critical problem in those cases where old-line trade unions and company unions are engaged in a struggle for supremacy.

A third objective has been the attainment of what has been called "democracy in industry," which implies a recognition of the right of labor to participate in the councils of those who direct its energies. This principle means that employees shall have a voice in determining wages, hours, working conditions, disciplinary rules, eligibility rules, entrance examinations, promotion standards, in fact, a voice in determining the whole paraphernalia of employment management. These demands culminate in the requirement that a method for the settlement of disputes be provided whereby "joint boards" upon which management and employees are equally represented, try to adjudicate cases which involve shop rules that have been recognized in the past or which involve the determination of new rules to be observed in the future.

There is also the demand, only less generally asserted, that in the adjustment of wages the economic requirements of labor should be placed ahead of dividends. This means that, within the limits of the dividends, the level of wages be not made dependent upon ability to pay. This demand has been officially recognized by public arbitration boards. In a case [17] before the Industrial

[17] *Amalgamated Association of Street and Electric Railway Employees* v. *Joplin and Pittsburgh Railway Company.* The Court of Industrial Relations, State of Kansas, Opinion and Order, April 23, 1920, Docket No. 3283.

Court of Kansas, where employees claimed that wages were too low to afford a reasonable standard of comfortable living, but the company insisted that earnings were not sufficient to pay higher wages, this board said in substance, that wages must come ahead of dividends to the stockholder and that a business which is unable to pay a fair wage to its employees will eventually have to liquidate.

Public Utility managements generally favor long-term agreements; in fact, whenever possible, they favor continuous agreements. As contrasted with their earlier attitude of opposition to arbitration, they now favor the provision of machinery for the settlement of grievances. These grievances generally involve disciplinary rules, notice of leaving or discharge, and the working out of definite lines of promotion which recognize seniority and special skill, but still leave an avenue open for the entry of "new blood." Management also contends that labor is not anxious to participate in risks and should therefore be excluded from control over managerial functions. It is contended that, at most, labor is concerned with obtaining "security of the job," and that its control over management should cease when security has been obtained. There is a growing movement to favor the inauguration of "gain-sharing" plans in order to promote efficiency. It is charged that labor, particularly trade union labor, does not coöperate to achieve the fruits of scientific management, namely, low production costs. In answer, it may be said that labor must be assured of the fairness of these plans and must be asked to coöperate in drawing them up.

The better employers realize also that, since so much of the worker's life is spent in the shops, measures should be taken to make working less irksome. Many things may be done to counteract routine, to afford educational facilities as a part of employment, to establish facilities for daily recreation and amusement. It is such activities that in the end build up a real "esprit de corps."

A good deal of dispute surrounds the right of employees to be represented by agents of their own choosing. The trade unions insist that such representation should be by men who are not employees and hence responsible alone to the unions. The employers, although conceding the right of employees to representatives of their own choosing, insist that the choice be restricted to representatives who are also employees.

In those cases where the company union has been introduced to supersede the trade union, agreements have been difficult of

attainment. Where either the trade union or the company union has been supreme, agreements have usually been reached.

The American Federation of Labor at its annual convention in 1919 took an unequivocal stand against company unions or industrial representation plans, declaring that they "are unqualified to represent the interests of the workers and that they are a delusion and a snare set up by the companies for the express purpose of deluding workers into the belief that they have some protection and thus have no need for trade organizations." Employers, on the other hand, favor the company union because they feel that the members will prove more tractable and can be induced to coöperate with management in introducing more economical processes and improved service standards. They are also favored because the company union is generally deprived of the employee's greatest weapon against the employer, the strike. Most of the constitutions of company unions provide that the members shall refrain from strikes, agreeing instead to submit their differences to arbitration. This is of the greatest moment to the employer in public service industries where the law imposes the duty of rendering continuous service.

The recently inaugurated Baltimore & Ohio Railroad plan for bringing about coöperation between management and its employees is interesting because it involves trade union recognition by the employer, and recognition by the employee on the other hand that management is under the legal duty to give adequate and efficient transportation service to the public. Elaborate codes of working rules have been arrived at jointly which control the relations of the parties and are a basis for coöperation.

There is a wide range between good and bad management of employment relations. Progressive employers have provided conditions superior to those which could be achieved through trade-union activity. No off-hand judgment upon the issue of company unionism versus trade unionism is therefore possible.

CHAPTER XXIV

PUBLIC UTILITY LABOR LEGISLATION

In the preceding chapter we surveyed briefly the evolution of policies by means of which management and labor were brought into voluntary coöperation with each other. When these methods failed, strikes and lockouts resulted, which led in turn to costly and inconvenient interruptions of service. With no alternative source of supply, the labor problem of public service industries assumed such importance in the eyes of the consuming public, that it was bound in the end to lead to some measure of governmental interference with the labor bargain.

The purpose of such legislation is to insure continuity of service by bringing management and labor into coöperative relations. The law imposes on public utilities the duty of rendering continuous and efficient service. When this obligation is jeopardized by conditions arising out of labor relations, the law brings these aspects of labor relations within the purview of its control.

Sec. 1. **The Movement to Assure Continuity of Service**

It does not appear that a special legal duty rests upon the individual employee of public utilities to render continuous service. Unlike the investor, the employee is not even constrained by the terms of an enforceable contract. Stockholders, collectively, may not withdraw their capital without the consent of the state; laborers, individually and collectively considered, may quit work at any time without asking anybody's consent. Only in certain minor respects is their right to quit collectively and individually abridged by the law, as when it compels locomotive engineers not to abandon their engines upon the road, but to bring them into the terminals. Difficult questions arise when employees quit collectively, that is, when they "strike", or when employers discharge employees collectively, that is when they use the "lock-out". Management may attempt to live up to the legal obligation of giving continuous service by hiring strike-

breakers. The old employees, however, continue to regard these jobs as their own, and resist attempts to displace them. Under these circumstances violence and bloodshed are likely to result.

Though recognizing the constitutional right of employers to hire and of employees to work for whomsoever they please, public authority was, nevertheless, impelled to take some action in order to protect the public interest in continuous service and to prevent disturbances of the public peace. These efforts have usually been along two lines. The state may adopt a policy of "conciliation" by merely assisting the parties in finding a new basis for agreement and leaving the actual adjustment of terms to the parties themselves. Or the state may restrict the freedom of action of the parties by placing their bargaining with each other under certain limitations. There are thus various degrees of state interference with the labor bargain.

The means of applying limitations upon the labor bargain has been by franchise provisions and special statutory legislation. They were made effective by the time-honored process of court injunction.

(a) *Franchise provisions.*

The earliest attitude of the public utilities was that labor relations were entirely the concern of management with which public authorities in their capacity as regulators had nothing to do. Provisions in franchises touching labor relations were thus either meagre or entirely non-existent.[1] Sometimes, however, they were brought into the franchise negotiations at the instance of employees. Thus, when the Toledo street railway franchise of 1896 was being drafted, the employees wanted to include a clause providing for arbitration of disputes between management and employees. More often this demand for arbitration came from representatives of the public. In Monroe, La., an attempt was made to put a clause into a street-railway franchise which aimed at eliminating service interruptions due to sympathetic strikes.

Regulating the wage-bargain by means of the franchise has not been successful. The Des Moines street-railway franchise of 1915, for instance, contained a provision for arbitration. But

[1] Even such important recent franchises as the following make no attempt to deal with the labor problem: The Chicago Settlement Ordinance (1907), the Taylor grant in Cleveland (1910), the New York Subway Contracts (1913), the Kansas City Settlement Ordinance (1914), the Montreal Tramways Contract (1918), the Cincinnati Re-settlement Ordinance (1918), the Massachusetts Service-at-Cost Legislation (1918).

this did not prevent an eight day strike in 1919 when the company, then in the hands of a receiver, refused to pay the higher wages awarded under an arbitration proceeding.

(b) *War-time influences.*

The strike evil was particularly apparent during the World War. Living costs were rising rapidly and employees were insisting upon wage increases, which the companies maintained, could not be granted unless increased rates were provided at the same time by amendment of franchises or by orders of administrative commissions. New York City actually experienced strikes on the lines of the Interborough Rapid Transit Company and on the surface lines of Manhattan and the Bronx. Denver and Kansas City also suffered from severe strikes on their urban transportation lines. The strike on the lines of the Kansas City Railways Co. was unusually prolonged, lasting from December 11, 1918 to March 31, 1919. It seems that transport utilities experienced the most difficulty. The most widely-heralded of these conflicts was the threatened nation-wide strike of the train service brotherhoods in 1916. This episode brought the Adamson Law which we will discuss presently.

These strikes, and many like them, directed public attention to the problem of securing continuous service, and many proposals were made and some legislation was enacted to settle labor difficulties. There was general agreement that with the entry of the United States into the war, the prevention of national and local strikes affecting public utilities and necessary war industries was an urgent necessity. In New York both the Merchants' Association of New York and the Public Service Commission for the First District suggested elaborate arbitration plans. Public discussion of the various proposals showed that opinions were far apart as to the degree of restraint which the state should exercise.

The National War Labor Board, with former President Taft as Chairman, was created to help allay the strike evil. This board continued to function until July 1, 1919. Although it did not entirely prevent strikes, it kept them from assuming serious proportions. The activities of the board were premised upon the following principles: (1) that there should be no strikes or lockouts for the duration of the war; (2) that recognition should be accorded the right of labor to organize and to join a labor organization of its own choosing; (3) that the "status quo" as to open or closed shop conditions should be main-

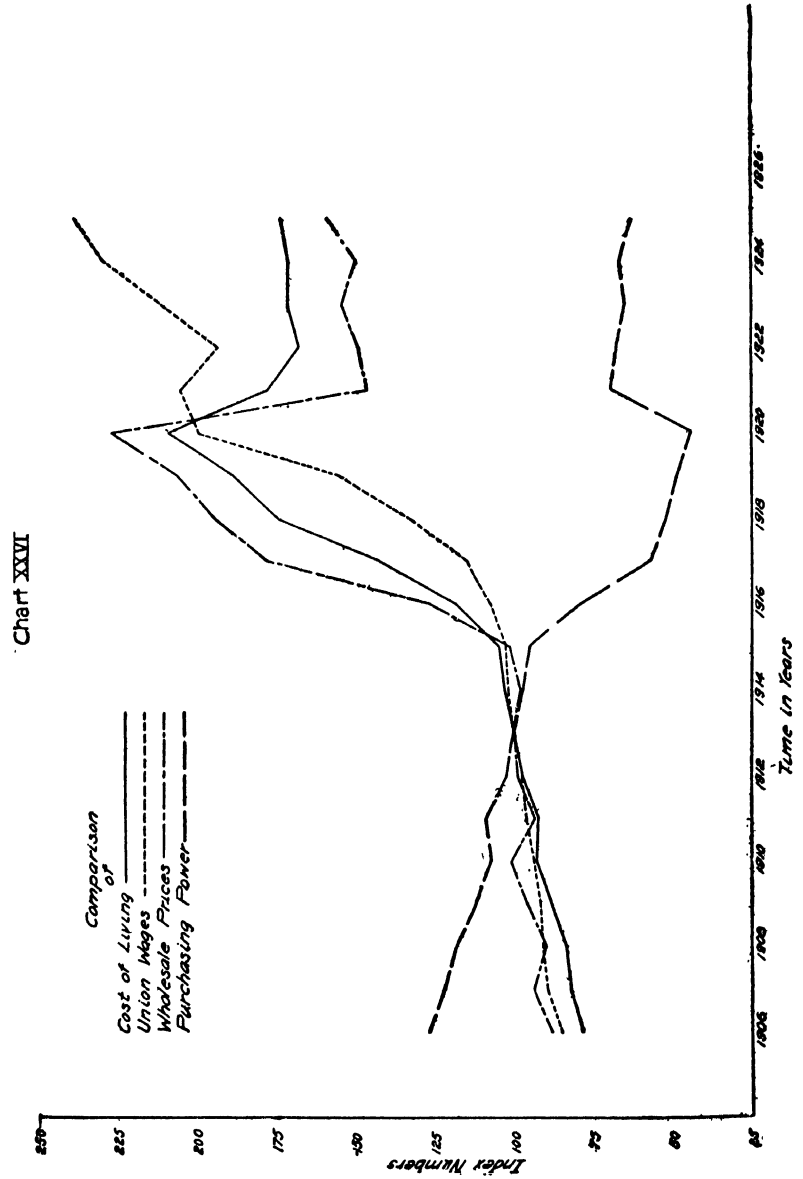


Chart XXVII
Comparison of
Cost of Living
Union Wages
Wholesale Prices
Purchasing Power
Index Numbers
Time in Years
250
225
200
175
150
125
100
75
50
1890
1900
1905
1910
1913
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925

tained (4) that wages, hours, and working conditions should be adjusted through the method of collective bargaining.

During the war period, as a result in large part of the efforts of the War Labor Board, the principle of collective bargaining became intrenched as a feature of labor policies. Though this may appear as a decided gain for the traditional labor movement, it should also be remembered that the same period brought the development of the company union as a rival agency. During this period, also, wages were substantially increased in consonance with the mounting cost of living.

The Board did not have authority to fix rates. All it could do was to recommend that rates fixed in franchises be revised by amendment or in new agreements. Where it was necessary that applications for rate increases be made to administrative commissions, it was the policy of the board to use moral suasion in order to get state commissions or local authorities to do their part. There can be no doubt that many public utilities were financially hard-pressed on account of the failure or undue delay of public authorities to act as the board recommended. In some cases they were even forced into bankruptcy.

Wage increases allowed usually proved inadequate because the cost of living continued to climb. Other prices paid by utilities were subject to the same upward trend. The situation is portrayed in Chart XXVI, p. 534, which makes a comparison between wages, prices, purchasing power, and cost of living. Further wage increases were thus necessary, particularly during 1919 and 1920. The management of public utilities was clearly annoyed by the labor problem. As one observer put it, managers looked upon their employees "as live wires that would cause trouble unless they were handled carefully". This was their attitude in particular, when, with the decline of prices in May, 1920, it was felt that the time had also arrived when it would be necessary "to deflate wages." The years from 1919 to 1922 thus represent crisis years in the handling of the public utility labor problem. During this period there was a considerable amount of state interference in the adjustment of the labor bargain.

Sec. 2. Special Legislation to Secure Continuity of Operation upon Railroads

We will trace first the development of railway labor legislation in the United States, and then note the outstanding developments elsewhere in the public utility field.

(a) *Legislation preceding the Federal Control Act.*

Legislation applying to steam railways began in 1888. Previously, bargaining between management and labor was both unrestricted and unaided. In that year, however, Congress passed an *arbitration* act that provided machinery for voluntary arbitration at the suggestion of either party. The arbitration board was to be composed of one representative of each of the parties and a third member to be selected by the first two. The board was then to proceed with an investigation of the situation and make its award. The award could not be enforced except as public opinion might exert pressure upon the parties to accept it. The act remained in effect until 1898, but neither employers nor employees availed themselves of its provisions. It also provided for *investigation* of trade disputes at the instance of the President, the Governor of a state or of either party to a controversy. The investigation was to be carried out by a commission of three, appointed by the President of the United States. This provision was used but once in investigating the Chicago railroad strike of 1894.

The next step was taken under the Erdman Act of 1898. This law retained the feature of voluntary arbitration boards, and added the *mediation* principle. In the event of a trade dispute either party could request the aid of federal mediators, who were the Commissioner of Labor and the Chairman of the Interstate Commerce Commission, in conciliating their differences and reaching a new agreement.

With the beginning in 1907 of concerted movements by employees engaged in train operation, the provisions of the Erdman Act were frequently invoked. The increasing seriousness and importance of the issues decided by arbitration when mediation proved unsuccessful brought it about that more power and responsibility was placed in the hands of the third neutral arbitrator than was deemed wise. Accordingly a further step was taken in the Newlands Act of 1913, which provided for the option of a larger arbitration board of six members, with two public representatives. The method of mediation was also given increased importance with the creation of a *permanent* Board of Mediation and Conciliation, which was empowered to act at the request of the parties, but could also take the *initiative* in offering its services.

The process of conciliating or arbitrating trade disputes continued to function for some years more. But there was grow-

ing dissatisfaction on the part of both the carriers and the employees with this method. In 1916, during the struggle for the eight hour day in train operation, the employees, particularly, refused to compromise what they regarded as their just claims, or to submit their case to an arbitration process which they regarded as unfair. Under threat of a national strike by the Brotherhoods, Congress, by means of the Adamson Law of 1916, practically constituted itself an *emergency* arbitration tribunal whose award had the compulsion of law.

During 1916 the tempo of industry was markedly increased by demands arising from the European War. Consequently, the demand for labor was also brisk and rendered more competitive on account of increasing scarcity due, in part, to diminished immigration from Europe. The cost of living was rapidly rising. Under these circumstances the four brotherhoods demanded the "basic" eight-hour day with time and one-half for overtime. The carriers objected that the demand for a "basic" eight-hour day was merely a disguise for increased wages, since it was well-known that hours could not be so reduced. Both sides remained obdurate. Finally, Congress passed the Adamson act which made the basic eight-hour day legal, and provided further that all work in excess of eight hours be paid for at least on a pro rata basis.

In his special message to Congress relating to the strike emergency, President Wilson had suggested legislation giving him the power to draft railroad employees into military service when required by military necessity. This proposal suggests the emergency measures sometimes taken in foreign countries to assure continuity of service on transportation lines. In 1910, for instance, Premier Briand called the railroad operatives to the colors and operated the trains under military law. Congress did not see fit to grant the President's request.

(b) *The labor policy of the period of federal control.*

During the period of government operation of the railroads the employees bargained with the government. Demands for increased wages were presented by their organizations to the United States Railroad Administration. In fact, demands for increased wages in November and December of 1917 were a not unimportant circumstance in determining upon the necessity for Federal Control. Disputes between regional directors of the Railroad Administration and the employees were taken care of through Boards of Adjustment, established by agreement

between management and men, and entirely bi-partisan in character. They operated successfully, largely because they were permanent boards, expert in personnel, and intent upon doing justice. The principal reason for the success of the labor policy adopted by the government was the conviction on the part of the men that their interests were being considered by management.

The general results are well summarized by Prof. Sharfman:[2]

"The labor policy of the Administration in the management of the railroads was distinguished by a sincere desire to accord fair treatment to all the employees in the service. The wage increases, for example, were neither the result of arbitrary determination by the Director-General, nor of compromise with the demands of the men. They were based upon thorough investigation of the facts, and were designed to establish a just level of compensation. In like manner, reasonably satisfactory working conditions were provided from the beginning. The initial wage order accepted the eight-hour day as the basis of payment, and as soon as the exigencies of war permitted, the eight-hour day was widely instituted in practice, particularly in shop service. Rules defining working conditions were incorporated into agreements—ultimately national in scope—which replaced those operative prior to Federal Control, and were made applicable, in many instances, to groups of workers that had been neglected under private management. While standardization may have been carried too far in these agreements, the policy of instituting improvements in working conditions before they had become the subject of actual dispute, proved very helpful in preventing disruption or demoralization of the service. In the adjustment of these working rules, as in the establishment of machinery of conciliation, the principle of collective bargaining was frankly recognized, the governmental officials dealing with the representatives of labor."

The effects of these developments in railroad labor policies upon the average daily compensation of railroad employees appears from Table XXIII, p. 539, which makes a comparison between the years 1914 and 1919.[3]

(c) *The labor policy of the Transportation Act of 1920.*

The Transportation Act of 1920 adopted the method of "compulsory conference" with a permanent agency for voluntary arbitration in the Railroad Labor Board. This method was, in effect, a compromise between two proposals. The first proposal, embodied in the Cummins Bill passed by the Senate, was in the form of an anti-strike provision making any agreement to hinder or prevent the operation of trains by two or more officials or employees a misdemeanor punishable by fine and imprisonment. The other proposal was embodied in the Esch Bill as passed by

[2] Sharfman, I. L., *The American Railroad Problem*, The Century Co., 1921, p. 336.

[3] Data from an unpublished report by E. W. Morehouse.

TABLE XXIII

WAR-TIME INCREASE IN AVERAGE DAILY COMPENSATION OF RAILROAD EMPLOYEES

Classification	*Number of Employees*	*Weighted Average Hours Worked per Day**	*Compensation per Day 1914*	*Compensation per Day 1919*
I. *Operation*				
Engineers	62,319	9.0	$5.24	$8.16
Firemen	63,580	8.8	3.22	5.88
Conductors	53,935	9.3	4.47	7.23
Trainmen	123,976	9.0	3.07	5.65
Other operating forces.	82,787	9.5	...	4.19
II. *Indirect Operation*				
Telegraphers	52,529	9.1	2.56	4.98
Clerks	216,764	8.9	2.54	4.66
Station Agents & Masters	14,503	29.5*	2.33	4.75
Other station employees	130,790	7.0 (28.1†)	1.98	3.73
Switchtenders & flagmen	30,867	9.2 (30.6†)	1.71	3.04
Other yard employees Yardmasters, Asst. Yardmasters, Levermen, floating equipment employees, etc.)	30,416	9.7	...	5.46
III. *Shop and Maintenance*				
Machinists	59,067	7.9	3.27	5.78
Carpenters	50,854	7.7	2.66	5.09
Other shop employees..	332,028	7.8	2.36	4.86
Foremen	76,227	8.7 (27.6†)	2.20	5.03
Laborers	435,538	8.0	1.59	3.10
All others	51,164	9.4 (28.2†)	...	4.10
Average wage (all employees)			$2.47	4.60
Percentage increase 1919 over 1914				53.6%
Average yearly wage for working year of 306 days—1919				$1407.60

* Data for hours are for July, 1919.
† Average days worked per month; no data regarding hours.

the House, creating three bi-partisan adjustment boards to which disputes could be submitted. The boards were composed of an equal number of employers and employees with a majority vote necessary for a decision. An appeal could be taken to a bi-partisan committee. The House proposal was based upon the labor

policy of the Federal Control period. There was no enforcement machinery. The public was not represented on the boards. It appeared to many as if the labor provisions of the Esch Bill were the logical outcome of previous experience with legislation of this kind.

The labor provisions finally adopted in the Transportation Act made it the duty of carriers and their employees to use every available method for composing their differences so that the continuity of operation might not be jeopardized. All disputes were to be considered first by a local conference of representatives of the carrier and of the employees. If agreement was not possible, disputes involving all matters except wages were carried to boards of labor adjustment, which were established by agreement (a) between a single carrier and its employees or organization of its employees, or (b) between any convenient combination of carriers and their respective employees or organizations of employees.

The act also created a Railroad Labor Board with a national jurisdiction. It was composed of nine members, three members representing respectively the employees, management, and the public. It was given jurisdiction over disputes involving grievances that were not settled by the adjustment boards. Disputes regarding wages went directly to the board from the local conferences. All decisions were by a majority vote and, in settling disputes involving wages, at least one member of the public group had to concur. The board published its decisions by transmitting a copy to the President and to the Interstate Commerce Commission. No further compulsion than that imposed by public opinion attached to its decisions.

As a guide in the determination of wages, Congress provided some general measures of reasonableness which included (a) wages paid for similar work in other industries, (b) the relation of wages to the cost of living, (c) the training, hazard, responsibility, and regularity of employment involved, (d) the inequalities resulting from previous wage adjustments.

The railroad labor board began its work under unfavorable auspices. It was opposed by the trade unions because it was deemed by them to be a step toward compulsory arbitration. It was also opposed by certain railways, notably the Pennsylvania Railroad, which desired to deal with its own employees, as organized in a company union. Unfortunately, also, concessions made to employees by the Federal Railroad Administration, particularly those relating to nation-wide standardization of work-

ing rules, were challenged by the carriers in early cases. The Board finally had to undertake their piecemeal revision. The attitude of railway executives, who once favored the board, changed with the success achieved by the engineers' and firemen's brotherhood in securing an advance in wages by threats of strikes. The favorable decision was rendered even after the brotherhood leaders had refused to obey subpoenas to testify before the labor board, in open defiance of a formal decision of the board. There was, consequently, much dissatisfaction with the board and its decisions. Unquestionably, the board did much good administrative work in classifying railroad labor, and in encouraging collective bargaining. Yet its arbitration and conciliation activities were vitiated because it lacked the confidence of the contending parties. There was no mutual recognition of rights and consequently no common ground for arbitration.[4]

The labor board laid down its policy concerning working conditions in what has been called its "labor code". This consists of principles with which it was suggested that voluntary working agreements should be in accord:

"1. An obligation rests upon management, upon each organization of employees and upon each employee to render honest, efficient and economical service to the carrier serving the public.

"2. The spirit of coöperation between management and employees being essential to efficient operation, both parties will so conduct themselves as to promote this spirit.

"3. Management having the responsibility for safe, efficient and economical operation, the rules will not be subversive of necessary discipline.

"4. The right of railway employees to organize for lawful objects shall not be denied, interfered with, or obstructed.

"5. The rights of such lawful organization to act toward lawful objects through representatives of its own choice, whether employees of a particular carrier or otherwise, shall be agreed to by management.

"6. No discrimination shall be practiced by a management as between members and non-members of organizations or as between members of different organizations, nor shall members of organizations discriminate against non-members or use other methods than lawful persuasion to secure their membership. Espionage by carriers on the legitimate activities

[4] For a very excellent brief discussion of the workings of the arbitration principle see Morehouse, E. W., "Some Limitations of Arbitration of Public Utility Labor Disputes," *Journal of Land and Public Utility Economics*, Vol. III, p. 77, Feb., 1927. Reference is made in the appended bibliography to sources where further details may be found. E. W. Morehouse, of the staff of the Institute for Research in Land Economics and Public Utilities is at work upon a comprehensive treatise dealing with the labor policies of public utilities. Mr. Jacob Perlman, sometime instructor in Economics at the University of Wisconsin, will shortly publish a history of the Brotherhood of Locomotive Engineers, which will give further details.

of labor organizations or by labor organizations on the legitimate activities of carriers should not be practiced.

"7. The right of employees to be consulted prior to a decision of management adversely affecting their wages or working conditions shall be agreed to by management. This right of participation shall be deemed adequately complied with if and when the representatives of a majority of the employees of each of the several classes directly affected shall have conferred with the management.

"8. No employee should be disciplined without a fair hearing by a designated officer of the carrier. Suspension in proper cases pending a hearing, which shall be prompt, shall not be deemed a violation of this principle. At a reasonable time prior to the hearing he is entitled to be apprised of the precise charge against him. He shall have reasonable opportunity to secure the presence of necessary witnesses and shall have the right to be there represented by a counsel of his own choosing. If the judgment shall be in his favor, he shall be compensated for the wage loss, if any, suffered by him.

"9. Proper classification of employees and a reasonable definition of the work to be done by each class for which just and reasonable wages are to be paid is necessary, but shall not unduly impose uneconomical conditions upon the carriers.

"10. Regularity of hours or days during which the employee is to serve or hold himself in readiness to serve is desirable.

"11. The principle of seniority long applied to the railroad service is sound and should be adhered to. It should be so applied as not to cause undue impairment of the service.

"12. The Board approves the principle of the eight-hour day, but believes it should be limited to work requiring practically continuous application during eight hours. For eight hours' pay eight hours' work should be performed by all railroad employees except engine and train service employees, regarded by the Adamson Act, who are paid generally on a mileage basis as well as on an hourly basis.

"13. The health and safety of employees should be reasonably protected.

"14. The carriers and the several crafts and classes of railroad employees have a substantial interest in the competency of apprentices or persons under training. Opportunity to learn any craft or occupation shall not be unduly restricted.

"15. The majority of any craft or class of employees shall have the right to determine what organization shall represent members of such craft or class. Such organization shall have the right to make an agreement which shall apply to all employees in such craft or class. No such agreement shall infringe, however, upon the right of employees not members of the organization representing the majority to present grievances either in person or by representatives of their own choice.

"16. Employees called or required to report for work, and reporting but not used, should be paid reasonable compensation therefor."

(d) *The Watson-Parker Act.*

The demand for the abolition of the Railroad Labor Board continued. First attempted by the employee organizations in the Howell-Barkley Bill, its abolition was finally accomplished

under the Watson-Parker bill. This bill became law early in 1926. It goes back to the practice of adjusting labor disputes by means of bipartisan boards inaugurated by the Federal Railway Administration. It creates adjustment boards "by agreement between any carrier and its employees", thus providing for representation of union as well as non-union employees. The members of the board are paid by and responsible to those whom they represent. Nor does the law specify the scope of the boards' jurisdiction, thus leaving the way open for any procedure which may be agreed upon. The act further creates a federal board of mediation of five members appointed by the President, whose chief function is to aid in the negotiation of wage agreements upon the request of either party. In the event of failure of the parties to reach agreements the board is to secure the submission of differences to voluntary boards of arbitration whose awards are binding. There is thus no permanent body to hear and decide disputes. If the parties fail to agree to submit disputed issues to arbitration, the President may appoint a fact-finding committee whose report will be given publicity. This act thus returns to the policy of non-coercion. Bargaining, mediation, and voluntary arbitration are the methods once more relied upon to secure coöperation.

The bill was opposed by some of the carriers, by manufacturers' and shippers' organizations, the American Farm Bureau, and the National Grange. The farmers' and shippers' organizations opposed the bill because the public was not given sufficient protection against high rates since the public had no voice in the negotiations until the fact-finding committee was appointed. Another argument [5] against the bill was, that under the new law the following out of a consistent labor policy was impossible, since no basic principles were suggested upon which agreements should be reached. Moreover, either party could refuse arbitration. If arbitration was agreed upon, awards relating to such complex matters as rates of pay would not be rendered by an experienced body which devoted all its time to the study of the labor problem. The new act was also subjected to much criticism because the Interstate Commerce Commission was not required to take arbitration awards or wage agreements into account, whereas the Railway Labor Board had always considered the effect of wages upon rates. Whatever the merit of these criticisms the new legislation indicates that the trend of public

[5] *Cf.* Pres. Edson of the Kansas City Southern Ry. in *Railway Review*, Feb. 6, 1926.

opinion is again running in a direction opposed to compulsory arbitration.

Sec. 3. Special Legislation Dealing with Labor Relations of Local Utilities [6]

In dealing with the labor problem of the local utilities, legislation during this entire period remained, with two notable exceptions, within the realm of mediation, conciliation, and voluntary arbitration. When disputes could not be settled by mediation and conciliation, efforts were made to get the parties to submit their differences to voluntary arbitration. The two notable exceptions are the Colorado system of compulsory investigation of trade disputes, and the Kansas Court of Industrial Relations.

(a) *Compulsory investigation of industrial disputes.*

We will discuss first the less radical of the two, namely, the system of compulsory investigation. This method originated with the Canadian Industrial Disputes Act of 1907. That act embodied the principle that in mining and public service industries in the event of a threatened strike or lockout, there should be a compulsory investigation by public authority of the causes, facts, and issues out of which the difficulties arose. Changes in terms of employment and other causes of threatened strikes and lockouts were to be investigated by the usual tri-partite board. The purpose in view was to protect the public interest in continuous service, at least to this extent that any sudden change of terms of employment (i.e. without thirty days' notice), and any strike or lockout during the period of investigation with consequent stoppage of production was declared illegal. The law thus attempted to provide a "cooling-off period", during which both the remedial processes of investigation, conciliation and voluntary arbitration, and the indirect coercion of public opinion could be brought into play. Although not denying the right of the parties to stop having business relations with each other, it was argued that there are circumstances when private rights cease and their assertion may become a public wrong. It was believed that the pressure of public opinion could best be brought to bear upon the disputants by publishing

[6] For details concerning all aspects of labor legislation, see Commons, J. R., and Andrews, J. B., *Principles of Labor Legislation*, rev. ed., Harper & Brothers, 1927, especially chap. III.

a report based upon an investigation into the causes of the dispute, and suggesting a possible basis of settlement. The law did not require the parties to accept the suggested basis of settlement, and it therefore stopped short of compulsory arbitration.

The relative success of this legislation induced the state of Colorado in 1915, following a strike in mines owned by Rockefeller interests in that state, to enact a similar piece of legislation. This law empowered the Industrial Commission of Colorado to compel an investigation of industrial disputes and to make a non-mandatory award. Where the Canadian act is limited to mines and public utilities, the Colorado act includes practically all pursuits except agriculture and domestic service.

(b) *Compulsory arbitration of industrial disputes.*

The second and more radical policy accepts the principle that there should be compulsory arbitration of industrial disputes. This policy outlaws the strike and the boycott and puts the determination of wages, hours, and working conditions, in the absence of a voluntary agreement, under governmental regulation. There is a cleavage of opinion in that some would apply compulsory arbitration to all disputes, while others would limit its application only to those industries which are affected with a public interest. New Zealand and Australia have taken the former tack. The State of Kansas illustrates the latter.

The application of the principle of compulsory arbitration (in effect public regulation of wages, hours, and working conditions) to industries which are public in character, is said by its proponents to be the logical result of the fact that rates, service, and financing are similarly controlled. It is argued that employees, like stockholders, should be subject to an obligation to render continuous service.

Growing out of a coal shortage and certain strikes in its coal mining district, Kansas in 1920 passed a law which declared the following industries to be affected with a public interest:

1. The manufacture of food products.
2. The manufacture of clothing and wearing apparel in common use.
3. The mining and production of fuel.
4. The transportation of these products.
5. All public utilities and common carriers.

These industries were declared to be subject to state supervision "for the purpose of preserving the public peace, pro-

tecting the public health, preventing industrial strife, disorder and waste, and securing regular and orderly conduct of the business directly affecting the living conditions of the people." The statute set up the Kansas Court of Industrial Relations. The Public Service Commission was abolished and its jurisdiction given to the court. It was composed of three judges appointed by the Governor for a term of three years.

The law granted to employees the right of collective bargaining. It guaranteed their right to quit individually and protected them against discharge for bringing a complaint into court. On the other hand, strikes were outlawed as well as picketing and boycotting. A complaint might be brought into court by ten tax-paying citizens, or the court could initiate investigations upon its own motion. The taking of evidence was governed by the rules of the Supreme Court of Kansas.

In fixing the rates of public utilities and the wages of employees the court was required to take into account a fair return upon capital; but wages and working conditions were to be fair at all times. The court was empowered to operate these industries in case of an emergency. Provision was made for appealing its orders to the higher court; yet in such proceedings these orders were considered as *prima facie* reasonable.

Sec. 4. Judicial Review of Legislation Providing for Compulsory Conference and Compulsory Arbitration

The scope of the Railroad Labor Board's power under the Transportation Act of 1920 was adjudicated in certain recent cases involving the Pennsylvania Railroad. In the first case the trade unions complained to the Board that the railroad refused to let its employees vote for union agents as their representatives in the local joint conferences with management. The Board consequently prescribed the form of a ballot recognizing this right. The railway company refused to obey the order of the board and proceeded with the organization of its company union. The board made public its decision and the fact that the company had refused to comply. Against this act the company appealed, but the board was sustained. It was within the discretion of the board to make public its suggestions and the fact that the company had failed to comply with its suggestions.

In the second case[7] the trade unions appealed to the court

[7] *Penn. RR. System Federation No. 90* v. *Penn. RR.*, 45 Sup. Ct. 307, 1925.

directly for a mandatory injunction to bring about a recognition on the part of the company of the trade union organization. The court declined, declaring that the recognition or non-recognition of the union was a matter of managerial policy. It was not the intention of Congress, the court held, to enforce such recognition as a matter of legal right. The duty to confer was compulsory but not the method of securing representation. The railroad could refuse to accept the suggestion of the Labor Board as to the latter and thereby "defeat the purpose of Congress" still the company would be "within its strict legal rights". As the court adds: "We do not think Congress, while it would deprecate such action, intended to make it criminal or legally actionable."

These decisions, as Morehouse observes,[8] made of the statutory "duty to confer" a moral duty merely. In this instance at least, compulsory conference, as a method of securing continuity of service, was shipwrecked upon the shoals of company unionism.

Two decisions [9] by the United States Supreme Court cast some doubt upon the effectiveness of the policy of compulsory arbitration. In the first case it was the opinion of the Court that compulsory fixing of wages infringed the liberty of contract guaranteed under the Fourteenth Amendment. In the second case the compulsory determination of hours also fell under the ban of the constitution. It should be noted, however, that the business of meat packing involved in these cases was regarded by the court as a competitive enterprise. Hence the degree of public interest was not such as to justify public regulation of wages and hours. It considers that there was no danger of any immediate cessation of food supply.

Whether the court would uphold compulsory arbitration of industrial disputes in the case of unquestioned public utilities may perhaps be inferred from the following quotation: "It involves a more drastic exercise of control to impose limitations of continuity growing out of the public character of the business upon the employee than upon the employer; and without saying that such limitations upon both may not be sometimes justified it must be where the obligation to the public of continuous services is direct, clear, and mandatory and arises as a contractual condition express or implied of entering the

[8] "Judicial Status of Arbitration of Public Utility Labor Disputes," *Journal of Land and Public Util. Econ.*, July, 1925, p. 378.

[9] *Chas. Wolff Packing Co.* v. *Court of Industrial Relations of State of Kansas*, 262 U. S. 522 (1923); *Wolff Packing Co.* v. *Kansas Ct. of Indust. Relations*, 45 Sup. Ct. 441 (1925).

business either as owner or worker. It can only arise when investment by the owner and entering the employment by the worker create a conventional relation to the public somewhat equivalent to the appointment of officers and the enlistment of soldiers and sailors in military service." [10]

The Adamson Act had been upheld by the United States Supreme Court [11] in a divided opinion upon the ground that it was within the power of Congress under the interstate commerce clause to prescribe a non-confiscatory standard of minimum wages which would be obligatory and remain in force during a period of national emergency, thus averting the calamity of a nation-wide strike and affording an opportunity for the parties to substitute a standard of their own. The dissenting minority, on the other hand, took the position that the act was, in fact, a measure fixing wages and working conditions, and therefore a violation of liberty of contract. The majority appears to think that in employments which are not private, and certainly during emergencies, Congress has the power of fixing wages and working conditions. This is the equivalent of *compulsory arbitration* in a crisis. Whether this same power could be delegated to an administrative board does not appear. In the Wolff Packing Company Case, Justice Taft carefully distinguished Wilson v. New as a case involving legislative as distinguished from administrative action.

Sec. 5. **General Summary**

It appears, therefore, that the experience of the United States with political coercion, when used continuously in regulating the labor bargain, has not been reassuring. The present legislative position is again one of mediation, conciliation, and voluntary arbitration. In New Zealand also it has been observed that if men are prohibited from striking, they are likely to develop other forms of non-coöperation such as the so-called "go slow" strikes and "iritation strikes". After all, the essence of coöperation is good will between the elements of the going concern. In order, therefore, to bring about coöperation the historical aspects of the labor problem must not be left out of account. Trade unionism has secured the good will of many workers. Their allegiance to a new form of unionism can not be gained by coercive means. To secure good will for coöperation under collective bargaining

[10] 262 U. S. 522, 541.
[11] *Wilson* v. *New*, 243 U. S. 332 (1917).

it may be necessary to build good will upon good will, as when the management of the Baltimore and Ohio Railroad accorded full recognition to the historic trade unions in its coöperative dealings with employees. This need not imply recognition of the "closed shop".

Moreover, there must come about a general and mutual understanding of the problems and aspirations of both management and labor. The issues and interests underlying the transactions of going concerns must be understood and interpreted in terms of a social psychology which recognizes that willingness, the vital spark of going concerns, can not be engendered by coercion.

All elements of the going concern must be mindful of the purpose of public utility concerns to render adequate service at reasonable rates to the public, and that to this end they must coöperate in securing efficiency. In bringing about such a desirable state of affairs, the adoption by management of scientific and progressive labor policies will go a long way. In this respect public utilities are in a position to be leaders rather than followers. If, in spite of all that the processes of coöperative dealing may do, conflicts arise the public interest should be in a position to express itself through the remedial processes of mediation and voluntary arbitration. When these are exhausted the importance of the particular social interests involved will determine what further steps may safely be taken. It may well be that the adjustment of labor disputes is then no longer an economic question involving only the failure in coöperation of an economic concern, but it may have become a political question involving the functioning of a political concern, that is to say, the state itself. It may then seem proper to use the coercion which resides in an injunction by a court or a legislative act. The power of coercion will then be applied in a manner which befits the gravity of the interests involved, namely, by the legislature itself.

CHAPTER XXV

THE PRICE BARGAIN

Under the price bargain may be classified the various transactions of public utilities concerned with the acquisition of property of all kinds. In considering the investment bargain, the center of interest was the terms and conditions upon which stockholders and creditors provided, in the main, the money funds which enabled the concern to acquire a going plant and to provide itself with working capital for operation and for further construction. In dealing with the labor bargain, it was shown what proportion of the funds derived from the sale of services were again expended in employing labor for operating purposes. It was also stated that labor employed on construction is paid largely out of capital funds or out of reinvested earnings. Similarly, expenditures under the head of the price bargain come out of capital funds and earnings. When enterprises were first promoted, and later in consolidations and mergers, large items of property were often purchased by paying for them in security issues whose cash value is not readily ascertainable. Normally, however, the price bargain is represented by cash transactions.

Sec. 1. **The Financial Importance of the Price Bargain**

Under *normal operating* conditions the price bargain relates to cash expenditures for raw materials, such as coal, coke, oil, and building materials; for partly and fully manufactured materials, such as copper wire, iron and steel products, machinery, rolling stock, tools, and apparatus; and for parcels of land, easements, and rights of way. It would also relate to construction or maintenance expenditures under contracts when such work is done for the concern by others, or to contractual payments when one utility buys services like electric power from another at wholesale. Likewise rents paid are costs which might be classified under the price bargain or, alternatively, under the investment bargain, depending upon one's point of view. For present purposes they are best classified under the price bargain.

The significance of the price bargain is not sufficiently appreciated. Quite often the mistake is made of basing the importance of the buying activities of a utility solely upon the showing made by the asset account "materials and supplies." However, this item merely shows materials and supplies on hand at a particular time. It does not show the quantities used up in operations over extended periods. The comparative importance of the price bargain for operation alone for different classes of utilities appears in Table X, page 110. In 1922 this bargain absorbed 27.7 per cent. of the operating receipts of electric railway companies in the United States. The same ratio for privately owned electric utilities was 34.1 per cent., for the steam railway industry 27.5 per cent., for the telegraph industry 24.3 per cent., and for the telephone industry only 3.1 per cent. A similar study made for the gas industry indicates that expenditures classified under the price bargain amounted to fully 42.46 per cent. of operating revenues in 1923 and to 49.19 per cent. in 1921. The average ratio for the gas industry based upon data for the years 1914, 1919, 1921, and 1923 was 43.58 per cent. These figures indicate convincingly that the price bargain occupies a very important place in the annual budget of public utilities.

In the electric railway, steam railway, telephone and telegraph industries, labor, as is well known, is a more important item of operating cost than is the outlay for material purchases. On the other hand, labor is much less important in the gas and electric industries while material purchases occupy a relatively higher rank. In the telephone industry labor costs and fixed expenses arising out of fixed plant absorb most of the current revenues. Material purchases chargeable to operation are largely restricted to maintenance of the fixed plant and to supplies used up in administration.

Sec. 2. **The Basis and Need for Regulatory Control**

Obviously the character of these transactions is so various and depends so much upon circumstances that little can be said in a detailed way in regard to these expenditures in a general work concerned with public utility regulation. Managerial discretion has and should be given the widest latitude in such transactions.

Regulatory authorities are not, however, entirely without jurisdiction over the price bargain. We have already seen that

commissions pass upon these expenditures when they determine "fair value" for rate-making purposes. They are bound also to consider the propriety of expenditures in approving security issues and later in supervising the application of the proceeds of such issues. Some measure of control over the price bargain is also derived from the commission's power to require reasonably adequate service and facilities. The largest direct influence, however, is exerted when commissions pass upon operating expenses as an element of cost in building up the reasonable level of earning power.

A search of commission decisions reveals little evidence that this phase of regulation has received the attention it deserves. One exception should perhaps be noted. Under service-at-cost franchises all expenditures of any magnitude, whether for operation or construction, must receive the approval of some administrative authority before they become a "cost" in the franchise sense. It was inevitable that in working out this form of regulation close supervision would have to be exercised over the more important price bargains.

In supplying their needs for land, raw materials, equipment, etc., public utilities must purchase in competitive markets. In this respect, the price, labor, and investment bargains are akin to each other. Seldom, if ever, is a public utility in the position of a buyer's monopoly. It is true, however, that a public utility may sometimes be required to purchase from a monopolistic or semi-monopolistic seller. In buying electric power, for instance, an electric railway may be dependent upon some other public utility. In that event the price bargain for one utility is, in effect, the rate bargain for the other utility, and thus subject to the complete control of the regulating authority having jurisdiction over both of them. In other cases, as in the purchasing relations between the Associated Bell Telephone Companies and the Western Electric Company, the price bargain is negotiated between two parties which are, in effect, subject to control by the same holding company. This is also true where coal companies and companies manufacturing equipment and rolling stock sell to public utilities under circumstances where, through intercorporate relations of either a holding company or a community of interest nature, buyer and seller represent the same financial interests. Under such circumstances it is peculiarly important that the price bargain be closely scrutinized by regulating authorities.

Sec. 3. Managerial Responsibilities

We have seen that the principle of controlled monopoly has been applied to utilities. This means that utilities do not have full control of their means of getting revenues. Consequently, under some circumstances, public utility managements are faced with a grave economic problem when they turn their attention to the buying end of their enterprises. They must keep their businesses in an operating condition capable of satisfying all reasonable service demands. To do this they must enter markets and buy in competition with unregulated industries. With public authority controlling revenues, management is under real pressure to take a serious view of their cost problems, and to practice economies in the matter of expenditures. This fact was well brought out before the American Electric Railway Association,[1] where it was pointed out how, in the electric railway field in particular, fares had for years remained relatively fixed in the face of rising price levels, though the quantity and quality of the service have been bettered. This result was accomplished because "the extremely narrow margin between revenues and expense has focussed the attention of the industry on every item of expenditure and the resulting scrutiny is reflected in the low cost of the service."

Sec. 4. The Dynamics of Prices and the Price Bargain

The aspect of prices which is of particular concern to management arises out of the uncertainty and fluctuations of the course of prices. On this account public utilities must observe and study price movements and seek, by the application of foresight and judgment, to keep their purchases upon as low a price level as circumstances will permit.

The war started a great price movement which exerted a marked influence upon the cost of service. Public service companies felt the influence of soaring price levels through the price bargain. In 1920 material costs for electric railways were about two and one-half times their 1914 levels.[2] Through efforts of the American Electric Railway Association an index of construction costs for the electric railway industry was prepared

[1] Doolittle, F. W., "Essential Operating Costs," *Proceedings of the Am. Elec. Ry. Ass'n*, 1923, p. 221.

[2] *Proceedings of Amer. Elec. Ry. Assoc.*, 1923, p. 221.

which was based upon 1914 price levels.[3] According to this special index number the peak of prices was reached at 256. Although price levels have declined to some extent it seems at present as if they will remain for some time upon a higher level than that of 1914. The index figures for December 1926 and January 1927 were 203.2 and 203.5 respectively. Trends of raw material prices are significant because they are soon reflected in the cost of all finished products.[4]

[3] *Aera*, Vol. 17, February, 1927, p. 71.

[4] The following paragraphs are from a recent survey of such trends:

"1. Copper receded to a price below normal prewar trend at the close of the war and necessary recoveries will influence finished products which did not recede to normal, thus compensating in part for other elements which will reduce. With refining capacity in excess of 3 billion pounds per year and a maximum of 2 billion pounds refined in 1916 it is apparent that this industrial burden will stabilize higher prices.

"2. Steel and iron basic products became a drug on the market when war contracts were cancelled and the commercial orders were not able to absorb production. Consequently prices fell to below costs of production in order to reduce stocks, release capital and prevent unemployment. The steel company did not earn its dividends and price recoveries became imperative. Increased steel prices compensate for other commodity recessions tending to maintain equilibrium on a relatively higher plateau.

"3. Zinc, farm crops, animals, etc., receded to below the prewar average and reasonable recoveries will compensate in part for other recessions.

"4. Building materials indicate the cycle influences reflected by all commodities. The building shortage and lag of price recessions will require years to overcome. Annual requirements are 500,000 houses which must be maintained before recoveries are attained. Records show approximately 120 families occupy 100 houses.

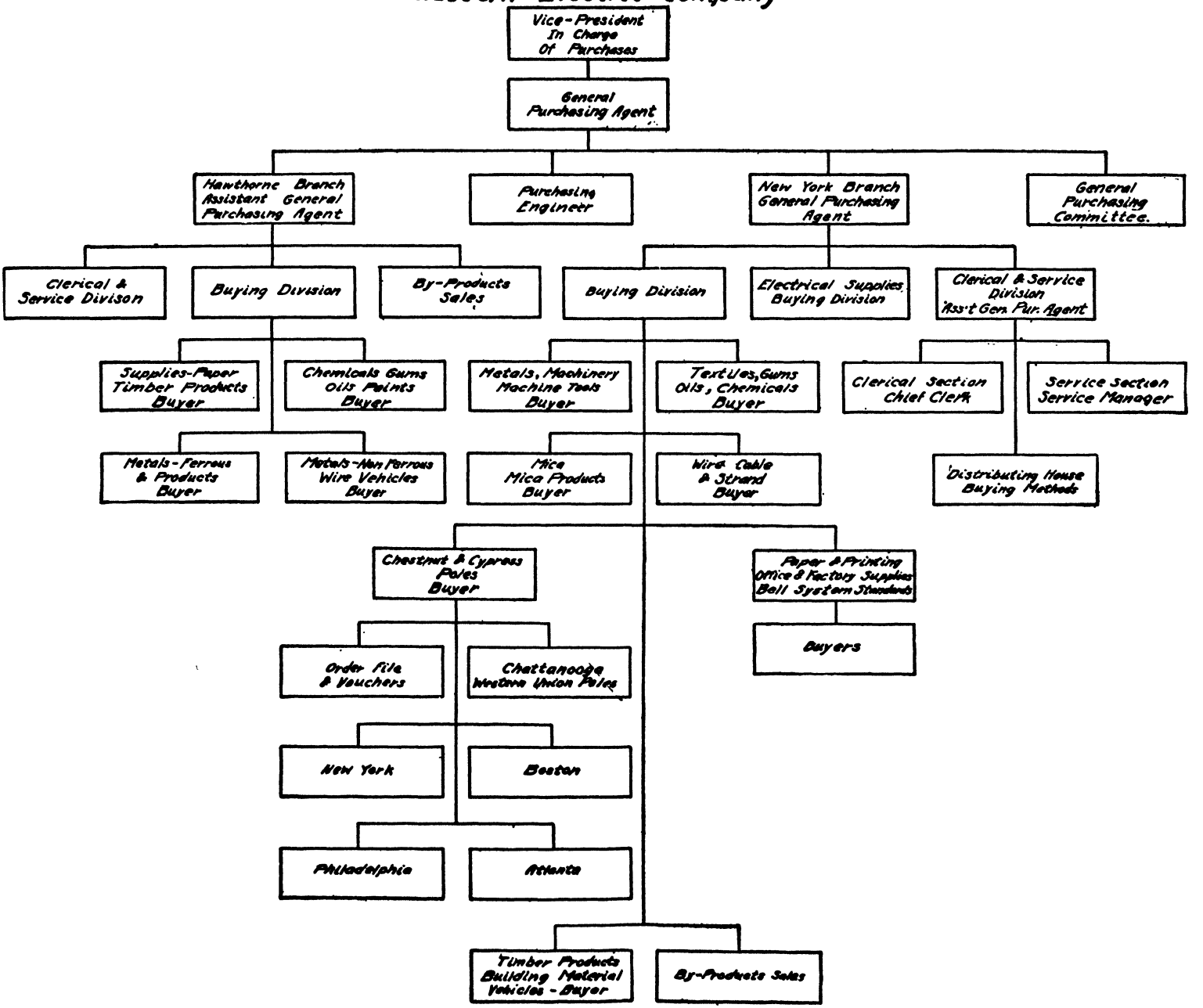
"5. Timber exhaustion will permanently increase lumber costs. Oak and Southern Pine ties are being replaced by Douglas Fir ties secured in the far west and railroads must therefore carry larger stocks and thus tie up larger sums in stocks on hand. Hard wood reserves are reduced to 25% which is principally in the southern Mississippi Valley. Hickory and Ash will be nearly exhausted in the next few years.

a. New England must import one-half of its consumption of lumber.
b. Pennsylvania virgin timber is practically exhausted.
c. Lake States lumber cut will fall to 50% by 1930.
d. Southern Yellow Pine mills will cut over their supply so that the present 5,000 mills will be reduced to practically 100 in ten years.
e. Rocky Mountain regions are sawing seven times the growth of saw timber.
f. Montana, Idaho, and the Pacific Coast must assume the burden with resulting concentration of ownership, limitation of competition, longer haul, and higher prices.

"6. Lumber prices have increased steadily for many years (there was no recession in price of soft woods after the Civil War), averaging 1½% increase per annum for the past 50 years. Hard woods have averaged 6⅓% increase per annum for 60 years. Concentration of ownership, control of "key acres," national forest inaccessibility, regional associations of lumber manufacturers and longer hauls will assure continued greater costs for

Chart XXVII

Organization of General Purchasing Department of the Western Electric Company



(Reprinted from L. C. Marshall, *Business Administration*, p. 384.)

The expansion of public utility investments during and after the war has further emphasized the importance of price changes. Management not only had to face rising and, later, fluctuating price levels but it had also to face the necessity of using more and better materials in the rendition of service. The technology of these industries was constantly changing. This is again well illustrated in the street railway field. Standards of track and paving construction have advanced. Rolling stock was changed in character in that sturdier, better-built safety-cars of steel construction were developed. Other improvements for insuring strength, durability and convenience of use were introduced with the result that obsolescence has become an important factor in the cost of operation. These developments have quickened the rate of turn-over of investment and have also extended the volume of capital outlay.

Sec. 5. **The Administration of the Purchasing Function**

The function of negotiating price bargains is usually placed in the hands of a distinct purchasing organization. This purchasing organization may be a department of operating public utilities, or may, in the case of syndicated properties, be a department of the parent holding or management company. In the latter event all major purchasing of the subsidiaries is consolidated and placed under the supervision of the central purchasing organization. In the telephone industry the Western Electric Company occupies a unique position because in it are combined the manufacturing and purchasing functions of the Associated Bell Companies. Chart XXVII shows the organization of the purchasing function of this company and illustrates the extreme degree of specialization which accompanies the consolidation of the purchasing function.

(a) *A classification of purchasing activities.*

This is not the place to discuss *in detail* the organization and administration of purchasing. The following classification of the activities of a typical purchasing department will, however, serve to emphasize the need for close articulation between the purchasing function and the operating departments in order to insure both economy in purchases and the supply of materials

lumber, thus compensating in part for recessions in other products and causing a higher plateau of prices when replacement must be purchased." Woy, F. P., *Engineering Administration*, Democrat Printing Co., Madison, Wis., 1923, pp. 249-51.

of the type and at the time required by the operating department.[5]

I. Information

(a) Obtaining information as to sources of supply.
(b) Recording date of past purchases.
(c) Recording prices and quotations.
(d) Preserving results of inspections and tests.
(e) Recording maximum and minimum quantities and estimating future needs.

II. Purchases

(a) Activities associated with material requisitions.
(b) Obtaining quotations.
(c) Placing and following up orders.

III. Invoices

(a) Recording and checking invoices with orders.
(b) Checking prices and charges, classifying materials, etc.
(c) Approving invoices and passing them on to accountants.

That management is alive to its duties in these respects appears from the following statement of one electric railway official:[6] "The investment in supplies frequently runs into hundreds of thousands of dollars, and their economical purchase, care, and systematic disbursement are among the more important functions of the traction utility. The needs of operation, maintenance, and construction departments must be anticipated and supplied without delay as the public must be promptly served."

(b) *Significance of the business cycle.*

In making its major purchases, particularly of supplies for construction when many commodities showing different price trends must be brought together, the business cycle is of special importance. Public utilities must exercise a reasonable degree of care and foresight in making purchases. This implies that management will make analyses of general price trends and must possess a knowledge of particular price movements. A market analysis of particular prices should enable it to base its purchases upon some forecast of future prices. But the price of any commodity in general use is a very complex phenomenon and the management has done its full duty if, in addition

[5] Marshall, L. C., *Business Administration*, The University of Chicago Press, 1921, p. 365.
[6] Doolittle, F. W., "Cost of Urban Transportation Service," *Amer. Elec. Ry. Assn.*, 1916, p. 18.

to the exercise of good faith and a reasonable discretion, purchasing is done under as scientific a procedure as is the customary practice among progressive business concerns.

The need for continuity of service, however, sometimes places management under peculiar disabilities in buying. Unforeseen or fortuitous conditions such as strikes, transportation embargoes, and traffic tieups, may make purchasing imperative regardless of price considerations.

It has always been urged by students of labor relations that public utilities should seek, so far as possible, to do their building during periods of slack employment. The alternation of prosperity and depression in the business cycle may make it impossible for public utilities to do their construction work during periods of unemployment, and yet at the same time not be forced to buy supplies during periods of high prices. The carrying of large stocks of supplies for extended periods may thus become necessary if public utilities are to refrain from purchasing at the peak. All these considerations indicate that a nice balancing of factors is involved in the proper timing of purchases, and these may sometimes lend a speculative aspect to transactions under the price bargain.

It thus becomes exceedingly difficult to apply proper canons of criticism to purchasing activities.[7] Public utilities can not be expected to exercise an unerring judgment in the matter of prices. Nevertheless, proper purchasing methods require that buyers have a working acquaintance with the economic theory of price movements and make an effort to articulate the needs of the going concern with propitious times for purchasing in the commodity markets.

(c) *Other important aspects of purchasing methods.*

Successful purchasing methods require not only that prices be investigated, but also that a bidder's reliability in the matter of delivery dates and of quality of materials be established. There is much, therefore, which tends toward the establishment of permanent buying relationships, instead of a policy of competitive "shopping around". In large establishments, the more or less steady requirements for standard apparatus, for coal, coke, oil, etc., are not obtained by means of purchase orders but under written contracts containing terms and conditions. In this way a convenient schedule of deliveries and payments may

[7] The price index of construction materials shown in Chart XXV should be consulted in this connection.

be worked out which will afford the utility an assured supply during the contract period, giving it the benefit of quantity discounts, and protecting it against price fluctuations.

In the matter of quality and quantity of purchases a buyer's special bargaining ability may have to be re-enforced by another specialist, an engineer of purchases, whose duty it is to keep a reasonable relation between quantity ordered and prospective needs, and to determine upon the detailed specifications to which material should conform.[8] In this connection standardization is important in order to keep down obsolescence and to eliminate unnecessary variations in specifications, both of which are costly and inconvenient.

(d) *Store-keeping.*

Purchasing has thus become an independent and centralized function, carried on by specialists in large organizations.[9] The receiving and inspection of supplies and their proper care and disbursement has been combined into another independent function, that of store-keeping. Purchasing and store-keeping are closely related. In its 1924 report the Committee on Purchasing and Stores of the American Electric Railway Association recommended that purchasing and stores departments, even if separately operated, should be under the direction of the same executive officer. If the two functions are operated as one unit, it is recommended that the storekeeper should be under the direction of the purchasing agent.

The activities of a well-organized stores department include the following:

1. Issuing requisitions on the purchasing department for the most economical amount of the right kind of materials for delivery at the most advantageous time and place.
2. Checking all materials received as to quantity and quality.
3. Storing all material in a safe and convenient manner.

[8] A convenient illustration is the purchase of coal upon the basis of a B. T. U. standard instead of by weight.

[9] The means employed by business units in keeping up their statistical records of price are (a) the published statements of price movements, (b) special information furnished by private statistical bureaus, and (c) the statistical data relating to purchases gathered from their own files. Thus the Middle West Utilities Co. keeps a purchase and cost record containing the quantity of every commodity purchased from particular manufacturers. The classification is so arranged that unit prices may be obtained for any commodity of all sizes and descriptions. A monthly price record of 60 commodities has been kept since 1916. *Proceedings of Middle West Utilities Co.*, p. 79.

4. Issuing the exact amount of materials and supplies at the time required.
5. Maintaining accurate records of all receipts and disbursements and of the balances of material on hand by means of a stock book.

The stock book is a kind of barometer of supply. It will disclose obsolete or slow-moving stores. It provides an accurate check on scattered supplies. It shows turnover and is thus an indicator of future requirements. If the record has been correctly kept and priced, the stock book may conveniently serve the purposes of a perpetual inventory.[10]

Similar procedure ought also to be applied in the care and sale of scrap.

Sec. 6. **Standardization**

Another essential element of policies respecting the price bargain is standardization. Standardization has been called the reduction of any line of product to fixed types, sizes, and characteristics. Its essential aim is simplification. Standards are usually arrived at after much experimenting. Thirty-three of the more important technical societies have united in forming the American Engineering Standards Committee. This body acts as a general clearing house for standardization problems, and is interested in securing standardization on a national and even international scale. One concrete result of the movement is the "National Directory of Commodity Specifications" published by the Department of Commerce. This is a handbook in which commodity specifications are coöperatively formulated by public purchasers, trade associations, and public utilities.

[10] As illustrative of the economies which may be expected from proper procedure in store-keeping, the results of a study of stores administration by a committee of the A. E. R. A. in 1923 may be cited. This study related to the ratio of materials and supplies on hand to the gross revenues of thirteen companies for which information could be obtained. The ratios were as follows:

Average ratio of		lowest four companies	3.08%
"	"	" next lowest four companies ...	5.64%
"	"	" remaining five companies	7.34%
"	"	" all companies	5.35%

It appeared that two of the lowest four companies, whose investment in materials and supplies represented 85% of the group total, operated under methods recommended by the Committee. It was estimated that if the second group could have operated on a ratio as low as that of the first, its investment would have been reduced by 42% or $878,000. Assuming that 12% represented a reasonable annual handling and carriage charge, an economy of $105,000 could have been effected. For the third group investment could have been reduced by 57% or $2,853,000 and the resulting economy for the year would have been $342,000. *Proceedings of the Amer. Elec. Ry. Engineering Association*, 1923, p. 543.

Standardization, properly understood, does not militate against progressive service. It is the legal duty and the economic purpose of going concerns to render adequate service upon the basis of progressively *advancing* standards. Not infrequently enterprises are beset with a managerial policy—and this danger is a very real one in the case of entrenched monopolies—which regards the operation of public utilities as opportunities merely for the earning of incomes. The competitive stimulus being absent, management settles down to a complacent routine of operations upon the basis of the status quo. This is taking an unprogressive view of the problem of standardization.

It is a commonplace of regulation that in the provision of materials, equipment, and structures, the formula of "adequate service" implies that these be modern, safe in operation, and capable of giving continuous service. By providing for depreciation or retirement reserves as a part of the cost of operation, public policy recognizes that management should not be financially handicapped in retiring inadequate or obsolescent portions of the going plant. One of the functions of administrative commissions is to keep public utilities abreast of the times. It is necessary, therefore, that the technical staffs of commissions should keep informed concerning the status of the properties under their supervision, and of the state of the art in this and other countries. Their duties in this respect will be especially helpful to the smaller utilities, particularly the small, isolated municipal plants; but supervision may also do much to encourage progressive policies in the case of the larger properties. Industry-wide coöperation must be the key-note in standardization.

This whole movement for standardization of commodities and materials purchased and used in industry is at bottom a movement for economy and efficiency. In only one aspect does it aim to promote economy of purchasing. The proponents of standardization do not want to hinder progress or to develop indiscriminate standardization; they recognize that standards must change and that in some fields standardization can not be carried as far as in others. The railway industry is a notable example. But they do claim that making all necessary allowances for diversity there is still a large place for economic standardization, consisting of the elimination of useless variations in detail. This has the effect of reducing the investment in materials and supplies besides making easier the maintenance of adequate stores. A further purpose is the reduction of the cost of manufacturing standardized materials whereby producers throughout the coun-

try are able to benefit by the resulting economies in the use of materials and labor.

Interesting testimony as to the advantages of standardization comes from an official of a company manufacturing equipment for electric railways. In testifying before the Federal Electric Railways Commission in 1919 regarding the use of the "safety car" to improve the financial situation of urban electric railways, he said: "The safety car is practically standard. The total amount of advance (in price) in the safety car was about 50%, and that was due to the fact that it was standardized and we could run them through in 100 and 200 car lots and sell them to the individual as he wanted them and practically take them off the shelf. Now, other cars have advanced over 100%." [11]

Public utilities should coöperate with manufacturers in cutting down such diversity in requirements as is based merely upon individual caprice. Ideas hatched by the mechanical departments of the various electric railways have brought forth standards peculiar to individual properties, and this is the principal reason why there are so many car types. Holding company control is doing something to produce uniformity. Scientific associations, the Department of Commerce, particularly the Bureau of Standards, are doing their part. It remains, however, for administrative commissions, and particularly for legislative bodies having control over service matters, so to shape legislative and administrative regulations that coöperation between public utilities and manufacturers becomes possible.

Sec. 7. **Vertical Integration and Syndicated Properties**

As an alternative to purchasing supplies and equipment from others, a concern may adopt the policy of self-manufacture and self-supply. To what extent should a public utility seek to become its own supplying agent? Seldom, however, do such proposals contemplate more than owning coal mines or gravel pits or operating shops for the construction and maintenance of equipment. From the standpoint of management this is a question of the comparative advantages of integration or vertical combination and of the present procedure. From the public point of view the question is largely one of the relative efficiency and economy of purchasing in the open market or of self-supply. Sometimes, however, it may be questioned whether an open mar-

[11] *Proceedings of Federal Electric Railway Commission*, Washington, 1920, Vol. 1, p. 400.

ket can be maintained, and collusive or improvident contracts prevented, particularly in the case of inter-related companies.

If the quantity required becomes great enough it may prove economical to extend ownership back to the source of supply. In syndicated properties this is usually accomplished by creating new subsidiary companies. The American Telephone and Telegraph Company with its subsidiaries, especially the Western Electric Company, is an outstanding example of integration. Whether a utility should get control of the large streams of material required, depends chiefly upon the economies that can be achieved. However, it may become imperative, regardless of economic considerations, that control be obtained of even small streams of very important material in order to insure reliability and continuity of supply. This aspect of the matter needs also to be considered. Can the manufacturing or mining function be economically combined with the public utility function? Or is it possible to organize a separate, well-officered department or company to carry on the new activities? On steam railways the general officers are usually transportation men, and manufacturing functions would not, perhaps, receive at their hands the managerial consideration which they merit. There is danger also that excessive manufacturing costs may be absorbed and covered up in the accounts of the public utility.

It is doubtful whether public utilities should be allowed to go very far afield in their efforts to supply themselves, because the difficulties of regulation would thereby be enhanced. For, after all, regulation must depend upon the free functioning of competitive forces in the supply of producers' capital in order to provide an economic starting point for the regulation of rates. It is a sound public policy which insists that *the control of earning power and hence of price-fixing shall extend only so far as it has been found necessary to extend the monopolistic principle in the organization of production.*

We have already mentioned the advantages which holding companies offer in purchasing supplies for subsidiaries.[12] These advantages may be conveniently summarized as follows

1. With quantity purchases, uniform demands and assured credit, manufacturers can be induced to give annual discounts upon purchase contracts.
2. More attention can be given to the selection and standardization of purchases from the standpoint of both quality and cost.

[12] Compare discussion of holding companies in Chapter IV *supra.*

3. Purchasing departments can be consolidated resulting in a reduction of stores and in the costs of administration.
4. The interchange and transfer of materials and equipment between subsidiary operating companies is conducive to economy in the utilization of supplies.

As Dewing writes:[13] "The central purchasing department of the holding company upon which requisitions are made by local managers is able to use greater discrimination in selecting machinery and equipment than the manager of the local company when acting alone. In the matter of intelligence, the single purchasing department can devote considerable time to a study of the relative costs of different types of transformers, gas retorts, or cars, as the case may be, and purchase standardized equipment for all the subsidiaries. . . . For it stands to reason that the manufacturers of even such staple commodities as cast iron pipe and copper wire will offer special discounts to the purchasing agents of groups of companies able to negotiate exclusive contracts carrying a large volume of purchases." [14]

Sec. 8. **Commission Control over the Price Bargain**

Governmental regulation of public utilities does not completely serve its purpose unless it actively lends its aid in effecting economies and improving technical processes. The nature of such promotional activities must be briefly examined for their effect upon the price bargain. It was said above that commissions by virtue of their power over service, rates, and security issues should keep utilities abreast of the times. In order to do this they must coöperate with the utilities in the promulgation of service standards as will be explained more fully in Chapter XXVII. Efforts of progressive utilities in furthering technical improvements should be encouraged by making liberal allow-

[13] Dewing, A. S., *Financial Policy of Corporations*, Vol. IV, p. 118.

[14] In a foot-note, Vol. IV, p. 118, Dewing gives the following illustration of discounts offered in the purchase of incandescent electric lamps. The important producers are subsidiaries of the Westinghouse and General Electric companies. These companies have made an agreement with each other covering a uniform scale of discounts, based on the gross purchases under a yearly contract, as follows: $150 a year, 17% discount on "standard packages"; $300 a year, 21%; $600, 24%; $1200, 27%; $2500, 29% $5000, 31%; $10,000, 33%; $20,000, 34%; $30,000, 35%; $50,000, 36%; $100,000, 37%; $150,000, 38%; $225,000, 39%; $300,000 and over, 40%. Such lump purchase contracts permit a single management controlling several companies to pool the purchases. The contract is signed by the purchasing department of the holding company, and attached to the contract is a rider giving a list of all the subsidiary companies whose total purchases are to be lumped together in figuring the composite discount.

ances in operating expenses for technical research and experimentation.[15] More than this, the commissions should encourage and promote coöperation between the public utilities and the various technical associations and manufacturers of technical equipment in the progressive improvement of the fixed plant, and the more general adoption of improved methods and practices.

It is, however, in settling the various problems of good service and fair rates that public authority is able most effectively to scrutinize and influence the price bargain. In various ways, both directly and indirectly, commissions may do much to penalize bad practices and reward good practices in the adjustment of the price bargain.

(a) *Limitations arising out of control over service.*

The significance of public control over service and the price bargain lies in the fact that public authority thereby determines indirectly the amount and character of much public utility purchasing. For instance, commissions have power to order repairs, the reconstruction, improvement and extension of the plant, and such other property changes as may be necessary to insure proper service. Statutes or administrative orders frequently impose special duties with reference to service. For example, express and telegraph companies have been required to use telephone service; all public utilities have been obliged to use safety appliances, and to obey sanitary and health regulations. These regulations may impose the expenditure of large sums. Similarly, standards of service laid down by commissions may impose expenditures upon utilities and operate indirectly to control even the selection of equipment. Formal orders involving standards of construction, the arrangement of facilities, and the installation and efficiency of equipment, have been promulgated by various commissions in service codes.[16] In these various ways the discretion of management with reference to the price bargain is limited.

Respecting details of service commissions have decided such questions: whether utilities should furnish direct or alternating current; whether a railroad company must furnish tank cars,

[15] Public opinion often regards with suspicion expenditures to which no immediately practical result can be traced. It is the duty of commissions to explain the purpose and need for them.

[16] *Cf.* Spurr, H. C., *Guiding Principles of Public Service Regulation*, Pub. Utility Reports, Inc., 1924, Vol. I, p. 105.

track connection and station facilities; whether electric, gas and water utilities may be required to install meters.[17] They have even designated the kind of material to be used in the construction of depots. Occasionally, commissions still exercise their original powers as when a railroad is ordered to complete the construction of its road in accordance with the terms of its charter.

The foregoing illustrations of orders affecting service have been picked from a mass of service regulations merely to show how managerial initiative respecting the price bargain may be circumscribed indirectly through commission control over service. The question may be raised: How far should this control extend? It is impossible to give an answer which is generally applicable. The usual interpretation is that commission control is not managerial in character. It is recognized that a reasonable zone of managerial discretion must remain if managerial responsibility is to remain a potent force. The exact limitation of this zone in particular instances will depend upon judicial interpretations of particular statutes, and the terms of such statutes, in turn, will depend upon the particular difficulties which are believed to need legislative correction. Authority conferred upon commissions will be sparingly exercised if management lives up to its responsibilities.

(b) *Limitations arising out of control over rates.*

In discussing the rate-base attention was called to the fact that commissions have reviewed the evidence as to property investments by applying the test whether such investments were "reasonably and prudently made." It is obvious that by this test an indirect control is exercised over the price bargain. What are excessive construction costs, or excessive prices for plant purchases, or unwise and premature extensions, or palpable errors of judgment in matters affecting engineering design and construction, are all matters that affect the price bargain. Most earlier proceedings involving valuations for rate purposes afford illustrations where something less than the full cost of property and plant was included in the rate-base.[18]

[17] Spurr, *op. cit.*, p. 107.

[18] It has been held, for instance, that present consumers of a gas company should not be required to pay rates which will yield a return upon the entire producing equipment of the company where approximately 80 per cent. was provided to meet anticipated demands of the future. Spurr, H. C., *Guiding Principles of Public Service Regulation*, Vol. II, p. 109.

A brief historical account of the manner in which railroad construction

Regulation also affects the price bargain when an allowance is made for working capital. Commissions have uniformly held that an allowance for materials and supplies must be made which is adequate to meet operating needs and to insure continuity of service. At this point the amount of stores and the prices paid often come up for consideration. It should be noted that discounts upon purchases are premised in part upon an adequate allowance for working capital.

Control over the price bargain may be exercised directly when security issues come before administrative authorities for approval. Thus it was held in Missouri that "the Commission, in passing upon an application for approval of the sale of public utility property and the price to be paid therefor, must protect the interest of the public against building up property accounts in excess of the value of the property transferred. . . . The sale of utility property at a price in excess of the value approved by the commission was authorized upon condition that the difference between the sale price and the fair value be amortized out of net income over a period of ten years and that no portion of such excess should be charged to the operating expenses or to capital accounts." [19]

Another instance of direct control over the price bargain appears when commissions pass upon what they regard as reasonable operating expenses. This is also the point of most direct incidence between regulation and the labor bargain. How far commissions may go in declaring expenditures to be improper or excessive is an important question. That such powers may be and are exercised is undeniable. It has been said that "the proposition that a company is entitled to a fair profit involves a further proposition, that its affairs are economically and judicially managed. The management may, if it desires, choose between profits and a high operating account, but it cannot rightly choose to impose both upon the consumer." [20]

How expenditures are distributed between the various accounts, let us say between direct expenses and supervisory expenses, is not of such vital importance to the consumer. Yet it

companies were used to pad investment accounts is given by Dewing (*Financial Policy of Corporations*, Vol. II, pp. 91-97). Similar occurrences might be chronicled in the earlier history of the local utilities. It may be said, of course, in extenuation of these practices, that they occurred at a time when the policy of continuous regulation had not even been suggested and would probably not recur again.

[19] *Re. North Missouri Power Co.* (Mo.), P. U. R., 1925-A, p. 545.

[20] *Re. Chicopee*, 18 Mass. Gas & Elect. Lt. Com. Reports, p. 33 (1903).

is highly important that total costs, material and labor, direct and indirect, be kept within reasonable limits. As stated above, the general rule seems to be that while a commission has the power to inquire into the efficiency with which affairs are conducted, it does not represent the owners of the utilities, and hence may not substitute its judgment for that of the management which is responsible to owners. The initiative in making decisions remains with ownership. Commissions must act within the limits of this rule in their control not only of the price bargain but of the engineering process as well. But they may, nevertheless, do or refuse to do certain things which exert a very direct pressure upon management.

In the utilization of materials and supplies, for instance, commissions may adopt certain physical or pecuniary standards of operating efficiency, disallowing all costs in excess of these standards, whether the result of improvident purchases or uneconomical operating conditions. In one case it was held by the Illinois Commerce Commission that the use of 11.8 pounds of coal per kilowatt hour in the generation of electric power was not efficient operation. It was decided that a power station of the size and character under discussion ought, when properly operated, to be able to realize a coal consumption of less than 7 pounds per kilowatt hour. Similar standards of operating efficiency have, from time to time, been used in cases involving other types of public utilities.[21]

The question of the propriety of prices paid by public utilities came to the fore frequently during the war and post-war periods. Not only prices but also the conditions under which purchases and payments were made have been considered. Thus it has been held that where, during an emergency, there has been purchased at high prices a quantity of coal sufficient to avoid discontinuity of service, customers ought properly to bear the increased cost.[22] Likewise it has been held that the actual cost of fuel purchased by a utility should not be rejected as a reasonable operating cost in the absence of a showing of abuse of managerial discretion.[23] On the other hand, where an unwise contract involved a large expenditure for fuel it was held that these costs should not be passed on to consumers in their entirety. In this case it appeared that the company in question had been slow and negligent in providing for its fuel needs. Although a

[21] *Re. Centralia Gas & Elect. Co.* (Ill.), P. U. R., 1920-F, p. 124.
[22] *Re. Milford Gaslight Co.* (Mass.), P. U. R., 1919-C, p. 4.
[23] *No. W. Ohio Light Co.* v. *Leipsic* (Ohio), P. U. R., 1924-B, p. 762.

railway strike had occurred in the fall of 1919 the concern had failed to act until the high price period of 1920, when it made a five-year contract at $3 per ton. In 1923, when the case was decided, coal could readily be bought for $2 per ton. On the basis of these facts the allowance in operating expenses for cost of coal was fixed upon the basis of a price of $2 per ton.[24]

That operating costs increased, or that supplies of poor quality were purchased, does not necessarily prove managerial inefficiency. Poor quality of materials are sometimes the result of dislocations in the commodity markets so common in war time. Electric railways, in particular, exemplify the truth of the adage that "sweet are the uses of adversity." They became keenly alive to the needs of economy and efficiency in operation when, with the rising prices of material and the ever menacing danger of substitute services, great inroads were made upon their earning power, rendered more or less inflexible by fixed franchise rates or by the unwillingness or inability of commissions to advance rates.

In purchase transactions involving public utility services the commissions have likewise applied a rule of reasonableness depending upon the facts in each case. In one case it was decided that the price to be paid for additional current needed by an electric utility should be based upon the present cost of gas and fuel oil used.[25] In another case it was held that even though the rate paid for electric power by a distributing company is higher than that paid by other companies elsewhere, nevertheless, this rate may properly be used in estimating operating expenses, since it appeared that the cost would be as great if the utility generated its own current.[26]

Examination of another class of cases involving inter-utility contracts is illuminating because they involve the effect of "community of interest" upon the price bargain. In one case before the New York Commission it appeared that a distributing company had made a contract with a producing company for electric power at $16 per horse power. Subsequently, the distributing company allowed the producing company to cease performance under the contract without properly contesting its right to do so. Thereupon the distributing company entered into another contract to which the producing company and a third company were parties. Under the second contract the distributing

[24] *Re. Citizens Mutual Heating Co.* (Ind.), P. U. R., 1924-A, p. 783.
[25] *Re. Southern Cal. Edison Co.* (Cal.), P. U. R., 1924-C, p. 29.
[26] *Croty* v. *Tomah Elec. & Telephone Co.* (Wis.), P. U. R., 1917-A, 439.

company agreed to take current required to supply its excess needs from the third company at $18 per H.P. The third company, however, secured its power from the producing company under a contract whereby it could purchase up to 20,000 H.P. at $16 per H.P. It also received a commission of 50c. from the producing company for each horse-power purchased. It was estimated that the expenses of the third company in selling and delivering the current to the distributing company could easily be covered by the commission of 50c. per H.P. allowed by the producing company. Upon the further showing that a "community of interest" existed between the third company and the distributing company, it was held that the consumers of the distributing company could not properly be burdened with the additional cost of energy amounting to about $2 per H.P. and resulting solely from the manipulation of these contractual arrangements.[27] In another case involving the sale of natural gas to a distributing company, where the selling company was a subsidiary of the same company which also owned a majority of the stock of the buying company, it was held that the reasonableness of the price of natural gas may be investigated in a rate proceeding.[28] In still another case it was ruled that where a distributing company paid excessive prices for gas to a generating company where both are under the same legal control the operating accounts of the distributing company are not conclusive evidence upon the question whether its earnings are adequate.[29] On the other hand, commissions will not interfere with power rates provided for in a contract between utilities controlled by the same board of directors if it does not appear that the right of consumers to reasonable rates is adversely affected.[30]

In this same connection contracts for financial, legal, engineering, accounting, purchasing, and instrument services between holding companies and their subsidiaries have come under commission surveillance. Such are the licensee contracts of the American Telephone and Telegraph Company, the Western Electric Company purchase contracts, and, in general, contracts for services rendered by holding or management companies to operating public utilities.

Contracts between the American Telephone and Telegraph

[27] *Re. Lockport Light., Heat. & Power Co.* (N. Y.), P. U. R., 1918-C, 675.
[28] *Re. Clarksburg Light & Heat Co.* (West. Va.), P. U. R., 1912-A, 577.
[29] *Natick Petitions* (Mass.), P. U. R., 1915-D, 655.
[30] *Re. Potomac Elec. Power Co.* (D. C.), P. U. R., 1917-F, 70.

Company and its associated companies, whereby the latter pay to the former 4½ per cent. of their gross operating revenues for such services, have been objected to by commissions.[31] Some have regarded the charge as excessive; others objected to the method of computation. Commissions criticizing the method of computation claimed that payments upon a percentage basis were unscientific and operated unfairly, for, by this arrangement, when rates are increased as a result, let us say, of increased wages, payments to the parent company go up in proportion, even though there has been no change in the nature of the service.[32]

The Western Electric Company contracts with the operating companies of the Bell System are true price bargains since they concern the purchase of supplies. They involve the question whether holding company control of both buyer and seller is inimical to a proper adjustment of the price bargain. In a number of cases where these contracts have been subjected to commission scrutiny, they have been upheld as being advantageous to the consumers.[33] Because these contracts cover special services rendered by the supply company as purchasing agent and as warehouseman, a charge of 2 per cent. of the purchase price of materials was held not to be an unreasonable burden upon operating telephone companies. On the other hand, it was also held in Louisiana that commodity prices paid under these contracts by operating telephone companies should be lowered proportionately to the reductions in prices of similar commodities in the open market.[34] "We see no objection," said the commission in the latter case, "to the petitioner making its purchases in the manner which it does, but for the petitioner to contend that the prices on commodities which it uses cannot be lowered to any extent after the prices for other constructed or manufactured commodities are lowered, will (would) be contrary to business principles."

In a recent case involving the New York Telephone Company, the operation of such a contract was thoroughly investigated and the conclusion was reached that the prices charged by the Western Electric Company were, on the whole, on a fair basis. To quote from the opinion of Commissioner Blakeslee:

[31] This percentage has since been reduced.

[32] *Re. Chesapeake & Potomac Tel. Co.* (Md.), P. U. R., 1920-F, 417. *Re. Western States Gas & Elec. Co.* (Cal.), P. U. R., 1924-D, 681, p. 697.

[33] *Cf.* for instance, P. U. R., 1921-C, p. 833; P. U. R., 1922-E, p. 46; P. U. R., 1922-C, p. 248; P. U. R., 1923-B, p. 352.

[34] *Re. Cumberland Tel. & Teleg. Co.*, P. U. R., 1922-E, p. 86.

"The fact that the American Telephone and Telegraph Company owns and controls both the Western Electric Company and the New York Telephone Company has given rise to suspicion, and it has been frequently urged that because of this fact the New York Telephone Company is forced to pay higher prices to the Western Electric Company for electrical equipment and services than would be the case if purchases were made in the open market. This subject has been thoroughly explored, the evidence covering 427 pages of record and 30 exhibits. * * * About 1902, after an investigation by the American Bell Company, it was found that in the purchase of supplies and other articles not manufactured by the Western Electric Company, the associated companies were competing against each other and, to a certain extent, with the Western Electric Company; that there was duplication and added expense in the matter of purchasing and warehousing; and that supplies purchased were not graded to any standard. A standard supply contract was entered into between the Western Electric Company as purchasing agent and some of the associated companies. This covered the purchase of poles, wires, crossarms, insulators, stationery, office supplies, directories, printing and all of the various articles used in the telephone business. The New York Telephone Company made such a contract with the Western Electric Company in 1907, and is now one of the largest purchasers of non-manufactured articles, obtaining annually from the Western Electric Company about 90% of its supply requirements. The associated companies are not required under this contract to purchase from the Western Electric Company; and receivers, transmitters, and induction coils (station sets) and repeaters are not covered by the standard supply contract, but are furnished to associated companies under the license agreement with the American Telephone and Telegraph Company. * * * The Western Electric Company sells telephone apparatus manufactured by it under two price lists, one to associated companies, the other to the general trade. Associated company prices are in general substantially lower and never higher than the lowest price to the general trade and are fixed regardless of quantity. Prices to the general trade follow common business practice in allowing lower prices for wholesale quantities."[35]

In earlier cases the power of the commission to pass upon these contracts was unquestioned. In a recent case involving the Southwestern Bell Telephone Company, however, the United States Supreme Court reversed the Missouri Public Service Commission in disallowing the payment, because nothing indicated bad faith or the exercise of improper discretion on the part of the directors of the company. In the words of Justice McReynolds, "while the state may regulate with a view to enforcing reasonable rates and charges, it is not the owner of the property of public utility companies, and is not clothed with the general power of management incident to ownership."[36] This opinion seems to leave no doubt that the initiation of contracts

[35] P. U. R., 1923-B, p. 545.

[36] *State of Mo. ex rel. S. W. Bell Tel. Co.* v. *Public Serv. Commission*, 262 U. S. 276, p. 289 (1923).

is within the sphere of management, although the opinion does not imply that some measure of control may not be indirectly exercised.

The case cited illustrates well the reality and potentiality of commission control of the price bargain. Although the courts hold that managerial discretion may not be interfered with, even where "community of interest" between purchaser and seller obtains, the commission may ferret out objectionable practices, if they exist. The procedure is reminiscent of the activities of the Massachusetts Railway Commission which exercised a wholesome influence upon public utilities in its time, even though its powers were merely investigatory.

Sec. 9. Some Special Legislation Involving the Public Utility Price Bargain

In addition to control exercised by commissions there has been a considerable amount of special legislation which affects public utility price bargains both directly and indirectly. The first of these was the so-called "Commodities Clause" of the Hepburn Law of 1906. This law provides that after May 1, 1908, it would be unlawful for any carrier to transport in interstate commerce any article or commodity other than timber and its products which the carrier owns or in which it is directly or indirectly interested, except such as may be needed in the conduct of its business as a common carrier. The purpose of the legislation was to divorce transportation from all other lines of business. By so doing it was hoped that the discrimination in rates and in the supply of cars practiced against independent producers by coal carriers who also operated coal mines could be eliminated. Although somewhat emasculated by judicial decisions, the law has, nevertheless, brought about something in the way of a segregation of the business of transportation from the business of coal mining. It has probably also been effective in preventing a further development of vertical integration which was so marked before 1906.

The Clayton Act, passed by Congress in 1914, was aimed at the abuse of discretion exercised by officers and directors of common carriers. A series of investigations [37] had shown that operating, construction and financing costs of railways had been

[37] Of the Pujo Committee of Congress into the "money trust"; of the Interstate Commerce Commission into the "New Haven Scandal," and into irregular practices of carriers in general. *Cf.* 31 I. C. C. Reports 32 (1914).

inflated due to the private interests of railway directors and officers in concerns supplying locomotives, cars, railroad appliances, electrical machinery, steel, coal, oil, cement, and other commodities and services required by carriers. The act accordingly placed special penalties upon embezzlement by railroad officials and provided further that after a certain date (ultimately fixed as January 1, 1921) no common carrier could have dealings with concerns in the purchase or sale of securities and supplies, or make any contracts for construction or maintenance, in an aggregate amount exceeding $50,000 in any one year, when an officer or agent of the carrier was also an officer or agent of or had a financial interest in the other contracting party, unless the contracts were let to the highest bidder in open competitive bidding under regulations prescribed by the Interstate Commerce Commission. The prohibition was accompanied by adequate penalties. This legislation was obviously aimed at giving common carriers the benefit of open market transactions.

Legislation against the practice of rebating has also affected the price bargain indirectly. It has been established that railroads paid more for supplies, especially lubricants purchased from the Standard Oil Company, so as, in effect, to confer upon the supplying company what has been called a "smokeless rebate." Such practices can be effectively dealt with, if discovered, under anti-rebate legislation.

The general purpose of special legislation affecting the price bargain or of commission control of the same has been to point out within what limits managerial discretion must remain in the adjustment of the price bargain. The courts have held that such control must not dispossess management of its initiative. It must leave the core of private interest untouched; yet it may supervise managerial activity by vetoing such initiative when it affects the public interest adversely.

CHAPTER XXVI

THE TAXATION OF PUBLIC UTILITIES

The taxation of public service corporations is, next to valuation, the most complex and difficult subject with which a general outline of public utility economics must deal. The great diversity of tax legislation by different governments, the varying methods and effectiveness of administration, the historical factors which have colored the development of tax policy, have given the subject a variety and complexity which almost defies condensation within a single chapter. To these considerations must be added another which should be kept particularly in mind in reading this chapter. The taxation of public utilities proceeds under the taxing power. It is therefore subject to the constitutional limitations imposed by the rule of equality. Taxation of the various tax subjects must be equal; the central problem, therefore, is one of determining what methods will produce equality of tax burden as between public utilities and other tax subjects. Definitive conclusions in the matter of taxation of public utilities can therefore flow only from a study of general tax systems and the comparative burdens which these impose upon public utilities as compared with other industries.[1]

There are two reasons, however, why the taxation of public utilities ought, nevertheless, to be discussed. The first is that, in the development of taxation, these industries were classified apart from other industries and were subjected to more or less distinct methods of taxation. The second is that taxes paid by public utilities are a substantial portion of the total cost of the service and are taken into account by regulatory authorities when fixing reasonable rates under the police power.

[1] For many of the facts contained in this chapter, and particularly for the historical material presented, I am indebted to Prof. H. D. Simpson of the Institute for Research in Land Economics and Public Utilities, whose doctoral dissertation upon the subject of the Taxation of Public Utilities was begun at the University of Wisconsin, and will shortly appear as a publication of the Institute.

Sec. 1. The Meaning and Relative Importance of the Tax Bargain

The term "tax bargain" may only be applied in a Pickwickian sense. The tax bill paid by public utilities is the result of a compulsory levy by the government within whose jurisdiction the property is located. Although the term bargain is used, there is nothing volitional about taxes; for they are not, ordinarily, the result of any contractual relation between the going concern and a governmental unit. Once before the term bargain was used in this extended sense. Dividends upon the common capital stock were included in the investment bargain for purposes of convenience in analysis. Only the original subscription to stock, however, could be considered as resting upon contractual relations. The future receipt of income by the stockholder flowed as a result of the workings of an economic institution, the corporation. Yet volition strongly colors the investment bargain as a whole.

In the case of the tax bargain, if volition played a part in determining tax payments, it did so only for those semi-compulsory payments in the nature of taxes which were provided for in special charters or franchises. A pseudo-volitional aspect is also given to the tax bargain by certain methods of property assessment, where the judgment of assessors plays a part in determining the tax base. Surely, within the limits of the total cost of maintaining governmental institutions, the actual apportionment of this burden of cost to different tax subjects through the assessment of their properties by tax commissions partakes of the nature of a bargaining transaction in which comparisons of burden represent the crux of the argument.

Table X of Chapter V classifies expenditures of the different types of public utilities under the heading of the Tax Bargain. Again, attention must be called to the fact that some taxes are not there included. Taxes levied upon property during the period of construction of the original going plant and upon its accretions are not classed as operating expenses under accounting classifications but become a part of the cost of fixed capital. Barring these minor items [2] the electric railway industry paid out 6.4 per cent. of its operating receipts in taxes during the census year 1922. The average for the five census years (1902, 1907, 1912, 1917, 1922) was 5.8 per cent., indicating that the

[2] In no event are the omitted items as important as labor or material costs chargeable to construction.

importance of its tax burden is growing. Yet the full significance of this growth is somewhat concealed by the form in which the facts are presented in this table.[3] The electric light and power industry, excluding municipally owned plants which pay no taxes or pay them only constructively, in 1922 paid out in taxes 7.87 per cent. of its total operating receipts, and an average for the five census years of 5.4 per cent. The corresponding figures for steam railways were 5.4 per cent. and 4.1 per cent.; for the telephone industry 7.3 per cent. and 5.2 per cent.; for the telegraph industry 4.5 per cent. and 2.8 per cent.

For water utilities and gas utilities, as usual, the facts can not be ascertained for the country as a whole. This is also true of that miscellaneous assortment of industries, which are of a public utility nature legally considered, but which, on account of their recent development or comparative unimportance from the standpoint of yield in taxes, have not been subjected to legislative regulation of the more thorough-going kind. For privately owned gas and water utilities, in the state of Wisconsin, an analysis of reports to the Railroad Commission shows that taxes constituted about 10 per cent. of operating receipts in the case of gas utilities and 18 per cent. for water utilities.

Taxes have added significance if a comparison is made between taxes and the amount of corporate *net* income.[4] In Table XXIV are shown the ratios of taxes to corporate net income for the more important public utilities where facts could be readily obtained from census or other data. The percentages show the amounts by which the stockholders' share would have been increased had there been no taxes levied by government. Apparently the conclusion is that taxes have been increasing faster than the net income available for dividends. The steam railway and electric railway industries have been most affected. Speaking particularly of electric railways, Simpson comments as follows: "From the stockholders' standpoint the question in turn presents itself whether this situation has been brought about by a change in his taxes or in his income. . . . It is apparent that the nether millstone of taxes remains relatively fixed; it is the

[3] See, however, Table XXIV, p. 577.

[4] In an article dealing with the statistical aspects of public utility taxation Simpson shows various kinds of ratios, among them the ratio of taxes to operating revenues as indicating the taxation of customers, the ratio of taxes to gross income as indicative of the taxation of property, and the ratio of taxes to net income *before taxes* as showing the taxation of stockholders. *Cf.* Simpson, H. D., "Taxation of Public Service Industries," ***Journal of Land & Public Utility Economics***, Vol. 1, No. 1, Jan., 1925.

upper millstone of "other expenses" that keeps grinding relentlessly upon the slender grist of net income remaining."

Although, as stated above, no definitive conclusions can be

TABLE XXIV

TAXATION OF PUBLIC UTILITIES [a]

RATIO OF TAXES TO CORPORATE NET INCOME

	1902	*1907*	*1912*	*1917*	*1922*
Steam Railroads	19.43	17.87	27.32	36.92	82.45
Electric Railways	42.75	48.97	51.41	81.06	113.64
Electric Light & Power	16.70	16.81	21.37	32.67	....
Telephone	13.59	15.07	24.18	40.66	48.41
Telegraph	5.90	13.27	33.00	33.74	44.57

[a] Based upon Census figures as compiled by Simpson and supplemented by other figures.

drawn from a limited study of the question, it may be well to present the facts, in so far as they are available, of comparative tax burdens.[5] This is done in Table XXV below.

TABLE XXV

COMPARATIVE TAX BURDENS

Year 1922

Items	*Ratio of Taxes to Gross Receipts*	*Ratio of Taxes to Net Income Before Taxes*
Electric Railways	6.18	53.19
Steam Railroads	5.18	45.19
Express Companies	1.50	44.60
Farms	6.29	31.40 *
Pullman Company	6.00	28.10
Telephones	6.83	27.28
Banks	6.69 †	26.40 §
Telegraphs	4.50	22.40
Elec. Lt. & Power	7.40	22.10

* Average 1922 and 1923.

† National banks, 7.44; state banks and trust companies, 5.93; averaged in ratio of gross earnings.

§ National banks, 30.2; state banks and trust companies, 23.62; averaged as above.

The first column in the above table shows how much of each dollar of gross receipts goes for taxes. The second column shows

[5] Simpson, *op. cit.* (*Journal of L. & P. U. Econ.*), p. 57.

the relative burden of such tax payments in terms of net income. It is clear that if the ratio of taxes to net income before taxes is an accurate measure of the real tax burden, that burden is far from equal.

Sec. 2. Stages in the Development of Public Policy with Respect to Public Utility Taxation

The changing attitude of the public towards public service corporations is reflected in the development of forms and methods of taxation as well as in the evolution of forms of regulation. During the greater part of the history of the United States, when much of the country was in a frontier condition of settlement, great inducements were held out to individuals and companies to encourage them in the development of public service enterprises. In tracing the history of public utility taxation Simpson has outlined five distinct movements and has assigned roughly the dates during which the ideas which lay at the basis of these movements influenced considerably the formulation of tax policies. Although, taken in the large, they have a very definite chronological sequence, there is a great deal of overlapping as to the time when these movements were effective and it cannot be definitely stated when one began and the other ended. These movements give us:

1. A period of subsidy from about 1790 to 1860.
2. A period of tax exemption from about 1790 to 1873.
3. A period of uniformity in taxation from about 1850 to 1890.
4. A period of differentiation in taxation resulting in special forms of corporate and of public utility taxation and extending from about 1873 to 1920.
5. A period of integration and of equalization of the burden of public service and other taxes within the single tax system.

The movement for integration and equalization is only now beginning. It aims to bring about equalization of the tax burden by systematic studies of the incidence of taxation and applying the results in the reconstruction of tax systems.

(a) *The period of subsidy.*

In order to bring about the construction of turnpikes, canals and railways most of the states early adopted policies of public aid through stock subscriptions, loans, land grants, and cash subsidies. Much of the enthusiasm for this kind of support was

wiped out in the financial collapse of 1837 when some of the state treasuries were actually bankrupted.

The western states and the federal government, however, continued the practice of subsidy after it had been abandoned by other states. On account of constitutional prohibitions against investing state funds in internal improvements, the assistance often had to come from municipalities and counties which were authorized to subscribe to railroad stock. Competition among cities for transportation facilities prolonged municipal assistance, although under statutory limitations. The federal government was urged by the states to continue the policy even after the states had refused longer to participate. The courts upheld the use of public credit in the financing of public utilities on the ground that public utilities performed public functions.[6]

The result of this policy was a rapid development of transportation utilities. The improvements were pushed into territories so sparsely settled that they were unable to supply the volume of traffic and business necessary for the continuance of profitable operations. This policy also gave us a period replete with graft and incompetent management, because much of the capital supplied by the public found its way into the pockets of promoters or was invested in such a manner as to be of little service to the public.

(b) *The period of tax exemption.*

Although the policy of direct subsidization was discontinued, public utilities were still looked upon as "works of necessity and grace" and hence the other early policy of almost complete exemption from taxation was not so easily discontinued. These tax exemption clauses were contained in early charters or in special acts and they conferred exemptions either for a term of years or in perpetuity.[7] Charters conferring such privileges were, of course, tenaciously retained, some of them well into the present century. The influence of the Dartmouth College decision was apparent. But the courts aided in another way by holding that even though exemptions were not specifically provided by statute, they could be implied from the charters, at least so far as local taxes were concerned, *unless there was specific authorization to tax.*

[6] *Dyar* v. *Farmington Village*, 70 Me. 515 (1878), also *Allen* v. *Inhabitants of Jay*, 60 Me. 124 (1872).

[7] Prof. Simpson's study contains illustrative details of this as well as other generalizations, and to these the reader is referred.

This insistence upon exemption in one form or another appears to rest upon the legal nature of enterprises providing turnpikes, highways, bridges, canals and railways. As in the case of subsidies, exemption was grounded upon the fact that the industries affected were regarded as public works and therefore exempt from taxation.[8]

Gradually a transition was worked out to the policy where public utilities like other enterprises were made subject to taxation. Exemptions were limited to terms of years corresponding to what appeared to be a reasonable developmental period. In this form exemption was continued as a policy until about the close of the nineteenth century. In another form, taxation was conditioned upon whether a public utility earned more than a specified dividend rate. Later, general incorporation laws for railroads, as in Ohio in 1848, reserved the right to tax. In the end the exemptions in the old special charters were eliminated by amendment or disappeared when the companies were dissolved.

(c) *The period of uniformity.*

By 1850 a reaction against the policy of exemption set in, first in Ohio, and then throughout the Middle West. The reasons for the reaction are found in the hard times of the fifties, in the

[8] Simpson produces this interesting illustration from *Inhabitants of Worcester* v. *Western Rail Road Corporation*, 4 Metcalf 564, p. 566 (1842), in which the Massachusetts court reasons as follows (after citing the usual powers and privileges of such companies):

"From this view of the various provisions of the law, by which the rights and duties of the Western Rail Road Corporation are regulated, it is manifest that the establishment of that great thoroughfare is regarded as a public work, established by public authority, intended for the public use and benefit, the use of which is secured to the whole community, and constitutes therefore, like a canal, turnpike or highway, a public easement.

"Treating the railroad then as a public easement, the works erected by the corporation as public works intended for public use, we consider it well established that, to some extent at least, the works, necessarily incident to public easement, are public works, and as such exempted from taxation. Such we believe has been the uniform practice in regard to bridges, turnpikes, and highways, and their incidents; and also in regard to other public buildings and structures of a like kind; as state houses, forts, and arsenals, court houses, jails, churches, town houses, school houses; and generally to houses appropriate to public uses."

This decision well illustrates one aspect of the thesis upon which this treatment of public utility economics is based, namely, that the concept of public utility is an institutional growth which involves drawing a line of demarcation between public services on the one hand and private businesses on the other. In this instance, the court is conscious of the fact that railways are not private in character, but the line between public services and public utilities is painfully indistinct.

passing of frontier conditions, in the growth of "debtor" communities, in the increasing burden of public debt and taxation when the extravagances of the subsidization and public improvement policies had to be liquidated.

The uniformity movement, as it developed, involved changes in tax statutes, constitutional amendments, or new constitutions with "uniformity clauses." These clauses provided that all property be taxed under a uniform rule and upon the basis of its cash value. Political parties and farmers' organizations centered their efforts upon putting an end to the favoritism which had been shown the public utilities.

The system of taxation first applied to railroad, telegraph, and other public service corporations was the general property tax with local assessment. It proved a "dismal failure." With assessment in the hands of local assessors taxes were evaded. Their experience with, and knowledge of, methods of ascertaining the cash value of properties extending through several states and many taxing districts was woefully inadequate. There was corruption of local tax officials by means of passes and special privileges. The character of railroad property itself introduced the possibilities of wide discrepancies in the assessment of property in adjacent taxing districts. Where honest attempts were made to derive a true valuation, the efforts were thwarted by the failure of the companies to supply the necessary or the correct information. The period was therefore marked by wholesale evasion of taxes and gross inequalities in assessment.

In some cases, as in Ohio, the carriers were required practically to assess themselves and to apportion the assessment among the various counties. Later, assessment by a board of assessors made up of the auditor of the counties through which each railway ran was tried. Similar methods were applied in the case of street-railway, gas, water and bridge utilities. Always, the public utilities found some method of evading the tax burden.

(d) *The period of special taxation.*

Taken in connection with the growing movement for rate regulation,[9] these results could not fail to bring on drastic action. The Granger, Populist, and other radical movements, growing out of economic conditions which obtained during the last three decades of the nineteenth century, were instrumental in bring-

[9] Briefly described in Chapter IX *supra.*

ing on further attempts to force utilities to assume a greater tax burden.

The development of a more satisfactory system of taxation, both in the matter of legislation and administration, was retarded by conflicts over jurisdiction between the local taxing districts and the states. The very constitutional provisions for uniformity which had initiated public utility taxation now stood in the way of a correction of the weaknesses. The difficulties which the movement for rate regulation encountered induced its proponents to try the use of the taxing power as an instrument for recovering what were regarded as excessive earnings. All these movements are epitomized in the "anti-corporation" feeling with which the discontented elements countered the "public-be-damned" spirit of the American phase of the Industrial Revolution.

Nevertheless, the difficulties in the way of more effective taxation of public utilities were gradually overcome by a series of special tax laws designed to get around constitutional obstacles. So many special forms of taxations were devised that state tax systems became a confused mass of unrelated tax measures, enacted without any basis of principle except that of securing increased revenues out of corporations in general, and out of public utilities in particular.[10] The more common types of special taxation were (a) the various forms of taxes on corporate franchises; (b) taxes assessed upon earnings either gross or net; (c) modifications of the general property tax as applied to corporate property, with ad valorem assessments; (d) the various forms of excise taxes on corporate capitalization, such as taxes on the normal value of capital stock, on the market value of the shares, on tonnage carried or other traffic unit, on instruments employed or other convenient index of business, on transactions, and a host of other variations.[11] Only typical ones among these special forms of taxation applying to public service companies will be discussed, particularly those that were more generally adopted and that have maintained themselves until the present time.

[10] This idea has been represented as "plucking the goose with the least squawking."

[11] No useful purpose would be served in presenting the details. The general reader, seeking only orientation, would be wearied by the recital and confused by the lack of system with which the various forms were combined.

Sec. 3. **Taxation of the Franchise**

The first of these types illustrates the method of franchise taxation. Historically considered, franchise taxation was developed as supplementary to general property taxation, the latter being locally administered while the former was assessed by some state agency. In Massachusetts franchise taxes were levied upon all corporations in 1864 in the form of a tax upon "corporate excess." This form evolved directly out of the general property tax in an effort to reach the so-called intangible elements of property value which the general property tax did not reach. The franchise was peculiarly "available" for this purpose because a tax upon the value of the franchise was regarded by the courts as the taxation of a "special privilege." It was also favored by the public because it was a tax aimed at monopolistic or semi-monopolistic profits that appeared to be escaping control under the police power, but that might be assessed for taxes under the name of franchise value.[12]

The most diverse bases were adopted for measuring the value of the franchise. What was aimed at in each case was the intangible wealth which represented tax-paying ability as much as did the tangible property values, both real and personal, already reached under the property tax.

Under the Massachusetts law the value of the franchise is now measured by means of the capital stock of corporations. Franchise value is assessed by the State Tax Commission, which begins by taking into account the market value of these securities and the capitalized value of profits. From the total assessed value of the capital stock is deducted the value of real estate and machinery locally assessed, the value of property outside of the state, and the value of tax-exempt securities held by the corporation. The remainder, or "corporate excess," is considered to be the value of the franchise and has been taxed since 1865 at the average rate of taxation upon other property throughout the state. This form of tax applies to both private and quasi public corporations with certain modifications. In the case of street railways, tracks, cars, poles, and wires are not considered as machinery subject to local taxation and are there-

[12] Governor Roosevelt, in 1899, in a special message to the Legislature of New York upon the taxation of special franchises said:

"A corporation which derives its powers from the state should pay to the State a just percentage of its earnings as a return for the privilege it enjoys. . . ."

fore taxed as part of the corporate excess. This law has been upheld as an "excise" tax on the corporate franchise and hence not subject to the constitutional requirement of uniformity applicable to property taxation.[13]

A similar tax in New York, applicable, however, only to public service corporations holding special franchises, defines the franchise as real estate, and makes it subject to local assessment. The value is determined by capitalizing the net earnings for each locality over and above a reasonable return upon the value of physical property. The law also provides that these assessments be equalized with the assessment of other property.

In California franchise taxation was first accomplished by the method of taxing the corporate excess.[14] A constitutional amendment in 1910, however, established a different method of taxing public service corporations and certain other classes of corporations. The power to tax these designated corporations was transferred to the state and gross earnings were made the basis of computing the tax. The new taxes were levied in lieu of property taxes, but they are regarded as taxes upon both the tangible property and franchises.

Thirty-six states now have some form of franchise taxation, which is usually supplementary to other taxes.

Sec. 4. The Gross Earnings System

This method at one time appeared to be gaining the greatest favor because of the ease with which the tax was administered. The central idea in this form of taxation is that the gross receipts are a better and more easily ascertained base upon which taxes may be assessed than is the value of the property of a corporation. It was argued that if the rate is properly adjusted, taxes upon gross earnings will cover both tangible and intangible property.[15] The taxes paid are easily assessed because gross revenues are readily ascertainable, and the amount of tax yield is fairly regular from year to year because gross earnings fluctuate less than do the net revenues. Moreover, since some public utilities like express companies had little physical property but a high earning power, the latter was better reflected in gross revenues and hence taxes on this basis provided a method

[13] *Western Union Telegraph Co.* v. *Mass.* 125 U. S. 530 (1888).

[14] Compared with the Massachusetts system, the California plan was modified by including the market value of bonded indebtedness along with the market values of the capital stock.

[15] Non-operating property is assessed locally under the general property tax.

of reaching both tangible and intangible property values. It has, on the other hand, been criticized because gross revenues are no fair index of earning power from year to year.

The tax was first levied as a supplement to the property tax in order to derive more revenues from public utilities. It was contested by them upon the constitutional ground that a gross earnings tax was an interference with interstate commerce. The tax was upheld, however, as not burdening interstate commerce (a) if levied in lieu of all other taxes, or in lieu merely of taxes upon intangible personal property, or (b) if levied only upon gross earnings arising out of intrastate commerce.

Due to the exigencies of experimentation the gross earnings tax was not applied to all public service industries at the same time but was applied tentatively to railway companies as early as the sixties by a few states. In the course of time its scope was widened so that it became the sole basis for taxing practically all public service industries in the states of Maine, Minnesota, California, and Connecticut, and constituted a substantial element in public service taxation in thirty-two other states. What commended it to the legislatures was the ease with which the taxes of public utilities could be increased or decreased. In California the system was inaugurated in 1911 after an elaborate investigation had been made of the burden of taxation on various classes of property. This investigation [16] was itself a premonition that the period of special taxation was giving way to one in which tax systems with their various forms of taxation would be built upon economic principles of equalization. Since gross revenues are no indication of the net income available to pay taxes, due to variations in the operating ratio, in the investment required, etc., the primary object of the California investigation was to ascertain what rates of taxation of gross earnings represented equivalent burdens upon the different branches of public service industries. Table XXVI, p. 586, shows the rates applied by the legislation of 1911 and the changes made since that time.

In other states tax rates upon gross earnings have varied from 1/40th of 1 per cent. to as high as 9½ per cent.

Sec. 5. **The Ad Valorem System**

The third distinctive form of special taxation which has been applied to public utilities is the so-called ad valorem system.

[16] Conducted under the direction of Prof. Carl O. Plehn of the Univ. of California.

TABLE XXVI

CHANGES IN RATES OF GROSS EARNINGS TAXATION AS APPLIED IN CALIFORNIA

Class of Public Utility	*Rates*				
	1911	1913	1915	1917	1920
Railways	4.00%	4.75%	5.25%	5.25%	7.00%
Electric Railways	4.00	4.00	4.00	4.00	5.25
Car Companies	3.00	4.00	3.95	3.95	5.25
Express Companies	2.00	2.00	1.60	.90	1.00
Telegraph & Telephone Companies	3.50	4.20	4.50	4.20	5.50
Gas and Electric Companies	4.00	4.60	5.25	5.60	7.50

In taxation the term "ad valorem" is used to designate a recent form of property taxation, in which assessment takes place under the "unit rule" [17] and by means of centralized assessment machinery.[18] The aim of the new system was to include, in addition to the assessment of physical items of property, such intangible elements as franchise value, good will, and going concern value. In tax nomenclature these terms are often used without sharp distinctions and are lumped together under the head of intangible values. The development of this special form of taxation is closely associated with the general movement toward centralization of tax administration. The general property tax, under even the best administration, is based upon the assessment of individual items of tangible property at their "cash value." Cash value has been interpreted as market value, and consequently "picked sales" of similar property have been used as the best index of market value, particularly of landed property. With respect to those items of property that are infrequently transferred, or where the sale constitutes a transfer merely of a controlling interest, as is often the case with corporately owned property, sales values are not available and resort was had to more or less "rough and ready" methods of estimating the "cost of reproduction." These methods, then, were applied also in the case of the "ad valorem assessment" of public utilities except that the work was done by means of a central state board.

Centralized assessment was lodged with state officials when

[17] The "unit rule" has been explained in Chapter XIV, page 322.

[18] Although tax systems are now generally administered and supervised by central administrative boards, the necessity for such administration arose from the development of special taxation of public utilities. In 1918 Prof. Lutz listed 35 states as having state tax departments.

"special" taxation, such as taxes upon gross earnings, capital stock, etc., were first introduced. Since such assessment was often put into the hands of ex-officio boards, the regular duties of these officials prevented them from doing more than to discharge their duties in a routine way. This fact, together with political and other influences which were brought to bear upon the boards, resulted in the comparative failure of these special taxes. Ad valorem assessment was thus introduced as an experimental alternative and the assessment of the entire property of public service corporations was put into the hands of administrative commissions. These had a more permanent tenure, were protected from political influences, and their assessments were presumptively non-partisan and scientific in character.[19] Missouri in 1871 was the first state to adopt what ultimately became the ad valorem system, by creating a State Board of Equalization which was empowered to assess the entire property of railways, with the exception of local real estate. Other states followed. When this method of taxation, and particularly the application of the unit rule, received the approval of the United States Supreme Court, it may be said that this special form of public service taxation was definitely established.[20]

The "unit rule" was approved in the following language: "A railroad must be regarded for many, indeed for most purposes, as a unit. The track of the road is but one track from one end of it to the other. . . . It may well be doubted whether any better mode of determining the value of that portion of the track within any one county has been devised than to ascertain the value of the whole road, and apportion the value within the county by its relative length to the whole."

It was felt that the removal of assessment from local assessors to a state board would bring about uniformity in methods, full value assessments, and put the determination of value where it would be removed from local influences and prejudices. Speaking generally, the system was applied in a piecemeal fashion to express, telegraph, railroad, canal, and telephone companies. The immediate result was that assessments were substantially increased. In Indiana, for instance, the assessment of one railroad was increased from $8,538,053 in 1890 to $22,666,470 in 1891, although the assessment of other property in the same districts was increased only 43 per cent. The use of the "unit

[19] *Cf.* Lutz, H. L., *The State Tax Commission*, Harvard Univ. Press, 1918, p. 35.

[20] *State Railroad Tax Cases*, 92 U. S. 575, 608 (1875).

rule'' is important because under it tangible and intangible property elements can be included by taking into account earning power as reflected in the market value of outstanding securities. The tax rate applied to the assessment usually was the average rate of taxation of property throughout the state.

The present-day system of ''ad valorem taxation'' dates from the passage of a constitutional amendment in 1900 by Michigan which provided that ''the legislature may provide for the assessment of property of corporations at its true value by a State Board of Assessors. . . . The rate of taxation of such property shall be the rate which the State Board of Assessors shall ascertain and determine is the average rate levied upon other property.'' Legislation in 1901 provided for a physical valuation of all the railroads of the state upon the basis of the cost of reproduction new less depreciation. Intangible values were separately assessed.[21] The average state rate when applied to the combined assessment very greatly increased the tax burden of railways in the state of Michigan.

Wisconsin began to displace its system of gross earnings taxes by the ad valorem system in 1899 when express, sleeping car, freight line, and equipment companies were assessed by the State Board of Assessors under the new plan. The average rate applied was a consolidation of state and local rates, and the taxes were in lieu of all other taxes. In 1903 the system was applied to railways and the methods of assessing them modeled closely upon the Michigan plan. In 1905 telegraph companies, street railway companies, electric light and power companies operated in connection with street railways, were brought within the scope of the system. Other states followed the example of Michigan and Wisconsin to the same or a lesser extent. At the present time all but twelve states have applied the ad valorem system in the taxation of public utilities to some extent, in quite a number of cases almost to the complete exclusion of other forms.

Sec. 6. **Miscellaneous Special Forms of Public Utility Taxation**

There remain several miscellaneous special forms of public utility taxation. Some of these were of greater importance in the past than they are at present, and there are several new

[21] The physical appraisal was made by Prof. M. E. Cooley of the Engineering Dept. of the University of Michigan, while intangible property was appraised by Prof. H. C. Adams of the Economics Dept. and Statistician for the Interstate Commerce Commission.

forms that are being applied at the present time. Some of them grew out of the difficulties encountered by the general property tax in reaching personal property, particularly securities like stocks and bonds.

(a) *Taxes upon Capital Stock and Securities.*

Capital stock was first taxed in 1831 under a system of excise taxation (one mill per share) by Pennsylvania, which is still the outstanding state to use the capital stock of corporations as a tax-base. Other states adopted it as a substitute for the personal property tax.[22] First applied to shares owned by non-residents, it was later applied also to shares in the hands of residents, and then extended to the funded and floating debt. It is difficult at times to distinguish between capital stock taxes and franchise taxes where the market value of the capital stock is taken as a measure of the value of the franchise. The federal government enacted a capital stock tax upon all corporations in 1916. The tax is sometimes levied upon the par value and at other times upon the market value of the shares. It is used either as a special tax upon selected types of public service corporations or upon corporations without distinction. The rates range from merely nominal rates (as in the case of Wyoming where the rate is 1/100 of 1%) to a rate of 5 mills (as in Pennsylvania where it is levied upon the "actual value" of the capital stock of domestic and foreign corporations with certain exceptions). In the latter state a tax of 4 mills upon the "nominal value" of corporate indebtedness is also imposed. Taxation of corporate securities is therefore an important component in the revenue system of that state. In other states it is merely an incidental source of revenues. Twenty-two states at present levy some form of capital stock tax upon public utilities.

(b) *Net income taxes.*

An early form of taxation akin to net income taxation was the tax levied upon dividends in excess of a specified rate. Outstanding recent illustrations are the Massachusetts tax of 1898 levied upon dividends of street railway companies in excess of 8 per cent., and the Federal Corporate excise tax of 1909 upon net earnings in excess of $5,000 taxed at a rate of 1 per cent. In general, barring a few earlier illustrations, public utilities have not been singled out for special taxation in applying this form

[22] It was also urged as a means of checking overcapitalization and of reaching intangible property values.

of taxation, but have been included along with other corporations under a corporate excise tax or under the general income tax. The Wisconsin general income tax of 1911 specifically exempts those public service corporations which are subject to ad valorem taxation. Only eleven states levy net income taxes applying to public service corporations, and most of these apply only to a limited number and carry rates varying from ½ of 1 to 3 per cent.

Public service corporations have been subject to the general income tax levied by the federal government since 1913 when the corporation excise tax of 1909 was displaced. The federal excess profits tax was an emergency revenue measure growing out of the World War. It was a graduated tax levied upon net income in excess of 8 per cent. upon the invested capital. Not many public service corporations paid this tax and it has now been repealed.

(c) *License taxes.*

Mention should also be made of license taxes which are usually, though not exclusively, levied as a local tax, and which frequently arose out of franchise grants. Regulation has, in a sense, made such taxes an anachronism because their objective was to force the public utility to divide monopoly profits with the community and to exact some recompense for the use of streets. The basis has been either a lump sum payment per annum or a specified amount per unit of rolling stock, or equipment, or K.W. of capacity, etc., depending upon the nature of the utility.[23]

[23] A committee report on "Special Taxes" of the American Electric Railway Association in 1923 brings the following tabulation of license taxes paid by 35 companies out of a total of 104 electric railways reporting to the committee:

Car Licenses (26 cos.)	$431,032
Pole Licenses (9 cos.)	3,365
Wire Licenses (2 cos.)	2,260
Track Licenses (7 cos.)	7,213
Car and Pole Licenses (1 co.)	717
Car, Pole and Wire Licenses (2 cos.)	11,143
Pole and Wire Licenses (1 co.)	1,033
Car Advertising Licenses (1 co.)	125
Total	$456,888

The electric railway industry is particularly subject to this form of taxation. Due to its straitened circumstances the industry has long been waging a campaign to secure remission from such taxes. This partial census indicates how prevalent these taxes still are, and something as to their nature.

Sec. 7. **Contributions in the Nature of Taxes**

Resembling to some extent license fees are certain compulsory payments in the nature of taxes arising usually out of franchises. A committee of the American Electric Railway Association refers to these in the following statement: "To some extent these special burdens are in the form of fees, theoretically based on special privileges, but for the most part they consist in the requirement that the utility shall render free service either to certain groups of citizens or employees or shall perform individually at its own expense certain pieces of public work. They are not taxes in the sense that a bill is rendered which is settled in cash and a receipt given therefor under the name of tax. They are taxes in that they are expenditures which would otherwise be paid for out of the public purse and are therefore, to the extent of their cost, just as distinctly a tax burden as a definite rate imposed upon real estate."

These indirect imposts or quasi taxes include street paving requirements for both steam and electric railways, the requirements of snow removal, street sprinkling, free transportation of public employees, free water supply for municipal purposes, free electric or gas supply for street and other public lighting, electric power to swing bridges, etc. Much dispute surrounds some of these items, particularly street paving. The construction and maintenance of pavement in the track zone was not at one time an unreasonable burden upon street railways in the horse-car days when the horses helped to wear out the pavement. Electric railways do not wear out pavements. Electric railway structures in city streets do cause extra expense in first cost and in upkeep, but the historical grounds for paving obligations have largely disappeared. Other obligations are survivals of the general "franking" privileges for public officials, of which the "railway passes" were the outstanding illustration. Paving and other requirements have been justified upon the ground that public service industries thereby repay city expenses incurred in providing a free roadway, such as expenditures for condemnation, surveys, excavation, filling, grading, etc. These arguments, both pro and con, lose themselves in the mazes of expediency and public policy. Electric railways do have a just cause for complaint if other competing public utility users of highways, like motor bus and trucking companies, escape with lesser tax burdens. Indeed, the same considerations may also

raise countervailing claims upon public policy, if street railways, by absorbing these burdens, are forced to accept less than a fair return upon their invested capital.

There can be no questioning the unreasonableness of the more extreme of these obligations. Street and sewer construction, paving of the entire street, gutter and sidewalk construction, certainly pass all reasonable bounds. To impose upon customers through lowered service standards or higher fares and upon electric railway stockholders through a less than fair return the burden of a public service which should be borne by the whole body of taxpayers is tantamount to the adoption of a policy of discriminatory taxation.

The amounts so paid are not a minor element in the tax burdens of electric railways. The A. E. R. A. Committee, referred to above, made an effort to ascertain the amount of such payments. The tabulation on the opposite page gives the result.

Operating revenues for the companies reporting amounted to $358,530,280. The ratio of total imposts to operating revenues for this group of companies was therefore 2.6 per cent.

Sec. 8. **The Gross-Net System of Earnings Taxation**

The report of the Special Joint Committee on Taxation and Retrenchment in New York in 1922 recommended the immediate adoption of a combined gross and net earnings tax on public service corporations.[24] The same proposal was made later by a committee of the National Tax Association.[25] The plan includes a flat tax on gross earnings (designed to take the place of taxes upon tangible property) supplemented by a tax on net earnings. The rate is computed on gross earnings, but is graduated in accordance with the ratio of net to gross earnings. Hence, the system has been called the gross-net system.

Simpson summarizes the effect of this system and the principal criticism of it as follows:[26]

> "The result is a progressive gross earnings tax (graduated according to operating ratio), but a regressive net income tax, beginning at 100% or over in the case of companies showing no net earnings or deficits and declining (as the proportion of net earnings increases) until the rates on gross and net tend to approximate the same figure. In the committee's illustrative tabulation, based on an initial gross earnings rate of 1% and

[24] Legislative Document No. 72.

[25] *Proceedings of National Tax Association*, 1922, pp. 162-194.

[26] Simpson, H. D., *The Taxation of Public Service Corporations*, A. W. Shaw Company (1927), Chapter XV (not yet published).

Paving Construction and Paving Repair and Maintenance:		
Paving Construction (60 cos.)	$2,372,143	
Paving Repair and Maintenance (64 cos.)	2,466,045	
Paving Construction and Paving Repair and Maintenance (3 cos.)	580,355	
(84 cos. reported) Total		$5,418,543
Street Cleaning and Street Sprinkling:		
Street Cleaning (10 cos.)	$660,944	
Street Sprinkling (23 cos.)	70,422	
Street Cleaning and Street Sprinkling (2 cos.)	40,644	
(34 cos. reported) Total		722,010
Snow Removal (31 cos. reported)		325,870
Bridge Construction (10 cos. reported)		262,009
Bridge Repair and Maintenance (34 cos. reported)		216,692
Traffic Policemen (6 cos. reported)		115,934
Support of Public Service Commission or Other Body or Officer (25 cos.)		172,291
Street Lighting (13 cos. reported)		47,286
Free Transportation of Police, Firemen, Mail Carriers and Municipal Employees:		
Police (17 cos.)	$523,866	
Firemen (13 cos.)	242,313	
Police and Firemen (13 cos.)	472,119	
Mail Carriers (2 cos.)	473,306	
Municipal Employees (5 cos.)	62,272	
(31 cos. reported) Total		1,773,876
(In addition to the above, 47 companies reported that they give free transportation to Police, Firemen, Mail Carriers or Municipal Employees but no record of the amount is available.)		
Miscellaneous Imposts (6 cos. reported)		289,744
TOTAL Imposts		$9,394,258

with net earnings varying from 5% to 40% of gross, the resulting tax represents a rate on gross earnings of from 1% to 3% and a rate on net earnings varying from 20% to 7½%.

"As a matter of fact, the schedule of rates suggested by the committee actually does only in slight degree what the theory above would intimate.[37]

[37] The theory of the committee was that: "The peculiar position of the public utility, as a privileged and regulated enterprise, appears to the committee to require a special tax treatment in order to carry out completely the principle of rate regulation. * * * Rate regulation and taxation must go together and supplement each other. * * * Changes in the legal rate limits occur at more or less long intervals. In the interim changed conditions may

"In the first place, the rates are graduated with reference not to the *rate of return* but to the *operating ratios* of the different companies. The two things, of course, are very different. A company with a large volume of business in relation to capital employed may operate on a close margin (that is, a high operating ratio) and still show a higher return on property value than a company operating on a wider margin but with a smaller volume of business in relation to capital employed.

"The reports of prosperous railways operating in dense traffic territory frequently afford illustrations of a low ratio of net to gross (a high operating ratio) associated nevertheless with a liberal rate of return on property value; while in the case of western roads, operating in "thin" traffic territory, even a low operating ratio frequently fails to yield a fair return on the property. Wide disparities between operating ratio and rate of return on property are exhibited by different groups of utilities, by individual utilities in the same group, and by the same groups and utilities in different periods.

"In the second place, the rate of graduation is so slight that the actual result is not a progressive or even a proportional but a regressive net earnings tax, as indicated by the committee's illustrative tabulation below: "

Gross Earnings	*Net Earnings*	*Ratio Net to Gross*	*Rate*	*Tax*	*Resulting Ratio of Tax to Net*
$100,000	Not over $5,000	Not over 5%	1 %	$1,000	0.20 or more
100,000	$5,000 to 10,000	5% to 10	1¼	1,250	.25 to .125
100,000	10,000 to 15,000	10 to 15	1½	1,500	.15 to .10
100,000	15,000 to 20,000	15 to 20	1¾	1,750	.116 to .087
100,000	20,000 to 25,000	20 to 25	2	2,000	.10 to .08
100,000	25,000 to 30,000	25 to 30	2¼	2,250	.09 to .075
100,000	30,000 to 35,000	30 to 35	2½	2,500	.083 to .071
100,000	35,000 to 40,000	35 to 40	2¾	2,750	.078 to .068
100,000	Over 40,000	Over 40	3	3,000	.075 or less

Sec. 9. **Valuation for Purposes of Taxation**

As Simpson well demonstrates, the *ad valorem* type of public utility taxation first used as its tax base an assessment which was equivalent to cost of reproduction, supplemented by an assessment of the so-called intangible property based upon a capitalization of surplus net earnings. The concrete application of this method to individual companies has more and more accentuated the capitalization of income and given correspondingly less and less weight to the cost of reproduction of the physical property. At the present time the method is, in effect,

permit of higher profits than were contemplated. * * * Taxation should be relied upon to take for the public a part of the extra profits made under unexpectedly favorable conditions or by the more fortunate corporations."

assessment upon the basis of the capitalization of net income. It is, therefore, an indirect application of the theory of ability to pay. In so far as the final assessment is modified by consideration of cost of reproduction, or investment in fixed property, or the market value of outstanding securities, consideration is given to factors expressing exchange values. Even bankrupt properties would thus be required to pay some taxes. This constitutes a recognition, in effect, of the traditional theory of taxation in accordance with benefit.

Criticism is from time to time directed against a tax assessment at variance with the rate-base which the public service commission uses in testing the adequacy of earning power. How can there be, say these critics, two "values" for the same property? The answer is clear. Assessment for taxation is an attempt to determine a tax-base against which tax rates are levied. A rate-base, on the other hand, is merely a device to test the reasonableness of earnings in an effort to place returns in public service industries upon a level which will preserve the credit of the undertakings. Rate-base determinations are therefore functionally and hence logically antecedent to the determination of a tax-base. A tax assessment may closely approximate the rate base or may diverge widely from it in proportion as the money return actually realized from rates approaches the regulatory standard of return. Economically well-situated and well-managed properties may yield a return in excess of that realized by other properties having substantially the same rate-base but which are less well-managed or otherwise poorly situated with respect to the market for their services. Regulation of rates does not constitute a guarantee of income. Justice in taxation therefore rests upon standards wholly apart from standards of rate reasonableness.

Sec. 10. General Summary and Criticism of Public Utility Taxation

The practice of public utility taxation appears to have run the gamut of tax theories. It passed successively from a theory of subsidy to a theory of complete or partial exemption, to one of uniform taxation, and is now just emerging from a period where taxes are imposed in accordance with the fiscal principle that public utilities may be used indirectly as tax collectors. In the course of this last development it has been established that the effect is an unfair allocation of the burden of taxation

upon the users of public utility services. With regulation functioning properly, taxes become a part of the cost of the service and are therefore largely shifted to consumers in the prices they pay for service. This is not the place to enter into the complicated question of the shifting and incidence of public utility taxation, nor into the more involved question of what constitutes a tax system of which public utility taxation is but a part. That belongs in a general discussion of taxation.[28] It is, however, important to note that the process of regulation has changed the nature of the tax problem with respect to public utilities. It creates a situation in which taxes are borne by consumers in some proportion which gives no evidence of being equal. If public utilities as a class bear more of the overhead cost of government than other industries, the consumers of these industries are excessively burdened provided the public utilities are successful in shifting the excessive burden to them. If the taxes can not be shifted but must be paid by owners out of an amount constituting only a fair return, the owners are unduly handicapped. In either case the utility is hindered in its economic development.

It becomes important, therefore, to secure an answer from the point of view of regulation to the following questions: (1) Do public utilities as a class bear a greater burden of taxes than do other economic enterprises? (2) Is one branch of public service industry burdened more than other branches? (3) Is one enterprise in a designated public service industry burdened more than other enterprises in the same industry? (4) Do such excessive burdens increase the price of the products or create disabilities under which management labors in rendering service?

These questions rest upon the assumption that public utilities should pay their just share of the cost of government. They also imply that a policy of subsidization and exemption should be adopted only during emergencies when the general benefit conferred clearly requires that tax burdens be temporarily lightened or entirely lifted.

Some have contended that public utilities be relieved of all taxation. The argument is that, since all residents use public utility services, it becomes a matter of indifference whether consumers carry the burden of taxation indirectly in the prices for

[28] The best brief statement of the general purposes of tax systems and of the methods calculated to realize these purposes, is the Preliminary Report of a Committee submitted to the National Tax Association in 1918, upon the general subject of a "Model System of State and Local Taxation." See also, *Proceedings of National Tax Association*, 1919, pp. 426-470.

service or directly in the form of taxes. To this the objection may be made that not all taxpayers are consumers. Furthermore, the relative quantity of service consumed by different patrons is not such as even approximately to equalize the benefit from reduced prices with the increased burden these same customers assume in the form of direct taxation. It is also overlooked that the cost of collecting taxes from public utilities is less than collecting the same amount from numberless patrons. Students of taxation have, therefore, concluded that all public utilities, whether owned privately or publicly, should be subject to taxation. They have likewise concluded that the burden of taxation should be equalized so that public utility services may not be unduly handicapped in competing with other industries for the purchasing power of customers.

Although exemption from taxation can hardly be discussed seriously in the case of privately owned public utilities, it does have a real practical significance in the case of publicly owned utilities. These are generally relieved from tax burdens and their customers have an advantage over the customers of other business units and at the expense of taxpayers. This fact may well be taken into account in the adjustment of rates. Assuming that public enterprises will continue to be tax-exempt, the English practice of having them make a definite contribution in relief of taxation may well be inaugurated.

That there is great need for studies of the burden of taxation as imposed by different tax systems is recognized. Such studies as have been made indicate that inequalities exist. Good administration of whatever tax system obtains appears to be the first essential. The expenditures of government must be met in some way, and public service enterprises, on account of the ease of collection and the high yield of tax revenue, will ever prove tempting tax subjects. But these industries must not be unduly burdened because upon their proper functioning depends the prosperity and well-being of the entire economic community. The second essential is therefore a well-equalized tax system, which produces the requisite amount of revenue without being burdensome in its incidence.

Upon this general subject of a properly conceived tax system no better authority can be quoted than a report upon a model plan for state and local taxation as drafted by a committee of the National Tax Association in 1918. Upon the relationship of public service company taxation to the tax system the report states:

"Public service corporations . . . are now frequently taxed by methods different from those applied to other classes of property, and must doubtless continue to be so taxed. Our plan, strictly applied, would require that only the tangible property of such corporations should be subject to taxation and that the taxation of gross receipts and the *ad valorem* taxation of corporations as going concerns should be abandoned. But such radical changes are not necessary, provided that existing methods are adapted to the general plan of taxation here outlined and certain adjustments are made in connection with the business tax which we herewith recommend. Uniformity of method, as we all know, is not necessary in order to secure substantial equality in taxation, and all that can be required of any proposed system is that it shall produce substantial equality in its net results. (The committee appreciated the resistance historical factors offer to wholesale modifications.)

"We, therefore, do not recommend that either the taxation of gross receipts or the *ad valorem* taxation of public service corporations as going concerns shall be discontinued wherever these methods are in successful operation. But we are obliged to point out that in many, and perhaps most, cases the amount of such taxation should be reduced or else that relief should be given to public service corporations in connection with the business tax. When public service corporations are assessed as going concerns, it is evident that they are more heavily taxed than other business enterprises which are subject to taxation merely upon their property, considered as property, and without reference to their value as going concerns. When a corporate-excess tax is applied to all corporations, equality may then be secured between public service corporations and other incorporated companies; but it is evident that unincorporated concerns escape with a lighter tax than successful corporations are required to pay.

"It seems clear to the committee that when public service corporations are assessed under an *ad valorem* system as going concerns, while other kinds of business are not, they are today discriminated against, and will be under our proposed system unless relief is given at some other point. The system we propose enables us to recommend such relief. We propose that, in addition to the personal income tax and to the tax upon tangible property, there shall be a business tax as hereafter outlined. Wherever public service or other corporations may continue to be taxed as going concerns by a method which involves the taxation of what is commonly called the corporate excess, or the good will, of such companies, we recommend either that they be wholly relieved of the business tax, or that the rate of such tax be reduced to a figure that will fairly offset the extra burden of taxation imposed upon them by the property tax.

"In the taxation of gross receipts a similar adjustment is necessary wherever such taxation is in lieu of, and is substantially equivalent to, the taxation that would otherwise be imposed under an *ad valorem* tax upon corporations as going concerns. Concerning the comparative merits of the tax on gross receipts and *ad valorem* taxation, it is unnecessary for us to express any opinion. We should probably be disinclined to recommend a change in the taxes on gross receipts now levied by such states as Minnesota, California, or Connecticut; and we should be equally disinclined to recommend a change in the *ad valorem* system now in successful operation in a state like Wisconsin. Diversity of method is not inconsistent with real equality in taxation, and at this point we content ourselves with a mere expression of our approval of the conclusions reached some years ago by

the committee appointed by the National Tax Association to consider the Taxation of Public Service Corporations.''[29]

In closing this brief survey of taxation, attention should be directed to the problem of double taxation which arises out of the diversity of methods of assessment adopted by contiguous states in levying taxes upon public service companies engaged in interstate commerce. Since each sovereign state determines for itself the details of its tax system and the methods of assessment, it is by no means an infrequent occurrence that the same property or earnings will be given a situs for purposes of taxation in more than one state. The aggregate assessment thus ascertained may materially exceed the assessment which would be obtained if one single assessment were made by means of a uniform method. Only substantial uniformity of taxation as between different states, or federal assessment for state purposes of corporations engaged in interstate commerce, can overcome this defect in tax policies.

[29] *Proceedings of the National Tax Association*, VII, pp. 372-383.

CHAPTER XXVII

CONTROL OVER SERVICE—CODIFIED STANDARDS OF SERVICE

The regulation of public utilities received its orientation from the fact that rate problems were the first to engage the attention of public authorities. Gradually, however, questions relating to the adequacy of service were raised and now the rendition of good service is regarded as of at least equal importance. In fact, in times of prosperity, when the productive facilities of a nation are being utilized to their utmost capacity, plant capacity of public utilities may be the limiting factor in business expansion.

Sec. 1. **The Obligation to Render Reasonably Adequate Service**

Under the common law, it should be recalled, those engaging in public callings were required to furnish reasonably adequate service and facilities. Statutory regulation has taken over this legal standard but has also provided regulations relating to specific matters of service. Regulatory commissions are charged with enforcing specific legislative requirements and are given discretion only regarding the application of the general standard. The law in a number of states makes it the duty of the commission to *establish standards of service.*

It should be noted that the law makes reasonable service and reasonable rates interdependent. Even if a poorer grade of service could be supplied at a lower rate, it is the commission's task to determine first what would be the reasonable grade of service under the circumstances and then fix rates accordingly.

In competitive industry the theory is that these questions will be solved automatically. Increased demands for service bring higher prices which, in turn, stimulate production. In monopolistic public service industries the initiative of producers may have to be supplemented by administrative determinations of what constitutes reasonable service. Rates are thus a resultant, at least in part, of a *regulated* demand.

Commissions were empowered to investigate conditions upon their own motion or upon complaint of customers, determine what was reasonably adequate service, and make and enforce any necessary rule, order or regulation to bring it about. By this process service was standardized and a code of performance provided with which the performance in individual cases could be compared. What some of these standards are will be explained shortly. They are usually promulgated after general state-wide or nation-wide hearings attended by representatives of the industry and after considerable preliminary study by technical experts of the requirements throughout the states and cities of this country and even of foreign countries.[1] The more uniform the conditions under which service is rendered, the easier is the task of standardization. The significant thing is that objective standards are set up which the utilities themselves were instrumental in formulating.

The widest adoption of such standards has been for the local utilities, particularly those supplying water, gas and electric service. A beginning has been made with electric and steam railway service and with telephone service. The work was carried on by a few pioneers among the commissions. In Wisconsin standards for gas and electric service were first issued in 1908.[2] After five years of operation, revised standards were adopted in 1913.[3] Service rules for telephone companies were issued in 1914 and for water utilities in 1920.

Standards must be revised from time to time in order to take into account changes in the art. This matter of improvement is vitally associated with reasonable service. In 1911 John H. Roemer, then chairman of the Railroad Commission of Wisconsin, said in an address delivered before the Illinois Gas Association:

"Less than two decades ago I saw in my home city an electric power plant just completed which was regarded the most modern and efficient plant of the kind in existence. Its capacity was regarded as enormous. Engineers and others interested in the advancement of the art of generating electric energy came from all sections of the country to view this plant which was equipped with the most modern appliances. For the past few years this plant has stood idle most of the time, serving merely as an auxiliary in emergencies. It is but an evidence of how rapidly the art has advanced and rendered obsolete the most expensive appliances. The ad-

[1] See "Standards of Electric Service," *Circular No. 56*, National Bureau of Standards, Washington, D. C.

[2] *In re. Standards for Gas and Electric Service*, 2 W. R. C. R. 632 (1908).

[3] Same title, 12 W. R. C. R. 418 (1913).

vancement in the art of telephony within a very few years is little less than marvelous. Costly equipments have been scrapped and entire systems reconstructed to meet the public requirement for the best service. In other utilities the changes have not been so marked and equipment has become more or less standardized, but who can tell what a quarter of a century may bring forth in any art or science? To meet the conditions as they arise is the only way that the best interests of the public and the utilities can be conserved in the matter of rates and service."

Service standards are enforced by means of customers' complaints and by a system of continuous inspection and supervision. Usually a state is divided into inspection districts with traveling inspectors making daily service tests and reporting to the Commission and to the utilities what they find.

Sec. 2. **Service Requirements Common to Several Utilities**

Standards of service must, of course, be fixed with reference to a particular industry. Operating rules more often relate to a particular plant because variations in local conditions must be taken into account. Certain requirements are, however, common to several kinds of utilities.

(a) *The measurement of service.*

Common service rules relate to the measurement of the quantity of service. When the so-called "flat rates" were in vogue no attempt was made to measure service. But soon the development of metering devices made possible the more accurate assessment of charges. Considerable difficulty was encountered in the standardization of meter service for gas, electric and water utilities. One illustration will suffice. An electric meter which registers at no load is said to be a "creeping" meter. Its variation from accuracy will vary however for different loads. It was therefore necessary to devise service rules which provide an allowable variation, usually from 2 to 5 per cent. The standard of accuracy adopted by different commissions varies but the above figures indicate the range.

In order that charges be as *accurate* as the mechanical device will permit, meters must be tested. Only such meters may remain in service which register within the range of allowable error. Meters are tested at the time of installation and retested at regular intervals. This procedure is required by a rule specifying a minimum frequency of tests (often fixed at 4 years). It is also provided that records of tests be kept and preserved

for specified periods and that facilities for testing be maintained. Other rules specify a method of adjusting charges when meters run fast or slow.

The work of testing is supposed to be a part of routine operations. But customers may also initiate tests, the so-called "complaint tests." In this case the rules provide that meters be sealed when disconnected and that customers be accorded the right to be present when the meters are tested. Some states provide a scheme of "referee tests" whereby the state commission or some other neutral state agency, such as the state engineering laboratory, makes the test for a fee varying with the size of meter. The fee is paid by either the customer or the utility depending upon whose contention is sustained.[4]

Still other rules provide for the calibration of meters, for methods of estimating charges in the case of defective meters, and for estimating or calculating quantities or ratios[5] where these are elements in the assessment of charges.

(b) *Payment of bills.*

A second type of service rules common to several utilities relates to the payment of bills. It has become a cardinal principle of the selling policies of public utilities to make clear to customers the method by which monthly bills are computed. The bill is arrived at by applying to a stated metered quantity of units of service the rates legally applying to the same. It is, therefore, provided that bills should show meter readings, quantity consumed, the rate schedule applying, and the steps by which the bill is computed. A department is usually maintained by the companies to which a customer may bring his complaints concerning bills and other matters. Here information may be obtained relating to rate schedules, the proper use and selection of equipment, and in general the means and requirements of obtaining service.

[4] The following figures are of interest as showing the result of such tests conducted by several electric utilities:

Meters in Service		745,724
Tested during 1925		60,536
Routine tests	47,933	
Complaint tests	12,603	
Meters running more than 2% slow		9,580
Meters within 2% slow or fast		45,252
Meters running more than 2% fast		5,704

[5] For instance, definitions and methods of calculating demand and power factors.

To insure payment of bills, customers may be required to make a deposit equal to an estimated bill for a specified number of months. A rule limiting and conditioning this practice and making the payment of interest upon these deposits obligatory, has sometimes been included in the published standards. The practice is growing of not requiring deposits from customers that own the premises or that establish their credit by other means.

(c) *Safety and continuity of service.*

A third type relates to safety and continuity of service, and to the handling of complaints from customers. Safety and continuity is safeguarded by rules requiring a continuous and routine inspection service. The more advanced commissions have maintained an inspection service of their own, but this is more for the purpose of enforcing and supervising service standards, as a "follow up" of specific orders, and for establishing the facts lying back of customers' complaints. A company's inspection service is designed to anticipate difficulties as well as to allay those arising from customers' complaints. Utilities must keep records of inspections and of complaints with their adjustments. Each complaint must be accorded a prompt and full investigation. Inspectors are guided by means of elaborate codes of construction and operating rules designed to promote safety, reliability, and economy of service.[6] The rule that customers be given notice if service is to be shut off is not without significance in this connection.

(d) *Furnishing and discontinuing service.*

Lastly, there are rules which govern the furnishing and discontinuing of service. Service is given to new customers under uniform and non-discriminatory rules. For this purpose standard applications for service and standard contract forms have been worked out for customers to sign.

All applications for service require some extensions of the distribution system. Difficulties arise when inordinately long extensions are required in order to serve new applicants. Electric

[6] There are rules, for instance, regulating the crossing of wires over railway tracks and over other lines of wire. In the latter case, where telephone lines and power lines are involved, there is, in addition to safety, the problem of eliminating inductive interference with telephone service. Others relate to the joint use of poles to promote the better appearance of streets where wires are placed overhead, and to promote public interests in economy of operation and in the conservation of our timber supply.

and telephone extensions are comparatively inexpensive. The cost of extending gas and water mains is greater. Until the motor bus appeared, street railway extensions were also very costly.

The current practice is to let ordinary extensions follow upon the application of a general rule, reserving extraordinary extensions for special treatment by specific orders. In the electric and telephone business it has become customary to classify extensions into urban and rural, and to apply a different rule in each case. The rule for electric service in urban territory usually is that companies furnish a fixed maximum in the way of poles, wires, meters, transformers, and protective devices. In rural districts there is a wide divergence of policy. Customers may be required to pay all or a substantial part of the total cost of making extensions. This was particularly true during the World War when extensions were difficult to obtain. The rules most satisfactory in operation appear to be those which require utilities to furnish extensions costing a specified maximum sum per dollar of estimated annual operating revenues.

Disputes have arisen when companies include the cost of extensions paid for by customers in the rate-base. As a partial solution of this difficulty a scheme was devised of making refunds to old customers as new customers connect up with the extension, the refunding plan being limited to a specified number of years. In a few states customers receive refunds whether new customers are added or not. It should be recognized, however, that the utilities must protect themselves against the demand for unprofitable extensions.

Under the common law a public utility must give service to all applicants and may not discontinue serving them without reasonable cause. Discontinuance is usually based upon the ground either of fraud or non-payment of bills on the part of the customer, or of hazardous conditions under which service would have to be rendered. Disputes over bills are not considered proper grounds for the discontinuance of service.

Service rules designed to promote the *efficiency* of operation and to control particularly the *quality* of the service rendered are best discussed separately for each utility.

Sec. 3. **Service Standards Peculiar to Gas Utilities**

Effective service standards have been applied in the gas industry, where there seems to have been a great need for stand-

ardization. An early record of tests made for the various gas plants in the state of Wisconsin, for instance, showed a wide variety of service conditions. The range in heating values was from 193 to 1050 B. t. u. per cubic foot, although the modal test showed values in the neighborhood of 600 B. t. u.[7] The standard fixed was as follows: the monthly average for the heating value of gas should not be less than 600 B. t. u. per cubic foot and the individual minimum should never be below 500 B. t. u. The tests were to be made anywhere within a radius of one mile from the distributing plants. Similarly, in the case of gas pressure a rule was fixed that the pressure shall be sufficient to support from two to six inches of water, and that the maximum pressure at any outlet on the system shall never be greater than double the minimum pressure at that outlet. The purity of gas is controlled by a rule allowing not more than thirty grains of sulphur for every 100 cubic feet and not more than a trace of sulphuretted hydrogen. Gas plants whose annual output was 2,000,000 cubic feet or over were required to equip themselves with standard instruments for measuring heat value and were required to make tests every other day. There were no great difficulties in devising standards for gas utilities.

The above standard recognizes that the quality of gas service is best expressed as heating value. When gas was used primarily for illuminating purposes in open-flame burners, its quality was expressed in candlepower. The increased use of mantle burners for illumination and the use of gas for cooking, heating, and for industrial purposes (now estimated to be at least 85 per cent.) has brought about a change to heat value specifications.

The characteristic of pressure is important because customers are unable to secure sufficient gas for use in the appliances to do their work efficiently if the pressure is too low. Likewise, excessive pressure leads to inefficiency, and is, in addition, dangerous. Comparative uniformity of pressure gives most efficient service because appliances must always be readjusted if the pressure changes.

The above rules were typical of the standard requirements of commissions until the war period. Then the companies began to contend that heating value standards should be reduced in order to cut down on the amount of gas oil required. This oil was becoming scarce and hence expensive. Some recession in the

[7] A British thermal unit (B.t.u.) is the amount of heat required to raise one pound of water one degree Fahrenheit.

standard was, accordingly, permitted but the minimum remained about 500 B. t.u.

Sec. 4. Service Standards Peculiar to Water Utilities

The service problems of water works are not capable of as much standardization because of the variety of conditions under which the plants operate. Good water service must conform to criteria of purity and of pressure. The question of purity is fundamental for water in domestic use. It should not only be fresh but free from disease-producing organisms and substances. To this end periodic tests of samples are required. Hydrants and "dead ends" of mains are flushed and records kept of the condition of the water.

Pressure is of most significance for industrial uses and public purposes such as fire protection. Usually a fixed minimum of pressure is set with the proviso that the pressure be increased upon reasonable notice in case of fires. The utilities must install recording pressure gauges so that pressure surveys may be made and the readings correlated with elevations. Other required records relate to daily pressure maintained and the daily amount of water pumped or filtered. The installation of station meters has resulted in more accurate records, where formerly the amount of "pumpage" was estimated from the "pump-stroke" or "revolution counter".

It is highly important that water utilities should have an adequate source of supply. The most difficult problems in this respect have confronted our larger cities. They have sometimes been forced to go long distances to reach new sources, thereby adding to the costliness of the systems.

In view of the predominance of municipal operation of water utilities, state commissions have been loath to regulate water utilities to the same extent as they have other utilities. Nevertheless, fire tests have often brought orders for immediate plant improvements in order to make fire protection adequate. The discovery of water pollution has also led to orders for changes in the source of supply or for the installation of filtration plants. Not infrequently the demand for extensions into unsupplied districts arises because of the need of reducing fire hazards.[8]

Extensions of municipally owned water utilities are still

[8] Typical Wisconsin cases involving the service of water utilities are: *In re. Investigation Hudson Municipal Water Works*, 3 W. R. C. R. 138 (1908); *Torrance et al* v. *La Cross Bd. of Water Com.*, 7 W. R. C. R. 27 (1911).

made under conditions which were once quite general also in the case of other utilities. The service pipes are usually provided by customers, the utility bringing the service up to the property or curb line and installing the meters. This practice puts a substantial part of the burden of construction cost upon customers.

Sec. 5. **Service Standards Peculiar to Electric Utilities**

The best work in standardizing service has been done for electric utilities. The two most important rules relate to voltage. One provides that the voltage measured at customer's premises shall remain constant within prescribed limits. Another, closely associated with the foregoing, is aimed at interruptions in service.

Variations in voltage affect service in four ways: degree of illumination, temperature, motor speeds, and rate of chemical activity. For our purposes it is sufficient to point out that permissible variations in voltage are limited to five per cent above or below the normal for lighting service and to ten per cent on power circuits. The utilities are required to keep continuous, graphic voltage records and to conduct voltage surveys from time to time over the entire distributing network, supplemented by frequent inspections. By bringing up inadequate voltage great improvements were brought about in the service of the smaller utilities in particular. Frequently this required a complete overhauling of the generating plants and of the distribution systems.

Interruptions of electric service must also be guarded against. They are especially serious in delaying electric railway transportation and in industries using electric power for continuous processes, as in foundry work. Acordingly, any temporary stoppage to do repair work should come at convenient times and after notice. Where energy is furnished by a hydro-electric plant, a stand-by steam plant is often necessary unless continuity of service is safeguarded by "interconnection".

An interruption is defined as a period of over thirty seconds during which the voltage on a particular circuit is less than 80 per cent. of its normal value. Standard operating records of modern power plants show at all times the conditions on the several circuits. They are indicated by recording devices or by frequent regular readings of non-recording instruments. Such records are essential for operating efficiency and normally are kept by all companies. Commissions have been helpful, however,

in improving service conditions by requiring that records be systematized, and that operating standards of older, smaller, and less efficient plants be brought as nearly as was practicable into line with modern plants.

HEATING UTILITIES. Very little has been done in the way of standardizing heating service, although individual features have received attention from time to time and assistance has been given by regulating authorities in drawing up satisfactory rules.

Sec. 6. **Service Standards Peculiar to Telephone Utilities**

The telephone industry has been giving steadily progressive service. It has been subject to rapid changes in the art, affecting costly and vital equipment. Consequently, only the financially sound companies have been able to keep up with the procession. The attention of commissions has been devoted in the main to the service problem in the smaller communities, and particularly to the service rendered by the small mutual telephone associations operating in rural districts.

Rules that lay down standards of good telephone service require, first of all, that equipment and lines be well maintained. They provide further that "cross-talk" and noises unreasonably interfering with communication be eliminated. The overloading of lines, i.e. connecting more subscribers to a single line than can be adequately served, is prohibited. This is a particular grievance in rural districts. Telephone utilities are also required to supply lines for "through traffic" so that long distance communication can be accommodated.

Standards have been set under which not less than ninety to ninety-four per cent. of all calls must be answered by operators within ten seconds. Depending somewhat upon the size of the exchange and the frequency of telephone moves, service standards usually require semi-annual revisions of directories. Customers are to be instructed how best to use the service and in their ethical obligations towards one another. The personal nature of telephone service creates peculiar problems.

A large measure of improvement was affected by means of legislation requiring companies to permit physical connection to be made with their respective exchanges or toll lines so as to provide a highway for communication beyond the confines of the territory served by a single company. This has been

particularly helpful in territory held by the independent companies. The physical connection must be made only when public convenience and necessity so requires and when such connection will not result in irreparable injury to the owners or to other patrons. Usually the companies are expected to make voluntary arrangements to provide for such switching service; but if the companies are unable to agree, the commissions are usually given the power to determine, after a hearing, whether the connection is necessary, and to fix the terms and conditions upon which such interconnection shall be made. An extra toll charge is generally assessed for the additional service.

The rules are enforced by routine inspections as well as by those made upon complaints. A good deal is accomplished by keeping service records and systematically reporting the facts so as to reveal the utilities that are the worst offenders as well as the particulars in which they are found wanting. In general the correction of service defects lends itself to processes of informal complaint and informal adjustment of difficulties. Improvements in service requiring extensive changes, such as converting lines from grounded to metallic circuits, are usually provided for in formal orders and must often be accompanied by rate increases. Not infrequently, complaints involve an improvement in the accounting and record-keeping system of the companies, so that service may be given better supervision.[9] Informal regulation is best applied in matters pertaining to service.

[9] L. H. Kinnard, President of the Bell Telephone Co. of Pennsylvania, sounds a note of precaution, if not of dissent, from the proposition that excellence in service depends upon the promulgation of service standard.

"There is obviously no simple test for telephone service. All proposals for standards of telephone service include standards to be applied to a considerable number of separate subjects. My observation has been that where such a situation is met, to establish standards for a great number of separate parts is not only misleading, but by its influence toward rigidity, retards progress. In popular parlance, it easily lends itself to the situation where 'alibis' are of as much interest as results. We have found in the management of the telephone business that where certain technical standards of performance are used in the detailed operations, we can never allow the attainment of those standards to be used as demonstrating the existence of satisfactory service or vice versa.

"The establishment of rigid standards in telephone regulation, certainly at this stage of the art, inevitably involves a confusion between standards of results and the methods or appliances for producing results. There can be hardly any question that where the character or results of service are not affected, the method by which the results are attained is purely a matter of management and not one of regulation. In a situation such as ours is at present, where it would not be practical in significant language to state standards of service except in terms of methods of production, it would not only be embarrassing to the management of the utility and to the regulatory

body, but would dangerously interfere with progress in production methods and in the improvement of the standard of service itself. It is easy to see how this would be so, for if a standard of service is stated in terms of the devices to be used or the methods to be employed, then that part of the organization expected to secure improvements has its horizon always limited by the consideration of a device or method that may be assumed to be good enough merely because it was officially satisfactory at the time of its adoption.

* * * *

"Another objection to the adoption of standards of service in the telephone industry is the important one of its effect upon the morale of the working and subordinate supervisory forces. The adoption of standards necessarily requires a close acceptance of the standards as a governing policy for the general management. At the present time any standards must be incomplete and misleading, as they cannot possibly take into proper account substantial differences in conditions. The carrying out of a policy based on certain rigid standards inevitably requires that where the job meets the technical standard requirements, it would be designated as a good job; and where it does not meet the technical standard requirements it would be known as a poor job upon which supervisory work has to be done. The subordinate supervisory forces and the working forces themselves, thoroughly understanding the conditions, would recognize the inadequacy and the misleading character of the tests that would then be applied to performance, and the effect of designating as 'good service' that which is merely technically good under favorable conditions, and as 'bad service' that which is merely technically bad under unfavorable conditions, without taking into account the general and over-all character and quality of service, would be unquestionably bad and would react, of course, on the service itself. We find it necessary in practical operations to be exceedingly careful on this point and not to use standards for one part of the job that may be easily susceptible to measurement if it is not feasible to adopt standards for another equally important part of the job not susceptible to measurement. To do so inevitably results in a lack of balance and bad service, and the discouragement of those who are willing and capable of doing the best over-all job." Quoted from Cooke, M. L., *Public Utility Regulation*, Ronald Press Co., 1924, p. 134.

Sec. 7. **Grading Public Utility Service**

Brief mention should also be made of attempts at grading public utilities upon their conformity to service rules.[10] The practice was introduced because it afforded a means of rating individual utilities according to their performance, and of determining, if possible, whether there had been any improvement in the degree of compliance with service standards from year to year. It was used for a time only as an office record. Later, the results were made public at annual state conventions of the utilities, with the view of stimulating a spirit of emulation. It is claimed that the experiment has been measurably successful.

The tables reproduced below illustrate the salient features of the scheme:

[10] This practice has, thus far, been tried only in Wisconsin.

RULES REGARDING GAS AND ELECTRIC SERVICE

Gas	*Elect.*	*Subject*	*Gas*		*Electricity*	
No. of Rule	No. of Rule		Credit	Rank of Rule	Credit	Rank of Rule
..	14	Creeping meters	..	..	4%	6
1	15	Accuracy of meters	7%	4	7	3
..	16	Installation tests	..	..	5	5
2	17	Periodic tests	14	3	14	2
3	18	Meter testing records	5	6	5	5
4	19	Meter testing equipment	5	6	5	5
5	20	Request tests	4	7	4	6
6	21	Referee tests	..	..	..	..
7	22	Meter readings on bills	4	7	4	6
8	..	Heating value	21	1	..	..
9	..	Calorimeter equipment	7	4	..	..
..	23	Interruptions	..	..	18	1
..	24	Station records	..	..	6	4
10	25	Pressure and voltage variation	18	2	18	1
11	26	Pressure and voltage surveys	6	5	6	4
12	..	Purity	4	7	..	..
13	..	Complaint records	5	6	..	..
..	27	Information	..	..	4	6
			100%		100%	

RULES REGARDING TELEPHONE SERVICE

Rule	*Subject*	*Credit*	*Rank of Rule*
1	Equipment and maintenance	15%	1
2	Loaded circuits	8	6
3	Through lines	5	8
4	Test inspections	10	5
5	Adequacy of equipment	12	3
6	Emergency provisions	6	7
7	Speed and adequacy of service	15	2
8	Operators service rules	4	11
9	Directories	5	10
10	Rules and instructions	5	9
11	Regularity of service and trouble record	11	4
12	Information to Commission	4	12
		100%	

Sec. 8. **Characteristics of Street Railway Service**

Service standards in urban transportation are hard to formulate. The intimate contact between the public and the instrumentality makes criticism easy. The public mind has become peculiarly sensitive. In all our cities agitation early forced commissions to give attention to service; yet the more the subject was investigated the more intricate it became. Good, bad, and indifferent service must be considered relative terms, to be applied only in the light of local conditions. Nevertheless, there are certain elements or characteristics of street railway service which stand out.

These elements may be grouped under the following headings: (a) speed, (b) regularity, (c) frequency, (d) convenience, (e) comfort, (f) safety, (g) courtesy.

(a) *Speed.*

The most important element in urban transportation service is the time limit within which a particular journey is completed. Traffic men appreciate that regular patrons, going to and from work, do not relish the thought of spending much more than half an hour upon the journey. When this time is exceeded upon surface lines the demand for a more rapid form of transit either by subway, elevated, or suburban steam railway arises. The element of speed, of course, does not have reference only to the rate at which the cars move. It has reference rather to schedule speed, the time consumed in covering a certain distance. This includes the time consumed in making stops, in taking on and discharging passengers. The advantage of rapid transit is its freedom from the interferences of vehicular traffic. Service is provided in train units, running in local and express service with scheduled station stops. Motor bus service, not being tied down to tracks or limited by the speed of local cars, has similar possibilities. About the only means of increasing the schedule-speed of surface transit consists in the elimination of street-intersection stops by the device known as the "skip-stop". This can not be done, however, in the business district. The average schedule speed, for the lines in one community, is about 12.35 miles per hour during the non-rush periods and 9.43 miles during the rush periods, which represents a rather substantial attainment when it is considered that an average speed of 11 miles per hour is exceptional. Little more need be said upon this point except to indicate other factors affecting speed, to wit

—(1) the type of car and its equipment, (2) the system of fare collection, (3) the number and location of stops, (4) the congestion of streets, (5) the number of line intersections, (6) the control of street traffic and (7) street grades.

(b) *Regularity of service.*

Nothing is more annoying to patrons than irregularity of service, especially during inclement weather. Regular although less frequent car service is preferable. Irregularity usually accompanies car shortage; but there are also delays due to causes over which operating officials have no control. Open draw bridges, blockades at steam railway crossings, interferences from other vehicles and fire-fighting apparatus, and bad weather are some outstanding causes for distorted headway. Delays due to equipment failures, to track and trolley failures, and to operating difficulties are inevitable concomitants of operation.

(c) *Frequency of service.*

The frequency of service is controlled by the rate of traffic flow. Cars will be spaced in accordance with the density of traffic. In their service orders, commissions usually specify a maximum standard which must be maintained during certain hours. For instance, from 6:00A.M. to 11:00P.M. a headway of 10 minutes may be required, while from 11:00P.M. to 1:00P.M. the headway is reduced to 20 minutes. A more frequent service usually is given during rush periods, and "owl car" service for the balance of the day.

Frequency of service depends primarily upon car supply, which in turn depends upon the conditions of economical operation. Too frequent service is wasteful. A proper balance must be maintained between the demands for service and economical operating cost. Sometimes the one-man car or "safety car" is used in order to give a more frequent service under more economical conditions. The exclusive use of the "safety car" has been confined, however, to smaller cities.

(d) *Convenience of service.*

Convenience as a characteristic of service is a complex element, consisting of several factors. The most important factors are the track layout and the routing of cars. The layout should be such that the tributary traffic area is not more than a reasonable walking distance away from a car line. This reasonable distance is usually fixed at one-sixth to one-fourth of a mile.

Likewise all strategic centers for business, mercantile, industrial, and recreational purposes should be accessible by rail. The routing of cars should be such as will, combined with an efficient transfer system, meet the convenience of the largest number of passengers in their daily journeys. Cross-town lines are important because they provide a direct route and avoid centers of congestion. Other important matters touching convenience of service relate to transfer privileges, owl service, suburban service and interconnection with interurban lines.

(e) *Comfort.*

The comfort of passengers is provided for in service standards in conjunction with frequency of service and the spacing of cars. Uncomfortable loading is controlled by the following devices:

1. The company may be required to furnish a specified number of car miles for some unit number of revenue passengers.
2. The company may be required to furnish a specified number of seats for each hundred passengers.
3. The comfortable load for each type of car may be specified. This load may be determined by experiment, or it may be fixed arbitrarily on the basis of a certain number of square feet of standing room per passenger.

These standards of comfortable loading will be very much relaxed during rush hours. After decades of agitation, it is finally realized that the straphanger can not be eliminated except at the cost of higher fares.

Other matters affecting the riding comfort of passengers relate to the type and arrangement of cars, to their heating and cleanliness and to the proper maintenance of vehicle and track.

(f) *Safety and courtesy.*

Transportation should be safe as well as rapid and comfortable. Safety is important to both passengers and other street users. It depends upon the safety equipment of cars, the rules under which operation proceeds, and the quality of the personnel by which the cars are manned. Control is exercised by means of municipal ordinances as well as commission orders and inspections. Within the limitations set by the personal equation the development of an attitude of courtesy toward patrons is a function primarily of operating rules and the selection and training of the car men. Beyond obvious breaches that merit disciplinary action, courtesy depends upon what has been called the "attitude of obedience to the unenforceable."

Sec. 9. **Steam Railway Service**

Little need be said in regard to the regulation of service for steam railways. Except in the vital matter of safety, both legislative and administrative regulation of service was not very general previous to the period of war-time congestion. Competition between carriers was and is still being relied upon to afford the public that measure of protection which is given by commission supervision in the case of the more completely monopolized local utilities. Management has thus been given greater scope except where vitally important matters were in danger of being neglected.

Since 1907 increasing wages and prices and a relatively inflexible rate structure have gradually injured railway credit. As a result the expansion in railway facilities did not keep pace with growing traffic. The consequences of this have been a deterioration in service, as was evidenced by recurring car shortages, and freight congestion. However, beginning about 1923, a marked improvement in service has again come about.

Special legislation by the states and by Congress, affecting specific matters, has been the favorite method of exercising control over service. The conflicting requirements of state laws, often enacted in order to secure some special advantage to local shippers, have placed a costly and inconvenient burden upon operations of interstate carriers. Laws relating to safety appliances and locomotive headlights, full crew legislation, demurrage legislation, laws prescribing carload minima, the number of cars per train, are outstanding instances of conflicting requirements which hampered the development of reasonable standardization.

In some states the regulation of service has been left to the administrative discretion of commissions acting under general statutory authority.[11] Service matters passed upon by commissions include the following: Administrative orders requiring close connection at junction points between trains of the same carrier or of connecting carriers; orders directing the stoppage of a sufficient number of trains at local stations; orders affecting the cleanliness, convenience, and sanitation of cars and depots; orders directing an equitable distribution of freight cars among shippers; orders providing improved safety devices, protecting dangerous highway crossings, and providing for the separation

[11] *Cf. Chicago & Northwestern Ry. Co. and Chicago Milw. & St. Paul Ry. Co.* v. *Railroad Com. of Wis.*, 47 Sup. Court Rep. 207 (1926).

of grades; orders concerning the adequacy of station facilities, the joint use of facilities, and the provision of spur-tracks and sidings; miscellaneous engineering inspection activities relating to yards, bridges, tracks, rolling stock, block signal and interlocking plants; the investigation of delays, accidents, and wrecks. Each case must be separately investigated and the order must take into account the tributary traffic, the approximate cost of improved service, the operating factors involved, and the present and prospective revenues. Reasonably adequate railway service depends upon such a multiplicity of conditions that it can not be readily objectified in standards of service.

CHAPTER XXVIII

THE ECONOMICS OF REGULATED MONOPOLY PRICE

Sec. 1. **Economic Characteristics of Public Utility Industries**

Public utilities are best organized as monopolies. The trend of events has proved that public utilities are forced by an inborn necessity to grow with expanding markets, to bring competition among themselves under control, and finally to consolidate until they have completely monopolized their respective markets.

Monopoly has been defined as the organization of production in such a manner that a single agency has control over supply. An approach to monopoly is worked out when several concerns, which have hitherto supplied service under competition, combine in such a way that they follow common price tactics. Such monopolies by agreement fall under the ban of the law because they are in restraint of trade. Public service industries soon discovered also that such contracts were particularly hard to maintain. Monopoly by agreement was thus changed into monopoly of full ownership. Since technical considerations make it advisable that the supply of public utility service be integrated, the policy of the law has been changed so as to favor monopolization. Administrative commissions in regulating rates are thus confronted with a situation where a sellers' monopoly bargains with a multiplicity of buyers, and where the advantage of bargaining is on the side of the sellers. Without governmental control public utility markets would be sellers' markets. Public utility economics must thus be distinguished from competitive economics.

In the introductory chapter a distinction was drawn between economic enterprises which are supported either by taxes or special assessments and economic enterprises which sell their services at a price. Public utilities belong in the second class because they are conducted as business enterprises. Their services command a price because they are both useful and scarce.

Wherever prices control the production and exchange of services it is necessary to know the economic conditions which determine the demand for and the supply of such services. Such an analysis is most important in the case of public utilities whose prices are fixed by government.

(a) *The theory of monopoly price.*

The regulation of rates involves two complementary problems. First comes the problem of assuring to a utility a reasonable earning power by fixing the general level of rates upon a compensatory basis. At the same time it is necessary so to adjust particular rates that they are reasonable with respect to each other. In fixing the general level of rates, regulation must keep in mind that the earning power of public utilities must, in the long run, be such as properly to compensate all the factors of production. This, however, can not take place in defiance of economic law. Public utility services are subject to the general law of price which expresses the interaction of the relative cost of producing these services and of the relative intensity of the demand of consumers for them.

The demand for public utility services, it should be noted, is very largely a *derived* demand. Transportation may be required for its own sake, but it is more largely required, as in the case of the railway freight service, in order to meet the demand for commodities in markets to which they must be hauled. Similarly, lighting, power, and heating services are increasingly required because of the demand for products and services into which these services enter as a part of the cost of production. The demand thus depends upon wants which express themselves both directly and indirectly.

It is also true, of course, that the demand for service is not *effective* unless combined with the necessary purchasing power. On this account, even though public utilities tend to become monopolies and to have a monopolist's control over supply, the prices of their products must be adjusted so as to stay within the limits of customers' effective demands.

Because public utilities, properly so-called, are business undertakings whose purpose is to earn a profit, it will be well to consider briefly how they could fix prices in the absence of governmental control. It is familiar doctrine that a monopolist will so adjust his supply as to enable him to sell it upon terms that will yield him a maximum net revenue. Since he has no control over the demand he will adjust the quantity of supply and the

price at a point which will assure him the maximum excess of earnings over the total cost of production.

But it is as true under monopoly as under competition that the higher the supply price the lower will be the quantity of service demanded at that price. The utility per unit tends to decrease as the supply in the hands of a single consumer increases. This *principle of diminishing utility* has certain far-reaching consequences upon the demand. How much the quantity will decrease will depend upon the elasticity of the demand. This is affected by the degree of essentiality which the service has attained in the eyes of the consumer. It will depend upon the factor of custom or habit in the establishment of living standards and upon the availability of substitutes. It is also affected by the variety of uses to which with expanding technique the service may be put. Illustrations of this were given in earlier chapters.

Each consumer has a demand price which represents the maximum that he will pay for any given quantity. The maximum price which he is willing to pay for the minimum quantity represents the maximum intensity of his want for the service supplied. Economists call this the marginal demand price. If the demand of a consumer disappears rapidly under the pressure of increased rates the demand is said to be elastic. If, on the other hand, a consumers' demand continues in spite of increased rates, his demand is inelastic.

On account of the large number of public utility consumers and the great variety of uses to which public utility services are put, the determination of the marginal demand prices of consumers is a difficult process. In fixing prices so that the net return shall be a maximum the monopolist must take into account the quantity that can be sold at the prices fixed, which gives him on the one hand *estimates* of *gross revenues* and on the other hand *estimates* of the *cost of production.* The differences constitute *estimated net returns,* of which he will aim to secure the greatest.

(b) *The classification of customers.*

For the sake of administrative convenience the public utility deals with its many customers by classes instead of individually. In disposing of the supply it will seek to fix a rate for each of these classes which will be as close to the maximum demand price of the consumers taken as a group as can be ascertained. But the utility will be careful to have in the same class only those customers whose marginal demand price is at least equal

to the price fixed for the group as a whole. In this way, if it can be conveniently done, the rate schedule will be so adjusted as to charge the class of consumers whose wants are most intense and who have the highest marginal demand price, the highest rate in the schedule. Consumers having a lower marginal demand price will be put in other classes and charged lower rates, the lowest rate being charged those consumers whose marginal demand price is least. A public utility is enabled thus to classify its customers and to discriminate among them upon the basis of their marginal demand prices, because as a monopolist it has sole control over supply. It needs fear no competitive source of supply to which customers may turn who dislike these discriminatory price tactics. This practice of classifying customers and charging them different rates is known in economics as "*class price.*"

It is necessary to recall here what was said in Chapter III about the limits of monopoly power. Some consumers may be in a position to use more or less adequate substitute services or they may undertake to supply themselves. The legal grant of monopoly does not usually extend to available substitutes. When a substitute for electric service such as gas service is furnished by the same company the public utility will calculate the relative advantages of having the same consumer take either electric service or gas service. The most important limitation upon the monopolists' power arises, however, from those customers who may supply themselves. A price must then be fixed which has reference to the cost at which the customer may supply himself.

(c) *The influence of cost of production upon the adjustment of monopoly price.*

Thus far nothing has been said in regard to the monopolist's own cost of production. In Chapter III the point was made that public utilities are under the necessity of making large investments in fixed capital of a highly specialized character. Upon this great fixed investment the business must yield a return to cover interest charges upon borrowed capital, taxes levied upon the property, insurance and depreciation. These costs must be met if the plants are to be kept ready to serve at all times. They accrue whether the properties are being operated or not.

Since these expenses are common to all units of output and since they remain constant whether the output be large or small they have been called overhead costs. The presence of large overhead costs tends to make a business subject to the law of decreasing costs.

On account of their legal obligation to render adequate and continuous service public utilities must also make investments in anticipation of a growing demand. This likewise makes public utilities peculiarly subject to the law of decreasing costs. Large overhead expenses, constant in amount, arise because the supply can not be increased by small increments. These large fixed investments represent an outlay which is common to a large number of units of a potentially increased supply. This raises the problem of securing increased utilization of the enlarged fixed plant.

The telephone business is, in some of its operations, a notable exception to the general rule that public utilities are industries of decreasing cost. The telephone industry from its central station aspect is one of increasing cost because with the increase in the number of consumers the number of possible connections is increased and ultimately, therefore, the size of the plant and the cost of operating it. However, it is also true that the utility of the service is very much greater under such circumstances.

An industry is one of decreasing cost if it can increase its output without proportionately increasing its production costs. If such an industry can, at the same time, maintain a uniform price per unit of output, then it is also an industry of increasing returns because profits increase as the volume of business increases. But if the increased volume of business can only be secured at reduced rates, profits will only be increased if the cost of production per unit decreases faster than the price per unit needs to be cut. It is, therefore, better to speak of public utilities as industries of decreasing cost. The law of decreasing cost affects industries differently depending upon, (1) whether the industry must cut its rates in order to secure increased business, (2) whether in cutting its rates it must do so upon all units of output, or (3) whether it may cut its rates only upon the increased units of output, leaving the rate upon the original units of output at the old level. This practice has been referred to as "fixing rates upon the additional business basis". It should

be noted that considerations of cost likewise lead to the policy of classifying output and of differentiating in price between the various classes of output.

A qualification must be introduced in order to counteract an erroneous impression that may arise. The law of increasing costs does not operate indefinitely. If an increased volume of business can only be secured at the expense of an enlargement of the plant, the additional amount of output is secured at an increasing cost per unit. Only when a regular and dependable increase in traffic is anticipated will managers expand the plant and hence increase overhead costs. Once the capacity of the plant has been increased, only a financial reorganization can decrease overhead costs. It is, therefore, important to recognize the qualification that the law of decreasing cost operates only within the limits of the capacity of the plant.[1] For this reason overhead or constant costs are better called capacity costs. If average costs per unit of output are plotted, the increasing output made possible by successive enlargements of the plant will give a cost-curve consisting of a series of wave-like cycles. The crest of the waves in the cost curve would mark the points when successive enlargements of the plant occurred.

This phenomenon of variable production costs per unit with a general tendency toward decreasing cost is due to the behavior of expenditures in all industries, where capital costs are large and where fixed expenses are correspondingly great. Therefore the principle is by no means confined to public service industries.

DIRECT OR OUT-OF-POCKET COST. There is another type of cost due to *actual operation* of the property variously called "direct expenses" or "out-of-pocket cost". It tends to *increase proportionately* with increases in output. Fuel cost is a very good illustration of an operating outlay which varies with output. But close analysis will reveal that some kinds of operating out-

[1] Since the above was first written this principle has been elaborated by Professor J. M. Clark in a book entitled, *The Economics of Overhead Cost*, The University of Chicago Press, 1923. The first reference to this principle, which also recognizes the limitations introduced by plant capacity, was made by Professor Emil Sax in an early treatise, "Die Verkehrsmittel" (1861). He refers to this principle under the ponderous designation of "relative intensity maximum." Some other writers that have figured in the development of this subject and whose writings should be consulted are the following, Taussig, F., "A Contribution to the Theory of Railroad Rates," *Quarterly Journal of Economics*, Vol. V, p. 443; Pigou, A., *Wealth and Welfare*, The Macmillan Company, 1912, Chapter XIII; Edgeworth, F. Y., "Contributions to the Theory of Railway Rates," *Economic Journal*, Vol. 21, p. 558; Lorenz, M. O., "Constant and Variable Expenses and the Distance Tariff," *Quarterly Journal of Economics*, Vol. 21, p. 283.

lay, such as the salaries and expenses of administration, also, show a tendency to remain relatively constant with increases in output. The total operating cost is therefore divisible into (a) more or less constant costs and (b) more or less variable costs. Hence, as the output increases, and until the rate of output exceeds the capacity of the plant and its administrative organization, the aggregate cost per unit of output has a tendency to decrease.

The proportions of the relatively constant costs to the relatively variable costs are not the same for every industry. In the railway business approximately two-thirds of the expenditures are more or less independent of the amount of traffic. Fixed expenses—interest, taxes, depreciation—continue in large part whether the amount of traffic is large or small. Therefore, so long as a railway has unutilized capacity, it is very anxious to increase its business. The hydro-electric power industry represents, perhaps, the extreme case where the amount of fixed capital required is so great that fixed charges are several times greater than the running expenses. Operating cost of hydro-electric stations is proverbially light.

THE PRINCIPLE OF JOINT COST. Other conditions under which service is rendered give rise to the principle of joint cost. This must be carefully distinguished from the principle of decreasing cost. It also is not peculiar to public service industries. We may assume the hypothetical case of a railway which hauls only coal. This road will be subject to the law of decreasing cost. Now let us assume that the same road undertakes to haul passengers, because it still has unutilized capacity available so far as its "roadway and track" is concerned. To do a passenger business, however, it needs passenger locomotives, passenger train cars, and special terminal facilities. It must also hire additional labor to operate passenger trains and extend somewhat its administrative organization. Under the new conditions, certain special costs are entirely assignable to the passenger business, but the old expenditure for "roadway and track" is also sufficient to take care of the new passenger business. It is an expenditure which now serves for the joint uses of both the coal-carrying and passenger-carrying activities. Although some additional maintenance cost is, no doubt, necessary on account of the higher operating standards required for passenger business, it is impossible to assign exactly the proportion of fixed expenses and maintenance cost which should go to each branch of the service. Certainly, the investment in "roadway and track" is

indistinguishably for both purposes. The passenger business, therefore, illustrates a case where the same fixed expense may be related to an additional increment of business which is of a different character and where this fixed cost consequently becomes a "joint cost." [2]

These costs are joint because we have difficulty in segregating costs applicable to different branches of a business. Refinements of accounting and of statistical analysis do enable us to go much further than was once thought possible in segregating costs chargeable to different outputs. But when all that we can possibly do has been done, there remain large elements of cost that can not be definitely assigned.

For *practical* purposes, (that is to say for cost apportionments as aids to rate-making) joint costs and constant costs have two characteristics in common: they will have to be met in total by *apportioning* them over all the available units of service. The principle of decreasing cost merely calls attention to the fact that these increased units of service may have to be sold under conditions which will make it impossible to distinguish how much of the original outlay is attributable to any single unit of service. But the law of joint cost goes further. It tells us that these service units may have to be sold to customers having a different intensity of demand. Prices for services or products produced at joint cost will therefore tend to equal (a) the cost for which they are separately responsible plus (b) that proportion of the joint cost which the relative intensity of the demand for each of them permits of being included in their separate prices. Service for which the demand is more intense will bear a larger proportion of the joint cost. Service for which the demand is least intense must bear its own special cost plus the smallest proportion of the total joint cost. So long as they make

[2] The classical illustrations of products produced at joint cost are the production of wool and mutton, of cotton fibre and cotton seed, of the various kinds of packing house products. It has been contended that in the railway industry, the only true illustration of joint cost is afforded by commodities transported in "back haul movements." This is a true case of joint cost, but it seems that this unduly restricts the concept. The significant thing in "joint cost" is that there must be two products for which a distinct demand exists and where the determination not to sell one of the products would not reduce the expense. Under these circumstances they can be made to share the joint cost. In the case of the coal road it might be said that all the ton-miles of coal transported are produced at joint cost but this would be identifying overhead cost and joint cost. On the other hand, ton-miles of coal transport and ton-miles of passenger transport are sold under different conditions of demand. The concepts of joint cost and overhead cost overlap. The former derives its explanation from demand and the other gets its explanation from supply.

some contribution to joint costs it is economical to produce and sell them, because they help to that extent to bear the total burden of joint cost.

We have also seen that the demand for the service of most types of utilities is not uniform throughout the day but tends to grow to a peak. It also fluctuates from month to month in accordance with certain seasonal variations. This raises another problem of securing better utilization of productive capacity with reference to the time when the demand is not at its maximum. If fuller utilization can be obtained at these other times a larger amount of gross revenues will be available to meet the same quota of overhead cost. If the increased business comes at the time of the peak so that the capacity of the plant must be increased, these additional units of supply are produced under conditions of *increasing cost* per unit: while at other times additional units can be produced under conditions of *decreasing cost.* The latter is the normal condition which usually underlies a public utility's computations of cost.

Not only must a public utility aim to secure fuller utilization of fixed plant, it must also seek to *prevent the loss* of business, particularly that which comes at off-peak times, because this will mean that the remaining output is produced at increasing cost per unit. The need of price discrimination is therefore a continuing economic necessity in order to *maintain* a maximum utilization of existing fixed plant.

Sec. 2. Some possible Effects of Monopolistic Price Discriminations

If all the units of a given supply could be produced by a monopoly at constant cost per unit, the producer could sell them at a uniform price per unit without incurring losses. If he sold at lower prices to some customers he would, in order to avoid losses, have to sell at higher prices to others. This would be discriminating arbitrarily among his customers and, while of no special advantage to himself, it would injure those consumers who pay the higher prices, particularly if they compete with his other consumers who pay less. Since a public utility sells most of its product to consumers who use the service for further production under conditions of competition, it becomes a utility's duty to hold the balance even between competitors. Utilities thus have the important social function of making the competitive organization of industry workable.

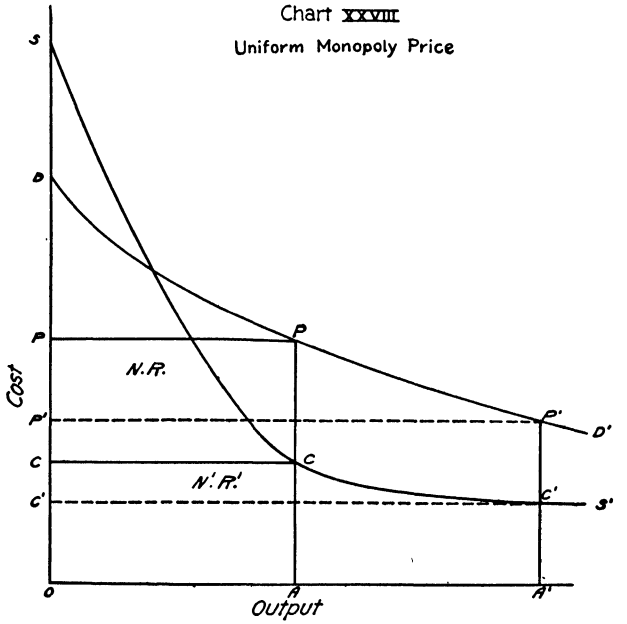
A public utility may, nevertheless, sell at a higher price to some customers, not because the cost of serving them forces it to do so, but because it desires arbitrarily to exploit its monopoly powers in securing higher prices and hence more net profit from those competing consumers who have a high marginal demand price. If, however, all competitors are charged a uniform price, let us say for power, the more efficient producers with high demand prices can retain their competitive advantages. Or, again, when uniform rates are charged, say for lighting, consumers with high demand prices get what has been called a "consumer's surplus". By classifying customers with respect to their demand prices and charging them a differential class price, the monopolist can invade what might otherwise be either a consumer's surplus or a competitive profit.

If increments of supply can be produced at decreasing cost a monopolistic producer will, in order to make his costs square with his income, sell these increments at different prices, conceding the lower prices to those customers whose demand enables him to secure a better utilization of his plant. This is the economic reason for differential price policies. In order, therefore, to obtain the maximum amount of *net revenue* from any given schedule of rates, it is important that the lowest rate in the schedule shall not be less than the cost of producing the supply furnished thereunder, and that each rate in the schedule higher than the lowest rate shall be so fixed as to be within the marginal demand price of each class of customers and yet contribute something toward net revenues. In this way the maximum of net revenue from all quantities of supply actually disposed of may be secured. This process is, of course, an experimental one, the monopolist judging whether he has fixed the proper class price by observing the way in which the market behaves.

Sec. 3. **Diagrammatic Presentation of the Theory of Monopoly Price**

The considerations outlined above may be shown by means of diagrams. We will first take the case of a public utility which charges uniform prices. In Chart XXVIII the line DD′ indicates a condition of fairly elastic demand. While the demand price decreases with increased supply, the price does not break or decline abruptly as it would were the demand very elastic. The line SS′ indicates that as the supply increases the cost per unit of supply decreases. If the quantity OA is put

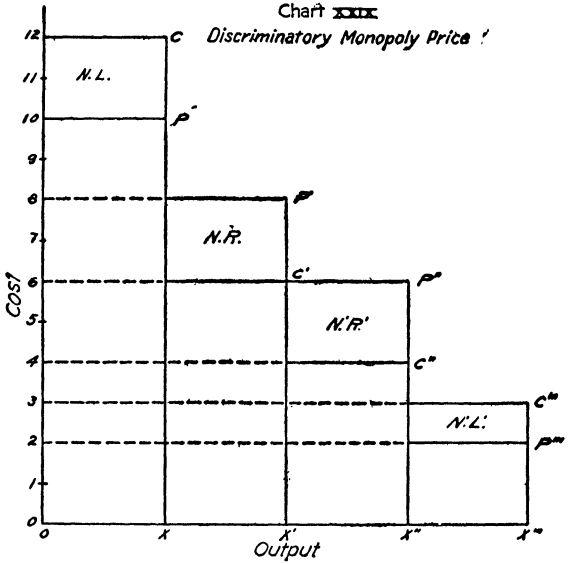
on the market, the cost per unit becomes AC. The total cost of production therefore is equal to ACCO. That amount of supply can be sold at the price AP, making the gross revenues APPO. The net revenue therefore is CPPC or the quadrilateral NR. If we suppose that the quantity produced is OA′ the cost per unit falls to A′C′ and the total cost becomes A′C′C′O. This quantity can be sold at the price of A′P″, making the gross revenues A′P′P′O. The net revenue then becomes equal to C′P′P′C′, or the quadrilateral N′R′. The area of N′R′ is greater



than the area of NR. Under these conditions,—that is, of elastic demand requiring some reduction in price as more supply is sold, but resulting also in a more than proportionate reduction in the cost per unit—the net revenue can be increased by producing a larger quantity. This diagram illustrates the situation where (a) the total cost includes a full normal return, and (b) where cost is represented as an average cost per unit for the full quantity actually disposed of, and (c) where a single uniform price is charged.

Now let us take the case of a public utility which discriminates in the prices to its customers. In Chart XXIX it is assumed

first, that the quantity OX can be sold to a group of customers whose demand price for this quantity is at least equal to XP or a demand price of 10. If all the costs of producing that much supply were included in the price it would have to be XC, that is, the supply price would be 12. The quadrilateral NL represents the net loss occasioned by the sale of that much of the supply. But the utility is operating a plant with a capacity greater than OX. We will assume that it increases its output to the quantity of OX'. The quantity lying between X



and X' can not be sold at the price XP but must be sold to customers whose demand price as a group does not exceed XP' or a demand price of 8. By increasing the quantity of supply, the *additional cost* of putting out XX' units of supply is at a cost of X'C' per unit, that is, the supply price of the increased quantity is 6 per unit. The quadrilateral NR represents the net return realized upon the sale of the increased supply. Provided the quantity OX can still be disposed of at a price of 10 the price X'P' or 8 is fixed in order to secure this additional business. It yields a net profit which offsets the net loss occasioned by the sale of the first quantity of supply. We will next assume that the capacity of the plant is such that supply can be increased to the total output OX''. The cost of the increased

supply X'X" is X"C" per unit or 4. This increment of supply we will assume can not be sold at the price of X'P' but can be sold at the price X"P" or equal to 6. The quadrilateral N'R' represents the net return realized from the sale of the last increment of business provided the preceding increments of supply can continue to be sold at the old prices. The net return N'R' is not required to offset any accumulated net loss upon preceding increments of supply. It therefore becomes a true monopoly profit, made possible by discriminating among customers by the device of exacting a class price, and by securing the increased output at lower unit costs in accordance with the behavior of overhead costs in relation to increased supply. The result of these transactions is tabulated below.

Transaction	*Quantity*	*Supply Price*	*Sold at Demand Price*	*Profit or Loss per Unit*
I	OX	12	10	Loss of 2
II	XX'	6	8	Profit of 2
III	X'X"	4	6	Profit of 2

It may now be assumed that the capacity of the plant has not yet been reached. Additional unutilized capacity is still available. But the additional output will have to be sold at a further reduction in price. The cost per unit of the last increment of supply X"X"' is equal, we will say, to X"C"' or to 3. In order to sell this increment, however, the monopolist finds that he must fix a price equal to X"'P"' or a price of 2. The demand price of customers who could take the last increment of supply is less than its separate unit cost of production. If the sale is made the monopolist realizes a net loss equal to the quadrilateral N'L'. The fourth transaction would therefore not only give him no net return for his trouble of manufacturing, but would go also in part to reduce the monopoly profit realized from his third transaction. N'L' would in part offset N'R'. As a true monopolist seeking to obtain a maximum net return the utility would refuse to extend its output to X"' and would content itself with the output X".

Sec. 4. The Self-destructive Nature of Competition

Competition among public utilities operating under conditions which make them naturally monopolistic is extremely hazardous.

Under free competition they will feel compelled to accept business which pays for the direct cost and very little more. On account of the difficulty of estimating even the direct cost they may sometimes accept the business at prices returning less than the direct cost. The consumer in his bargaining is enabled to play competing producers against one another. If each of two competing producers has a plant of the same capacity the initial outlay of each will tend to be the same. As more and more product is produced, the same first cost can be related to more and more units of product, and will therefore be a smaller and smaller cost per unit. Inequality of output or of rate of growth in output between producers will show itself in the higher cost per unit for the competing producer who sells less. Competition is therefore inordinately keen. It may even become "cut-throat" when neither of the two are collecting enough to meet their fixed charges but are merely struggling to see who may lose less.

In ordinary business undertakings like farming and merchandising, the force of fair competition serves to protect customers against unreasonable prices and inferior goods or services. Producers are, therefore, left to themselves with only that minimum of governmental interference which is imposed when the public health, safety, or morals come to be adversely affected. Experience has proved, however, that competition functions abnormally in the public utility field. It has been demonstrated that under modern conditions such competition is slow to arise, that it is limited in its operation, and that it tends to destroy itself.

The comparative reluctance of competition to assert itself is due to the fact that large sums of capital are required, and that the complexity of operations makes great demands upon managerial skill. Added to this is the consideration that specialization of capital has made competition hazardous because of the capital losses which inevitably accompany business failure. Moreover, before enterprises may be pronounced successful, a long time is required in building up a market sufficient to absorb the product. This is especially true if the enterprise must compete with one already operating.

In the transportation industry carriers compete for traffic moving between large centers but they do so usually by operating over separate routes, thus tapping new traffic territory. While this is an aid toward a successful financial outcome for each of them, the local traffic along these routes is placed entirely at the mercy of the carrier. In fact this characteristic appears

in all industries (like gas, electric and telephone utilities) which require that customers, in order to be served, must be directly connected with the plant. The very evident costliness and inconvenience to customers of disconnection from one plant and of reconnection with another, together with the heavy cost to producers and the confusion in public thoroughfares arising from parallel facilities, tends to prevent that complete paralleling of facilities which would make competition more pervasive.

The self-destructive nature of competition rests upon the fact, already referred to, that, given a certain plant facility, the expenditures for operation are to a varying degree constant, regardless of increases in the rate of output. When there is thus unused capacity, producers in their desire to secure full utilization of the plant will try to secure an increased volume of business, which, although it proportionately increases variable operating costs, can not affect constant expenditures. The operating cost attributable to increased traffic is therefore relatively small. The result is a tremendous inducement to get additional traffic. Competition for this traffic will be at rates which aim to cover the variable cost and as much more as competition will permit. This opens the door to discriminations and to rate wars in which rates go below even the level of actual out-of-pocket costs.

A further fact that makes competition difficult is that costs are not accurately ascertainable for separate units of traffic. Certain costs are incurred for operations as a whole or for combinations of traffic units and not for a single class of business. This is where the principle of joint cost applies. Since such expenditures are incurred jointly they can be apportioned over joint products only arbitrarily. Even that portion of operating expenses which varies with traffic is segregable only with difficulty. Thus the determination of the proper basis of charge has often become a matter of the "interaction of intelligent guesswork and external pressure." Out of this struggle for traffic have come either receiverships or an irresistible drive toward co-operation, culminating in consolidations or formal and informal understandings as to the prices to be maintained.

We may look at the situation from another point of view. Where two competing producers are operating in the same market it is usually the case that their combined capacity is in excess of existing or potential requirements. Under these conditions neither producer is able to supply his share of the total requirements under conditions where the cost per unit is as low as it can be made. This leads to two evils from the stand-

point of consumers. First, when the two competing producers endeavor to increase their output, discrimination will enter as between different consumers of the same plant. In order to keep their income as high as possible the competing producers will seek to maintain higher prices for the first units of supply, reducing prices only upon those increments of business for which there is competition. These discriminations under competition are not made upon any definite principle, sanctioned by public policy, but lead to a wide variety of arbitrary price adjustments. Second, the supply of product is wasteful of producing capacity. One producer may be fully capable of supplying the total requirements. Under competition, both producers are trying to charge prices equal to their separate costs. If they are successful, by agreement among themselves, or by means of discriminatingly high prices upon the output not subject to competition, consumers in the aggregate are paying more than the necessary cost of production.

The difficulties arising out of competitive production and out of the consequent discrimination in price adjustments have led to the adoption, so far as possible, of a policy of complete integration of supply in a given market. Thus the principle of monopoly was introduced. The reasoned conclusion, that the cost of production would be less under monopoly if there were no waste of surplus producing capacity, may have had something to do with the adoption of the new policy. Was this change, although dictated by economic considerations, also in the public interest? There can be no doubt upon that score at the present time, provided the monopoly is regulated. The only questions remaining relate to the scope, character, and intensity of regulation, and to the question whether public ownership and operation ought to be substituted for a policy of regulated private monopoly.

While most discussions of monopoly approach the problem from the point of view of the monopolistic control over price, it is important to note that monopoly is also a way of organizing production, which has its own peculiar advantages. This is our chief interest in it from the point of view of public utility economics. It is, of course, important to understand the theory of monopoly price so that we may know why a monopolist is in a position to increase his gains over and above what would come to him if he were required to sell in competition with other equally efficient producers. This provides the economic reason why the monopolists' power over the prices which he may charge

consumers must be limited by regulation. But it is equally important to understand the advantages of monopolistic organization of an industry which operates as a public utility and is thus limited by law in its power over prices. In the latter case, monopoly operates as a beneficent principle of organization which makes possible the conservation of productive capacity, the limitation of profit and the systematizing of rates.

Sec. 5. The Bearing of Regulation upon the Theory of Monopoly Price

What, it may now be observed, is the effect of governmental regulation upon the price policies of a public utility which operates as a monopoly? In the first place regulation can prevent a public utility from charging rates which equal the full marginal demand prices of its customers. Regulatory policy does permit the utility to classify its customers thereby recognizing monopolistic class prices, but it does not permit experimentation with quantity supplied and with the rates in order to determine the point of maximum return from the point of view of the producer alone. Since public policy seeks to insure the utility a total reasonable earning power, sufficient to compensate all the factors of production and no more, the adoption of a differential price policy under regulation is dictated by other considerations than those which arise out of the desire to secure the maximum revenue. This should make clear that if regulation imposed a uniform price policy upon public utilities it would not be aiding consumers as a whole. For, in classifying customers and in fixing class rates, regulation is seeking to extend supply to all customers who can pay rates at least equal to the separate cost of producing the increased supply and in addition make some contribution toward the necessary return. This appears clearly from Chart XXIX where it was assumed that the unit cost of production was sufficient to cover all reasonable operating expenses including a reasonable return upon the investment in the fixed plant.

It is therefore incumbent upon regulation so to fix prices, or permit the monopolist so to fix them in the first instance, as will enable the plant to attract sufficient custom to realize the maximum economy in production. If it is cheaper or more convenient for customers to supply themselves, their demand prices will reflect these considerations. Such customers should not be served. If customers are willing and able to use cheaper

substitutes, whether they be substitutes produced by another monopolistic public utility or substitutes produced by competitive producers, their demand prices will likewise reflect these considerations. The public utility must be permitted to compete for this class of custom but not at the expense of placing an additional burden upon its other consumers. Therefore the sale must not be at prices below the separate costs of producing these additional quantities of output. To produce at less than the separate costs not only throws the burden upon other consumers but also demoralizes the market for the substitutes.

In the case of customers able to supply themselves, the adoption of a price policy calculated to secure their custom but at a net loss to the public utility will not only make matters worse for other consumers, but will put those who have hitherto supplied themselves in a position of dependence upon a business which can not, in the long run, maintain its economic capacity to render this service continuously.

Returning once more to Chart XXIX, after the utility has extended its output to the quantity OX″ it will be satisfied, barring other considerations, to let matters rest, for that is the point of maximum net returns. But, by hypothesis, the area of N′R′ represents gross income in excess of necessary supply price of the quantity OX″. It therefore becomes the duty of the regulating authority to reduce the earning power to the point of reasonableness, economically defined. Obviously, rates may be reduced until the excess net return represented by N′R′ disappears. This can be done in three ways: First, by reducing the prices for all units of output comprised within the quantity OX″. This should be done pro-rata because under the theory of overhead cost [4] all units of output are equally efficient in bringing about the degree of utilization which results in the cost level of X″C″ for the final increment. Second, by requiring the monopolist to extend his supply in the direction of X″′ until full utilization is reached, even though the added supply must be sold to customers whose marginal demand price is less than the supply price of the added increment. Third, by combining the first method with the second method so that the benefit of a lowered price will be extended to existing customers and service extended to new customers with a lower demand price.

Improvements in the quality of service without change in price is another means of carrying off excess revenues but

[4] We are here abstracting the added refinement that there are various classifications of overhead cost for different purposes.

this does not affect the theoretical validity of the above procedure. It is, however, important to note that the *option* of pursuing any one or a combination of these methods is in the hands of regulating authorities and not in the hands of the public utility. Under any well conceived plan of regulation the *obligation* to do something to carry off accrued monopoly profits falls upon regulating authorities. It is conceivable, also, that the surplus net revenues may be divided between the patrons and the monopolist by using this condition as the point of incidence for a properly conceived scheme of awarding a management bonus. The chief consideration is that *public purpose* and not private commercial purpose shall control the disposal of the excess. In this way, monopoly is limited by regulation. Instead of being an instrument of extortion, as is popularly assumed, monopoly becomes a beneficent method of organizing industry and of eliminating the risks and wastefulness of competitive production.

Sec. 6. **The Special Case of Extensions**

All along we have been assuming that the market surrounding the plant is such as exactly to absorb the output at prices which will repay the expenses of production. Let us suppose, however, that the size of the plant must be increased in order to provide output to consumers who are clamoring for service. With respect to this new increment of plant one should observe that it also may bring about an increment of potential capacity, that is, capacity as yet unutilized. Under a mature conception of regulation, it is recognized that the conditions under which the capacity of plants is increased are a business risk which may be assumed only with the consent of regulating authorities. Consent having been given, it is not thereby implied that the state underwrites the risk, but that, in the opinion of the proper authorities, existing customers' interests of securing the fullest possible economic utilization of the plant will not be jeopardized by such extension. For it should be observed that the effect of the expansion in capacity is to enable the law of decreasing costs to run again with reference to the additional capacity, so that economics of full utilization may once more be realized by extending service to more customers. In addition, the business is stabilized through the attachment of more customers with new and diverse uses. What is, perhaps, more important is that the enlarged producing capacity may make possible far-reaching

economies arising solely out of the increase in size and capacity of manufacturing plant.

Sec. 7. Some Misconceptions of Public Utility Rate Theory Analyzed

This explanation of the theory of regulated monopoly price places in proper perspective two conceptions of the basis of public utility rates which have been offered from time to time as complete and independent explanations of the way in which such rates should be fixed. These are the so-called "cost of service principle" and the "value of service principle" of rate-making.

"Value of service" as a sole basis for rates is a question-begging phrase which is utterly incapable of offering a key to the situation. It is true that prices paid measure the value or power in exchange of services or commodities. Any one price, however, expresses merely the ratio of exchange between two things of value. All we can say when we observe one dollar exchanging for a bushel of potatoes is that in the estimation of the buyer the dollar has a value equal to or less than the bushel of potatoes, else, presumably, he would not buy. Price tells us nothing as to the individual estimates which buyer and seller have regarding the two things exchanged. For all we know the price might have been increased or diminished and the transaction would still have taken place. Value or worth of the service can only have meaning to a single purchaser. It can therefore only mean that public utility rates should be fixed at what individual customers will pay. Rates thus fixed justify themselves. No regard is had as to whether they yield a large or a small profit over cost or no profit at all. Value of the service as a criterion of rate reasonableness can mean only that rates shall be based upon individual demand.

The origin of this theory may be traced to the natural law theory of Stoic philosophy and the adaptation made of this idea by Roman lawyers when they maintained that only those prices were proper that were based upon actual exchanges. Originally applied by economists only where competition was assumed to fix a sort of objective market price, the phrase "value of service" was adapted by traffic officials of railways in particular to explain the basis of railway charges under semi-monopolistic conditions. Even when the phrase is softened down from an interpretation of "all the traffic will bear" to "what the traffic

will bear," it clearly betrays the views of those who at that time regarded governmental regulation of prices as arbitrary interference with what they would like to regard as the "natural law" of competitive pricing.

The same defect attaches to the "cost of service principle" as an explanation of individual prices. This, we can see at once, bears a close family resemblance to the "just price" of the Church Fathers and of the mediæval schoolmen who said that value in exchange should be based upon expense of production. According to this principle, not what the buyer regards as the worth of the service to him, but the economic sacrifice made by the producer is the basis of price. Yet basing individual utility rates upon individual costs is out of the question because costs are incurred not for *single* commodities and services but for commodities and services in *quantity* and hence *jointly*. Only by averaging cost with quantity can an assumed average cost per unit be ascertained. It is necessary to observe also that cost leaves out of account the demand or the desirability of the service to the consumer. Therefore, like value of the service, it is merely a partial explanation of the considerations which fix market prices. In Chart XXIX, were cost the only basis for price, the quantity OX would have to be sold at the price XC, that is 12. But customers will only pay a maximum of XP, that is 10. Cost price would therefore be prohibitive.

Transportation utilities illustrate best the incompleteness and inadequacy of a cost theory. Aside from the fact that there is no ascertainable cost of performing a particular service, rates based upon an average cost per ton-mile of haul would prevent a full utilization of the railway plant. If rates were based upon an average cost per ton mile, low grade commodities like coal could not be carried at all, or for only short distances. Transportation charges would so add to the cost of a low grade commodity that substitutes would come into use and the amount of traffic would fall off. High-grade commodities like silk, on the contrary, would be carried at lower rates than they now pay, without any increase in quantity carried. On the other hand, by varying the rates charged for the transport of different classes of freight, the total quantity (ton-miles) of transport may be increased, which has a tendency to reduce average costs. Therefore it is proper to say that unit costs depend upon rates because unit costs are determined by the quantity of goods transported, which in turn depends upon the rates charged.

There is, however, this element of truth in the cost theory,

that average variable unit costs represent for particular services a figure below which rates may not go without failing to make some contribution toward fixed costs. It also is useful in determining for the traffic as a whole the general level of rates that must be charged in order to yield a reasonable earning power. The value of the service principle in turn is useful because it gives some indication of the way in which rates may be charged against the different classes of service in order to encourage that fuller utilization of plant capacity upon which the realization of net revenues depends. This purpose, that is, securing fuller utilization of plant capacity, ties together the value of service principle, properly so-called, and the cost of service principle, properly so-called, into a coherent explanation of price-fixing under conditions of regulated monopoly.

CHAPTER XXIX

COST ANALYSIS IN ITS RELATION TO SELLING POLICIES

The theory of regulated monopoly price requires that the primary basis of a public utility rate structure be the cost of the service, first in the sense that the total necessary expenses of production are the measure of reasonable gross earnings; and second, in the sense that the specific cost of the unit of service, in terms either of an estimated average unit cost for all units, or in terms of an estimated average unit cost for a given increment, is one of the measures of individual rates. An analysis of cost along these lines is the subject matter of this and the following chapter. The theory requires, further, that a public utility rate structure rest upon the "value of the service" to the customers as a secondary basis. This sets an upper limit upon particular rates consonant with customers' demand prices. Some illustrations will be given in the following chapter to show how customer classifications give effect to this secondary principle of rate-making.

Sec. 1. Cost Analysis as Applying to the Rate-Schedule as a Whole

The first step in cost analysis is to examine the elements of cost which make up the necessary expenses of production. Our previous discussion has amply demonstrated that the total yearly [1] earnings under the rate-schedule should be sufficient to reimburse the going concern for the following necessary outlays:

1. The annual cost of operation as represented by reasonable operating expenses.
2. The annual cost in taxes and compulsory contributions to government charged as an operating expense. It should be recalled that some taxes and compulsory contributions like paving costs are treated as an

[1] The year will be taken as a convenient unit of time, although the analysis may be made for shorter or longer units depending upon the specific purposes which the analysis serves.

expenditure for capital and charged to some appropriate fixed capital account.

3. The annual cost of providing for the replacement of public utility capital as old forms of fixed physical equipment give way to new forms.
4. The annual cost of a reasonably adequate supply of capital.

The following calculation is typical of the kind made by administrative commissions to ascertain the reasonableness of the general level of rates. The figures given relate to an electric railway utility.[2]

Operating Revenues		$4,612,397.15
Operating Expenses		
Way and Structures	$ 214,545.37	
Equipment	259,545.71	
Traffic	2,500.00	
Transportation	1,925,692.75	
Power	530,706.05	
General and Undistributed	394,199.51	
Total	$3,327,189.39	
Taxes	340,732.04	
Depreciation	471,104.00	
Total Operating Expenses		4,139,025.43
Net Income Available for Return		$ 473,371.72
Rate-base	$18,160,970.00	

Per cent. return upon Rate-base $= \frac{473{,}371.72}{18{,}160{,}970} = 2.7\%$.

Since this return of 2.7 per cent. upon the rate base was deemed to be unreasonably low, the commission held that rates should be increased. It accordingly estimated, that if operating revenues at certain increased fares amounted to $5,519,015.91, and the reasonable operating costs shown above were deducted, the net income available for return would become $1,379,990.48, which represents a rate of return of 7.59 per cent. This was considered to be a reasonable rate of return and the company was ordered to put the fares into effect.

In making these calculations, commissions are faced with the difficulty that, though it may be possible to determine whether earnings have been adequate to cover these necessary outlays for some past year, it becomes a troublesome matter to determine

[2] *T. M. E. R. & L. Co. et al* v. *City of Milwaukee*, 21 W. R. C. R. 1, p. 54 (1918).

what earnings and expenses will be for some future year. This is a difficulty inherent in all rate-making processes. Unless provision is made for a revenue-stabilizing and equalizing device, the articulation of earnings and costs will always be by approximation only.[3]

Earnings under a prescribed schedule of rates depend upon the volume of sales and the distribution of this volume among the various rate classes. Volume of sales depends first of all upon general business conditions.[4] Traffic grows during periods of prosperity and declines again during periods of depression. American railways experienced a great decline in earning power during 1921, a year of depression, in spite of the substantial rate increases of 1920. This two-year period best illustrates the effect of a decreased volume of business upon the flow of revenues.

Other influences affecting the volume of sales are fortuitous circumstances like epidemics, wars, and public calamities. The influenza epidemic in 1918, for instance, decreased the patronage and hence the earnings of electric railways throughout the country, due to the reduction in social intercourse. The effect of wars in stimulating some forms of traffic and in depressing other forms, is sufficiently familiar not to require detailing here. Sometimes these influences have only a local effect, but their influence is nevertheless important as concerns the volume of sales of any single concern. Still other causes affecting volume of sales arise out of the manner in which rate schedules stimulate the demand of different classes of users. When important adjustments are made in particular rates, the volume of sales under old rates is no certain index of what may be expected under the new rates. It becomes, as we have seen, a question of carefully weighing the chances that customers may serve themselves or use substitutes, as well as a question of carefully estimating the consumers' ability to pay.

But under some circumstances earnings alone should not be depended upon to meet the necessary costs of service. This is true of the administration of the post-office and was true also of the railways during the period of federal control and operation. Public policy may dictate that deficiencies in earnings

[3] The recapture clause of the Transportation Act of 1920 is designed in part to serve this purpose, as are also the "barometer funds" or "stabilizing reserves" of service-at-cost contracts.

[4] *Cf.* Vanderblue, H., and Crum, W. L., "Fluctuating Statistical Standards of Public Utility Operations," *Journal of Land and Pub. Util. Economics*, Vol. I, p. 138 (1925).

shall be made good out of public funds. Rate-making will then involve a combination of the principles of private finance which distribute charges in proportion to cost and of the principles of public finance which distribute costs in accordance with criteria of general benefit. Although subsidies are most frequently applied to public enterprises, they may also be used to support privately owned public utilities.

Sec. 2. **Cost Analysis and the Adjustment of Class Rates**

In fixing particular rates we pass from a consideration of cost of service in terms of the total amount necessary to cost of service in terms of the individual responsibility of customers for such outlays. Cost analysis from this point of view concerns the proportion in which each class of customers, and each individual of a given class, should share in bearing the burden of cost. It proceeds upon the hypothesis that each consumer should contribute toward total earnings at least in proportion as costs are definitely traceable to him. This is the principal function of the second type of cost analysis.

(a) *Capacity costs as fixed expenses.*

Cost analyses involve an examination of the conditions of supply. We know that the technological conditions of turning out product require two classes of expenditures. First come expenditures whose magnitude depends upon the productive capacity of the plant. Within this limit they are fixed or inelastic. They tend to remain the same whether the output increases or decreases, providing always that an increase does not exceed the capacity of the plant. They are thus called *capacity costs.* In fact it is necessary to recognize that there is, in addition to plant capacity, a species of managerial capacity. Expenditures for general supervision are also relatively inelastic in amount. They can not be reduced if output decreases nor need they be increased until the growth in output goes beyond the capacity of the managing personnel. Fixed costs are therefore overhead costs. As output increases unit costs will decrease.

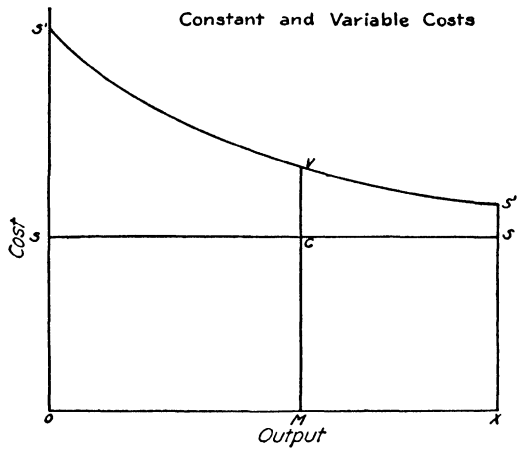
(b) *Output costs as variable expenses.*

The second class of costs increase in amount with increase in output. Hence they are called elastic, "out-of-pocket" or prime costs. If the increase in cost is directly proportional to the increase in units of output, then variable costs are a *constant*

cost per unit. At any one time, therefore, a unit of output should be held responsible for some variable share of the constant costs plus a more or less *constant unit cost* arising out of variable expenditures. Changes in operating technique, variation in wages of labor and prices of material, increased or lowered efficiency with which the plant is being operated, bring it about that variable expenses do not remain the same per unit. But they tend to remain the same unless the above mentioned causes intervene.

Chart XXX

Constant and Variable Costs



Differential or class rate depend upon the pro-rating of overhead expenses. In Chart XXX the line OX indicates increase in output, the maximum output being reached at point X. The line SS indicates the unit cost for variable expenses which must be associated with *each* unit of output. The lines S'S' indicates the unit cost for fixed expenses which must be associated with *successive* units of output. For any given unit, let us say M, the unit costs for variable expenses are represented by the line MC, while the fixed costs per unit when the output is equal to OM are represented by the line CV. Rates based upon cost should therefore equal MC plus CV. When the output is at its maximum, namely, OX, the variable costs are the same, namely XS, but the unit cost of fixed expenses has declined to SS'. With output equal to OX, in order to cover total costs, rates need only be fixed at XS plus SS'. In order to expand output beyond capacity, additional fixed investment is required, and hence a new phase in the variation of production cost begins.

Sec. 3. The Typical Case of Electricity Supply

It is impossible to illustrate the operation of these principles of cost analysis in connection with each of the industries that make up the public utility family. It is true, however, that they apply with more or less force in each case. They can be illustrated most clearly and completely in the electricity supply industry and we will therefore discuss cost analysis in terms of this business.

(a) *Fundamental units of capacity or demand and of output.*

The unit of sale of electric energy is called the kilowatt hour. Energy requirements or the rates of output are measured in terms of kilowatts. This is also spoken of as the "load" carried by a generator, by a single power station, or by a power supply system composed of several power stations. The power stations may be either steam-electric or hydro-electric stations, and often the two types will be combined in the same electric generating system. It should be noted that the "load" upon a power station also is the "demand" for energy as required by customers. It is the duty of an electric utility to supply this demand at the time when it is wanted. The exigencies of the use of power are such that there can be no delay in the supplying of customers' energy requirements. In order to meet the demand at all times, the utility will provide itself with a capacity which exceeds the greatest demand from customers. This extra capacity, called "reserve capacity," is necessary in order to insure that energy supply can be continuous even if accidents or other contingencies require that some power units be temporarily put out of commission. The reserve is also necessary in order to extend the service of the utility. When the demand of customers is equal to or exceeds the capacity, as it often did during the World War, the utility will proceed to ration service under proper regulatory safeguards.[5] The kilowatt thus measures both the capacity of a plant and the demand that customers make. In the former case it measures the maximum *potential rate* of supply and in the latter it measures the *actual rate* of supply. A demand of one kilowatt, supplied for one hour, means

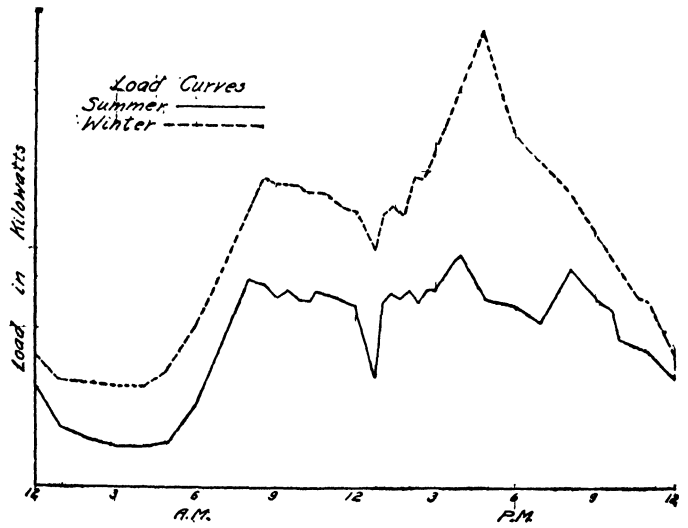
[5] Attention should be called to the fact that generating instruments are "rated" according to kilowatts. For short periods of time these instruments may carry a greater load than the rated capacity, but not without danger of overheating and otherwise injuring them.

that the plant has supplied some customer with an energy *output* of one kilowatt hour (kw.hr.).

(b) *The variation in demand or the load curve.*

The demand or actual rate of supply varies throughout the day. It is shown graphically by means of daily load curves. The configuration of these daily load curves will differ as between plants and will also vary from day to day on account of seasonal and other changes in the demand. The habits and

Chart XXXI



industrial characteristics of the community which the plant serves will determine the daily and seasonal variation in the demand. Typical daily load curves for a metropolitan city for a winter day and for a summer day are reproduced in Chart XXXI. It should be noted that the time of lowest demand comes in the early morning hours, while the highest demand (the station peak) comes during the late afternoon hours in the winter time and during the late afternoon and early evening hours in the summer time. Other seasonal load curves for smaller communities having different characteristics are shown in Charts XXXII and XXXIII.

The load upon the power plant is, of course, the composite of the demand which different classes of customers make *simultaneously*. For instance, the street-lighting load represents an

Chart XXXII

Typical Seasonal Load Curves for an Electric Utility
Chiefly Residential Consumption-1925

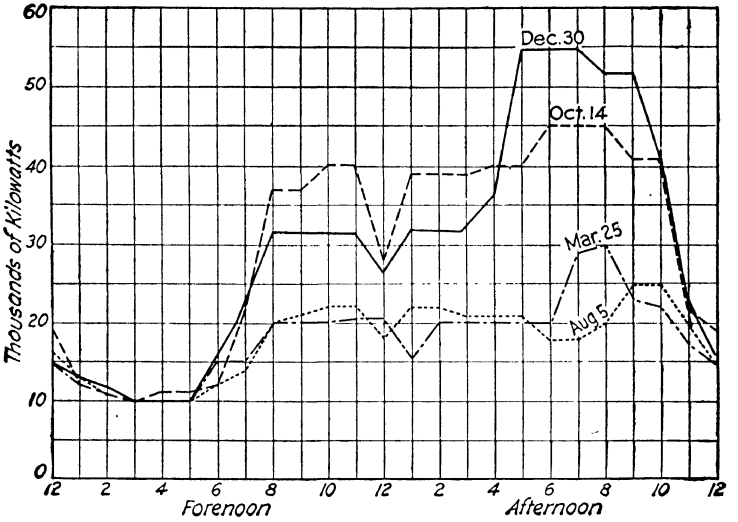
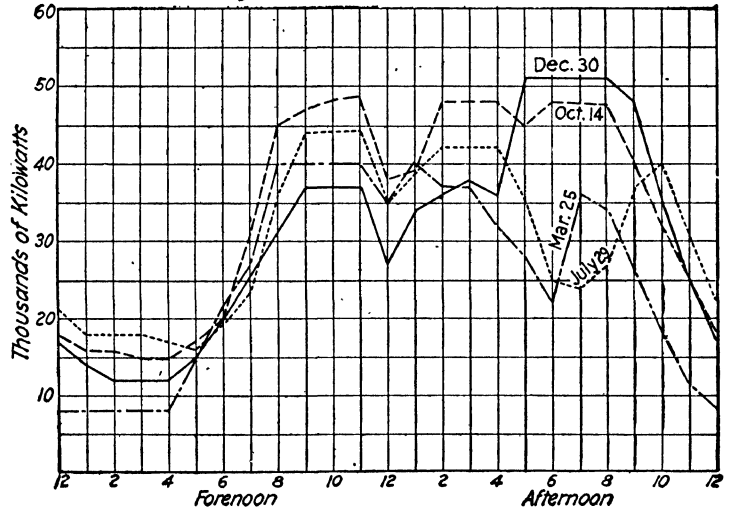


Chart XXXIII

Typical Seasonal Load Curves for an Electric Utility
Chiefly Industrial Consumption-1925



even load which is carried during the hours between the time of sunset and sunrise. Upon the street lighting load will be superimposed the industrial load if such industries operate on a night shift. Upon it also will be superimposed the electric railway load which is comparatively heavy during early evening hours and dwindles to nothing or to a slight demand for owl-car and work-train service after midnight, becoming heavy again when normal street railway schedules are resumed. The lighting load of residences and of restaurants, theaters, and display lighting will also swell the demand.

During the day time the load consists of the composite demand for industrial power, for such residence and commercial lighting as is required, for street-railway power, for cooking and other household uses, etc. The coincidence of these separate demands is such as to give a recession in the demand during the noon hour and to build up to a peak demand during the late afternoon. This peak is known as the maximum coincident demand. On account of the lighting load, the peak ordinarily comes earlier in the winter and later in the summer. It is also likely to be higher during the winter than during the summer so that the day of the highest maximum demand for the year occurs during December or January. There are, of course, unusual conditions where these characteristics do not obtain.

The demand is registered by means of special demand meters. It is usually recorded as an average demand for a short interval of time (15 minutes, half-hourly, or even hourly). The characteristics of the diurnal load curve and the changes it undergoes with the seasons are important from the standpoint of the operation of power stations, and are made use of by "load dispatchers." Load curves are important in rate-making because they indicate the degree of utilization of power plant capacity from period to period.

Sec. 4. The Concept of "Load Factor" as Indicative of Intensity of Plant Utilization

The output in kilowatt hours is the product of the demand and the time interval. We thus get daily, monthly, and yearly output in kilowatt hours. The relationship between the maximum possible output and the actual output expresses the degree of utilization, called the "load factor." This has been defined as the ratio of the average power used to the maximum power used during a certain period of time. We may thus have load factors

for a day, a month, or a year. The yearly load factor is of most importance in cost analysis.[6]

Sec. 5. Economy in the Utilization of Plant Arising Out of Diversity in the Time of Demand

Economy in the utilization of plant will arise when the demand for service comes at different times. This is expressed in a ratio which is called the demand factor. It is the ratio of maximum demand to the total connected potential demand (also called the connected load). This definition requires some explanation. It was said that the load upon a power station also indicates the demand which customers are making. Yet it is well known that customers are not using all their energy-consuming appliances at the same time.

Take the case of a small residence consisting of seven rooms, each of which has an outlet for lighting service for general illumination. Let us say that each room is served by one 40-watt lamp. The total connected lighting load would thus be 7 x 40 or 280 watts. Is it likely that this residence consumer will be using all of the seven rooms at the same time? Manifestly, that would be the exception. It is more likely that the actual maximum demand for energy will be for lighting four rooms, or 160 watts. Now we may assume that in order to make lighting arrangements more convenient and to use electric power for other household uses, the consumer increases the number of his outlets. This will enable him to secure spot lighting, to operate an electric washing machine, vacuum cleaner, electric mangle, toaster, percolator, etc. He also installs an electrically driven pump for a private water-supply system, an electric stove for cooking, and an electric water heater. Although the number of outlets is increased and also the number of energy-utilizing devices, it is apparent that the maximum demand has not been increased in the same proportion. Let us assume that the entire connected load has been increased to 2200 watts. A maximum demand meter is installed and indicates that the maximum demand does not exceed 1500 watts or 1½ kilowatts. The demand factor has thus been modified from $\frac{160}{280}$ or .57 to $\frac{1500}{2200}$ or .68. This demand factor may change from time to time, but

[6] Another ratio, useful for various purposes in connection with a cost analysis, is the capacity factor or plant factor. It is the ratio of the average load to the rated capacity of the power station.

it will vary within narrow limits unless the character and extent of the installation is materially changed. Since it is impracticable to measure the active demand on account of the expense involved, the percentage of the total connected load which is active may be assessed at some average rate, and this rate may be checked by means of periodic tests. Thus we see that, in order to determine the actual maximum demand which the customer is likely to make upon the central power source, it is necessary to reduce the connected load by applying a demand factor which gives us the proportion of the connected load that may be considered *active*. The use of these ratios in actual rate analyses will be explained later.

At this point another important factor enters. If this customer were the only one, the power source would only need to have a capacity somewhat in excess of 1½ kilowatts. But the fact is that he shares with other customers the use of the same power source. It is not likely that the maximum demand of other residence consumers will come at exactly the same time as that of the first customer. With respect to any very large group it is in the highest degree improbable that their individual maximum demands will come together. In proportioning the capacity of the central power source to the actual demand which the group as a whole is likely to make, the grand total connected load of all customers should be reduced by two steps: first, by considering that only a proportion of the connected load of each customer is active, and second, by considering that this active connected load for each of the different customers does not come *at the same time*. Therefore, by taking account of the diversity of use among customers the required capacity needs to be equal only to the connected load which is *active at the same time*. This has been called the maximum coincident demand. The *diversity factor* has been defined as the ratio of the sum of the maximum power demands of the subdivisions of any system or parts of a system to the maximum demand of the whole system or of part of the system under consideration, measured at the point of supply.

A numerical example will illustrate the process. The data assumed in the example are shown on page 651.

Of the total connected load of 4.9 kw. only 3.1 kw. is active, indicating an average demand factor of $\frac{3100}{4900}$ or .63+. Of the total individual maximum demands of 3.1 kw. only 1.7 kw. is exerted at the same time, indicating a diversity factor for this

Customers	*Connected Loads*	*Max. Active Connected Loads*	*Max. Active Coincident Connected Load*
A	1200 watts	600 watts	200 watts
B	1500	1000	500
C	2200	1500	1000
Total	4900	3100	1700

group of $\frac{3100}{1700}$ or 1.8+. The power source, so far as these customers are concerned, need only have a capacity equal to a maximum demand of 1.7 kw. plus the necessary reserve.[7]

Just as there is diversity in demand between customers in the residential class, so there is diversity between commercial customers and power customers. The diversity factor for power and commercial customers is lower than for residence customers, because according to business practice commercial installations are used with less variation as to the time when the maximum comes. But there is considerable diversity between the three classes. Substations in residential districts may carry a light load while substations in commercial districts are carrying a moderate load and those in industrial districts a very heavy load. It is this cumulative effect of the diversity factor in lowering the coincident demand upon the power stations that is reflected in the daily load curve.

Thus the load factor and diversity factor are not only important from a technological standpoint but from an economic standpoint. The load factor shows the degree of plant utilization. The higher the load factor the greater is the economy of utilization. The diversity factor is an expression of the degree to which consumers' demands may be articulated with each other so that less capacity is necessary to meet coincident demands. The higher the diversity factor the less is the need for plant capacity. The diversity factor measures economy in the *installation* of capacity, and hence in fixed capital outlay. The load factor measures economy in the *utilization* of installed capacity, and hence in overhead cost.

Load factor economy can be made clearer by referring to the load diagrams above. The maximum demand for the winter load curve is equal, let us say, to 1000 kw. If this maximum demand

[7] No significance should be attached to the proportions. They were selected arbitrarily to illustrate the principle.

were continuous throughout the day, the total output in kw. hours would be 1000 × 24 or 24,000 kw. hrs. The actual output under the conditions of variability in demand as shown by the load curve is, let us say, 12,000 kw. hours. This indicates a load factor of 50 per cent. It is equivalent to a continuous demand of 500 kw. In order to improve the load factor it would be necessary to secure customers whose maximum demand comes at a time which is not coincident with the station peak and hence will take service largely off the peak.

Sec. 6. **Differential Costs of Railway Traffic**

It still remains to show how the principles set forth are reflected in actual selling or rate policies. Although public utilities in one sense turn out a homogeneous product,—kilowatt hours of electric energy, gallons of water, or cubic feet of gas, passenger miles or ton-miles of transportation—the service is sold to consumers under such diversity of conditions as to time and use, that cost of supplying a unit quantity is not necessarily the same. These differences in the cost of serving different classes of customers must be recognized in rates.

It is impossible within the limits of space available in a general outline to explain all the intricacies of cost calculations. This should be done in special monographs dealing with the rate problems of each utility. Our aim here will be to restrict the discussion to certain general observations more or less common to all utilities.

A cursory reference to the differential costs of railroad service and their relation to the rate structure must suffice.[8] Railroads have in the course of time developed numerous service classifications and rates are differentiated in accordance with them. Railroad traffic is first divdied into freight and passenger train traffic and the separate cost of each branch must be determined. The allocation is made difficult by joint cost and overhead cost. Since joint costs cannot be traced to specific joint products and overhead costs are untraceable to specific units of output, they are, so far as cost analysis is concerned, lumped together in making cost apportionments. It may be found convenient to divide the total cost also into variable and fixed so that the contribution which each service classification should make toward meeting fixed expenses may be determined.

[8] The subject has been treated at length in several monographs. Compare, for instance, Ely, O., *Railway rates and Cost of Service*, Houghton Mifflin Co., 1924.

Each of the two categories of cost referred to above must in turn be subdivided. The cost of passenger train traffic must be divided into mail, baggage, express and passenger services, and the separate cost of each determined. Freight train service must be similarly differentiated and the costs must be allocated to terminal and movement services, carload and less than carload service, etc. Allowances must then be made for special services such as sleeping and parlor car services, or icing and refrigeration services.

Sec. 7. **Differential Costs of Electric Service**

In the analysis of the cost of electric energy it was found that the maximum demand for the year determines the size of installation. This means that the fixed expenses such as return on investment, taxes, and depreciation are more or less proportional to the demand. They have consequently been called demand costs. Other costs like fuel, oil, operating labor, and so on, are variable expenses because they depend very largely upon the quantity of service produced. Hence, they are called output costs. Yet output and demand are not the only factors in accordance with which costs vary. Certain other expenses, like reading of meters, billing and keeping customers' accounts, vary more nearly with the number of customers. They are, roughly, the same for each customer and are thus called customer costs. Demand, output, and customers' costs are the principal kinds of cost differentiation.

In relating these costs to the rate structure it has become commonly accepted practice that each customer should pay a fixed amount as a customer cost, a variable amount depending upon the output which he consumes as an output cost, and a variable amount depending upon this demand as a demand cost. The amount paid as a demand cost is the same per kilowatt of demand for all customers in the same class. As between different classes, the demand portion of the total charge is assessed in accordance with what the traffic will bear. Again it is important to recall the general limitation that no more than the necessary costs should be charged.

Demand or readiness to serve costs are not of equal importance for all utilities. Utilities were divided into two classes furnishing service either with or without storage. When water is stored in a reservoir or gas stored in a holder it is not necessary that these utilities have a producing capacity equal to the

maximum demand. No doubt these utilities exhibit irregularity in hourly demand, but capacity for storage makes it possible that a very much smaller plant produce the necessary supply under conditions of uniform rate of output. Storage thus insures greater load factor economy. During periods of maximum demand, with the plant working at full capacity, the stored supply can be drawn upon. During periods of minimum demand the plant may be shut down and the stored supply again drawn upon.

It should be noted, however, that storage is additional cost, made necessary by irregularities in the daily demand. It is thus a demand or readiness-to-serve cost. The need of securing full utilization still remains but the need is less accentuated. Additional demand coming at the time of the peak requires either increased storage capacity or increased producing capacity or both. The fact that storage is possible has some influence upon the form of the rate-structure of these utilities.

Street-railways, with their morning and evening rush hours, telephone utilities, and electric utilities are the best illustrations of enterprises whose capacity costs depend upon the peak of the demand. Telegraph utilities have characteristics which place them intermediate between these types. They are not required to give instantaneous service, but may spread the peak of service over some longer interval of time so long as service is rendered without undue delay. In times of emergencies, railroads may declare embargoes upon particular types of freight movements, thus affording them some relief from the trials and costs of abnormal peak demands.

(a) *Some limitations of cost differentiation.*

Cost analyses for rate-making purposes are subject to certain special limitations. While it may be practical to examine into the cost of rendering service with great minuteness for certain managerial purposes, the degree of refinement in cost analysis for rate-making purposes should not exceed that which can be made practically effective in rate differentiation. All the variables of cost could not possibly be included in any rate schedule without unduly complicating the administration of these utilities and without giving rise to criticisms from customers who are unable to understand the reasons for the differentiation. Experience has shown that standard electric rate schedules which go beyond a recognition of two elements, one depending upon demand or readiness to serve, another depending upon

actual consumption of service units, are too complex for practical purposes. In effecting rate differentiation based upon demand costs it is desirable to distinguish three classes of customers, (a) those who take service prevailingly at the time of the peak alone, (b) those who take service entirely off the peak, and (c) those whose demand comes at both times. Usually, however, the first class is not specifically recognized in the construction of rate schedules, the utilities preferring instead to induce these customers to extend their consumption into periods when the demand is lower.

(b) *Apportionments of cost to demand, output and customer classifications.*

An apportionment of costs in accordance with the three variables of demand, output, and number of customers will give different percentage assignments depending upon operating conditions. One method of distributing costs is illustrated in Table XXVII, p. 656.

The basis of segregating consumer expenses has been, so far as possible, direct allocation. Items of expense peculiarly related to the consumer and depending upon the number of consumers have been placed in this group. This would include the cost of maintaining meters, of setting and removing meters, meter department supplies and expenses, and costs of collection. Certain other expenses such as the maintenance of poles, lines, transformers, etc., have been apportioned only in part to this group. Generation expenses have been divided upon a basis which gives effect to the load factor of the system. This accords with the theory that if the plant were operating at 100 per cent. load factor all the expense would be chargeable to output. Fuel and water used in generation were apportioned in part to demand upon the theory that a certain proportion of this expense is due to an imperfect load factor which makes necessary expenditures for fuel for banked boilers.[9]

[9] The best brief discussion of the reasons which underlie cost apportionments for electric supply is from Worthingham, F., *The Theory of Electric Rates.* The illustrations are drawn from English central station practice of several decades ago and are thus somewhat antiquated. But the basic factors are still the same. We therefore quote the pertinent part at some length:

"For every kilowatt of consuming devices installed, there must be provided a corresponding capacity of (1) boilers, together with their accessories of feed pumps, feed tanks, coal storage, coal conveying plant, mechanical stokers, steam pipes, etc.; (2) engines, with their condensers, pumps, condensing water tanks, spare parts, etc.; (3) dynamos; (4) switchgear and

TABLE XXVII

TYPICAL COST APPORTIONMENT OF AN ELECTRIC UTILITY

	Total	*Costs Varying with No. of Consumers*	*%*	*Costs Varying with Demand*	*%*	*Costs Varying with Output*	*%*
Generation Expense	$ 71,945.83	.....	....	$32,024.68	44.5	$39,921.15	55.5
Distribution Expense	21,908.01	$10,347.11	47.2	6,910.62	31.6	4,650.28	21.2
Commercial Expense	6,411.25	6,411.25	100.0	.....	...	.....	...
Total above	$100,265.09	$16,758.36	16.7	$38,935.30	38.8	$44,571.43	44.5
General Expense *	14,368.60	2,400.99	16.7	5,579.33	38.8	6,388.28	44.5
Taxes *	6,975.65	1,164.93	16.7	2,706 55	38.8	3,104.17	44.5
Depreciation *	35,417.92	5,914.78	16.7	13,742.16	38.8	15,760.98	44.5
Return *	64,000.00	10,688.00	16.7	24,832.00	38.8	28,480.00	44.5
Total Cost	$221,027.26	36,927.06	16.7	$85,795.34	44.5	$98,304.86	44.5
Chargeable to							
Residence and Commercial Lighting	132,132.75	35,108.34	26.5	47,793.20	36.2	49,231.21	37.3
Power	34,594.05	1,808.72	5.2	13,141.35	38.0	19,643.98	56.8
Street Lighting	16,184.66	.....	....	8,740.47	44.0	7,444.19	56.0
Railway	38,105.80	.....	....	16,120.32	42 3	21,985.48	57.7

* Apportioned on the basis of directly assignable costs. A more accurate method would allocate taxes, depreciation and return in accordance with the assignment of property values to the customer, demand and output groupings. The investment in power stations, transmission lines and substations can be divided between demand and output in accordance with load factor considerations.

The cost analysis in Table XXVII is only one of several that might have been used for illustrative purposes. It was chosen

instruments; (5) land on which the plant may stand, which will involve an annual charge for rates (taxes) in addition to the interest on the purchase money; (6) buildings to house the plant, together with such accessories as cranes, etc.; (7) distributing mains and feeders, using the term in the broadest sense to include transformers or transforming stations (substations); (8) service lines, meters, fuses, and accessories in consumers' installations. The capital expenditures on this plant will require an annual sum for repairs, which will be the same for a portion, whether energy is being supplied or not; but for the remainder it will be rather heavier if the plant is supplying than if it is merely running light.

"The items above enumerated are the more obvious components of the standing charges (fixed expenses), but there are others equally important; these are (1) wages of men in boiler house, engine room, mains and installation departments; these men must be in attendance whether much or little plant is running, but the numbers employed in the engine room and boiler house will undoubtedly be increased with the amount of plant actually at work, so that a portion only of these wages must be regarded as a standing charge; (2) the amount of coal necessary to be burnt per hour to maintain the temperature of the boilers, steam pipes, engine jackets, etc.; this is a very heavy item, and will amount to about 14 lbs. of coal per day per kilowatt of capacity of plant; (3) office accommodation, clerical staff, and 'establishment charges'; (4) salaries of engineering and managerial staff.

"The various items enumerated are not actually proportional to the maximum demand in kilowatts; many of them tend to diminish per kilowatt as the size of the station increases, but they are all independent of the number of hours the demand is kept up. Again, the term 'cost of production' is used above in its widest sense; it is more usual to subdivide the cost into cost of generation and cost of distribution, and this may conveniently be done, but the two together are the true cost of supply.

"The running charges must now be considered. (1) The most important is undoubtedly the coal that must be burnt to supply steam to the engines, as distinguished from that required to maintain the temperature against the radiation losses. This will not be strictly proportional to the output for a given maximum rate, as the steam consumption depends upon the load at which a particular engine is working, but by proper subdivision of the plant it can be made sensibly so. (2) Feed water; this is practically proportional to the coal burnt. (3) Oil, cotton waste, and engine room stores; these are roughly proportional to the time of running. (4) Wear and tear, causing repair and renewal of plant; this is practically proportional to the time of running, but perhaps increases at a slightly greater rate than simply in proportion. (5) Additional wages for men over and above those required for standing by the plant in readiness to run it. (6) Loss by leakage and resistance in distributing mains, and transmission losses in feeders, including transformer losses. If transformers are left on, irrespective of the load, a portion of the loss in them is, of course, a standing expense.

"In the address given by Dr. Hopkinson he takes the concrete case of a station capable of supplying 2500 kilowatts, and estimates the cost of running light or being ready to run, and actually running fully loaded, to be, respectively as follows (distribution costs being omitted):—

	Running Light £	*Fully Loaded* £
Land	1000	1000
Buildings	1500	1500
Rates	500	500

for the sake of simplicity because it includes only the outstanding variables in the cost of electricity supply. It fails, for instance,

	Running Light £	*Fully Loaded* £
Boilers	2100	2100
Switchboard and conductors	7800	7800
Engines	2160	3600
Dynamos	1350	2250
Coal	6000	30000
Stores	600	3000
Wages	5000	7500
	28,010	59,250

"These figures show that the standing charges, or the cost of being ready to supply, will not differ greatly from £ 11 per kilowatt, while the running charges, or cost of giving the supply, will not be much more than one-third of a penny per kilowatt hour. * * *

"The figures given by Dr. Hopkinson are arrived at from theoretical considerations, and take a broad view of the question; they may be open to correction in matters of detail, but their general accuracy has never been assailed. They are somewhat difficult to test by means of figures obtained in actual practice, so far as relates to the relative magnitude of the two items of cost, since the value of the actual standing charges is hard to ascertain; it is probable, however, that the fixed are estimated on a somewhat liberal scale, while the running charges are difficult to approach in practice. In a paper by Mr. Arthur Wright in 1896, he states, as the result of careful analysis of figures relating to the central station at Brighton, that the standing charges there amount to about £ 18 per kilowatt, and the running charges to about three-fourths of a penny per kilowatt hour. Both these items of cost are greatly in excess of those arrived at by Dr. Hopkinson, but they are of the same order of magnitude, actually and relatively, and go far to confirm his figures.

"A great fallacy seems to underlie much that is written concerning methods of charging. The consumer appears to be regarded as a person who devotes his time to watching his electric meter, and who has to be 'encouraged' to turn on his lamps by means of various kinds of inducements in the shape of lower rates for longer hours of consumption. In other words, it seems to be assumed that a man will deliberately turn on his lamps because he can get his energy at a lower rate per unit, though his total account is increased. Surely this is bargain-hunting run wild!

"The real purpose served by a sliding scale based upon the length of use is, not that it induces consumers already taking the supply to use it longer, but that it renders it possible for a different class of consumer, normally using his lamps for longer hours than those already connected, to avail himself of the supply which he would be unable to do unless the price were brought down. Thus, a consumer using his lamps an hour a day can well pay 5d. per unit, whereas one requiring light all day long would find the cost at that rate absolutely prohibitive, though he can afford to pay 2d. per unit, and will, moreover, save money by discarding gas for electric light at this price.

"It cannot be too strongly impressed on suppliers of energy that a consumer will take his supply as, and when, it suits him to do so, and that his own convenience is the only thing that he will consider. They may as well accept the fact that nothing that they can do will make him burn his light, or use his motor, a single minute more than he needs to do so; what they must seek to do is to attract those consumers whose avocation or

to take account of the diversity factor obtaining between the various classes of customers and the power source. It also takes no account of the variation of density of traffic. The cost differentiation is sufficient, however, to illustrate how the cost of service theory influences the rate-structure and hence the selling policies of public utilities.

habits necessitate their using the supply for long hours for their convenience, and in order to do this, they must have a sliding scale which will cause the price to diminish to such consumers to such an extent as to enable them to save money by giving up the illuminant which they have been in the habit of using.

"It is by no means uncommon for the rate of charge to be made to depend on the class of demand, a different rate being charged for energy supplied for motive power and heating from that for lighting.

"Such a course is logically unsound, for the cost of production of a given quantity of energy at a given rate is absolutely unaffected by the purpose to which that energy is applied.

"On the other hand, from a commercial standpoint, it can readily be justified. A demand for energy for motive power or heating usually implies a very large consumption, and it is perfectly defensible to accept a lower rate of profit on a larger turnover.

"The proceeding amounts, in fact, to a special bid for a particular class of consumer. Unless a low price be charged for motive power or heating, electrical power cannot compete with other agents, and hence the alternatives are a very large consumption at a price giving a lower rate of profit than in the case of an ordinary lighting consumer, but a large aggregate profit, or no consumption at all; obviously the former course is the one to be preferred.

* * * *

"Another basis for reduction in price which is justifiable almost solely on commercial grounds, is the aggregate annual consumption. Discounts are sometimes given to consumers on the ground that they consume very large quantities of energy. Apart from the consideration that the large turnover is to be desired, and the fact that a single large consumer costs slightly less than a number of small consumers whose aggregate consumption is the same for certain items, such as service connections, meters, inspection, collection of accounts, etc., there is no appreciable lessening in the cost of production, and therefore correspondingly little reason for diminution of price.

"The principle is, in fact, a dangerous one, and should only be admitted under the strictest safeguards. If a reduction based on the total quantity consumed be given at all, it should be but a small one, and should take the form of a discount on the account for all units consumed above a certain minimum number, and not on the whole account, otherwise the defect already pointed out, of the account actually diminishing for an increased amount of energy supplied, will not be avoided."

CHAPTER XXX

DIFFERENTIAL RATES AND THE CLASSIFICATION OF CUSTOMERS

After the necessary analyses of cost have been made so that the connection between the principal service characteristics and the accrual of cost is established, the final step is to build these service and cost characteristics into a rate system. This may again be best illustrated by pursuing further the analysis of the cost of electricity supply begun in the last chapter.

Sec. 1. **Differential Costs as Related to Rate Structure**

The differential costs of electricity supply are first related to units of service and these unit costs in turn combined in a basic rate structure. The differential costs are obtained from the apportionment in Table XXVII. Neglecting the amount chargeable against the electric railway and street lighting departments, the unit costs chargeable against the commercial electric light and power business are:

Consumer cost	\$36,917.06 ÷ 4069 number of consumers = \$9.07 per consumer per year.
Demand cost	\$60,934.55 ÷ 2383 kilowatts of active connected load = \$25.57 per kilowatt per year.
Output cost	\$68,875.19 ÷ 1,974,901 kw. hrs. = \$3.48 per kw. hr.

The consumer costs and demand costs are sometimes combined into a single total in order to work out a rate which shall consist of only two parts, an energy charge of 3.48c. per kilowatt-hour and a demand charge per active kilowatt of connected load. The demand charge is then ascertained by dividing the combined consumer and demand cost of \$97,851.61 by 2383, the kilowatts of active connected load, or \$41.06 per kilowatt per year. These unit costs are used in a form of rate schedule common for power consumers, as will be explained later.[1]

Another form of rate schedule has been found convenient for

[1] See p. 671 *infra*.

lighting consumers. The combined consumer and demand expenses amount to $41.06 per year per kilowatt of active connected load. This is a fixed expense regardless of the number of hours the plant is operated per day. If the plant is operated for only one hour per day the $41.06 per kilowatt per year may be divided by 365 to ascertain the fixed expense per kilowatt hour or 11.25 cents when the plant is in operation one hour daily. Combining the energy charge with the fixed cost we have the following scale of unit costs.

Hours Daily Operation	*Fixed Charge*	*Energy Charge*	*Total*
1	11.25c.	3.48c.	14.73c. per kw. hr.
2	5.63	3.48	9.11 " " "
3	3.75	3.48	7.23 " " "
4	2.81	3.48	6.29 " " "
5	2.25	3.48	5.73 " " "
10	1.13	3.48	4.61 " " "
15	.75	3.48	4.23 " " "
20	.56	3.48	4.04 " " "
24	.47	3.48	3.95 " " "

Let us take the case of two consumers having exactly the same active load, say of one kilowatt; but one consumer uses this active load for two hours per day while the other uses it for only one hour per day. If the amount paid is to depend upon the number of kilowatt hours consumed, the first consumer should be charged a lower rate per kilowatt hour. Although the output cost per kw. hr. is the same in both cases, the fixed cost per kw. hr. must be lower in the case of the consumer whose demand continues for two hours. The rate ought therefore to take into account the hours of daily use of the consumer's active connected load. In other words, a uniform rate per kw. hr. fails to take into account differences in the cost of service. Or we may take the case of a consumer whose demand of two kilowatts continues for only one hour, while another consumer with a demand of one kilowatt uses energy at this rate for two hours. The investment on behalf of the first consumer (neglecting the diversity factor) is twice as great as in the case of the second. A uniform rate per kw. hr. is therefore discriminatory with respect to the second consumer. If a kilowatt-hour rate takes into account the decreasing unit cost of service as consumers increase the amount of energy used by them, all consumers may secure additional energy at the lower rate.

Sec. 2. **Differential Rates Based upon Customer Classifications**

The secondary basis upon which a public utility rate structure rests is the value of the service to the consumers with its emphasis upon customers' demand prices. Costs which are not directly traceable are apportioned to customer classifications in accordance with the value of service principle. This kind of rate differentiation will now be considered.

(a) *The classification of freight.*

The idea that rates must be varied to suit the demand of consumers was first applied extensively in railroad tariffs. Some development along this line can be seen even in the earlier "tolls" charged by turnpike and canal companies. In order to secure full utilization of the newly constructed railroads, traffic departments set out by means of so-called "missionary rates" to secure new types of traffic which would help meet fixed expenses. Beginning as carriers of passengers, they very soon began to haul also the more valuable classes of freight, and by degrees extended carriage to the less valuable commodities. This type of traffic had to be secured not only by taking it away from the canals and highways but much of it had to be created. Improvements in transportation capacity and reductions in the cost of carriage made this possible. In order to carry the lower order of freight traffic, lower rates were based upon "what the traffic will bear." Freight traffic was classified according to the value of the commodity per hundred weight. Later the classification was refined to take into account also the relationship of weight to bulk so that the value of the commodity was brought under the two denominators of weight and space capacity. Other considerations were added, as the competitive relations of commodities to one another (that is to say, whether they competed as substitutes and hence could bear only the same transportation charge) and the convenience and risk of carriage. The result was a great multiplicity of classifications, first one for each road, and later for groupings of roads in the same traffic territory. In the end the railroads of the United States united upon three freight classifications, each applying in distinct territories.[2]

[2] A "Western Classification" consisting of 10 classes applies in territory west of the Mississippi River; an "Official Classification" consisting of 9 classes applies in the northern half, and a "Southern Classification" of 13 classes applies in the southern half of the remainder of the country.

In order to secure national uniformity, a single classification was worked out by the Interstate Commerce Commission and recommended to the carriers for adoption. This consolidated classification provides that class rates be quoted upon commodities grouped or "rated" into ten classes. Commodities in the highest class were to bear the highest rates. The percentage relationship of these class rates to each other is shown by the following scale beginning with first class at 100 per cent: 100; 85; 70; 60; 45; 35; 30; 25; 22½; 20. These percentages thus indicate the variation or spread between rates applied as class differentials upon equal units of weight.

Sometimes, in order to give a commodity an even lower rating than that of the class to which it belongs, it was lifted out of the classification and given a special or "commodity rate." These usually applied upon specified commodities and between specified stations and were granted in order to meet competition or to create new traffic. For it must always be borne in mind that railways, although essentially monopolistic, are still subject to various forms of railway or substitute competition which may divert traffic to other channels. They are also subject to the limitations of their customers' marginal demand prices, so that high rates may destroy or discourage traffic. The principle of "what the traffic will bear" thus tends to set a maximum limit upon rates within what may be termed an interior zone of reasonableness where the minimum limit upon rates is set by the necessary out-of-pocket cost. The outer zone of reasonableness is limited, as we have seen, by the total reasonable cost of service and by the constitutional safeguards against confiscatory rates.

The necessary out-of-pocket costs are determined best for classes of traffic. The value of the service principle under normal conditions applies only in the apportionment of indirect or fixed costs. The element of return upon the rate-base is the most important of these indirect costs. Refinement in cost accounts or cost analysis may show that for certain classes of traffic even the investment may be definitely allocated. For certain purposes out-of-pocket costs may thus include even fixed charges, including the return. The important point is that the value of the service principle applies only to the non-allocable costs. Classifications are thus based upon the degree of refinement in cost analysis as well as upon the stratification of customer's marginal demands by classes in proportion to a rationally or experimentally ascertained ability to bear. The freight classifications of railways and the various commodity tariffs presump-

tively give effect to this differential ability of the various kinds of freight to help bear this total burden of non-allocable costs.

Railroad rate differentiation may be illustrated by means of a hypothetical example, using for this purpose the consolidated classification suggested above. As already stated, classifications are not made upon the basis of "what the traffic will bear" alone. Cost considerations which take into account special costs of handling, of risk, of the average load in relation to weight and space capacity of cars, etc., are interwoven with ability to bear. If we assume, however, that allocable terminal expenses and movement expenses per hundred weight for a ten-mile haul equal something less than 1.5 cents per hundred pounds, then the distribution of the non-allocable costs might take place in accordance with the following scale:

Class	*Scale of Weights*	*Lowest allocable average cost plus minimum contribution toward non-allocable costs*	*Rate per cwt.*	*Additional contribution to non-allocable cost in relation to minimum amount*	*Percent of contribution*
I....	100	1.50c.	10.00c.	8.50c.	566⅔
II....	85	1.50	8.50	7.00	466⅔
III....	70	1.50	7.00	5.50	366⅔
IV....	60	1.50	6.00	4.50	300
V....	45	1.50	4.50	3.00	200
VI....	35	1.50	3.50	2.00	133⅓
VII....	30	1.50	3.00	1.50	100
VIII....	25	1.50	2.50	1.00	66⅔
IX....	22½	1.50	2.25	.75	50
X....	20	1.50	2.00	.50	33⅓
Commodity Rates	Various	1.50	1.50	.00	....

The above figures illustrate only the distribution of non-allocable costs in proportion to ability to bear and it shows the relative contribution made by commodities in the different classes in relation to an assumed minimum of both allocable costs and non-allocable costs as applying upon commodity traffic taken as a single group. The actual allocable cost per unit haul will, of course, vary with the type of traffic. It will be higher for all classified traffic than for freight moving under commodity rates. It will be higher for the same class of freight moving in less than car-load quantities than for car-load quantities. The percentage

scale in the last column does suggest, however, that classified freight traffic bears a very much higher proportion of the indirect costs than does freight moving under commodity rates. How much less each class bears than is shown in the table would depend upon how much higher the allocable costs are for the class in question as compared with the allocable costs for commodity traffic which was taken as a minimum.

No mention has been made of the assignment of non-allocable costs of transportation as a whole to the various branches of railway service, particularly to the freight and passenger business. This has become a difficult problem in view of the development of the automobile as a carrier. In this case social considerations, unrelated to ability to bear, are of some importance. The classification of passenger traffic obtaining in European countries is a good illustration, however, of ability to bear as applied to the carriage of persons. In this case the classifications also depend upon differentials based in part upon the cost of superior accommodations furnished passengers who use the higher class of service.

(b) *Customer classifications of other utilities.*

In discussing customer classifications of other utilities no more will be attempted than to review very briefly the extent to which the classification idea has been adopted and what are the forms which classification has assumed.

The express business has adopted a very simple grouping of commodities into three classes, merchandise being in Class 1, articles of food and drink in Class 2, and small packages in Class 3. Differentiation upon the basis of ability to bear is commingled with other considerations. Still Class 2 rates are differentiated from rates upon goods in Class 1 by being placed at 75 per cent. of Class 1 rates. Commodities which are especially valuable, or where the risk is great or the bulk considerable, are accorded, as in railway freight classifications, higher than Class 1 rates by some definite multiplier.

Interurban and urban passenger carriers have not adopted classification to any appreciable extent. The reason is that classification of persons upon the basis of ability to bear is regarded as undemocratic and arbitrary, and would be enforceable only with difficulty. The ease of collecting fares that are not differentiated, is a point which has counted against much experimentation with ability to bear in the passenger business. Nevertheless the working of the principle is to some extent dis-

cernible. The cash fare patron, presumably the occasional rider, is charged a higher fare than the person riding regularly, who is given the option of purchasing tickets at a lower rate. Optional classification thus provides some opportunity for rate differentiation which is self-executory. School children traveling at lower fares, children under 12 traveling at half fare, are other instances in point. Low weekly ticket rates (the weekly pass) are an illustration of rate differentiation based upon the desire to stimulate the riding habit. Indirectly, this brings about some differentiation in accordance with ability to bear. The advent of the motor bus is forcing experimentation with differential rates.

Rate differentiation of other public utilities is so intertwined with considerations of cost as to be barely recognizable as differentiation based upon "what the traffic will bear." When the process of manufacture becomes continuous, for example by providing storage facilities, costs are more largely direct, and the practical importance of rate differentiation according to ability to bear declines.

There is another factor, however, of which account must be taken. If, with increasing output, the size of the plant can be enlarged so that the economies of large scale production become available, it is advisable to extend rate differentiation to new customers. This is particularly true of electric utilities. A use classification may be applied such as electric power for heating, storage battery charging, or refrigeration. In this case the new customers are generally consumers of power who have been supplying their own requirements from isolated plants. Ability to bear is here limited by the alternative cost of service. Rates sufficiently below the alternative cost must be offered to such consumers in order to induce them to abandon their isolated plants. Frequently, special contracts are drawn up, the terms of which enable power customers to retire their investment in such plants. However, these special contracts should provide rates which are in excess of directly allocable costs and which make some contribution to indirect costs.

Use classifications, however, are hard to justify and also hard to police, especially where the particular use is not readily distinguishable. Unlike the service furnished in transporting freight, electric, gas and water utilities furnish a homogeneous product. Nevertheless, gas used for power, lighting and heating, water used for domestic, fire protection or industrial purposes, telephones installed in residences or business establishments, furnish criteria for important use classifications. Yet the tend-

ency is to eliminate use classifications, if differentiation can be based upon some criterion of cost.

Sec. 5. **Rate Systems**

The development of public utility rate systems reflects the progress which was made in the analysis of the conditions of demand and supply that lie back of the actual sale of public utility services. Again only the more important aspects of this development will be touched upon in these pages.[3]

(a) *Flat rates.*

The oldest form of rate was the so-called "flat-rate." According to this each customer paid a fixed sum for some convenient period, the month, the quarter, or the year. It was used by the older types of local utilities, particularly water and gas utilities. But even here some differentiation was recognized because the flat rate varied with the size of the premises. The size and character of the premises seemed to give some indication of the probable demand for and consumption of service. In this form the prices were usually termed "rentals."

(b) *Fixture rates.*

Differentiation really began when these flat rentals were changed into *fixture rates.* They were called fixture rates because the price became a specified sum per fixture, a different sum being charged for each type of fixture. Water utilities best illustrate this practice. Fixture rates were in use at a time when the quantity of water consumed was less generally metered than it now is. It took the form, for instance, of a fixed sum per period for each tap, with some differentiation whether the tap was in the kitchen, the bathroom, or an outside tap for hose-connection. The same form of rate was also used for gas and electric service at a time when these utilities were very largely rendering only a lighting service. The amount paid under flat rates was, therefore, roughly proportional to the amount of service which it was estimated could be furnished by means of the fixtures.

These early forms of rates thus attempted to take into account only approximately the quantity or output of service consumed.

[3] An extensive literature is available relating to railroad rate-making. There has also been considerable discussion of the methods of rate-making for local utilities. The specialist is referred to these materials, some of which are given in the bibliographical appendix.

Presumably, it was considered that overhead costs, not varying with output, were best apportioned equally. Rate differentiation was thus founded upon a cost differentiation which took into account only variation in quantity.

Fixture rates were, however, uneconomical because quantities consumed could only be estimated. They were conducive to waste because they failed to take accurate account of the true variation of consumption among consumers. Excessive consumption was not penalized by a higher charge upon the person causing the waste. Fixture rates also failed to distinguish properly between the short and long hour customer. However, even after meters became available, the change to a new system could not be accomplished at one stroke because of the expense of installing meters and because the influence of custom in fixing prices was very strong. This was particularly true in the case of water utilities. For this reason cases [4] may be found where the sale of water in large quantities on a flat-rate basis is condemned as unbusinesslike but the sale of water for domestic use on a flat-rate basis is continued upon the ground that requiring consumers to install meters might work a hardship upon them.

(c) *Meter rates.*

With the introduction of cheap water, gas, and electric meters, various forms of meter rates were developed. First came the uniform or straight-line meter rate. It usually took the form of a fixed rate per unit quantity (per thousand gallons of water, per thousand cubic feet of gas, per kw. hr. of electric energy). All consumers pay the same rate per unit of output regardless of differences in their respective demands and the total quantity of service consumed. Large consumers will be found paying the same rate as small consumers. It is accordingly a form of rate which might be adopted under circumstances where the conditions of supply for different consumers are practically the same and where the cost per unit of output is accordingly the same also. Even under such circumstances, however, the theory of overhead cost may bring about differentiation upon the basis of ability to bear. This was soon recognized in that uniform rates failed to develop the business to a maximum. Analyses of cost also showed that this form of rate was ill-adapted to and inequitable for those utilities where demand and customer costs were

[4] *Cf. Leavenworth* v. *Leavenworth City & Ft. Leavenworth Water Co.* (Kansas), P. U. R., 1915-B, p. 611.

important. No rate schedule could long serve an industry that failed to take account of cost variations so significant.

This led to the adoption first of step meter rates, and later of block meter rates. The step rates provide a scale whereby a larger quantity of output can be purchased at a lower price per unit than can a smaller quantity. Sometimes this rate form [5] consists of a uniform meter rate with a step system of discounts. In other cases it takes a form such as that shown in the following scale:

Less than 250 kw. hrs. per month	10c. per kw. hr.
From 250 to 750 kw. hrs. per month	9 " " "
" 750 " 1250 " " " "	8 " " "
" 1250 " 2000 " " " "	7 " " "
" 2000 " 3000 " " " "	6 " " "
All in excess of 3000 kw. hrs. per month	5 " " "

The outstanding defect of step-meter rates is that they result in regressive charges since, at certain points, it is possible to reduce the total bill by increasing the quantity consumed. To remedy this defect block meter rates were introduced. These may again consist of uniform meter rates with discounts applying to blocks of service units or of varying meter rates applicable to blocks of service. The block meter rate is illustrated by the following scale:

Energy up to 250 kw. hrs. per month	10c. per kw. hr.
" *in excess* of 250 but less than 750 kw. hrs. per mo.	9 " " "
" " " " 750 " " " 1250 " " " "	8 " " "
" " " " 1250 " " " 2000 " " " "	7 " " "
" " " " 2000 " " " 3000 " " " "	6 " " "
All energy in excess of 3000 kw. hrs. per month	5 " " "

At this point it is well to recall the scale of costs as developed on page 661. Obviously these variations in rate per unit for the different blocks can be made to conform to variations in cost with increasing output, but good judgment must be exercised not to have the total charge exceed the ability of the consumer to bear and to take into account the benefit accruing to the enterprise as a whole from the development of its business.

(d) *Demand or readiness-to-serve rates.*

It is a characteristic of demand or readiness-to-serve rates that they take into account the demand, actual or estimated, which

[5] *Cf.* Watkins, G. P., *Electrical Rates*, p. 45. D. Van Nostrand Co., 1921. Mr. Watkins' monograph is a comprehensive analysis of the factors underlying electric rates from an economic point of view and should be consulted.

customers make upon the plant. In view of the fact that they also apply to the quantity of energy consumed, it may be said that they are based, in a rough sort of way, upon the load factor of consumers.[6]

One form of this general type of rate schedule for electric utilities, adapted particularly to residence and commercial lighting service, is called the Wright demand rate, after the man who first conceived it. The following is a simple illustration:

For the first 30 hours' use of the *active* load.....	12 cents per kw. hr.
For the next 60 hours' use of the active load.....	6 cents per kw. hr.
For all current consumed in excess of 90 hours' use of the active load	3 cents per kw. hr.

Applying this rate schedule in terms of the estimated demands (see footnote 6) for a residence lighting consumer with a total connected load of 1700 watts, the active connected load for rate-making purposes is 700 watts. This consumer would then pay in accordance with the following scale:

For first 700 watts × 30 hrs. = 21 kw. hrs. at 12c per kw. hr.
" next 700 watts × 60 " = 42 " " " " 6c " " "
" all kw. hrs. in excess of 63 " " " " 3c " " "

[6] The active connected load of consumers, when used as the basis of the demand charge, is reduced by certain percentages for different classes of consumers. The use of demand meters is costly and has, therefore, been restricted to very large consumers who take service under demand rates as fixed in special contracts. The Wisconsin Commission in the Madison Gas & Elec. Company case fixed the following percentages to be applied to customers' total connected load:

I. Residence lighting customers:
For the first 500 watts or less of the rated capacity the per cent of the connected load to be considered active is 60%. For rated capacity in excess of 500 watts, the per cent of the connected load to be considered active is 33⅓%.

II. Power consumers:

Installations under 10 hp. and one motor used, per cent active....	90
" " 10 hp. " two or more motors used, per cent active	80
Installations from 10 to 20 hp. irrespective of number of motors, per cent active	70
Installations from 20 to 50 hp. irrespective of number of motors, per cent active	60
Installations from 50 to 100 hp. irrespective of number of motors, per cent active	50
Installations over 100 hp. irrespective of number of motors, per cent active	50

Thus a consumer having a total monthly consumption of 80 kw. hrs. would pay the following bill:

21 kw. hrs.	at	12c	= $2.52
42 " "	"	6c	= 2.52
17 " "	"	3c	= .51
Total bill			$5.55

Power customers using large quantities of power and over long periods usually take service under a special form of demand rate called the Hopkinson rate, after Dr. Hopkinson, who in 1892 wrote the first scientific treatise upon the subject of electrical rates.[7] This rate consists of two parts. One part makes a specific charge for the fixed or demand costs, the other part makes a specific charge for the variable or output costs. The following schedule illustrates this form:

Demand Charge

First	50 kilowatts or less of demand.....	$3.00	per kw. per month
Next	150 " " " " "	2.70	" " " "
Next	200 " " " " "	2.50	" " " "
Over	400 " " " " "	2.25	" " " "

Energy Charge

First	1000 kw. hrs. per month.....	5c	per kw. hr.
Next	2000 " " " "	3c	" " "
Over	3000 " " " "	1.5c	" " "

Another method of giving effect in rate schedules to the demand element in the cost of service is by means of the so-called active room basis of assessing the demand. This is a form of rate used exclusively in residence lighting service. This basis does not penalize the use of convenience and decorative lighting, or the use of electric appliances; but encourages the use of electric energy for all purposes. It has been determined that the maximum demand of residence consumers is roughly a function of the number of active rooms.[8] The room basis of rates is more effective in equalizing the cost of the service between various classes of customers than are the block or increment meter rates.

[7] Pioneer papers upon this general subject have been reprinted in *Reprints of Selected Original Rate Papers*, Edison Illuminating Company of Detroit, 1915. Special attention is called also to the Dougherty form of demand rate which merely adds to the demand and energy charges a special customer charge.

[8] Certain rooms such as bath-rooms, cellars, garrets, etc., although equipped for lighting, are not counted as "active rooms."

The gas and water supply industries are also subject to demand costs but the rate-maker does not have available as practical a method for ascertaining and classifying demands. Moreover, storage exerts a strong influence in making demand costs of lesser importance. For this reason, gas and water rates are not, as a general rule, based upon load factor considerations, but usually take the form of block meter rates. The reasons for a reduction in the price per unit as the quantity consumed increases are, that consumer costs, relatively constant per customer, amount to about 25 per cent. of the total and would, therefore, be a decreasing amount per unit as output increases; that the large consumer is also the long-hour consumer with a better load-factor; and that by encouraging large consumers to take service from the central plant through lowered rates for increased quantities, these consumers make some contribution to overhead costs.

The increasing utilization of gas for house-heating and as a fuel by industrial plants has raised the question whether some recognition should be given to the features of demand costs, of output costs, and consumer costs in the adjustment of rates to wholesale customers. Although such rate schedules have been devised, very little progress has as yet been made in putting them into effect.

The minimum charge may or may not be a feature of public utility rate schedules. It was at one time customary to charge each customer from 50c. to $1.00 as a minimum, even though the quantity of service consumed at regular rates would cost less or there had been no consumption whatsoever during the month in question. The practice is justified as a differential feature because consumer costs and readiness to serve considerations are theoretically applicable. Yet the amount of uncompensated cost is often so small that placing this burden upon other consumers works no appreciable hardship.

(e) *Some special considerations affecting transportation and telephone rates.*

The normal unit for measuring passenger service is the passenger mile. This unit is recognized in the adjustment of station to station rates of steam railways and electric interurban railways, which have, generally speaking, been placed upon a mileage basis. Where competition obtains, the short-line distance rate of one of the competitors becomes the rate which the other competitor with a more circuitous haul must meet. The

first departure from a mileage scale appears in the zone rates under which a haul entirely within one zone is charged a fixed amount. Persons riding into or through a particular zone will pay a zone rate which has some relation to distance but does not discriminate between hauls shorter than the full zone distance. Mileage and zone rates disregard the so-called terminal costs upon the theory that these costs may be spread uniformly over distance components, since passengers require little in the way of special terminal facilities.

In the case of urban transportation, the directly opposite principle is invoked. Since the average haul is a relatively short distance, and the density of traffic over the lines is great, terminal and movement costs are spread uniformly over another unit of service, the passenger. Modifications, recognizing distance to some extent, are introduced when suburban lines of lower traffic density are treated in accordance with the zone principle, or when a charge is made for transferring to another conveyance in order to complete a longer or differently circumstanced journey. The zone system obtains in European cities. The ease of fare collection and historical considerations have thus far committed American practice to the uniform flat fare, limiting the zone system to cautious and experimental trials in areas of low traffic density.

There is an unquestioned cost component depending upon the demand in the operating cost of urban transport. It arises from the extreme demands for service during the morning and evening rush. Were it possible to differentiate them, passengers riding during rush hours ought to pay more than those using the facilities during non-rush hours. In spite of the higher specific cost of service, it was and still is the practice to grant lower fares to rush hour patrons because they are the *regular* patrons. Such defiance of cost considerations is based upon psychological factors, which are in turn founded on ability to pay, tradition, and considerations of social policy. These have acted as deterrents in experimentation with demand rates.

Two significant departures should, however, be recorded. The first is the "weekly pass," first tried in Racine, Wisconsin, in 1919. It has found a limited application in cities where unorganized jitney competition existed. For a fixed weekly payment of $1.00 or $1.25, the holder of the pass is entitled to an unlimited number of rides. It thus represents a return to the principle of a flat rate, which is indeed a very effective device to eliminate competitors who can not adopt the same plan. The

weekly pass does not build directly upon demand costs. Indirectly, however, it takes account of the fact that such additional riding as it induces would come at a time when the local transportation system has unutilized capacity and would therefore mean relatively little additional outlay.

The second departure takes demand costs more definitely into account. This system has been called the "nickel permit." In return for a permit costing a specified sum per month, the holder of the permit is entitled to ride at a low rate of fare, usually the customary nickel fare. The permit thus constitutes a quasi-readiness-to-serve charge, while the regular fare is the output portion of the total payment. This low output rate is designed to stimulate riding and meet competition. Under this system the occasional rider is charged a substantially higher cash fare. If urban transportation systems continue in the future to have difficulties in meeting the necessary cost of the service, it may well be that an even more effective allocation of readiness-to-serve costs may have to be attempted under public ownership or under a system which blends public and private finance.[9] The special assessment plan of construction is a case in point.

The rate-problems of steam railway carriers are peculiar. The very great complexity of the business, the diverse economic conditions—partly historical and partly geographical in origin—the pervasive influence of competition in shaping the rate structure of the country, makes it altogether inadmissible that the problems be discussed from the point of view of monopoly price. It is sufficient to say at this point that cost analyses of increasing refinement are being used to test the adjustment of both the class and the commodity rate-structure. The final adjustment is generally a compromise between what is and what should be. As Commissioner B. H. Meyer well said some years ago, there is no single yard-stick to measure rate reasonableness.[10]

In dealing with telephone rates, the difficulties of analyzing costs and of metering the service have stood in the way of a differentiation of telephone rates. Commissions have, however, carefully distinguished the toll business from the ordinary exchange business of telephone plants. Toll service was placed

[9] For further discussions of rate problems of urban transport systems, see Doolittle, F. W., *Cost of Urban Transportation*, and Jackson and McGrath, *Street Railway Fares*.

[10] The best brief discussion of railroad rate structure, which places emphasis upon principles, is in Vanderblue and Burgess, *Railroads; Rates, Service, Management*, chapters 5 to 12.

upon a message rate basis, and the costs of conducting this service carefully segregated.

The invention of devices for recording the number of messages in ordinary exchange service has made possible the introduction of the measured rates for exchange service. A large proportion of the business is, however, still upon a flat rate basis, with some differentiation of customer classes based upon cost and value of service considerations. An interesting application of differentiation based upon both cost and value of service is the night-message rate of telegraph utilities. Various kinds of analyses have been attempted to ascertain separately by means of traffic and cost surveys the costs dependent upon the number of calls, upon the number of subscribers, and upon the existence of peak loads. Based in part upon such cost components, rates are then differentiated into rates for measured or flat-rate service, and these in turn into business or residence classifications, with additional differentiation into single-party or multi-party service.[11]

[11] For typical rate cases involving cost analysis and rate adjustment see *Re. St. Croix Telephone Co.*, P. U. R., 1916-A, p. 552; *Bogart* v. *Wis. Tel. Co.*, P. U. R., 1916-C, p. 1020.

PART IV

TRENDS IN PUBLIC POLICIES AFFECTING UTILITIES

CHAPTER XXXI

THE GOVERNMENT AS PUBLIC SERVICE ENTERPRISER

The progenitors of our modern public utilities were built and managed by the state. In both ancient and medieval times they were treated as public functions. The question whether these industries are best conducted under the restraints of private property or of public property did not arise until democratic forms of government undertook to carry into practice those liberal economic ideas of the eighteenth century which were bent upon providing more room for individual initiative. The industrial revolution, beginning at about the same time, brought in its wake a great increase in the number and kind of public service enterprises. What was more natural, therefore, than that these new economic developments, involving as they did a lengthy period of technical experimentation and of ripening for economic uses, should be left to private initiative. This was particularly true of English-speaking countries. On the continent of Europe, however, the monarchical tradition was more effective in preserving the accustomed scope of governmental initiative. For this reason England and the United States are the outstanding illustrations of countries whose public utilities are privately owned.

The idea that public functions may be left in private hands dates from the "farming out" system, first applied to taxation. As applied to public utilities it began with the highways of England in 1663. In that year the counties of Cambridge, Hereford, and Huntington were permitted by act of Parliament to levy tolls for the maintenance of trunk roads. The turnpike trusts, thus sanctioned by law, developed into corporations which

later extended their activity into the canal and railroad fields. On the continent, on the other hand, the construction of railroads was principally by the state. Accordingly, in the nineteenth century there began that discussion of the comparative merits of public and private ownership and operation of public utilities which has from time to time elevated the question to the rank of an issue in practical politics.

Sec. 1. The Need of a Scientific Attitude

Public opinion upon the question of public versus private ownership has become in large part a matter of political faith or of individual interests. Socialists and communists have treated the question as a matter of principle and have adhered to public ownership as a matter of party policy. It has appeared to them as an important step toward the ultimate goal of collective ownership of all productive instruments. Individualists are equally set in the other direction because they fear public ownership, widely extended, would be the beginning of the end for the system of private property. Prof. Taussig well remarks:[1] "The business and well-to-do classes of all countries, and especially of English-speaking countries, rarely consider this subject with an open mind. They listen readily to all the evidence that tells against public ownership, and are pessimistic as to its prospects. The persons now in control of the money-making monopolies supply them freely with all sorts of distorted information and superficial arguments. In the United States more than anywhere else, their prejudices are rank. This attitude is due to various causes. In part, it is an inheritance from the older political philosophy of laissez faire and non-interference. In part, it is due to sad experience of misgovernment in this country. But to no small degree it arises from a lurking fear of dispossession. Public management is 'socialistic'; it is feared as the entering wedge to complete expropriation." The proponents of public ownership also fail to analyze facts critically, letting hopes and aspirations color their statements of the case.

The scientific position is the liberal position which looks at the question from a functional point of view and considers only that the social interests and economic services involved in the maintenance of public utilities be effectively secured and that they be made available at the lowest economic cost. So con-

[1] Taussig, F. W., *Principles of Economics*, 1915 Ed., Vol. II, p. 412.

ceived, the answer to the question of public versus private ownership no longer is an article of faith, to be decided upon emotional grounds, but becomes instead a problem in instrumentalism. Public ownership is neither foredoomed to fail nor foreordained to succeed. One may be willing to concede that public ownership of railways has been, on the whole, successful in Prussia; that private management failed in Italy; that private ownership and operation worked satisfactorily in England.

It must be recognized, however, that the peculiar social, economic, and political conditions of different counties make impossible the transplanting of institutions from one country to another with the expectation that they will operate with the same efficiency in all of them. Causal relations in the social sciences do not have the same universal validity that they have in the natural sciences. Institutions are essentially methods of doing things, and they must be suited to conditions in a specific place and time.

Sec. 2. The Various Forms of Governmental Enterprise

It is necessary to point out the leading forms of governmental enterprise which have been suggested from time to time. So far as this country is concerned there exists a strong movement for ownership of local utilities by municipalities, counties, or specially created municipal districts. Here has been the historic battleground upon which this issue was fought out. Since the unfortunate experiences with state ownership and operation, there has been very little evidence of a movement with the state as the owning unit. As a combined result, however, of the conservation movement, and of the growing interconnection of power sources into super-power systems, there have been proposals for state-owned and operated electricity supply works. The example of the Province of Ontario, Canada, in creating in 1906 the Hydro-Electric Power Commission to own and operate power systems, has proved contagious. California, New York, Wisconsin, and Pennsylvania are states in which a new movement looking toward state ownership has taken a more or less definite form. Efforts to induce the federal government to undertake public utility enterprises have been confined largely to agitation for nationalization of the railways of the country into a unified system at the time when the period of federal control was coming to a close and for a brief time thereafter.

From a somewhat different point of view the proposals may

be distinguished into those which contemplate complete public ownership and operation, and those which would inaugurate public ownership but would leave operation in the hands of private corporations under a rental arrangement. A third possible form—private ownership with public operation—has never been seriously considered. Even in Europe only occasional illustrations can be found. The federal act of 1918, providing for war administration of the privately owned railroads, so that unified operation might be possible, was clearly adopted only as an emergency measure and was to be automatically terminated twenty-one months after the coming of peace. However, instances can be found where a mixed system of ownership, partly public and partly private, is combined with private operation and management.

The laws relating to local public utilities now quite generally provide the legal machinery whereby local units may acquire, construct and operate these utilities. In many cases public ownership is provided for in franchise contracts where it takes the form of a purchase option available at definite times. In others, particularly under the indeterminate form of franchises, the right to purchase is recognized by statute and can be exercised at any time. The properties may, of course, be taken by government under the state's general powers of eminent domain. In that event the necessity of the taking must be determined by appropriate legal proceedings; whereas under a franchise the public utility has consented in advance to acquisition proceedings. Such statutory authorizations or contractual agreements for public purchase do not necessarily constitute an admission that public acquisition would be wise, but are a recognition rather of the wisdom of making public ownership available as an alternative. Far from definitely settling the question, recognition is merely accorded public ownership and operation as a policy which may become necessary and advisable. In fact, public ownership and operation find a place in the regulatory program upon the theory that the effective threat of displacement may make the private functionary more responsive to public interests and more amenable to a policy of governmental regulation.

In the same way the mixed system of ownership, as adopted in the New York, Boston, and Philadelphia subway contracts, is not necessarily an admission that public ownership is preferable, but rather that public participation in ownership has become necessary in order to provide facilities of public credit in the conduct of these enterprises.

The courts have decided that public expenditures made in acquiring, constructing, or aiding public utilities are for a public purpose. This was recently pointed out by a federal court in very significant language, indicating that the courts have, on the whole, left the decision upon the expediency of such action to legislative discretion.[2] Discussing state expenditures for grain elevators, flour mills, banking and insurance, the court said:

"The other jurisdictional element presents the question whether the bill shows a case arising under the Fourteenth Amendment. That depends on whether the purpose for which the laws here assailed seek to use the taxing power is private or public. When a state enters a new field of taxation, as North Dakota has in these laws, that question is always raised. It was urged against laws to establish public schools, and publicly owned water, gas, and electric plants, with the same vehemence as it is now urged against the present laws. The line of legislative power has been steadily advanced as society has come to believe increasingly that its welfare can best be promoted by public as distinguished from private ownership of certain business enterprises. Laws which at one time were held invalid, have at a later period been sustained by the same court. No judge can investigate judicial decisions rendered during the past ten years without being impressed with the rapid extension of state activity into fields that were formerly private. The twilight zone that separates here permissible from forbidden state action is broad. Business which will seem to one court to be public will seem to another to be private."

Sec. 3. **Enabling Legislation**

There are several varieties of legislation which provide that governmental units may own and operate public utilities. Before the era of commission regulation such provisions were frequently inserted in franchises which enabled governments to take over the properties of public utilities (particularly waterworks, highways and bridges) at the end of the franchise period without paying compensation.

Where compensation was required two methods of acquisition may be distinguished. According to the first method, the government exercised a purchase option definitely provided for in the franchise. According to the second method, the property was taken compulsorily under the power of eminent domain. This would also be the method by which the federal government might take over the ownership and operation of public utilities carrying on interstate commerce.

Ordinarily, the decision to proceed with the purchase had to

[2] *Scott et al.* v. *Frazier et al.*, 258 Fed. 669, June 14, 1919.

be confirmed by means of a referendum election. The terms of franchises differed. In rare cases public ownership might be brought about automatically through the expiration of a franchise which provided that the property revert to the city. The more common provision, however, was that the community might purchase the property at a price the determination of which was fixed in the franchise itself. A frequently used method of computing the price was that of capitalizing the net income for the last year of private operation at a definitely fixed capitalization rate. In other franchises it was provided that the purchase price be determined by arbitration.

The method of acquiring public utilities by condemnation was available at any time. Under such legislation, although the terms of the franchises had not yet expired, the community was authorized to exercise the power of eminent domain and thus condemn the properties. In this event the necessity of the taking was first determined by a jury. If the verdict of the jury was favorable to purchase, the price to be paid was fixed by another jury, and confirmed by a decree of the court. In these cases the value of the franchises for the remainder of the terms was a definite component of the "just compensation."

A third method should be distinguished since it grew out of the indeterminate permit. The limited terms of old franchises were changed by statute into indeterminate permits, if a public utility voluntarily surrendered its *old* franchises.[3] It was also provided that *new* franchises granted after a certain date were to be indeterminate permits. Then these laws went on to provide that the municipality concerned could at any time hold a referendum election to decide whether the property of a local utility should be purchased. If the referendum favored purchase, the utility and the commission were notified that the municipality was authorized to take over operation. The purchase price could then be fixed by agreement between the city and the public utility or the city was empowered to apply to the administrative commission for a determination of the "just compensation" to be paid by the city to the public utility.

Still a fourth method should be mentioned which has been very important from an historical point of view in bringing about public ownership and operation of certain types of utili-

[3] Sometimes, as in Wisconsin, a utility was construed to have consented to a surrender of old franchises, since street railway utilities, not specifically electing to retain their old franchises before a certain definite date, were deemed by statute to have chosen to continue operation under indeterminate permits.

ties, particularly water utilities and electric street lighting utilities. This method is based upon a statutory authorization which permits municipalities to purchase or construct certain designated local public utilities. The need for systems of water supply or street-lighting has often been the reason for construction of city-owned plants. Unless restrained by exclusive franchises in the hands of privately owned companies, these municipal enterprises would then undertake to compete with private plants for commercial customers. Under such circumstances private owners were sometimes quite willing to sell their plants. In some cases, as in Cleveland, Ohio, public ownership came as a result of the annexation by the city of a suburb which was in possession of a public plant. The plant could then be extended to serve customers in the enlarged market.

Many technical, legal obstacles are often in the way of public ownership, but these need not be detailed here. However, attention should be called to at least one obstacle because of its great importance. Public ownership, we have seen, was recognized as an integral part of the program of regulation. One reason advanced for the adoption of the indeterminate form of franchise was that it would make easier the adoption of a policy of public ownership. With provisions for justly compensating private owners in the event of purchase, it was believed that the financial credit and operating conditions of privately owned utilities would at all times be such as to encourage the maintenance of satisfactory service at reasonable rates. The power of terminating the franchise by public purchase would make public utilities more amenable to public regulation. If the system of private ownership and operation under public regulation failed to produce adequate service at reasonable rates, the way was clear for converting private property in public utilities to public property. Not potential competition but potential public ownership was thus regarded as an added safeguard in industries where actual competition was out of the question. But the threat of public ownership, backing up public regulation, is an empty threat if the change to public ownership can not be made effective.[4]

This theory met its first difficulty in the problem of severance damages. Private owners whose properties extended beyond one municipal area into other municipal areas could claim legal

[4] Wilcox, D. F., "The Indeterminate Permit as a type of Public Utility Franchise," *Journal of Land & Public Util. Econ.*, Vol. II, p. 327, July, 1926.

compensation for severance damages if a single municipality purchased only the property within its own municipal boundaries. Moreover, the purchase by a city of less property than that which the private owners considered an economic unit was in any event an economic mistake. The threat of severance damages and the fact that a city would, if the purchase were consummated, have on its hands a less efficient operating organization, proved to be serious stumbling blocks in the way of this alternative. In some cases this defect was remedied by providing that a city might purchase more property than that located within its limits; or a new public corporation was created with an enlarged administrative area, whose sole purpose was the acquisition and operation of such properties. The metropolitan sewer, water and public utility districts are cases in point.[5]

In the second place the theory met the decisive obstacle that local governing units were unable to finance the purchase of these public utility undertakings. In order to purchase these properties it was necessary that the entire amount of the "just compensation" be paid in cash, unless other arrangements could be made by voluntary agreement whereby outstanding bonds were assumed by the city or a plan of installment purchase was provided for. Even these remedial arrangements encountered difficulties. If the entire amount had to be paid in cash, it would obviously be necessary for municipalities to borrow the money upon their general credit. Only a relatively small amount could be spread upon the tax roll from year to year.

The power of cities to borrow upon their general credit (which is the taxing power) is also restricted by statutory or constitutional limitations. The latter are particularly difficult to avoid because of the innate conservatism of voters. Moreover, expanding municipal functions in recent years involved increased expenditures for highways, educational purposes, sanitary and protective measures, and these had served to bring many municipalities close to their limits of indebtedness. In all our larger cities, therefore, only an increase in their borrowing power would make such financing feasible.[6]

[5] The reader should consult Chapter XXXII in which a plan is outlined whereby the city of Milwaukee might overcome these difficulties in exercising a purchase option. See especially Appendix A, Sec. 17, p. 778.

[6] A typical constitutional limitation of the borrowing power is one which prevents municipalities from incurring an indebtedness greater than 5% of the assessed value of their taxable property. The range in the different states is from 2% to 10%. The Wisconsin limitation is as follows: "The principal of the aggregate funded debt of cities of the first class shall never

In order to remedy this situation several suggestions have been made and some of these carried into effect. In Montana, for instance, where the normal limitation is 3 per cent., it is provided that by popular vote the rate may be increased to 10 per cent. for the provision of water or sewer facilities. In Kentucky a higher rate is fixed for the larger cities, those of the first and second classes having a rate of 10 per cent. while others have a rate of 5 per cent. In other states higher limits are specially fixed where the purpose is the acquisition of public utilities.[7] In defense of these higher limits for public utility purposes it is urged that the usual grounds for a limitation upon municipal expenditures do not exist because these properties are revenue-producing enterprises and therefore measurably self-supporting.

A further distinct type of enabling legislation empowers cities to borrow funds under conditions which give to the municipal bonds so issued a first lien upon the property acquired. This is tantamount to a loan upon the credit of the public utility alone, the city operating the property under its proprietary powers.[8] It is contended by some investment bankers that such bonds can be advantageously disposed of, even though the margin of property security is low, because the bonds are exempt from federal and state income taxes. Thus far, however, it does not appear that this mode of financing has come into general use.

One more suggestion made in this connection should be mentioned. It has been urged that authority be conferred upon municipalities to condemn merely the equity of stockholders, thus reducing the amount of the "just compensation" which would have to be made. This is designed to place cities in a position analogous to that of a private corporation (except that the

exceed a sum equal to five percentum on the amount of the assessed value of the taxable property in any such city, which value shall be ascertained and determined by the average annual amount of the assessment rolls thereof for the next preceding five years." (Sec. 6, chap. 370, 1909).

[7] Alabama 3%, Utah 8%, North Dakota 4%, South Dakota 8%, Georgia 9%, Pennsylvania 10%, South Carolina 8%, Louisiana 10%, Virginia 18%.

[8] A Wisconsin statute authorizing such issues provides as follows: "All moneys received from any bonds issued pursuant hereto shall be applied solely for purchasing, acquiring or constructing such public utility, and in payment of the cost of any necessary extensions, additions and improvements, and there shall be and there is hereby granted and created a statutory mortgage lien upon the public utility so purchased, constructed or acquired to and in favor of the holders of the said bonds and each of them, and to and in favor of the holders of the coupons of said bonds. The public utility so purchased, acquired or constructed shall remain subject to such statutory mortgage lien until the payment in full of the principal and interest of the bonds issued pursuant thereto." (Sec. 927-11.)

corporation does not have the power to compel a sale) which may secure control by buying all or a controlling interest of the common stock alone.

Sec. 4. The Movement for Public Ownership and Operation

The public ownership movement in this country has concerned itself chiefly with the local utilities, more particularly with water, manufactured gas and electric utilities. Carl D. Thompson, Secretary of the Public Ownership League of America, in a recent survey of the subject,[9] brings together from scattered sources certain statistics which give some idea of the extent of the movement at the present time. One can not fail to be impressed by the increase in the number and variety of economic services which the government has undertaken to render. It is, however, true that if those publicly owned properties are eliminated which serve the purposes of *strictly* governmental functions, the amount of investment by government in strictly public service enterprises in comparison with private investment is not large. Only in the field of water supply and of irrigation utilities does public initiative appear to have a clear preponderance. It should be noted, however, that some utilities, such as highways, canals, waterways, bridges and sewers, have not been managed as commercial enterprises, at least not for a very considerable period of time, and are therefore not properly included in a survey of public service industries properly so called. Other forms of public enterprise, like fire and police alarm systems, printing establishments, heating plants, etc., have been operated as governmental facilities, accepting no private customers. There are still other forms, like housing, banking, state insurance, flour milling, etc., which, although commercial in character, are again not public utilities strictly so called, because they compete in the same market with like enterprises which are privately owned. Unlike Great Britain and continental European countries, the United States still is the classic home of privately owned and operated public utilities.

(a) *Progress of the movement.*

The movement for public ownership and operation, nevertheless, has some concrete results to record. In the artificial gas

[9] Thompson, Carl D., *Public Ownership*, Thom. Y. Crowell Co., 1925. The Institute for Research in Land Economics and Public Utilities is also engaged upon an extensive survey of publicly owned electric light and power utilities in the United States.

industry the outstanding example of a publicly owned plant was that of Philadelphia, established in 1841 and operated until 1887, when it was leased to a private company. Another early and apparently successful gas utility was that established in Richmond, Virginia, in 1852. This plant has continued as a publicly owned and operated plant to the present time. Other important municipal gas utilities are located in Duluth, Minn. (established in 1898), Holyoke, Mass. (established in 1896), and Omaha, Neb. (established 1920).

The progress of public ownership in this country, so far as electric utilities are concerned, may be ascertained from the special census returns for central electric light and power stations. The first municipal electric plants were established early in the eighties of the last century and largely for street lighting purposes. By 1892 the number of municipal stations had increased to 235. From 1902 to 1922 the number increased from 815 to 2581. While there has been an appreciable increase in the number of instances, both absolutely and relatively, statistics of the kilowatt capacity of the stations and of the output in kilowatt-hours indicate that in these respects municipal stations do not show the same rate of growth. In fact, the output suffered a relative decline. The truth of the matter appears to be that most of the municipal plants are relatively small and devoted primarily to lighting business. More recently, with the increasing tendency to purchase power from private companies, they operate only distributing systems. There has been some increase in the power business as shown by the H. P. capacity of motors served, but the major increase has come in the lighting business as the statistics of arc and incandescent lamps served show. Private enterprise has thus been more than holding its own because of the special emphasis which it places upon the development of the power business in our large industrial communities.

Outstanding illustrations of publicly owned and operated electric utilities in the United States are Seattle, Cleveland and Los Angeles. All of these plants operate in competition with privately owned companies. The Los Angeles utility is the largest of the three and compares favorably with private utilities operating in cities of a size comparable to Los Angeles. These plants have been veritable storm centers of agitation both for and against public ownership. Without an intensive and detailed investigation into the facts it is impossible to express an opinion as to the merits of the contending claims. The economic posi-

tion of electric utilities varies so much that comparisons are likely to be misleading.[10]

Municipal plants have often been established because the smaller communities did not hold out the promise to private enterprise that the plants could be made to pay. In recent years the construction of transmission lines and the interconnection of power sources has made possible the extension of electric service to communities that formerly could not be supplied. In many cases municipally owned properties have either been sold to private companies or have discontinued the production of electric energy in small central stations. This development illustrates the principal advantage of private enterprises which are not confined to a single local market and the principal disadvantage of municipal enterprises which are thus restricted. The Ontario hydro-electric system is a publicly owned and operated enterprise which aims to overcome this disadvantage by providing for the production of hydro-electric power in large and small central stations, and the transmission and sale of this power to large and small communities which own and operate only the local distributing systems. It is the aim of this enterprise to distribute this power at cost. Like the municipally owned plants already mentioned this project has been drawn into the controversy over the comparative merits of public and private ownership of public utilities.[11]

There are only a few examples of public ownership and operation of electric railways in the United States. The outstanding instances are Seattle, San Francisco and Detroit. While San Francisco has operated a municipal street railway for some time, this enterprise grew from small beginnings and is still competing and dividing the market with a privately owned utility. In fact, the privately owned railway still handles the bulk of the traffic. Seattle and Detroit represent recent acquisitions, the former coming in 1919 and the latter in 1923. Conditions in

[10] Prof. R. T. Ely and the writer are at present engaged in an investigation of the Los Angeles electric utility and will report upon this enterprise in the near future. Some of the more technical aspects of these controversies will be commented upon at length in this report.

[11] *Cf.* the Murray & Flood Report of 1922 upon this enterprise, prepared for the National Electric Light Association, and the Hydro-electric Power Commission's reply in "The Refutation of Unjust Statements." Also Wyer, S. S., *Report of Smithsonian Institution*, Washington, D. C. But see also, Patton, Harold S., "Hydro-electric Power Policies in Ontario and Quebec," and Doran, H. B., "The Rise and Decline of Municipal Ownership in the Electric Light and Power Industry of Wisconsin," in *Journal of Land and Public Utility Economics*, Vol. III, at pages 113 and 173 respectively. May, 1927.

these cities have been so abnormal in recent years and municipal operation has as yet so little history behind it that no conclusions can be safely drawn as to the results. Another outstanding development is in Toronto, Canada, where municipal operation began in 1922. A serious study of these experiments in public operation, which is not an *ex parte* statement of the case, is very much needed. In spite of untoward conditions, the electric railway industry in conjunction with motor carriers is so important in providing mass transportation, counteracting congestion, and keeping city life upon an efficient plane, that all new departures should be sympathetically observed and the results not prejudged.

(b) *Public participation in ownership.*

The development of rapid transit systems appears to have called forth a new departure in ownership and operation of public utilities which is best classed as a mixed system. The costs of these projects are too great to attract private capital. Moreover, it seems that adequate transportation in metropolitan cities depends upon unified operation of surface, subway and elevated lines. It has, however, proved so difficult to amalgamate these systems, as the history of the New York and Chicago situations attest, that the progress in this direction is very slow indeed. It has not only been hard to get public coöperation but also to secure those agreements as to the financial terms of consolidations between the private owners of properties that would have to become parts of a unified system, that rapid transit improvements have been slow of development. Philadelphia and Boston possess, in this respect, the greatest margin of advantage.

Without going into details, the usual method in this country of providing rapid transit, especially subways, is for the city to construct the permanent way and structures and then to lease the facilities to a private company which on its part provides power facilities and rolling stock and operates the property. The lease contract, besides fixing the rental, may also fix the rate of fare.

The first subway contract in New York was entered into in 1906 and gave the lessee the right to operate for 50 years with the privilege of renewal for 25 years on readjustment of the rental. The rental, in this contract, was an amount equal to the interest on the city bonds issued to pay for the construction cost plus 1 per cent. a year for a sinking fund to retire such bonds at maturity. It was provided, however, that if the profits from

operation fell short of 5 per cent. of the cost, payments into the sinking fund might be reduced to ½ of 1 per cent. for the next five years, provided the profits continued to fall below 5 per cent. of the cost. Cars and equipment furnished by the lessee were to be purchased by the city at the termination of the lease and at a price to be fixed by agreement or by arbitration.

As in the case just cited, rapid transit contracts usually carry a so-called recapture clause under which the city may at a stated time take over operation.

(c) *The dual system contracts.*

Rapid transit is so important for the larger cities that a word more should be added in regard to further developments in New York. The demand for more subways and additional extensions of elevated lines ultimately led to the adoption in 1913 of the so-called "dual system contracts", which provided for a comprehensive scheme of rapid transit development under a coöperative plan whereby the city built certain additional subways, leasing one portion for operation to the Interborough Rapid Transit Company and another to the New York Municipal Railways Co. These leases run for forty-nine years and provide that each company contribute a certain amount toward construction of the city-owned lines, build certain other elevated lines at its own expense, and also provide the necessary equipment for all lines at its own expense. The title to equipment for all city-owned lines was to rest in the city. Each company was to charge a rate of fare of five cents with free transfers, except to the lines of the other company and to the elevated lines. Surplus profits were to be divided equally with the city. The proceeds from operation were to be pooled. The financial arrangements are somewhat complex. Some idea of them may, however, be gained from the following:

"The first deductions from the pooled (net) receipts, to be made even in advance of the preferentials, included: To the city such rentals as were due from the Interborough Company for the first subway; taxes and governmental charges of all kinds against each company; twelve per cent. of the revenue for maintenance exclusive of depreciation; for depreciation five per cent. from the Interborough and three per cent. from the Brooklyn Company. Then came the preferential payments," ($6,335,000 per year in the case of the Interborough and $3,500,000 in the case of the Brooklyn Company to compensate for profits foregone in synchronizing the term of the old leases with the new ones) "and after that, six per cent. on the company's investment for construction and equipment, out of which an amortization fund must be set aside; to the City by the Interborough Com-

pany an amount equal to 8.76% on the City's expenditure for construction; one per cent. of the revenue to be paid into a contingent reserve fund. The surplus remaining is to be divided equally by the City and Company.[12]

The increase in prices which set in shortly thereafter placed the cost of the work, originally estimated at $330,000,000, in excess of $400,000,000, of which the City's portion was more than $200,000,000. Commenting upon these contracts in 1917, James B. Walker, the present Mayor of New York, writes:[13]

"Since the adoption of the Dual System contracts opinion has been divided as to their merits—that is, whether they were a good or bad bargain for the City. They were both. They were good in the enormous increases of rapid transit facilities which they assured at a time when the city was sorely in need of relief. They were bad in that they assured the operating companies a continuation of large profits and placed the burden of carrying deficits from operation upon the City, besides giving the companies first call on the revenues. Time alone will show whether the good or the bad predominates. The primary object in building rapid transit railroads is to provide quick transportation service for the people; whether the operation of such roads will bring a monetary return to the City is secondary. There is no question that the Dual System will fulfill the first; whether the second will be realized only the future can tell. Had the Dual System negotiations failed, however, the plight of the city would have been serious, for the building of new lines would have been delayed and the burden of constructing them would have been placed wholly on the municipality, the resources of which would not have permitted such a large addition to the rapid transit system as was made possible by the coöperation of the companies under the Dual System agreements."

Table XXVIII, p. 691, showing condensed comparative income accounts of the Interborough Rapid Transit Company, gives some idea of the financial history of this venture since 1913.

(d) *Some pertinent statistics.*

Further details regarding the progress and present extent of the public ownership movement can best be shown by means of some pertinent statistics compiled from official sources. Reference has already been made in Chapter III and particularly in Table V, p. 50, to the rapid growth in publicly owned water utilities. A few statistics for other utilities are compiled in Tables XXIX, XXX and XXXI, and presented without comment because no definite conclusions are warranted by a mere marshalling of figures. They will serve, however, to indicate the extent of the public ownership movement in each field. A more

[12] Walker, James B., *Fifty Years of Rapid Transit Co.* The Law Printing Co., New York, 1917, p. 253.
[13] *Ibid.*, p. 261.

TABLE XXVIII

COMPARATIVE INCOME ACCOUNTS—INTERBOROUGH RAPID TRANSIT CO. OF NEW YORK [a]

Year	Gross Operating Revenue	Operating Expenses	Net Income	Non-Operating Income	Gross Income	Interest & Sinking Fund on City Bonds	Rental and Guaranteed Dividend, Manhattan Ry. Co.	Other Interest & Sinking Fund Payments	Total Deductions	Net Corporate Income
1913....	$32,497,870	$15,377,623	$17,120,247	$487,490	$17,607,737	$2,339,482	$4,217,500	$ 4,513,687	$11,070,669	$6,537,068
1914....	33,515,395	14,984,001	18,531,393	612,852	19,144,246	2,361,064	4,235,000	4,523,602	11,119,666	8,024,580
1915....	33,433,742	15,075,294	18,358,448	623,631	18,982,079	2,360,066	4,235,000	4,318,529	10,913,595	8,068,484
1916....	35,891,528	16,349,871	19,541,755	580,830	20,122,586	2,380,619	4,235,000	4,793,640	11,409,259	8,713,326
1917....	39,866,146	19,454,677	20,411,468	559,076	20,970,545	2,375,714	4,235,000	5,474,472	12,085,186	8,885,358
1918....	40,497,728	22,871,919	17,625,808	593,599	18,219,408	2,384,537	4,235,000	6,937,112	13,556,649	4,662,758
1919....	43,207,209	29,367,482	13,839,726	617,302	14,447,028	2,413,637	4,235,000	11,608,731	18,257,368	3,810,339 *
1920....	51,478,410	34,328,618	17,159,791	608,368	17,768,159	2,428,487	4,235,000	13,340,508	20,003,995	2,235,835 *
1921....	55,031,941	38,760,340	16,271,600	639,123	16,910,724	2,435,768	4,235,000	14,704,782	21,375,550	4,464,826 *
1922....	53,540,859	35,075,331	18,465,528	652,875	19,118,403	2,482,633	4,235,000	15,167,566	21,885,199	2,766,797 *
1923....	55,559,436	37,054,819	18,504,617	573,850	19,078,467	.....	1,760,000	17,450,262	19,210,262	131,795 *
1924....	57,773,775	36,604,945	21,168,830	402,763	21,571,593	.....	2,773,877	17,726,539	20,500,416	1,071,177
1925....	58,418,991	36,387,975	22,031,016	292,200	22,323,216	.....	3,065,310	18,111,119	21,176,429	1,146,787

[a] Compiled from Poor's Manual of Public Utilities.
* Deficit.

detailed presentation of available statistics will be in the survey referred to above.[14]

Sec. 5. Problems of Public Ownership and Operation

Difficulties encountered in carrying out the policy of public ownership and operation may be conveniently summarized under the two headings of economic problems and administrative problems. An impression prevails that public initiative alone operates under handicaps. Yet there is no doubt that inefficiency and incompetence are also tucked away in little observed recesses of private industry. The difference is that the acts of public officials are always done under observation. Both types of organization must delegate authority to officials who work with an apparatus of administrative rules and a standard routine which require frequent overhauling. A frank avowal of shortcomings and a study of means of overcoming them can only prove helpful when the government is called upon to function as a public service enterpriser.

(a) *Economic problems.*

The first problem of a public administrator is that of segregating public utility functions from other public functions. The reason for insisting upon such a segregation is that public utilities should be self-supporting. If they cannot be made self-sup-

TABLE XXIX

MUNICIPAL AND PRIVATELY OWNED GAS PLANTS IN THE UNITED STATES AND CANADA.[a]

Year	*No. of Private Plants*	*No. of Municipal Plants*	*Total*	*Per Cent Municipal*
1899	951	14	965	1.5
1916	2233	126	2359	5.34
1923	1665	109	1774	6.1
Artificial gas	941	67	1008	6.6
Natural gas	665	16	681	2.4
Acetylene plants ...	46	11	57	19.3
Gasoline plants	13	15	28	53.7

[a] Compiled from Thompson, C. D., *op. cit.*, pp. 260-261. Mr. Thompson is Secretary of the Public Ownership League of America, Chicago, Ill.

[14] See footnote p. 687 *supra*.

TABLE XXX

PHYSICAL AND FINANCIAL STATISTICS OF ELECTRIC UTILITIES

U. S. CENSUS

Year	*Number of Stations*			*Capacity in K. W.*			*Output in K. W. H.*		
	Commercial	Municipal	Total	Commercial	Municipal	Total	Commercial	Municipal	Total
1902	2805	815	3620	1,098,855	113,380	1,212,235	2,311,146,676	195,904,439	2,507,051,115
1907	3462	1252	4714	2,500,209	209,016	2,709,225	5,572,813,949	289,462,788	5,862,276,737
1912	3659	1563	5222	4,768,762	396,677	5,165,439	10,995,436,276	537,526,730	11,532,963,006
1917	4224	2318	6542	8,411,944	582,463	8,994,407	24,398,983,183	1,039,320,089	25,438,303,272
1922	3774	2581	6355	13,407,041	906,397	14,313,438	38,413,240,163	1,878,296,272	40,291,536,435

Year	*Operating Revenue*			*Net Income*			*Cost of Construction & Equipment*		
	Commercial	Municipal	Total	Commercial	Municipal	Total	Commercial	Municipal	Total
1902	$ 77,349,749	$ 6,836,856	$ 84,186,605	.....	.....	.....	$ 482,719,879	$ 22,020,473	$ 504,740,352
1907	156,000,257	13,614,434	169,614,691	$ 37,744,824	$ 3,695,379	$ 41,440,203	1,054,034,175	42,879,447	1,096,913,622
1912	264,317,150	22,663,708	286,980,858	60,394,297	6,301,824	66,696,121	2,098,613,122	77,065,144	2,175,678,266
1917	462,473,917	39,586,063	502,059,980	91,506,626	8,819,307	100,324,933	2,933,016,941	127,375,200	3,060,392,141
1922	936,286,275	83,587,359	1,019,873,634	257,959,666	20,135,450	278,095,116	4,229,356,023	235,659,668	4,465,015,691

TABLE XXXI

PHYSICAL AND FINANCIAL STATISTICS OF ELECTRIC RAILWAY UTILITIES

U. S. Census

	1922		*1917*	
	Total	Municipal	Total	Municipal
Physical Statistics				
Number of companies	858	16	943	8
Track mileage—total	42,450	794	43,365	121
Revenue cars	88,707	2,366	91,448	260
Energy purchased—Kw. hrs.	5,931,601,934	167,280,818	4,947,348,042	26,976,871
Energy generated—Kw. hrs.	6,473,450,701	39,354,170	7,240,502,789	.....
Passengers carried	15,331,399,851	485,420,178	14,506,914,573	40,037,483
Rev. car miles—Total	2,124,523,362	58,830,194	2,139,801,530	6,731,969
Passenger	2,068,293,833	58,746,538	2,087,818,534	6,709,068
Express, frt. & mail	56,229,529	83,656	51,982,996	22,901
Passengers per car mile	7.41	7.69	5.41	4.98
Passengers per mile of single track	361,163	611,491	334,531	331,683
Financial Statistics				
Operating revenue	$1,016,719,092	$23,241,377	$709,825,092	$1,682,354
Operating expenses	727,795,168	17,383,188	425,594,654	1,462,719
Net revenue	288,923,924	5,858,189	257,230,438	219,635
Taxes	64,788,315	411,409	45,756,695	126,146
Operating income	224,135,609	5,446,780	211,473,743	93,489
Non-operating income	32,329,229	71,113	20,282,948	28,608
Gross income	256,464,838	5,517,893	231,756,691	122,097
Deductions	199,277,226	1,833,285	175,305,761	263,993
Net income	57,187,612	3,684,608	56,450,930	141,896*
Road and equipment	5,058,762,454	57,986,327	5,136,441,599	7,125,415
Funded debt	3,117,621,457	37,881,600	3,058,377,167	6,088,025
Number of employees	300,523	8,259	294,826	1,055
Wages and Salaries	445,680,135	11,276,416	267,240,362	804,583
Aver. per employee	1,483	1,365	906	763

* Deficit.

porting or if a policy of deficit financiering appears preferable, the extent of the deficit and the amount of public subsidization should not be unknown quantities. Only in this way can public enterprises be scientifically administered. A correct estimate of the public benefit must be possible on account of which these enterprises may, under some circumstances, make claims upon the public purse. Normally the cost of public utility services should be met by the individual user in the first instance. Even if publicly owned and operated they should be treated as going concerns of an economic character and should not be confused

or merged entirely with state functions, which are going concerns of a political character.

Recognizing this distinction, it is necessary that governments set up a form of business organization which will be judged by the economic criterion of balancing receipts and expenditures. This organization must develop its own accounting and financial régime. There should be no hidden sources of financial support by means of which a portion of the burden of support is placed upon the general tax-payer. It should, on the other hand, be relieved of the burden of free public service or of rendering these services at less than compensatory rates. It should be free to bargain for a labor supply at wage rates which take into account only criteria of operating efficiency. It should not be required to mingle benevolent or political considerations with commercial considerations. Like any other business organization, it should meet its interest obligations and depreciation charges out of net operating revenues alone. Sinking fund charges, if placed upon the tax roll, should be recouped from operating profits because the special benefit to consumers of reduced indebtedness should be counterbalanced by proper charges. This should be done because taxes are paid for a common benefit and not for a special benefit which goes only to those who receive service.

There is also good ground for arguing that rates should be high enough to yield a sum equivalent to the taxes which would be paid if the utility were private and to yield, in addition, a reasonable operating profit upon the city's equity.

(b) *Administrative problems.*

The most telling arguments against public ownership and operation come from those who claim that it means management by politicians instead of by business men. In 1919 a committee was appointed by the Merchants Association of New York to investigate and report upon the problem. The report emphasizes this aspect, stating that "the cause of inefficient management and excessive cost when governments undertake economic activities is simple. All the activities of any government are necessarily carried on by political machinery and that machinery is wholly unsuited to the economic field." This contention appeals to American psychology with its background of spoils politics and its deep-seated disrespect for or lack of confidence in politicians.

In recent years it has become the fashion to refer to public

ownership as "political ownership," assuming thereby to condemn it out of hand. At the same time the wide-spread diffusion in the ownership of public utility securities among employees, customers and investors is referred to as true public ownership. Such representations are, to say the least, insincere. The initiated know very well that in all cases where many persons make up a constituency upon whose consent a lease of power is based, an opportunity is afforded for the display of political talents. The question in the end is one of determining which method best serves the public interest.

Those ranged on the other side of this question are not without a shibboleth. Private ownership and operation is castigated as "production for profit" while public ownership and operation is sanctified as "production for service". With public service commissions in a position to control the amount of profit this contention is beside the mark. Instances are not lacking where municipalities, which are the fortunate owners of well-conceived and well-managed public utilities, have derived large profits from these undertakings and used them for other public purposes.

From an administrative point of view the peculiar difficulties of public management are that it tends to become slothful and careless. In order to make management accountable to the public, it becomes hedged about with restraints which prevent comprehensive and far sighted planning and executing these plans with vigor and effectiveness. The disciplinary conditions of employment may be undermined by a political nepotism which deadens the initiative of talented employees.

This was early recognized by Prof. John R. Commons. In discussing public administration of public utilities he said: "The vital problem of public ownership is not economical but administrative. If it could be guaranteed that the administrative difficulties could be removed, there would remain no problem whatever. The problem is this: How can business efficiency be based on universal suffrage? The answer must propose administrative devices suited to democracy." These devices, he contends, should be codified as a part of every enabling act. First among these devices is the referendum which is effective in checking corruption. But it does not directly promote efficiency. Operating efficiency depends upon the conditions of civil service. The traditional civil service commission with its power to submit an "eligible list" for appointments, to hold examinations for promotions, to vote removals etc., entirely independent of the department affected, is not well conceived. No responsible busi-

ness manager, he contends, could concede such outside interference. Responsibility implies authority. He therefore insists that civil service must become self-governing, which leaves the head of the department free in his control because he has the initiative, but guarantees justice in decisions to employees by providing boards of appeal equally divided between representatives of management and employees. This scheme facilitates business efficiency because it places responsibility upon management; it is democratic because it depends upon labor organization. A third device involves regulatory control over accounting and the preparation of official audits so that voters may have confidence in the results of operation and be given the facts for intelligent action in referendum elections.

Sec. 6. **Sociological Perspective**

It would be futile to attempt to set limits which governmental initiative should not exceed. No one can foresee the exigencies which the future may bring and in obedience to which governmental enterprise will be extended. The state with its subdivisions is both a political and an economic institution. In emergencies civilized man will in the future, as he has in the past, use the state in furnishing economic utilities. But in thus extending the range of state functions it will always be an important consideration whether great evils may not attend such expansion in the power of the state. As John Stuart Mill observes in his Essay on Liberty:

> "Every function superadded to those already exercised by the government, causes its influence over hopes and fears to be more widely diffused, and converts, more and more, the active and ambitious part of the public into hangers-on of the government, or of some party which aims at becoming the government. . . . If every part of the business of society which requires organized concert, or large and comprehensive views, were in the hands of the government, and if government offices were universally filled by the ablest men, all the enlarged culture and practical intelligence in the country, except the purely speculative, would be concentrated in a numerous bureaucracy, to whom alone the rest of the community would look for all things; the multitude for direction and dictation in all they had to do; the able and aspiring for personal advancement. To be admitted into the ranks of this bureaucracy, and when admitted, to rise therein, would be the sole objects of ambition."[15]

[15] W. S. Jevons in 1867 published a paper in which he set forth the conditions under which public ownership and operation is most likely to succeed. Here are his tests: "It seems to me that state management possesses advantages under the following conditions: (1) Where numberless wide-

Fortunately, economic developments, since the time when Mill expressed these fears, have caused the corporation to be perfected as an economic institution which makes possible the conduct of large capitalistic ventures without the intervention of governments. This development is peculiarly significant in the public utility field. On the other hand, the problem of making such public service corporations serve the general welfare has appeared with an altogether new insistence. If the state is to abdicate in favor of public service corporations it is highly important that the public utility institution be groomed for the task of regulation. May it not be that creative intelligence is fashioning an instrument which enables us to escape the dangers of concentrating too much power in the hands of government officials, however able, and of placing an over-weight of economic responsibility upon governmental institutions?

When one takes into account the many economic functions which governments are now performing and which leave much room for improvement, one may well be content to work along the historic path that these industries have thus far, in the main, traversed in this country. That will mean that regulation must be carried further, perfecting it in those respects in which it has developed weaknesses, expanding it where expansion is needed, and contracting it where experience has shown that governmental interference deadens individual initiative. For, after all, the public utility institution is peculiar in that it aims to blend individualism with collectivism. It aims to preserve a sense of individual responsibility by putting service upon the basis of economic price, but at the same time it aims to bend economic processes so that they will serve the general welfare. Volition and compulsion, we say once more, are the mingled ingredients of economic motivation in this sector of the industrial field.

Recognition that some development along this line may be expected comes from two widely varying sources. The great patriot and industrialist of Germany, the late Walther Rathenau, had arrived at the conviction that the great industries of

spread operations can only be efficiently connected, united, and coördinated, in a single, all-extensive government system. (2) Where the operations possess an invariable, routine-like character. (3) Where they are performed under the public eye or for the service of individuals, who will immediately detect and expose any failure or laxity. (4) Where there is but little capital expenditure, so that each year's revenue and expense account shall represent, with sufficient accuracy, the real commercial conditions of the department." Bullock, C. J., *Selected Readings in Public Finance*, Ginn & Co. (1906), p. 95.

his native country must be socialized. As President of the "Allgemeine Elektricitäts Gesellschaft" (General Electric Co.) and as food administrator during the World War he had gained an especially intimate knowledge of the workings of the present economic system. Endowed with rare social vision, he was able to overcome the prejudices of his class against governmental interference. Without minimizing the difficulties of state control and recognizing the solid accomplishments of private capitalism, he nevertheless believed that state control must be exercised and extended in the future. He believed that the cardinal fault of the economic system was its waste of time and material due to the excess of individualism. As organized at the present time, he maintained that the average cost of production was increased, and that this extra cost fell as a burden upon the community of consumers. As opposed to the capricious production of individualism he favored standardization in production and stabilization of price through associations of producers. To this end he advocated the recognition by the government of economic groups carrying on industrial functions not unlike our public service corporations, and a parallel development of governmental regulating agencies not unlike our public service commissions. Upon these agencies, he thought, the government should confer the requisite administrative powers. The general government, political in its make up, should reserve to itself only general powers of control.

The well-known American industrialist and investigator, M. C. Rorty, has come to practically the same conclusion, modified however to suit the American scene. In discussing a probable answer to the social dilemma presented by the individualistic and collectivistic orientation, he writes:[16]

"Between the advantages and disadvantages of individualistic and socialistic forms of government it is hardly possible that a simple solution may be found. However, a hint at the ultimate answer may lie in the organization of the human body. Here there has developed, through long centuries of evolution, a natural and effective balance between the brain and the other vital organs. The brain thinks, reasons and plans—but although it is faithfully served by the other vital organs, it has no control over their routine operations. Such control is exercised by separate special brains (or ganglia), each organized and equipped for its particular function—and the more important and vital this function is, the more complete is the control by the ganglion in charge, and the less direct is control by the central brain. The hand may lift involuntarily at a threatened blow, or may be raised at

[16] M. C. Rorty, *The Economic Problem*, A. W. Shaw Co. Mr. Rorty is vice-president of the American Statistical Association and a past president of the Board of Directors of the National Bureau of Economic Research.

will; but no conscious effort of the mind can stop the beat of the heart. Yet the heart would be less, rather than more, truly the servant of the whole body if the mind could interfere with its operations.

"So in the ultimate development of our national organization, if we should cling too closely to an extreme individualism, we might be in the position of a man whose heart beat according to its own fancy without regard to the real demands upon it, whose lungs filled and emptied with no regard for the work at hand, and whose digestive organs furnished sustenance or not as they felt inclined. In the reverse direction, if we should centralize power over the vital functions of trade and commerce and industry in our representative assemblies, we might be like a man who was compelled to order each heart beat and each breath by an effort of the will. Between these two extremes there must ultimately be, in our national organization, as in our physical bodies, a rational compromise.

"But we cannot hope to realize at once a final perfection in our national organization. In our present representative assemblies—in our state legislatures and in the Federal Congress—we have the conscious centers of our national life, while in our great corporations we have the beginnings, and in some cases almost the fully developed forms of our national vital organs and their associated and controlling nerve centers. Both are adapted to their special purposes—representative assemblies organized for legislation, and, on the whole, truly responsive to the broader currents of popular thought, but lacking continuity of policy and incapable of quick decisions in emergencies—corporations, on the other hand, organized for administration and decision, manned by specialists of long training, and planning steadily for future growth along lines of well-established policy."

It is not inconsistent with the development of public service enterprise in the United States that some public services, like water-supply, sanitation, irrigation shall be largely, if not exclusively, in governmental hands, organized, however, with the view to securing economical administration. Nor is it inconsistent that, here and there, where historical or other conditions are favorable, other public service enterprises,—electric utilities, street-railways, rapid transit facilities—be conducted wholly or partly by government. What is important, however, is that governmental administrative organs and the public finances be not overloaded with economic enterprises so that inefficiency and confusion will result.

It would be particularly unfortunate if an important public service enterprise were placed in governmental hands, while the community upon which the voting of bonds and other financial support depends is perilously divided or opposed to the policy. Under such circumstances public management can not possess the necessary initiative. At every bond election the issue of public versus private ownership would be fought out, resulting in distressing uncertainties and set-backs. Economical management cannot be reduced to an exact science. To secure good

administration under private as well as public management involves conferring the privilege of making mistakes but also of being answerable for them to an economic electorate, either the stockholders or the community of consumers. Unless the government as public service enterpriser is reasonably freed from the vagaries of public opinion, a situation will be created, to which economists have frequently pointed,[17] in which the risks of extending service will not be assumed. For it is certain that the hope of gain stimulates private entrepreneurship while the fear of loss, particularly under the conditions mentioned, restrains the public entrepreneur.

We may best conclude this brief résume by quoting again from Prof. Taussig:

"The history of the past shows the spur of profit to have been at work, and apparently indispensable—, private management has been a necessary stage. Public management has come as a transition and a growth, not by an independent start. . . . The present state of water-power transmission through electricity supplies an instructive illustration. Here are great possibilities, nay, great certainties. The simple matter of building dams and impounding the water can indeed be done by the state. But the hydraulic and electric plant, and the transmission and distribution of the power, involve risks and call for enterprise and vigor (not to mention technical progress) such as public officials are not likely to supply. The utilization of water power through electricity thus waits on private initiative and management. Obviously, a monopoly situation exists, or at all events impends; there is just so much power, and he who controls it controls all the industrial possibilities. The public should never give away in perpetuity the the ownership of this great resource. Yet it can probably secure its effective development only by allowing scope for private profit. Only at a later stage, when the best ways of utilizing the power have come to be understood, may public management take the place of private."

In thus selecting *monopoly* and *industrial maturity* as the economic earmarks in accordance with which the public ownership and operation of public utilities may be attempted with some promise of success, this liberal economist of the twentieth century may have succeeded better in generalizing upon this problem than did W. Stanley Jevons, the liberal economist of the nineteenth century.

[17] For instance, Pigou, A. C., *Wealth and Welfare*, 1912, p. 28.

CHAPTER XXXII

SERVICE-AT-COST IN THE REGULATION OF LOCAL UTILITIES

In earlier chapters the course of regulation was traced through the stages of judicial regulation, regulation by charter and special franchises, and regulation under the indeterminate permit with its supplementary administrative commission having a statewide jurisdiction. With this evolution another line of development of regulatory institutions was compared. This begins with the Official Revision System of Great Britain, continues through the Sliding Scale System as applied first in Great Britain and then in Massachusetts, and terminates finally in the service-at-cost franchises of the war and post-war periods. In these developments the various instrumentalities of regulation were successively tested, modified, combined and recombined in an effort to evolve a regulatory framework which will function to protect both the producer and consumer of public utility services.

Both lines of development have brought the cost of service principle for fixing the general level of rates more and more clearly into view. The state commission system applies the cost principle in a rather inchoate fashion for each rate litigation. Service-at-cost franchises relate only to local utilities and apply the cost principle to individual companies by carefully defining the cost of the service in each case. They give the city control over service and set up machinery for continuous accounting and supervision.

Sec. 1. **A Public Utility Survey**

An opportunity to analyze and appraise the service-at-cost idea in the regulation of our local public utilities arose in connection with a general survey of the public utility situation in Milwaukee, Wisconsin. This survey was made by the writer for a joint aldermanic and citizen's committee, appointed by the common council of that city. The results of the survey were embodied in a "Summary Report," published under date of

July 25, 1921, and in four unpublished supplementary reports. They deal very largely with the properties and operations of The Milwaukee Electric Railway and Light Co., but include also a survey and evaluation of the principles and practices of regulation in general.

The company operates a joint railway, electric and heating utility. The railway utility consists of an urban, suburban and interurban railway system, the interurban system radiating north, south, and west from the city and covering with its network of ancillary motor-bus and motor-truck lines the entire southeastern quarter of the state. The company also operates a system for the production, transmission, and distribution of electric energy for light and power. This system serves the same general territory that the railway covers and operates in conjunction with the Wisconsin Gas and Electric Company. Together they supply the power requirements for more than half the industrial output of the state. Steam heating service is rendered in Milwaukee, and urban electric railway and gas service in several of the smaller cities in the district, notably Racine and Kenosha. (See for map Chart XXXIV.) These companies are controlled through stock ownership by the North American Company, a holding company incorporated in New Jersey, with principal offices in New York. From the point of view of the diversity and extent of service, the Milwaukee property is therefore typical of the combination movement which has been going on in the public utility field for a long time. It is likewise representative of the multiplicity of problems that beset the conduct of public service enterprises. The company, and the territory in which it operates, is truly one of the main proving grounds of regulatory experiments and expedients.

Another fact makes this company an unusually good subject for study. An unbroken history since 1896, with its complement of accounting and statistical records, provides a wide factual basis for testing the results of policies. Uniform accounts and records prescribed by the Railroad Commission of Wisconsin have been punctiliously kept and expanded even beyond these standards.

In its summary report the committee concluded that it would be unwise and, in view of the state of municipal finances, impracticable to undertake at present the acquisition and operation of the utilities concerned as municipal enterprises. It recommended, however, that the city council authorize the committee to enter into negotiations with the company with the

view of drafting an operating agreement which would embody all the necessary elements of a complete regulatory program, and which would transfer powers of regulation from the state to the city government.

Since no adequate legislative authority was available by virtue of which the city could enter into an agreement of this kind, an Enabling Act was drafted and submitted to the state legislature. It received the approval of that body and the Governor after certain minor amendments had been incorporated. Under the authority of this Act the council authorized the committee to draw up and negotiate the contract reprinted as Appendix A. It is the joint product of city, company and commission.

The proposed operating agreement contains all the essential elements of a Service-at-Cost contract; but the modifications introduced and the further purposes to be achieved are so important as to make the contract something more than merely a service-at-cost franchise. In fact, it constitutes a reassertion of the demand for reasonable decentralization in public utility regulation. It lays the groundwork for a more active, affirmative, and beneficent interest on the part of local government in local utilities.

It will be the purpose of this chapter to explain briefly the salient terms of this agreement, and the findings of fact underlying it. In brief, it aims to solve the problem of bringing about reasonable decentralization in public utility regulation without uprooting the state commission system. It aims also to open the way for a more active interest and participation in the affairs of this public utility by the city of Milwaukee. The company and the commission were equally in favor of the experiment.

Sec. 2. Important Provisions of the Milwaukee Operating Agreement

Any estimate or appraisal of the provisions of the Milwaukee Operating Agreement must take into account the situation of the parties during the course of the negotiations. As already indicated, in Wisconsin term franchises have been changed into indeterminate permits. Fixed fare and other provisions have been modified by commission orders. This served to place the company in a secure position in that it was not asking for an extension or modification of an expiring franchise. Its economic future was likewise assured because it had a complete monopoly of its territory, and because its future earning power was subject

to the orders of a commission whose regulatory standards were quite clearly established. Its corporate credit, already on a high plane, was protected by the diversity of its services in a territory of diversified industry. The only cloud on the financial horizon was the future of its interurban electric railway operations. The element of compulsion was, therefore, absent from the negotiations. While there had been from time to time considerable criticism of its service and of the commission's handling of the service and rate problems, the situation was not bad; and, most important of all, there was no danger of suspending service. Emergency situations like strikes, expiring franchises, long political antagonisms, impending or actual insolvency, had figured in practically all other recent negotiations of franchises in other localities. In this instance the negotiations were conducted in a spirit of reasonable accommodation and with a desire to promote common interests by all the parties concerned in the arrangement.

The preamble of the contract reflects this situation. It recites, among other things, that it is the common desire of the parties to maintain unimpaired the investment of the company and the earning power of its property. This general intention was of importance to the city in view of the provision of the contract looking toward purchase of the property by the city at a price to be determined at any time on the basis of a fixed formula, and in view of the further provision that the city might participate in the financing of the company. In order at the outset to allay all popular suspicion, the preamble definitely stated the intention of the parties that the cost of the service shall, throughout the contract period, be met only out of earnings from operation and "that the City shall in no sense guarantee the earnings."

(a) *Tenure.*

Since the indeterminate permit law was in the background of these arrangements it was possible to fix a definite period for the operating agreement itself. That term was fixed at the comparatively short period of ten years, but the contract was automatically renewed for a further ten-year period unless, at the end of any eighth year of such a ten-year term, the electors voted to terminate. This arrangement gave the contract all the strength which inhered in the indeterminate permit law. At the same time it gave the city an opportunity to withdraw upon two years' notice if the dissatisfaction should prove so general

as to result in a majority vote against the contract in a referendum election. On the other hand, successful operation would give the contract all the inertia of a going concern. The contract, of course, was terminable at any time by mutual consent or by purchase.

(b) *Property and area subject to contract.*

Owing to the fact that the city of Milwaukee has lagged in its annexation program, it comes next to New York in point of congestion. The area immediately contiguous is closely built up and its economic operations are closely tributary to the city. There are four "satellite cities" and as many villages. Together with certain intervening unincorporated sections, residential and industrial in character, the whole comprises a metropolitan district with a population in excess of 600,000. In order to anticipate imminent annexations the contract was so designed as to apply to all the properties rendering service within this metropolitan district. There was thus included urban and suburban transportation by electric railway and motor-bus, electric service for lighting and power and steam heating service. All appurtenant structures and equipment including power plants, went with the primary properties. The new Lakeside Power Station, reputed at that time to be the most modern in the country, was likewise included although owned, for convenience in financing, by another affiliated company. Interurban transport facilities of a mobile character like rolling stock were excluded. The contract provided, however, that these services should continue to enter the city and pay a rental for the use of joint facilities. Similarly, unity of operation was maintained by providing for reciprocal services, (such as the exchange of power) to be rendered by properties located inside and outside the district at rates provided for in the contract. This obligation to render reciprocal service continued in the event of purchase by the city. In this way the contract avoided disrupting an economically producing plant, maintained proper segregation of the costs of operating joint facilities, and obviated the necessity of paying heavy severance damages in the event of purchase. For it must be borne in mind that the contract gave the city the right to purchase the entire property in the district. This right cleared up an uncertainty of the indeterminate permit law which was passed at a time when utilities were still operated principally in municipal units, before the period of consolidation and of inter-city service extensions.

(c) *Value of investment.*

The appraised value of the fixed property located within the metropolitan district, as of July 1, 1925, the effective date of the contract, was tentatively set at $56,456,505, hereafter referred to as the initial value.[1] (For details see Table XXXII.) The

TABLE XXXII

TENTATIVE APPORTIONMENT OF PROPERTY ACCOUNT

T. M. E. R. & L. Co.

July 1, 1925

Utilities	*Amount*	*Per Cent.*
Railway	$23,457,678	41.55
Electric	8,722,530	15.45
Street Lighting	378,258	.67
Heating	1,524,326	2.70
Power *	13,481,813	23.88
Common	8,891,900	15.75
	$56,456,505	100.00

* This figure excludes approximately $13,500,000 of investment in power property owned by an affiliated company—Wisconsin Electric Power Co.—which is leased by T. M. E. R. & L. Co. and in all respects subject to the terms of the Milwaukee Operating Agreement.

appraised value of the entire holdings of the company in fixed property on the same date amounted to $72,211,935. The contract provided that the value of the investment at any future date should be determined by adding to the initial value the cost of all additions, extensions and improvements, and by deducting for all abandonments and replacements, either at cost if constructed since January 1, 1914, or at initial valuation if the property was in existence on that date. All changes in the property account were, of course, subject to the city's approval. When approved, they became binding upon both parties.

This accounting procedure was calculated to carry into effect what has come to be called the "prudent investment" standard of public utility valuation. To the management was left the

[1] An audit of the company's books of account had not been completed. The tentative figures are based upon an appraisal as of January 1, 1914, plus audited annual additions to property, in so far as available, up to date. A final determination of value was to be made after the audit had been completed. To this figure there would have to be added about $13,500,000, the value assigned to the property of the Wisconsin Electric Power Co. This property came under the agreement by virtue of a lease that was expressly validated and approved in the contract.

initiative in abandoning, renewing or extending the property, but the approval of the city must first be obtained before the changes could become binding under the contract. Extensions might likewise be suggested by the city but had to be approved by the company. The advisability of any step affecting the property account would thus be determined at the time change was contemplated. Anyone familiar with appraisal and valuation practice will note the significance of this procedure. It obviated the possibility that the city's representatives might, in the light of future events, challenge the wisdom of capital expenditures which good business judgment upheld at the time they were made. The same procedure applied in connection with operating expenditures. In this way the operations of the company were subjected to the process of continuous audit. No audit or engineer's inspection, coming years after the fact, could possibly apply the same rigorous tests and be as certain of its ground as one undertaken while the work was in process and the details fresh and available. The contract contemplated that suggestions looking toward an improvement in methods and practices might come from the city. The technical staff of the city was required at all times to work in close coöperation with the company's representatives, avoiding duplication of effort and yet bringing to bear the rigorous criticism and watchfulness of regulation.

The initial value was arrived at by taking an appraisal of the cost of reproduction new, prepared by the Railroad Commission of Wisconsin as of January 1, 1914, by making some minor adjustments and corrections, and by adding the net capital expenditures for the years from 1914 to 1924 as ascertained by means of an accounting audit and engineering check of actual changes in the property account. The principles guiding the *audit* of capital additions were exactly the principles which the contract contemplated should be adopted in the future. It can thus be said that, so far as the rate-base is concerned, the contract was applied retroactively to January 1, 1914, the date of the appraisal.

But the investment in fixed property did not represent the total capital of the utility. To this figure was added a sum representing the current assets or, to use an economic term, the circulating capital used in the business. In order to provide an equally flexible and simple procedure for determining this element, the contract provided a formula which was based upon (a) accounts receivable from customers, (b) cash, (c) current in-

ventory of materials and supplies, and (d) any deficit below the normal amount in the stabilizing reserve. Any tendency toward undue accumulation of items under these headings could be checked by administrative regulation. It should be noted that this formula allowed no working capital for the street railway beyond cash and materials and supplies, because it was recognized that the street railway was conducted on a cash or cash in advance basis. The deficit, if any, in the stabilizing reserve was added because such a condition indicated an excess in the cost of the service above operating revenues. (See Chart XXXVI, p. 731.) The contract specifically provided that nothing should be added for "going value". The final sum, made up of fixed investment plus working capital, became the base upon which the rate of return was calculated. It also was the price at which the city could at any time purchase the property. These valuation provisions will be further discussed in the following section.

(d) *Cost of service.*

The cost of service was defined as follows: (1) all operating expenses, taxes and rentals as approved by the city; (2) periodical credits to operating and insurance reserves as fixed in the contract, (existing regulations and practices as to credits were to remain in effect initially but could be changed from time to time as experience proved them to be either excessive or deficient; (3) an annual allowance for depreciation as fixed in the contract (this allowance could be modified by agreement or by arbitration); (4) a return upon the value of the investment as fixed in the contract. The rate of return to be allowed as a part of the cost of the service was fixed at 7.7 per cent. upon the value of the investment for the first year of operation under the contract. This rate was a weighted average made up of a rate of return of 7.5 per cent. upon the investment in railway property and 8 per cent. in electric and heating property. These were the returns hitherto allowed by the Railroad Commission of the state and only departed from in emergencies. For any year subsequent to the first, the rate of return was computed in accordance with a formula which was based upon variations in the cost of borrowed capital. This formula was explained in Chapter XIX and will be dealt with further in the next section.

The contract fixed the amount of accrued depreciation attributable to the value of the investment as of the date of the contract and this sum was set up in a depreciation reserve. For each

future year, until changed as provided for, the accruing depreciation was fixed at the rate of 2.82 per cent. of the current value of the investment in fixed property. Upon the balances in operating reserves a stipulated interest rate was credited; in the case of the depreciation reserve interest was credited to that reserve, in the case of operating reserves it was credited to the particular reserve affected. These interest payments constituted a deduction from the rate of return.

(e) *The fixing of service rates.*

Rates were at all times to be so adjusted as to produce sufficient income to meet the cost of the service. A stabilizing reserve was set up among operating reserves at a figure which served as a "bench mark" in measuring the flow of revenues in relation to the cost of service. Hence the contract provided that changes in rates must follow variations in the flow of net revenues. The schedules of rates which would become successively effective were provided in advance by agreement between the management and the regulating authority. It should be recalled again that this arrangement was not a guaranty of the cost of the service. If higher rates did not yield the flow of income required, the deficiency registered itself in a lessened surplus available for dividends. This element of risk was inherent in the business and was not assumed by the city.

The question of discrimination in rates was handled by means of administrative regulation. Rates applying outside of the city limits were fixed by the Railroad Commission, although they would follow the terms laid down in the contract previously approved by the state. The city and the company would thus be joined in defending the terms of the agreement. Inside the city limits, however, the city had original jurisdiction, although customers might appeal to the Railroad Commission on the issue of discrimination.

(f) *Control of operation.*

It was not the intention of the contract to empower the city to execute any work upon or to operate the properties subject to the contract. A provision for corporate autonomy segregated regulatory from operating functions. Regulatory functions in the hands of the city included (1) control of all intra-metropolitan district service, (2) control, by way of approval, of all expenditures both capital and operating, (3) review and inspec-

tion of accounts, records, operations and practices, and (4) control over extensions.

The kind and quality of the service to be rendered was subject to city specification with the proviso, of course, that such service could be paid for out of earnings under existing rates or other rates to be authorized.

Additions, extensions or improvements of fixed property might be proposed by either party but must be approved also by the other party. Disapproval by the city was final. Disapproval by the company would have to be premised upon a contention that the capital expenditure would not prove compensatory and was not reasonably required to meet the convenience and necessities of public service. In other words, the over-all earning capacity of the property would have to be jeopardized before the company's disapproval could be maintained. In this way the earning capacity of a particular extension could not be made the issue. In the event of disagreement the issue was to be submitted to arbitration. However, a particular extension proposed by the city, even though deemed unprofitable in the above sense, if found by the arbitration authority to be capable of operation as a segregable and independent unit, might be (1) constructed or acquired by the city or (2) constructed by the company out of city funds. In either event, operation by the company was compulsory under a leasing arrangement which provided that the full cost of the service must first be met out of the additional revenues to be derived from operating the extension in question, and that thereafter the rental must be a balancing amount with a nominal minimum of one dollar per annum. This provision was designed primarily from the street railway standpoint and looked toward the ultimate need for additional surface or rapid transit lines. It also looked to the possibility of generating by-product power in connection with garbage disposal or of coördinating municipal functions generally with service rendered by the company's property. The contract aimed to forestall future difficulties such as arose in Philadelphia, Detroit, Toronto, New York and elsewhere, when it was discovered that city-built facilities could not be operated economically by themselves but would have to be operated in conjunction with the utility system to which they appertained. It was also contemplated that transit facilities might be financed, at least in part, as local improvements by means of special assessments, although this was not referred to in the contract.

(g) *Machinery of control.*

The agreement provided for the creation, by separate ordinance, of the office of Public Utility Commissioner, whose duty was the administration of the agreement. Salaries and expenses of the commissioner and his staff were to be paid by the company and charged as an operating expense, with the limitation that they might not exceed one-third of 1 per cent. of the annual gross operating revenues in the metropolitan district. This left the city free to adjust relations with its own employees.

Whenever, in the administration of the contract, disagreements arose between the city and the company, the particular issue could be submitted to arbitration. The arbitral authority might be either a temporary board or the Railroad Commission, at the option of the city. In certain classes of cases the dispute had to be referred to the Railroad Commission, and in cases involving wages or conditions of employment, to the State Board of Conciliation. By restricting the scope of the issues to be submitted and by provisions for summary awards, it was expected that disputes would be limited in number and duration. The initial valuation, the rule for determining the future value of the investment, the formula governing the rate of return, the city's control over service, its right to purchase the property and the rules for computing the purchase price, were subjects outside the purview of the arbitration arrangements.

Any failure of the company to comply substantially with the terms and conditions of the contract was subject to a penalty clause equal in severity to that embodied in the Railroad Commission Act. Fines imposed were payable to the city and would come out of the fixed return.

(h) *Municipal purchase and financing provisions.*

The agreement contemplated that the city might become a creditor, a part owner or a purchaser of the property. The creditor relationship centered about a provision which created a Municipal Mortgage, the lien of which attached to all property of the company "then owned or thereafter acquired" subject to the contract. The lien of the Municipal Mortgage was subject to the prior lien of all outstanding mortgages. Bonds issued under this mortgage were payable *twenty years after the date of termination of the contract,* and bore interest at 5 per cent. They could be issued only to the city and were not negotiable until the contract was terminated.

The city was given the first option, under reasonable restric-

ons, to purchase specified amounts of either the bonds of any rthcoming issue under the company's prior lien mortgages, bonds issued under the Municipal Mortgage. If the city sired, it could also provide the company with cash in consid-ation of credits to a City Equity Account. Except for the irpose of refunding outstanding securities, the company reed not to employ funds, obtained by the sale of Municipal ortgage bonds, outside the metropolitan district.

When as a result of operation it was found that the balances the Depreciation Reserve were in excess of reasonable require-ents the surplus was to be retained in the business and funded the issuance of Municipal Mortgage Bonds, or, at the election the city, credited to the City Equity Account.

The partnership relation centered in the City Equity Ac-unt. This account was opened to record all indebtedness to e city not otherwise provided for. In the event of the disso-tion of the company the city would be paid the credit balance this account before any assets were distributed to the holders the common stock. The arrangement of the priorities was follows: (a) company's senior mortgage indebtedness; (b) unicipal Mortgage indebtedness, (c) the claims of holders of eferred capital stock, (d) the City Equity Account, (e) the mmon stock. If the contract was terminated in any other anner than by purchase, the credit balance in the City Equity ccount was to be liquidated at the option of the company ther in cash or bonds or both; if liquidated in bonds, the city ight elect to receive bonds either under the Municipal Mort-ge or under a designated senior mortgage. Upon the credit lance of the City Equity Account the city was to receive iarterly interest payments in amount equal to the weighted erage dividend rate upon preferred stock. The city was also ven the option to provide the company with cash in lieu of e issuance by the company of preferred capital stock or the curring of unsecured indebtedness, the cash amounts so paid be credited in the City Equity Account. The use of funds pplied through the medium of the City Equity Account was ewise limited to the metropolitan district, except for refund-g operations.

The city was empowered to purchase the property subject to e contract *as an entirety at any time* upon giving six months' tice. The purchase price was computed by debiting the city ith the then value of the investment and crediting the city ith the following: (a) the credit balance in the Depreciation

Reserve, (b) the credit balance in the operating reserves to the extent to which assets secured by such reserves were purchased or liabilities were assumed, (c) the credit balance above the initial amount in the Stabilizing Reserve, (d) the principal and accrued interest of mortgage bonds surrendered by the city to the company, (e) the credit balance and unpaid interest of the City Equity Account released by the city to the company, (f) the balance of any other unpaid current indebtedness plus accrued interest. The difference between the above debit and the above credits was the balance of the purchase price which would have to be paid in cash. The company would thereupon turn over the property to the city, free and clear of all liens except such from which the company could not lawfully secure a release. In that event the city assumed the indebtedness secured by such unreleased liens and the cash payment was reduced by an equal amount. In addition to the fixed property the company was required to turn over materials and supplies and accounts receivable arising out of contract operations equal in amount to the current allowance for working capital.

Sec. 3. An Appraisal of the Provisions of the Milwaukee Contract

(a) *Fundamental purposes.*

The service-at-cost idea has been implicit in the work of the Railroad Commission of Wisconsin from its inception.[2] For this reason the operations of the Milwaukee Electric Railway and Light Company have, on the whole, been developed in conformity with this standard. In the proposed contract, however, this cost principle was converted from an amorphous into a crystalline form. For it must be confessed that impatience with the uncertainties of commission and court procedure, the endless chain of misunderstandings, and the evasion of issues characteristic of legal opinions, had much to do with the formulation of terms.

Briefly stated, the agreement provides a plan which gives free scope for an orderly unfolding of public policy. The essentials of that policy are:

(1) That the supply of public utility services under modern conditions is a function of government which it may perform

[2] *Cf. Buell* v. *C. M. St. P. Ry. Co.*, 1 W. R. C. R., 324 (1906); *Hill* v. *Antigo Water Co.*, 3 W. R. C. R. 623 (1908).

directly or which it may delegate to a quasi-public corporation under a franchise.

(2) That the franchise should be exclusive; the monopoly principle should be adopted for the purpose of securing the best organization of the factors of production. At the same time the contract limits the monopoly power by means of a regulatory process that enforces reasonable service standards and fixes rate schedules that will yield earnings no greater than are necessary to enable the franchise holder to perform efficiently these public functions.

(3) That conditions may arise which will make difficult, if not impossible, the rendering of adequate service by private initiative alone. Provision must therefore be made for a blending of private with public finance. The city, acting in its proprietary capacity, may assume risks as a creditor or part-owner, or both.

(4) That the city may desire to resume in its entirety the duty of furnishing these public services. Hence a method must be provided whereby private investment may be retired and the property pass into public hands with the least possible delay, cost, and friction.

(5) That transportation, lighting, heating and power services are best rendered under conditions of joint operation and that all of these services must therefore be included in the contract.

(b) *Current criticisms of service-at-cost contracts.*

Criticism of service-at-cost franchises, as already stated, has centered very largely upon the valuation assigned to the property and upon the rate-of-return allowed on this basis. The charge is that the valuations and rates-of-return are too favorable to the companies because all franchises, except the Cleveland franchise, have been formulated at a time when commodity prices and money rates were high.

It may be of interest, therefore, to analyze critically the valuation and rate-of-return provisions of the Milwaukee agreement. The initial value is based upon an appraisal of the cost of reproduction new of the property as of the inventory date, January 1, 1914.[3] However, it must not be assumed that the property was

[3] This date is, of course, purely constructive. As a matter of fact, the inventory was taken during a period of about 13 months, a part of the operation falling even in the year 1913. It is a commentary upon the inexact methods adopted by even the best commissions that, in applications involving rates, the Railroad Commission of Wisconsin has always based its valuations upon this appraisal, adding each year's additions as per books, without at-

appraised at prices ruling at this date. The commission actually applied the *normal cost of reproduction theory,* in accordance with which the unit prices applied often vary widely from prices ruling at the date of inventory.

The normal cost of reproduction theory in the case of the Milwaukee properties was taken by the Railroad Commission in its pre-war sense. It is clear, therefore, that the price level upon which this appraisal rests is lower than the price index for construction in 1914.

Moreover, the commission's engineers did not apply the "substitute plant" theory, but rather the "equivalent plant" theory in interpreting what is "property used and useful" in the public service. Wherever possible the construction experience of the company was taken as a guide. These modifications and improvements, as compared with the cost of reproduction theory in its crude form, tended to place the Milwaukee appraisal upon a basis approximating the historical cost.

(c) *Investment as a standard of value.*

In order to throw some light upon the question of the present reasonable investment in the properties, the various audits available for different periods of the company's history were analyzed and brought together into chronological sequence. This involved making additional audit inspections of the books and effecting certain reconciliations. These were then combined with an adjudicated finding by a federal court of the reasonable investment in the property in 1897 when the property was not very extensive. The resultant figure of historical investment closely approximated the figure obtained from the appraisal, as is shown in Table XXXIII, p. 717.

The city's representatives contended that the historical cost should be the basic standard of value. The company's representatives were committed to the cost of reproduction. In the end the parties agreed that the appraisal of 1914 should be taken as a starting point because investigation developed the fortuitous circumstance that the two bases yielded nearly the same results. The recommendations of the city's committee were to the effect that the city adhere to the basis of investment in its negotiations with the company as to property values. After a series of conferences, this recommendation was finally accepted by the company as a matter of principle.

tempting to correct for the overlapping of the two operations or to audit the additions.

TABLE XXXIII

ANNUAL ADDITIONS TO PROPERTY AND PLANT

THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY
and
MILWAUKEE LIGHT, HEAT & TRACTION COMPANY *

Year Ending	*Combined Companies* Total Amount	*T.M.E.R.& L.Co.* Amount	*M. L. H. & T. Co.* Amount
Dec. 31, 1897.....	$ 9,209,883.14	$ 8,344,515.64	$ 865,367.50
1898.....	602,930.38	281,935.89	320,994.49
1899.....	1,733,040.30	795,546.94	937,493.36
1900.....	816,759.59	710,998.11	105,761.48
1901.....	919,351.85	739,223.35	180,128.50
1902.....	1,417,328.73	959,086.05	458,242.68
1903.....	1,410,463.02	1,211,090.56	199,372.46
1904.....	1,674,906.41	1,160,890.36	514,016.05
1905.....	1,745,454.03	777,044.73	968,409.30
1906.....	2,148,274.38	1,029,514.82	1,118,759.56
1907.....	1,709,518.70	597,471.28	1,112,047.42
1908.....	1,164,725.18	316,718.61	848,006.57
1909.....	2,234,275.84	986,421.46	1,247,854.38
1910.....	1,156,502.39	951,200.97	205,301.42
1911.....	2,877,022.41	2,539,927.88	337,094.53
1912.....	1,907,783.00	1,649,694.43	258,088.57
1913.....	3,540,724.64	3,053,023.31	487,701.33
Jan. 1, 1914, as per books adjusted	$36,268,943.99	$26,104,304.39	$10,164,639.60
Jan. 1, 1914, as per appraisal	36,459,537.00	26,109,872.00	10,349,665.00
Excess of Appraisal over Historical Cost	$190,593.01	$5,567.61	$185,025.40

* An affiliated company, since 1919 merged with T. M. E. R. & L. Co. Only a portion of its property is located in the Metropolitan District.

(d) *The Theory of Public Utility Valuation Embodied in the Contract.*

The Milwaukee contract contemplates that the property of the company shall be treated in accordance with the going concern theory of regulation. The rate of return is applied to a "rate-base" which is the historical cost of assembling the technical plant and business. The rate-of-return is adjusted in accordance with ruling money rates. The old capital, it is true,

has been "sunk" in these enterprises and cannot readily escape. But the market price of the securities will reflect the conditions obtaining in the money markets, being either above or below par value, so as to make the yield rates of the securities conform to the "going rates" for similar investments. New capital cannot be attracted and old capital cannot be indefinitely retained upon a basis of return that is no longer adequate. Increased money rates require increased returns upon capital which otherwise may be withdrawn from the industry. Similarly, customers should be given the benefit of favorable turns in the money market.

In the Milwaukee contract the significant departure from current practice under the system of regulation by state commission consists (1) in adopting the going concern point of view, (2) in founding the "rate-base" upon stabilized investment costs, and (3) in providing for an automatic adjustment of the rate of return as part of the cost of the service, *according as higher or lower money rates actually impinge upon the going concern.*

(e) *Continuous Audit and Engineering Inspection.*

The contract sets up an initial value as the investment in the fixed property. Its relationship to the valuation problem as currently treated by courts and commissions has been explained above. Contrasting with this shifting basis of valuation, the contract provides a valuation rule which is agreed upon between the parties. This rule had already been applied in the determination of the cost of the property which was added since the inventory was taken in 1914.

The results of this audit for each year are summarized in Table XXXIV, p. 719.

The nature of the adjustments may be explained as follows:

(1) Errors of accounting theory or of clerical accuracy. These are too various and technical to permit of inclusion here. It is sufficient to remark that the entire accounting regimen of the company, so far as it affects these transactions, was overhauled and adjusted to promote the successful application of the valuation rule. In this effort the city's representatives were aided by representatives of the company, and the results were given official status through a detailed check and formal approval by the Railroad Commission. These adjustments were not made

TABLE XXXIV

ADJUSTMENTS IN PROPERTY ACCOUNT

T. M. E. R. & L. Co. and M. L. H. & T. Co.

	Corporate Fixed Property Account	*Engineering and Accounting Adjustments*	*Corporate Fixed Property Accounts as Adjusted*
1914 Valuation Excl. of Materials & Supplies — *Operating*	$35,802,867.00	$ 46,485.00	$35,756,382.00
Non-Operating	656,670.00	41,775.00	614,895.00
Total	36,459,537.00	88,260.00	36,371,377.00
Yearly Book Additions 1914	858,160.86	55,068.66*	803,092.20
" " " 1915	674,601.70	88,081.66	762,683.46
" " " 1916	1,292,113.56	59,509.44	1,351,623.00
" " " 1917	3,396,697.30	54,299.27*	3,342,398.03
" " " 1918	1,723,332.47	127,766.85*	1,595,565.62
" " " 1919	1,410,384.21	82,183.33*	1,328,200.88
" " " 1920	5,225,880.49	97,348.76*	5,128,531.73
" " " 1921	3,855,323.73	423,541.32*	3,431,782.41
Sub-total	54,896,031.32	780,876.99*	54,115,154.33
Yearly Book Additions 1922 †	5,459,081.14	.....	5,459,081.14
" " " 1923 †	5,844,745.76	.....	5,844,745.76
" " " 1924 †	4,595,074.04	.....	4,595,074.04
Budget 6 months .... 1925 †	2,619,431.00	.....	2,619,431.00
TOTAL	73,414,363.26	780,876.99*	72,633,486.27

* Deductions.
† Adjustments not yet determined.

ex parte but were arrived at in conferences between representatives of company, the city and the commission.

(2) Adjustments arising out of the practical need of working out a transition from the policy of periodical physical valuation to one in which a particular valuation becomes the starting point for a continuous accounting of capital expenditures under a rule of contract. These adjustments were largely engineering adjustments and relate to material and labor quantities, supervision and engineering overheads, the proper segregation of maintenance items from reconstruction items.

The final apportionment of fixed property values within the metropolitan district was not made but awaited the formal adoption of the contract. A tentative apportionment, showing the significant property groupings into which the total value of

the investment would ultimately be divided, was given in Table XXXII.

Power property is used in common and was treated as if it were a separate utility—wholesaling its power on a complete cost-of-service basis to the primary distributing utilities. This segregation suggests some of the accounting and statistical arrangements which would be necessary to proper administration of the contract. A permanent property record would also have to be maintained.

(f) *Aspects of public finance.*

The provisions of the agreement relating to municipal participation in financing were intimately bound up with the rate-of-return formula. When funds are furnished through municipal credit, and invested in bonds under the Municipal Mortgage in an amount equal to twice the amount of a similar investment in the City Equity Account, the company is entitled to only half the normal differential rate indicated for the then current interest rate. In other words, upon every dollar of investment represented by indebtedness to private persons the company will secure a differential return for management and risk-taking of say, 2 per cent. The company will secure a differential return of only 1 per cent., however, upon every dollar of investment represented by indebtedness to the city under the restricted conditions of the Municipal Mortgage, provided further that the city has accepted a partner's responsibility for half that amount under the conditions applying to the City Equity Account. This feature may be called "the half-differential device." This device is an inducement to city investment and the benefit goes to consumers. It is subject to the limitation, however, that the reduction in return to the company shall not operate to make the return available for dividends upon the common stock to less than the rate of return payable upon funds in the City Equity Account. (See Table XXXV, p. 721.)

In order to prevent undue "trading on the equity" and to insure its credit standing in other respects, the company agreed to maintain a proportion of share capital to loan capital of not less than 30 per cent.

The question may be asked: Why was the normal rate of return fixed at 7.70 per cent. when the index interest rate stands at 5.7 per cent.? The answer is that in order that negotiations might come to a successful issue the negotiators had agreed upon the premise that the existing situation must be recognized; that

TABLE XXXV

RATE OF RETURN FORMULA[1]

Applying on

A. Company Investment Normal Rate of Return			*B. City Investment* Contingent Rate of Return[3]		
(a) Index Interest Rate[2]	(b) Normal Differential	(c) Rate of Return	(d) Interest on Mun. Mortgage	(e) Alternative Differential[4]	(f) Normal Differential[5]
6.30%	1.70%	8.00%	5.00%	0.850%	1.70%
6.20	1.75	7.95	5.00	0.875	1.75
6.10	1.80	7.90	5.00	0.900	1.80
6.00	1.85	7.85	5.00	0.925	1.85
5.90	1.90	7.80	5.00	0.950	1.90
5.80	1.95	7.75	5.00	0.975	1.95
5.70	2.00	7.70	5.00	1.000	2.00
5.60	2.05	7.65	5.00	1.025	2.05
5.50	2.10	7.60	5.00	1.050	2.10
5.40	2.15	7.55	5.00	1.075	2.15
5.30	2.20	7.50	5.00	1.100	2.20
5.20	2.25	7.45	5.00	1.125	2.25
5.10	2.30	7.40	5.00	1.150	2.30
5.00	2.35	7.35	5.00	1.175	2.35
4.90	2.40	7.30	5.00	1.200	2.40
4.80	2.45	7.25	5.00	1.225	2.45
etc.	etc.	etc.	etc.	etc.	etc.

[1] The gross return is the total of amounts derived by applying to the company's investment the rates specified in columns (c) and to the city's investment the rates specified in columns (d) and (f) or in (d) and (e). In computing the gross return, the credit balance in the City Equity Account is treated as company investment.

[2] When Index Interest Rate exceeds 6.30% contracting parties shall agree to an emergency rate of return or, failing to agree, the emergency rate of return shall be fixed by Railroad Commission.

[3] Contingent Rate of Return may not reduce Normal Rate of Return so as to reduce dividend rate on outstanding common stock below rate of interest then currently paid on City Equity Account.

[4] To be applied on Municipal Mortgage Bonds in amount equal to twice credit balance in City Equity Account.

[5] To be applied on Municipal Mortgage Bonds in excess of twice credit balance in City Equity Account, if any.

is, the rights to which the company was entitled under the alternative process of state regulation must at least be the point of departure.

In Chapter XIX and Table XVIII, p. 418, are given the facts as to effective interest rate, the actual return earned upon capital, and the return as fixed by the Railroad Commission. The figures indicate the divergence between what regulation aims at in theory and what regulation accomplishes in practice. Regulation

of rates, as now administered, is merely a qualitative and quantitative *test,* undertaken periodically, of the reasonableness of rates. The operating agreement proposes to change this testing process into one of continuous accounting upon the basis of continuously operative principles agreed upon in advance.

A few comments should be added about the provisions relating to municipal financing. It is an unquestioned fact that the credit of the city of Milwaukee, judged by the interest rate paid upon municipal indebtedness, is superior to the borrowing position of the company.[4] This advantage rests upon the taxing power of the city, upon the constitutional and statutory limitations as to municipal indebtedness, and upon the fact that municipal securities are tax exempt. It is certain, however, that there will always be a margin of advantage in municipal borrowings regardless of legislation changing the status of these securities as to tax-exemption in the future. The contract aims to use this advantage in financing the properties in the future, but under such conditions that the advantage will be a benefit to consumers in improved service or reduced rates. Nor will the interest charge become a burden upon the fiscal machinery of the city. The purchase of bonds by the city and the investment of its funds in the City Equity Account are credited as a part-payment when the city exercises its purchase option. Until the city purchases, it remains in the position of a creditor. Not the least important consideration in this connection is the thought that the city, as a regulating authority, is put in the position of being able affirmatively to challenge the terms of any contract for the loan of money from private sources. The determination of what is a reasonable rate for money has proven one of the most illusive problems in regulation and, at the same time, one most affected by wide-spread popular suspicion. By giving the city an option to participate in financing, the contract sets up machinery which can prevent extortion in the adjustment of the utility's investment bargain.

(g) *Treatment of Depreciation.*

The proposed Milwaukee agreement assumed that depreciation reserves are merely convenient devices for the following operations:

[4] See figures published in the *Institute News* for Sept., 1923, of "Institute for Research in Land Economics and Public Utilities," where the same methods have been applied and the facts ascertained for a much wider range of security issues.

1. The measurement as accurately as possible of the periodical wastage of capital chargeable against the operations of a given period.
2. The reservation out of earnings of funds sufficient to provide for the replacement of the physical capital but under such conditions as to permit of a credit to property and plant account of the *cost* of property removed or retired and of a concurrent charge to depreciation reserve. The cost of removing property is charged to operating expense. The new unit of property, if the operation is one of replacement, is charged to plant account at its cost.
3. The measurement of the extent to which the customers, taken collectively, have fulfilled their accruing obligations to provide earnings, not for *amortization* of the capital fund, but for its *maintenance.*

The rate-base, therefore, is not the investment less accrued depreciation, but the investment undiminished by accrued depreciation. The balance of the depreciation reserve at any time represents a capital fund contributed in advance of its actual use, but as part of an accounting régime. The utility, which may meanwhile use these funds for investment in additional assets, is required to credit to the reserve a fair interest return.[5] This reduces the depreciation requirement by the amount of the anticipated interest and lessens the cost of the service to the same extent. Since the rate of return is applied to a rate-base which includes also the investment in assets acquired out of depreciation reserve accruals, the interest accretions to the reserve are analogous to interest payments upon borrowed capital. The difference between the amount paid in interest and credited to the reserve and the amount earned by way of return is the company's profit. The investment in assets offsetting the reserve is thus labeled as an investment coupled with a condition. They become a part of its property as a "going concern," but nevertheless it is a qualified ownership. The original umbra of investment in physical property is surrounded by a penumbra of re-invested earnings in additional physical property, the cost of which is equal at any time to the balance in the reserve. The property, by anticipating renewal charges, has cast its shadow before. Analogous treatment, of course, is accorded all operating reserves. By parity of reasoning, when the property is sold to the city under the purchase provisions, the depreciation reserve liability is deducted from the value of the investment. Upon purchase the city assumes the liability of the company to fulfill the condition with which the company's qualified property

[5] The contract, as drafted, is defective because the interest allowed upon the balance in the depreciation reserve ought to have been made equal to the index interest rate.

in depreciation reserve balances is coupled, that is to say, to renew the physical property as it wears out.

Under the contract the treatment of the value of the investment, of the rate of return and of depreciation is intimately connected. Changing price levels, as reflected in the capital account, are related by means of the index interest rate with the changing cost of capital. The depreciation reserve registers the turnover of the actual cost of the physical property while the reserve automatically adjusts itself to changes in the investment. Changes in the investment may be due either to the growth or decline in the extent of the property or to changes in the level of prices, or to both of these factors.

Accountancy thus becomes a true hand-maiden in making effective the going concern theory of regulation. The appraisal of physical property was useful only in providing a starting point.

Sec. 4. **Probable Operating Results**

In order to illustrate how the contract will work out in practice, the terms of the contract have been applied to the actual results of operation for the years 1923 and 1924. These were normal years from the point of view of business conditions in the Milwaukee district. No changes in rates occurred during these years, so that the flow of revenues was not affected by abnormal or unusual circumstances.

The accounting classification of the company permits a segregation of the revenue receipts for the following geographical districts:

1. Railway and bus transportation.
   (a) Single-fare area (substantially coterminous with the city of Milwaukee).
   (b) Suburban zones (exactly coterminous with the metropolitan district).
   (c) Interurban system (outside the contract area).
   (d) City of Racine (outside the contract area).
2. Electric utility.
   (a) City of Milwaukee.
   (b) Outside of Milwaukee.
3. Heating utility.
   (a) City of Milwaukee.

In order to segregate the gross revenues of the company which would have accrued under the contract, it was necessary only to divide one of the above items (2-b)—electric system outside

TABLE XXXVI

INCOME ACCOUNT—T. M. E. R. & L. Co.

Year—1923

In accordance with Milwaukee Operating Agreement

	Milwaukee Metropolitan District					*Operations Outside Milwaukee Metropolitan District*					
	Quarter-Year ending Mar. 31, 1923	Quarter-Year ending June 30, 1923	Quarter-Year ending Sept. 30, 1923	Quarter-Year ending Dec. 31, 1923	Year Dec. 31, 1923	Quarter-Year ending Mar. 31, '23	Quarter-Year ending June 30, 1923	Quarter-Year ending Sept. 30, 1923	Quarter-Year ending Dec. 31, 1923	Year Dec. 31, 1923	Corporate Year Dec. 31, 1923
Operating Revenues	$ 4,891,195.98	$ 4,411,381.56	$ 4,113,645.67	$ 4,763,510.21	$18,179,733.42	$973,889.59	$ 988,876.52	$1,077,653.99	$ 986,647.18	$4,027,067.28	$22,206,800.70
Non-Operating Revenues	32,444.93	35,485.42	18,839.12	35,010.39	121,779.86	24,932.60	34,961.84	47,804.05	44,663.50	152,361.99	274,141.85
Total	4,923,640.91	4,446,866.98	4,132,484.79	4,798,520.60	18,301,513.28	998,822.18	1,023,838.36	1,125,458.04	1,031,310.69	4,179,429.27	22,480,942.55
Operating Expenses											
Way & Structures	85,748.89	94,289.68	100,658.45	101,486.01	382,183.03	37,727.00	51,488.47	47,117.30	40,231.54	176,564.31	558,747.34
Equipment	221,679.44	220,428.20	207,310.76	193,904.28	843,322.68	68,442.15	64,217.88	81,785.18	69,345.16	283,790.37	1,127,113.05
Traffic & Transportation	838,442.09	839 910.93	849,973.09	824,208.58	3,352,534.69	164,467.72	182,373.45	199,021.80	180,980.10	726,843.07	4,079,377.76
Power	1,435,705.04	1,231,923.53	1,103,621.55	1,311,291.39	5,082,541.51	438,417.87	406,633.51	448,674.74	448,851.47	1,742,577.59	6,825,119.10
Superintendence	37,354.22	36,115.81	38,175.76	41,667.12	153,312.91	6,993.33	7,685.67	7,830.15	7,532.17	30,041.32	183,354.23
Distribution	86,608.93	78,079.71	74,842.20	82,613.06	322,148.90	10,750.68	13,827.37	12,403.51	12,530.15	49,511.71	371,660.61
Utilization	64,351.77	51,123.47	43,361.82	62,897.67	221,734.73	18,687.46	9,781.33	12,370.18	17,100.69	57,939.66	279,674.39
Commercial	103,156.41	97,940.92	110,624.98	62,929.55	374,651.86	20,437.54	20,752.99	24,923.82	9,129.97	75,244.32	449,896.18
General Expenses	87,106.90	84,455.75	74,339.84	73,500.69	319,403.18	7,544.19	41,969.08	10,291.14	5,976.34	65,780.75	385,183.93
Injuries & Damages	133,196.19	127,196.96	121,569.06	186,685.53	568,647.74	19,094.78	12,633.57	25,234.22	20,235.61	77,198.18	645,845.92
Other Undistributed	34,093.51	32,658.98	26,720.17	17,099.09	110,571.75	*206.19*	358.06	3,347.57	*3,550.75*	7,050.19	117,621.94
Depreciation	314,194.24	318,648.18	326,699.63	336,331.51	1,295,873.56	82,412.49	36,768.51	35,070.58	71,212.93	225,464.51	1,521,338.07
Taxes	241,448.49	243,528.07	243,887.90	222,258.08	951,122.54	80,971.31	83,707.59	51,291.05	*59,744.96*	156,224.99	1,107,347.53
Total	3,683,086.12	3,456,300.19	3,321,785.21	3,516,877.56	13,978,049.08	955,740.33	932,197.48	959,361.24	826,931.92	3,674,230.97	17,652,280.05
Net Operating Revenues	1,240,554.79	990,566.79	810,699.58	1,281,643.04	4,323,464.20	.....	.....	.....	.....	505,198.30	4,828,662.50
Return on Investment	941,941.90	1,000,455.65	1,040,063.20	1,102,774.88	4,085,235.63	.....	.....	.....	.....	.....	.....
Current Surplus	298,612.89	*9,888.86*	*229,363.62*	178,868.16	238,228.57	.....	.....	.....	.....	.....	.....
Valuation											
Fixed	47,626,928.81	48,258,692.63	49,400,742.60	50,766,966.84	.....	.....	.....	.....	.....	.....	.....
Working Capital	4,074,942.93	4,169,220.30	4,818,634.32	6,654,269.56	.....	.....	.....	.....	.....	.....	.....
Total	51,701,871.74	52,427,912.93	54,219,376.92	57,421,236.40	.....	.....	.....	.....	.....	.....	.....
Index Interest Rate	5.644%	5.565%	5.646%	5.663%	.....	.....	.....	.....	.....	.....	.....
Differential	2.028	2.068	2.027	2.019	.....	.....	.....	.....	.....	.....	.....
Rate of Return	7.672	7.633	7.673	7.682	.....	.....	.....	.....	.....	.....	.....
Stabilizing Reserve	$ 700,000.00	$ 998,612.89	$ 988,724.03	$ 759,360.41	.....	.....	.....	.....	.....	.....	.....
Current Surplus	298,612.89	*9,888.86*	*229,363.62*	178,868.16	.....	.....	.....	.....	.....	.....	.....
Total	998,612.89	988,724.03	759,360.41	938,228.57	.....	.....	.....	.....	.....	.....	.....

TABLE XXXVII

INCOME ACCOUNT—T. M. E. R. & L. Co.

Year 1924

In Accordance with Milwaukee Operating Agreement

	Milwaukee Metropolitan District					*Operations Outside Metropolitan District*					
	Quarter Year Mar. 31, 1924	Quarter Year June 30, 1924	Quarter Year Sept. 30, 1924	Quarter Year Dec. 31, 1924	Year Ending Dec. 31, 1924	Quarter Yr. Mar. 31, '24	Quarter Yr. June 30, '24	Quarter Yr. Sept. 30, 1924	Quarter Yr. Dec. 31, 1924	Year Ending Dec. 31, 1924	Corporate Year Dec. 31, 1924
Operating Revenues	$ 5,223,491.09	$ 4,503,231.46	$ 4,068,037.25	$ 4,912,328.75	$18,707,088.55	$964,502.13	$933,320.21	$ 990,600.22	$ 964,401.04	$3,852,823.60	$22,559,912.15
Non-Operating Revenues	50,128,77	22,696.24	26,207.18	33,796.66	132,828.85	11,426.14	43,636.94	28,379.16	36,613.04	120,055.28	252,884.13
Total	5,273,619.86	4,525,027.70	4,094,244.43	4,946,125.41	18,839,917.40	975,928.27	976,957.15	1,018,979.38	1,001,014.08	3,972,878.88	22,812,796.28
Operating Expenses											
Way & Structures	119,109.67	102,163.45	85,848.78	94,233.05	401,354.95	40,573.98	52,443.42	37,917.54	35,022.88	165,957.82	567,312.77
Equipment	246,986.93	222,644.34	194,419.48	182,813.86	846,864.61	66,363.64	67,412.71	54,762.55	54,040.37	242,579.27	1,089,443.88
Traffic & Transportation	933,259.76	865,230.95	806,667.56	807,775.25	3,412,933.52	152,783.85	164,988.49	169,813.17	183,271.46	670,856.97	4,083,790.49
Power	1,440,151.02	1,167,918.82	1,001,858.30	1,190,575.56	4,800,503.70	337,763.54	313,151.70	335,076.67	295,064.17	1,281,056.08	6,081,559.78
Distribution	140,192.85	129,633.37	131,035.36	127,379.87	528,241.45	16,128.79	25,419.03	25,480.66	21,943.27	88,971.75	617,213.20
Utilization	59,329.34	65,517.78	52,209.40	72,085.54	249,142.06	14,664.02	12,225.80	13,150.09	15,951.56	55,991.47	305,133.53
Commercial	112,673.90	99,593.92	100,043.13	78,876.00	391,186.95	19,319.53	18,496.04	21,881.32	13,484.49	73,181.38	464,368.33
Gen'l & Undist. Exp.	114,050.95	109,143.53	102,864.20	73,557.89	399,616.57	26,399.94	43,603.90	49,734.13	41,715.41	161,453.38	561,069.95
Injuries & Damages	141,952.33	126,145.72	116,568.15	232,869.52	617,535.72	17,994.16	19,657.94	22,832.37	17,685.54	78,170.01	695,705.73
Depreciation	343,428.21	349,429.08	377,658.86	383,523.97	1,454,040.12	43,265.47	43,265.47	43,265.48	43,265.47	173,061.89	1,627,102.01
Taxes	278,104.66	278,562.86	284,104.91	293,151.81	1,133,924.24	81,599.42	86,032.32	83,637.51	75,691.94	326,961.19	1,460,885.43
Total	3,929,239.62	3,515,983.82	3,253,278.13	3,536,842.32	14,235,343.89	816,856.34	846,696.82	857,551.49	797,136.56	3,318,241.21	17,553,585.10
Net Operating Revenue	1,344,380.24	1,009,943.88	840,966.30	1,409,283.09	4,604,573.51	.....	.....	.....	.....	654,637.67	5,259,211.18
Return on Investment	1,095,543.65	1,101,922.75	1,115,520.83	1,133,987.09	4,446,974.32	.....	.....	.....	.....	.....	.....
Current Surplus	248,836.59	91,978.87	274,554.53	275,296.00	157,599.19	.....	.....	.....	.....	.....	.....
Revaluation											
Fixed	51,773,591.83	52,624,778.82	53,568,632.39	54,400,562.95	.....	.....	.....	.....	.....	.....	.....
Working Capital	5,539,714.12	4,986,036.73	4,896,819.92	5,005,479.49	.....	.....	.....	.....	.....	.....	.....
Total	57,313,305.95	57,610,815.55	58,465,452.31	59,406,042.44	.....	.....	.....	.....	.....	.....	.....
Index Interest Rate	5.592%	5.603%	5.564%	5.571%	.....	.....	.....	.....	.....	.....	.....
Differential	2.054	2.049	2.068	2.065	.....	.....	.....	.....	.....	.....	.....
Rate of Return	7.646	7.652	7.632	7.636	.....	.....	.....	.....	.....	.....	.....
Stabilizing Reserve Balance	$ 938,228.57	$ 700,000.00	$ 608,021.13*	$ 333,466.60*	.....	.....	.....	.....	.....	.....	.....
Current Surplus	248,836.59	91,978.87†	278,554.53	275,296.00	.....	.....	.....	.....	.....	.....	.....
Total	1,187,065.16	608,021.13	333,466.60	608,762.60	.....	.....	.....	.....	.....	.....	.....
Transfer to City Equity Account	487,065.16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* Deficit below $700,000.00 constitutes an addition to working capital.

† Computations following do not take into account rate changes authorized under contract.

Chart xxxx

Machinery for Management and Control under Contract

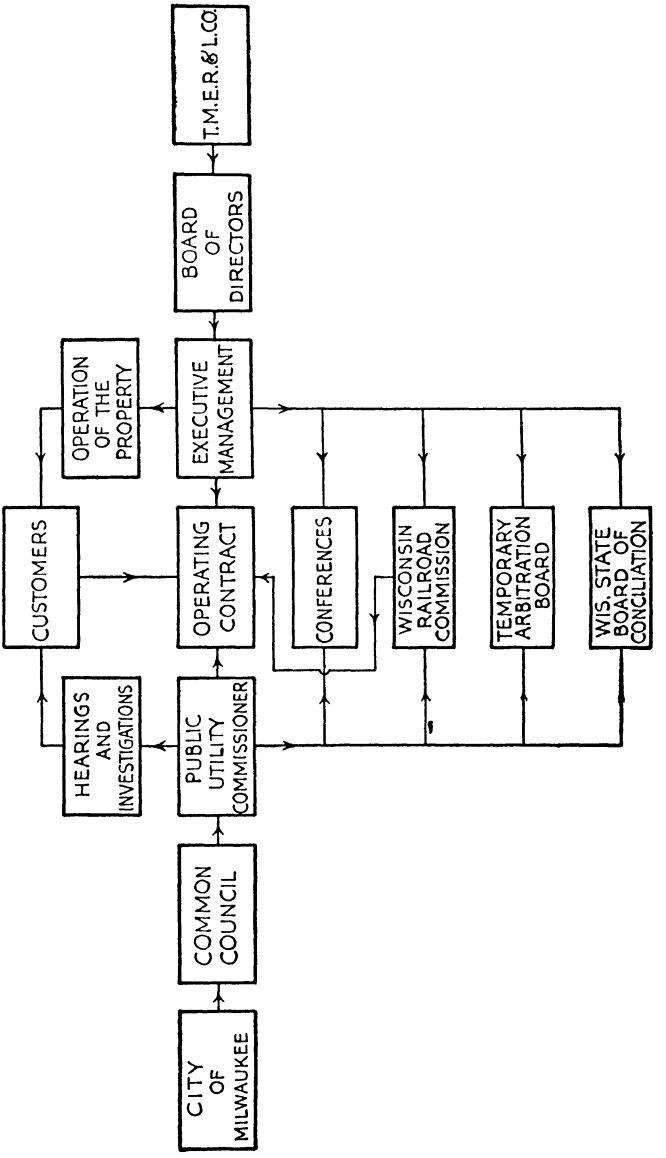


TABLE XXXVIII

SUMMARY STATEMENT OF INDEX INTEREST RATES

T. M. E. R. & L. Co.

Year 1923

	Jan. 31	*Feb. 28*	*March 31*	*April 30*	*May 31*	*June 30*
Funded Debt	$41,569,000	$41,569,000	$ 41,569,000	$40,697,000	$40,697,000	$ 40,634,500
Floating Debt	2,090,032	2,393,000	1,712,123	1,171,913	941,383	1,603,285
Total	43,659,032	43,962,000	43,281,123	41,868,913	41,638,383	42,237,785
Quarterly Total	.....	.....	130,902,155	.....	.....	125,745,081
Interest on Funded Debt	2,142,970	2,142,970	2,142,970	2,073,210	2,073,210	2,070,085
Interest on Floating Debt	124,202	145,380	104,528	78,314	63,042	101,156
Amortization of Disc. & Exp.	195,588	194,945	194,945	184,301	184,301	170,370
Total	2,462,760	2,483,295	2,442,443	2,335,825	2,320,553	2,341,611
Monthly Index Rate	5.6409	5.6487	5.6432	5.5769	5.5731	5.5439
Quarterly Total Interest	.....	.....	$7,388,498	.....	.....	$6,997,989
Quarterly Index Rate	.....	.....	5.6443	.....	.....	5.5652

	July 31	*Aug. 31*	*Sept. 30*	*Oct. 31*	*Nov. 30*	*Dec. 31*
Funded Debt	$40,484,500	$40,587,400	$ 50,101,695	$50,042,900	$46,942,900	$ 46,944,500
Floating Debt	2,205,495	2,234,296	1,100,530	1,100,325	200,713	677,024
Total	42,689,995	42,821,696	51,202,225	51,143,225	47,143,613	47,621,524
Quarterly Total	.....	.....	136,713,916	.....	.....	145,908,362
Interest on Funded Debt	2,062,585	2,069,247	2,635,203	2,632,319	2,415,319	2,415,423
Interest on Floating Debt	136,552	138,458	63,234	63,221	13,747	45,302
Amortization of Disc. & Exp.	194,533	124,568	223,819	266,266	205,271	205,003
Total	2,393,670	2,402,300	2,922,266	2,962,406	2,634,337	2,665,728
Monthly Index Rate	5.6071	5.6100	5.7075	5.7924	5.5879	5.5977
Quarterly Total Interest	.....	.....	$7,718,216	.....	.....	$6,262,471
Quarterly Index Rate	.....	.....	5.6456	.....	.....	5.6628

TABLE XXXIX

SUMMARY STATEMENT OF INDEX INTEREST RATES

T. M. E. R. & L. Co.

Year 1924

	Jan. 31	*Feb. 29*	*March 31*	*April 30*	*May 31*	*June 30*
Funded Debt	$46,963,500	$47,009,600	$ 47,159,200	$47,230,400	$47,344,100	$ 47,369,100
Floating Debt	201,649	202,629	215,739	230,194	247,253	531,809
Total	47,165,149	47,212,229	47,374,939	47,460,594	47,591,353	47,900,909
Quarterly Total	.....	.....	141,752,317	.....	.....	142,952,856
Interest on Funded Debt	2,416,658	2,419,654	2,429,378	2,434,944	2,442,334	2,443,959
Interest on Floating Debt	13,807	13,871	14,725	15,663	16,771	33,786
Amortization of Disc. & Exp.	205,515	205,909	206,555	206,834	207,392	207,495
Total	2,635,980	2,639,434	2,650,656	2,657,441	2,666,497	2,685,240
Monthly Index Rate	5.5888	5.5906	5.5951	5.5993	5.6029	5.6058
Quarterly Total Interest			$ 7,926,070	.....	.....	$ 8,009.178
Quarterly Index Rate			5.5915	.....	.....	5.6027

	July 31	*Aug. 31*	*Sept. 30*	*Oct. 31*	*Nov. 30*	*Dec. 31*
Funded Debt	$47,258,200	$47,182,600	$ 47,197,000	$47,155,300	$47,167,500	$ 47,194,800
Floating Debt	764,839	975,053	1,563,293	1,644,246	866,006	2,660,998
Total	48,023,039	48,157,653	48,760,293	48,799,546	48,033,506	49,855,798
Quarterly Total	.....	.....	144,940,985	.....	.....	146,688,850
Interest on Funded Debt	2,439,001	2,434,567	2,435,523	2,433,750	2,434,543	2,436,317
Interest on Floating Debt	47,828	60,410	95,705	100,559	53,821	161,345
Amortization of Disc. & Exp.	183,928	83,504	83,884	183,625	183,676	183,685
Total	2,670,757	2,678,501	2,715,112	2,717,934	2,672,040	2,781,347
Monthly Index Rate	5.5614	5.5619	5.5683	5.5696	5.5629	5.5788
Quarterly Total Interest	.....	....	$8,064,370	.....	.....	$8,171.321
Quarterly Index Rate	.....	.....	5.5639	.....	.....	5.5705

TABLE

ESTIMATE OF

T. M. E. R.

Year	Cash	Materials and Supplies	Accounts Receivable		
			Inter. Co	Customer's	Misc.
1923					
Jan.	$ 506,817.28	$ 2,737,103.76	$ 905,285.01	$ 862,636.96	$ 573,859.67
Feb.	390,756.31	2,718,187.16	1,596,751.58	861,170.74	644,789.13
March	854,788.98	2,625,776.35	667,805.52	798,449.23	807,796.99
Average .	.....	.....	.....	.....	.....
April	999,394.57	2,603,831.44	659,877.57	782,540.20	700,920.25
May	439,389.91	2,874,318.15	963,345.30	702,964.87	698,272.36
June	252,549.73	2,977,868.76	973,412.74	754,389.42	731,952.28
Average .	.....	.....	.....	.....	.....
July	541,496.91	3,050,208.50	786,328.13	721,868.53	771,670.35
August	515,250.35	3,130,535.43	815,983.33	788,790.75	797,600.24
Sept.	207,032.41	3,278,945.28	3,747,020.51	669,081.16	815,612.62
Average .	.....	.....	.....	.....	.....
Oct.	331,067.51	3,238,472.23	4,469,063.94	803,767.77	792,490.32
Nov.	600,750.26	3,396,446.49	4,721,904.78	815,877.05	781,955.68
Dec.	318,200.43	3,311,080.48	4,353,215.70	707,369.65	721,376.51
Average .	.....	.....	.....	.....	.....
1924					
Jan.	895,246.12	3,125,734.70	3,738,330.88	927,706.38	721,136.23
Feb.	853,232.91	2,915,278.71	3,806,494.91	874,758.89	748,076.20
March	1,329,726.31	2,815,191.41	3,362,568.23	838,537.40	792,315.41
Average .	.....	.....	.....	.....	.....
April	816,671.85	2,846,090.27	4,261,128.80	776,412.00	785,184.86
May	210,702.02	2,798,095.68	4,326,925.12	798,382.13	832,935.86
June	590,714.12	2,987,132.12	3,363,799.73	773,935.98	799,372.67
Average .	.....	.....	.....	.....	.....
July	603,135.77	3,059,155.12	3,214,297.82	776,190.71	824,760.58
August....	722,821.56	3,290,770.34	3,258,700.61	684,140.43	795,221.40
Sept.	899,801.83	3,274,121.58	3,234,242.93	800,077.75	779,665.75
Average .	.....	.....	.....	.....	.....
Oct.	1,179,409.78	3,220,092.14	3,297,102 13	904,355.93	978,034.03
Nov.	873,271.56	2,988,265.66	3,478,068.70	838,291.99	757,527.00
Dec.	813,454.68	2,788,992.61	3,606,139.75	832,142.06	987,100.33
Average .	.....	.....	.....	.....	.....

XL

WORKING CAPITAL

& L. Co.

Total Corp. Current Assets	*Less. Corp. Current Assets Non-Operating*	*Corp. Current Assets Operating*	*% Gross Operating Rev. Mil. Metro. District*	*Contract Working Capital*
$5,585,702.68	$ 768,423.62	$4,817,279.06	...	$.....
6,211,654.92	1,427,288.65	4,784,366.28	...	.....
5,754,617.07	645,955.30	5,108,661.77	...	.....
.....	.....	4,903,435.70	83.1	4,074,942.93
5,746,563.83	601,606.54	5,144,957.29	...	.....
5,678,290.59	377,493.35	5,100,796.74	...	.....
5,690,169.93	551,347.22	5,138,822.71	...	.....
.....	.....	5,128,192.25	81.3	4,169,220.30
5,871,572.42	580,825.64	5,290,746.78	...	.....
6,048,160.10	700,869.18	5,347,290.92	...	.....
8,717,691.98	963,995.62	7,753,696.36	...	.....
.....	.....	6,130,578.02	78.6	4,818,634.32
9,634,867.77	1,172,020.18	8,462,847.59	...	.....
10,316,934.26	1,572,671.34	8,744,262.92	...	.....
9,411,242.77	2,362,206.66	7,049,036.11	...	.....
.....	.....	8,085,382.21	82.3	6,654,269.56
9,408,154.31	2,516,821.92	6,891,332.39	...	.....
9,197,843.62	2,768,912.26	6,428,931.36	...	.....
9,138,338.76	2,882,734.84	6,185,771.88	...	.....
.....	.....	6,502,011.88	85.2	5,539,714.12
9,483,487.78	2,851,308.96	6,632,178.82	...	.....
6,967,040.81	2,996,950.58	5,970,090.23	...	.....
8,514,954.62	3,008,131.50	5,506,823.12	...	.....
.....	.....	6,036,364.08	82.6	4,986,036.73
8,477,540.00	2,903,088.25	5,574,451.75	...	.....
8,751,654.34	2,932,693.81	5,818,960.53	...	.....
8,987,909.81	2,893,740.02	6,094,169.79	...	.....
.....	.....	5,829,194.02	80.4	4,896,819.92
9,573,994.01	3,117,633.58	6,456,360.43	...	.....
8,935,424.91	3,113,034.42	5,812,390.49	...	.....
9,027,829.43	3,247,976.41	5,779,853.02	...	.....
.....	.....	6,016,201.31	83.2	5,005,479.49

of Milwaukee. This was accomplished by analyzing the company's detailed records.

Operating expenses were similarly localized. The cost of power, including a rental charge for the Lakeside plant, the principal central power station of the system, was apportioned to the different branches of the service upon the basis of "output." Taxes and depreciation (at the rate fixed in the contract) were allocated upon the basis of the location of the physical property. Because the contract as first drawn contemplated a quarterly accounting of the cost of the service, revenues, expenses, and return were determined quarterly. In calculating the rate of return, it was assumed that operation under the contract was in its second year, and, therefore, that the formula predicated upon a changing index interest rate was in effect.

The results of these calculations are shown in a series of tables which are self-explanatory. Tables XXXVI and XXXVII show the results for the years 1923 and 1924 respectively. The method of computing working capital and the index interest rates appears in Tables XXXVIII, XXXIX and XL, pp. 726 to 729.

If the quarterly system of accounting had been retained, the stabilizing reserve would have increased from $700,000 in January, 1923, to $1,187,065 by April 1st, 1924, necessitating a *rate decrease* at that time.[6] The excess of revenue would have been credited to the City Equity Account and the balance in the Stabilizing Reserve reduced to $700,000. These two operations would have resulted soon in a depletion of the stabilizing reserve below the minimum figure and a *rate increase* would again have been in order. Rate changes, while necessary, should not come too frequently. It was apparent that the quarterly scheme of accounting rendered the stabilizing reserve too sensitive, and the accounting period was accordingly lengthened to six months.

Charts XXXV and XXXVI were prepared to visualize the regulating and accounting procedure by means of which the contract would be administered.

Sec. 5. **The Fate of the Contract**

The contract was passed by the Common Council March 2, 1925, and accepted by the board of directors of the company,

[6] It is interesting to observe that the development of the private automobile has shifted the seasonal peak of the street railway from summer to winter.

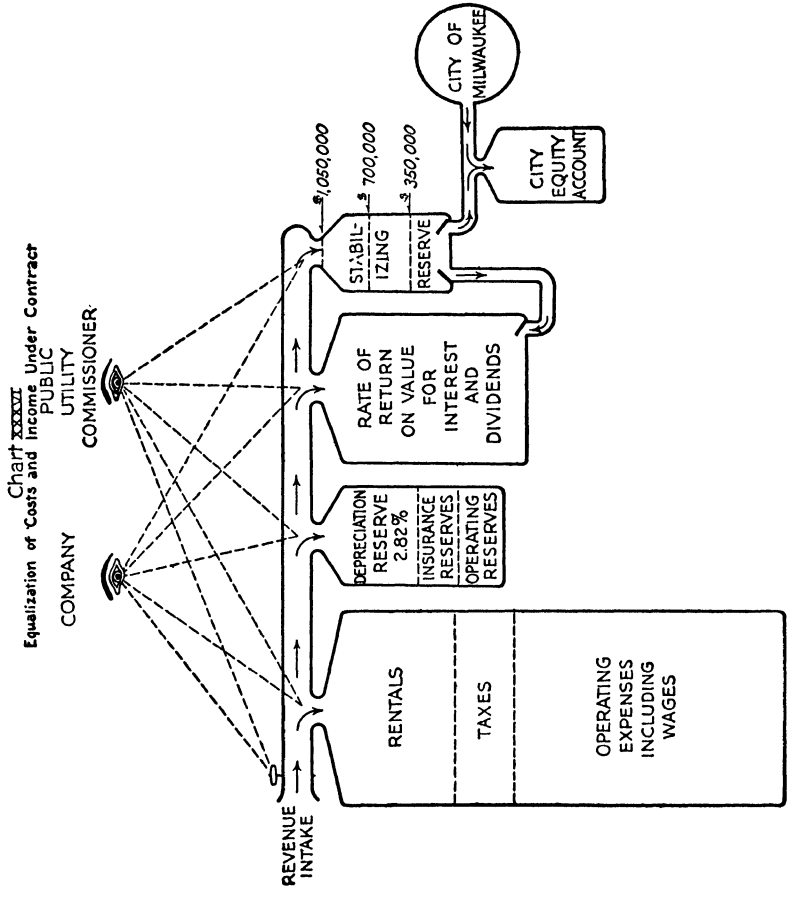


Chart XXXVI
Equalization of Costs and Income Under Contract
COMPANY
PUBLIC UTILITY COMMISSIONER
REVENUE INTAKE
RENTALS
TAXES
OPERATING EXPENSES INCLUDING WAGES
DEPRECIATION RESERVE 2.82%
INSURANCE RESERVES
OPERATING RESERVES
RATE OF RETURN ON VALUE FOR INTEREST AND DIVIDENDS
$1,050,000
STABIL-IZING
$ 700,000
RESERVE
$ 350,000
CITY OF MILWAUKEE
CITY EQUITY ACCOUNT

whose action was confirmed by a vote of all classes of the common and preferred capital stock on March 23, 1925. The Railroad Commission of Wisconsin approved the contract in an opinion dated March 23, 1925, from which the following is an extract:

"Whereas, During the period of negotiations between the City, through its representatives, and the Company, the Commission has been constantly informed of the progress and status of such negotiations and has, from time to time, examined earlier and successive drafts of the proposed ordinance and has discussed the details of such proposed contract at various times with the representatives of the city and the Company, and the final and complete copy of the executed contract being before us and having been considered with great detail and care, and the commission being fully advised in the premises.

The Commission Finds,

1—That the value of the investment as fixed in the contract for both rate-making and purchase purposes is reasonable and just in amount.

2—That the method provided for accurately ascertaining the value at any time in the future is reasonable and just to both parties.

3—That the rate of return allowed under the contract upon the value of the investment is reasonable and, when taken in conjunction with other elements of the cost of the service, will yield a reasonable basis for the adjustment of rates in the future.

NOW THEREFORE, IT IS ORDERED that the said contract be and the same is hereby approved."

The agreement was submitted to the voters at a referendum election on April 6, 1925, and defeated. The contract failed of adoption largely because the time was too short for an adequate explanation of its terms to the electorate. With no emergency present to induce a city-wide interest in the question, and with the general atmosphere of suspicion usually aroused when proposals of this kind come to a vote, the contract succumbed to a multiplicity of imagined objections.

The agreement was an attempt to connect up the two lines of development referred to at the beginning of this chapter. If adopted it would, on the one hand, have brought about local regulation with its more careful and intimate scrutiny of operations and its more definitive statement of what are reasonable costs of operation. On the other hand, it would have kept the state commission in the background for arbitration and appeal purposes, and for the determination of all questions where statewide uniformity is essential.

CHAPTER XXXIII

GENERAL SUMMARY AND FORECAST OF THE DEVELOPMENT OF REGULATION

At no time in the development of public utility regulation in the United States has the need been greater and the opportunity on the whole better for calm reflection upon the path which public policy has thus far traveled. Electric railways alone excepted, all other important branches of public service industry are enjoying comparative prosperity. Even this industry, when properly articulated with the developing motor transport industry, may look forward to stabilization upon an economic basis. The last decade and a half has been a supreme test of the economic vitality of at least some of these industries. Competitive developments, the rising costs of operation, the development of a far-reaching control of rates and service by public authority, the economic dislocations attending the World War and Reconstruction, have combined to test the economic foundations of all the public utilities. The strain of the war has subsided if not entirely passed. Trying as this period may have been to management and regulating authorities, it provided an unmatched experimental period for observing the operation of legal and economic principles and the methods of regulatory control.

Sec. 1. **Public Utility Credit**

The best single index of the economic status of an industry is the credit standing of its securities in the investment market. Railway securities have long held the dominant position. After 1900, when the combination movement penetrated into this field, ascendancy appeared to pass to industrial securities. Since the close of the war it seems as if the securities of local public utilities, particularly of the electric light and power industry, the gas industry, and the telephone industry have attracted security buyers. These years also coincide with the years of maximum expansion in the physical plants of these local utilities. In all cases, however, whether an industry was expanding or remain-

TABLE XLI [a]

Summary of Government and Corporate Financing

1919-1925 [b]

	1919	*1920*	*1921*	*1922*	*1923*	*1924*
Grand Total	$4,286,188,860	$4,010,048,184	$4,203,793,085	$5,244,862,294	$4,989,745,599	$6,327,085,941
Government * Total....	1,546,535,214	1,043,743,487	1,812,885,274	2,171,579,847	1,756,905,502	2,488,514,877
Corporate Total	2,739,653,646	2,966,304,697	2,390,907,811	3,073,282,447	3,232,840,097	3,838,571,064
Public Utilities † ...	462,271,650	496,822,550	671,085,220	980,433,795	1,138,396,158	1,529,639,827
Railways—Steam ..	208,117,000	377,879,500	655,288,500	651,531,350	518,249,450	940,296,969
Industrials §	881,341,460	1,063,139,273	440,075,925	567,503,552	820,821,529	507,818,272
Other Corporations ‡	1,187,923,536	1,028,463,374	624,458,166	873,813,750	783,672,951	709,259,596

[a] Taken from The Journal of Land & Public Utility Economics, July, 1925, p. 307.
[b] Compiled from the records of the Commercial and Financial Chronicle.
* Includes Farm Loan and War Finance Corporation issues.
† Primarily local public utilities.
§ Iron, steel, coal, copper equipment, motors, accessories, and other industrial and manufacturing.
‡ Oil, real estate, rubber, shipping and miscellaneous.

ing relatively static, the normal replacements of the physical plant have, on account of the higher current cost of making these replacements, made some increase in the capital fund necessary. Such demands were, of course, superimposed upon the capital required for refunding purposes.

These conditions are reflected in the increased volume of security issues by local public utilities.[1] For 1924 these new security issues amounted to a total, in round numbers, of one and one-half billions of dollars, and they represented a little under 40 per cent. of all corporate security issues of record. For the years from 1919 to 1921, annual security issues averaged about a half billion dollars of par value. This lower volume was due to the uncertainties and the higher interest rates prevailing during this period as compared with the lower interest rates and greater confidence of investors in the stability of these industries prevailing during the period since 1921.

The above total may be compared with the total financing of steam railways, governmental units, and industrial and other corporations. The absolute amounts and percentage distribution of the total volume is shown in Table XLI, p. 734. The figures show that while the total demand for capital from all of these sources has been increasing, the demand for capital by public utilities has been increasing very much more rapidly. In fact, governmental borrowings show very little increase and the demand for capital by purely private corporations declined after 1920. Only about 13 per cent. of the total financing was by pure holding companies.

Most of the capital issues have been for the purpose of securing new capital; the percentages of replacement capital, that is, security issues for refunding purposes, show a steady decline.

Statistics of the types of security issues also show that most of the financing, particularly after 1920, has been upon a long-term basis, for long-term bonds and notes were a higher percentage of the total. Stock issues also increased markedly; while the issues of short-term bonds and notes declined. This is, no doubt, explained by the fact that after 1920 falling interest rates made short-term financing appear less desirable and long-term financing more advisable.

We have previously shown (in Chapter XVII) that the pro-

[1] The evidence has been gathered by H. B. Dorau of the staff of the Institute for Research in Land Economics and Public Utilities in connection with a Doctoral Dissertation upon Public Utility Credit. Some of the facts have been published serially in the Journal of Land Economics and Public Utilities. *Cf.* Volume 1, p. 305, July, 1925, and succeeding issues.

TABLE XLII [a]

WEIGHTED AND SIMPLE AVERAGE YIELD AT OFFERING PRICE OF NEW PUBLIC UTILITY SECURITY ISSUES

1919-1926 [b]

The Years 1919-1926	*All Maturities* *				*Long Term*		*Short Term* †	
	Weighted Average Yield		Simple Average Yield		Weighted Average Yield	Simple Average Yield	Weighted Average Yield	Simple Average Yield
	Others	Railroads	Others	Railroads [c]				
The year 1919	6.55	6.10	6.68	5.91	6.21	6.25	6.78	7.03
First Quarter	6.49	5.99	6.68	6.02	6.22	6.21	6.75	7.21
Second Quarter ...	6.63	6.19	6.70	5.62	6.29	6.33	6.86	6.99
Third Quarter	6.40	6.24	6.58	6.16	6.12	6.28	6.54	6.82
Fourth Quarter	6.70	6.00	6.78	6.00	6.27	6.24	7.20	7.05
The year 1920	7.55	6.93	7.64	6.94	7.52	7.59	7.59	7.68
First Quarter	7.14	6.73	7.16	6.69	6.75	6.64	7.27	7.34
Second Quarter ...	7.57	6.95	7.69	7.01	7.40	7.58	7.64	7.72
Third Quarter	7.70	7.03	7.87	7.25	7.61	7.75	8.21	8.12
Fourth Quarter	7.88	6.94	7.94	6.86	7.77	7.84	8.15	8.29
The year 1921	7.13	6.42	7.47	6.05	7.11	7.42	7.27	7.66
First Quarter	7.62	6.62	7.75	6.68	7.54	7.63	7.87	8.02
Second Quarter ...	7.62	6.82	7.63	6.72	7.58	7.62	8.05	7.65
Third Quarter	7.34	6.15	7.53	6.00	7.28	7.46	7.90	7.89
Fourth Quarter	6.56	5.39	7.02	5.67	6.59	7.03	6.35	6.95
The year 1922	6.06	5.58	6.34	5.63	6.03	6.32	6.39	6.53
First Quarter	6.46	5.82	6.72	5.63	6.57	6.75	5.89	6.40
Second Quarter ...	6.00	5.39	6.33	5.60	5.98	6.27	6.76	6.96
Third Quarter	6.05	5.18	6.23	5.19	5.98	6.16	6.80	6.89
Fourth Quarter	5.83	5.82	5.99	5.49	5.80	6.04	6.60	5.50

The year 1923	6.04	5.37	6.31	5.51	5.99	6.26	6.73	6.72
First Quarter	5.88	5.16	6.19	5.30	5.86	6.17	6.39	6.36
Second Quarter ...	6.11	5.48	6.27	5.61	6.02	6.20	6.85	6.65
Third Quarter	6.35	5.27	6.49	5.48	6.25	6.36	7.16	7.11
Fourth Quarter	6.01	5.55	6.36	5.67	5.98	6.32	6.52	6.67
The year 1924	6.03	5.18	6.14	5.24	6.04	6.16	5.97	6.04
First Quarter	6.08	5.31	6.20	5.38	6.04	6.20	6.25	6.23
Second Quarter ...	6.10	5.45	6.23	5.38	6.15	6.28	5.86	5.94
Third Quarter	6.14	4.94	6.16	5.06	6.17	6.19	5.72	5.96
Fourth Quarter	5.81	5.00	5.96	5.08	5.82	5.95	5.78	5.99
The year 1925	5.58	5.25	5.81	5.24	5.66	5.83	5.55	5.86
First Quarter	5.46	5.27	5.78	5.42	5.65	5.81	5.32	5.77
Second Quarter ...	5.72	5.06	5.87	4.88	5.74	5.86	5.58	5.94
Third Quarter	5.53	5.53	5.77	5.65	5.50	5.77	5.68	5.73
Fourth Quarter	5.77	5.26	5.82	5.14	5.77	5.80	5.76	6.02
The year 1926	5.53	...	5.72	...	5.52	5.70	5.77	5.82
First Quarter	5.65	5.11	5.78	5.12	5.63	5.75	6.26	6.02
Second Quarter ...	5.52	4.69	5.72	4.85	5.53	5.74	5.37	5.64
Third Quarter	5.62	5.08	5.69	5.18	5.57	5.65	5.90	5.73
Fourth Quarter	5.36	...	5.68	...	5.32	5.61	5.79	6.01

[a] Taken from the *Journal of Land and Public Utility Economics,* October, 1925, p. 500; April, 1926, p. 236; Feb., 1927, p. 98, and May, 1927, p. 217.

[b] Compiled from the records of the *Commercial and Financial Chronicle.*

[c] Compiled from Dorau, A. B., "The Cost of Railway Capital Under the Transportation Act of 1920," *J. of Land & P. U. Econ.,* Feb., 1927, Vol. III, p. 5.

* Including all classes of interest-bearing obligations; that is, bonds, notes, debentures and certificates. The yield is computed on offering price to maturity.

† "Short term" includes all maturities of 1-5 years inclusive; "Long term" all issues for longer than five years.

portion of bond issues to the total of capital liabilities had been growing. From 1919 to 1921 this tendency continued. After this period the proportion of stock issues increased, most of the new stock in the case of local utilities being preferred stock. Telephone and telegraph companies, however, sold more common than preferred stock.

The yield rates at which these securities were offered for sale to investors is shown in Table XLII, p. 736. The weighted average annual yield rates of all securities other than steam railway securities varied between a maximum of 7.55 per cent. in 1920 and 5.58 per cent. in 1925. For steam railway securities the range was a maximum of 6.93 per cent. in 1920 to 5.18 per cent. in 1924. This clearly shows that public utilities have materially bettered their credit position over what it was shortly after the close of the war.

Sec. 2. **Effect of Regulation upon Earning Power**

No matter what factors a commission may take into account in fixing the rate-of-return, and how meagre or liberal that rate may be, there is no *guarantee* that such a return will be earned. Upon that score a public utility occupies no better ground than the owner of capital invested in a private enterprise.

The war worked havoc with many utilities. Commissions did not see fit to make rate increases at the time of application in the hope that improvement in economic conditions would make them unnecessary. Often, when increases were granted, they proved insufficient to meet the increased costs of labor and capital.

The public utilities are not without fault themselves in that they regarded the development of regulatory institutions as an encroachment upon their managerial prerogatives and have shortsightedly resisted the process. A measure of blame may also be placed upon some of the leaders of opinion among the commissioners, who have at times taken a timid and narrowly legalistic view of the situation. When, in 1910, altered circumstances forced the railroads, for instance, to make application for general rate advances upon the plea of failing earning power they were met by pronouncements from the commission such as the following: "We must not regard too seriously, however, the effort of railroad counsel to establish this commission in *loco parentis* toward the railroads. . . . This country cannot afford to have poor railroads, insufficiently equipped, unsub-

stantially built, carelessly operated—nevertheless, it is likewise to be remembered that the Government has not undertaken to become the directing mind in railroad management. We are not the managers of the railroads. And no matter what the revenue they may receive, there can be no control placed by us upon its expenditures, no improvements directed, no economies enforced."[2]

[2] 20 I. C. C. 317. This extreme position was somewhat modified in the following:

"We have no authority, as such, to say what amount these carriers shall earn, nor to establish a schedule of rates which will permit them to earn that amount. Our authority is limited to inquiring into the reasonableness of a particular rate or rates and establishing that rate or practice which is found lawful, in place of the one condemned as unlawful. . . . While the authority of this commission only extends to the passing upon the reasonableness of the rate presented for its consideration, *it is not confined to single rates. Any number of rates may be embraced in the same complaint, and the duty of the commission is to consider and pass upon all those as presented.* When, as here, there is involved the propriety of advances which affect the entire rate fabric within this territory, embracing one-half the tonnage and one-half the freight revenues of this whole country and when the advance is justified mainly upon the ground, not of commercial conditions, but by lack of adequate revenues upon the present rate basis, this Commission must determine the fundamental question." (See discussion of rate-making powers, Chapter XII, p. 273 *et seq.*)

But again in the rate advance case of 1914 the old point of view appears. "In my view the foregoing report and decision constitute a new and radical departure and a most serious and portentous step, in that by this step the Commission is shown to deem itself justified in sanctioning these increased rates . . . upon consideration of general financial and operating results, without resorting to other ordinary tests or factors heretofore deemed pertinent and necessary to the determination of the reasonableness of rates. I am not aware of any prior case in which this commission or any court has held that the need by a carrier of money was of itself proof of the reasonableness of a specific rate, or body of rates, increased to meet such need." Commissioner Daniels alone appears to have accepted the full implications of the regulatory process. "I am individually of opinion that our duty in the present case requires us in frankness to make a finding upon the general issue of the alleged inadequacy of the revenues of the carriers collectively. The carriers, the protestants, and the country are entitled to know the conclusion of the Commission on this point, and not to be left with a confusing mass of detailed evidence and isolated conclusions upon single matters involved therein. The three previous general rate advance cases have unquestionably held that the Commission may make a finding to determine, in connection with other relevant testimony, the justice and propriety of permitting particular increased rates to become effective. In the present case the general issue is simply not met, and in passing upon particular rates proposed to be increased a novel doctrine is for the first time invoked to disallow increased rates save where the specific evidence relating thereto makes a refusal manifestly impossible. The failure to follow established premises to their legitimate conclusion only beclouds the principles upon which the Commission may be expected to act in future and leaves nothing certain but uncertainty.

"In the matter of rate regulation and fixation we have reached a point where one of two courses ought deliberately to be chosen and clearly announced. If, despite increased costs not offset by increased revenues, in-

Not only should earning power vary with costs but earnings should also increase and diminish in due synchronism with variations in cost. Throughout the war period the trouble was that, though rates were ultimately increased, this was not done until the utilities concerned had experienced difficulties. Regulation of earning power thus lacked flexibility and certainty. As hitherto administered it has failed on the whole to synchronize properly rate changes with changes in economic conditions.

This defect is again well illustrated in recent steam railway experience where proper adjustment is not easily attained and where regulation was slow in developing. It will be recalled that due to increasing costs of operation general advances in rates were granted. The most important increases came in June, 1918, when passenger rates were advanced about 20 per cent. and commutation rates 10 per cent., and on May 25, 1918, when freight rates were advanced 25 per cent. These increases were justified by the fact that the cost of supplies and equipment had materially increased and that wages were being increased by order of the Director-General dated May 25th, but made retroactive to January 1st, 1918. By the close of 1917 the labor problem had become serious on account of employee enlistment and withdrawals to secure higher wages in war industries. Those that remained complained that wages were low as compared with living costs which were mounting rapidly at that time. The railroads had refused demands for wage increases on the plea of inadequacy of earnings, though conceding the justice of the demands. When the government assumed control, a Railroad Wage Commission was appointed to investigate and make recommendations. In their report of April 30th, 1918, they found that wage scales were inadequate in that 97 per cent. of railroad labor received rates of pay of $150.00 per month or less. Increases averaging about 16 per cent. were therefore recommended and these were made effective in the order mentioned above.

Following the close of the war the labor situation continued to be acute on account of demands for further increases in wage

creases in rates are to be denied, except where in individual instances gross injustice would be occasioned by their denial, the carriers ought to be apprised of this policy, so that they may set their house in order, if they can, against such a situation. If, on the other hand, we are to acknowledge in general what we are perforce compelled to admit in detail, just and reasonable increased rates should be permitted not grudgingly but with such fair measure of allowance as will indicate that the transportation industry is entitled in the interest of the public to earnings sufficient to provide a service commensurate with public needs."

rates. The Director-General granted substantial increases to train service employees and other less important groups in April, 1919, but announced that he believed the war cycle of wage increases was complete. Other increases would have to await developments. Yet labor was dissatisfied, particularly the switchmen who went out on an unauthorized strike. After the intervention of President Wilson the men returned and were precariously kept at work upon the promise that the government campaign against profiteers would reduce the cost of living. In this, expectations were disappointed and the men renewed their demand in February, 1920. The Railroad Labor Board created under the Transportation Act of 1920 awarded increases of about 22 per cent. in July, 1920, aggregating $600,000,000 per annum. The greatly increased cost of materials together with the last wage increase made further increases in rates imperative, and these were accordingly ordered later in the month. They varied between 25 per cent. and 40 per cent. for different groupings of freight rates. Together with further substantial increases in passenger rates and miscellaneous charges, they aggregated, as estimated by the commission, $1,134,000,000, but the rates did not become effective until August 26, 1920.

Now appeared that combination of circumstances which gives point to our criticism. While the carriers had not been able to escape the increased costs of operation, the shippers were not called upon to pay higher rates until deficits had accumulated. From the point of view of our argument it is of no consequence that a definite rental return had been guaranteed the roads under federal control. These deficits had to be met out of taxes.[3] After the guaranty period had terminated the reduced return impinged upon the carriers. Although the Commission had fixed 6 per cent. as the fair return upon the property value, the railroads during 1921 earned only 3.3 per cent. The causes of these deficiencies in earning power are to be sought first in the failure of many state commissions to grant corresponding increases in intra-state rates, until required to do so by the Interstate Commerce Commission, and secondly in the marked decline in traffic during the winter of 1920-21.

The industrial depression of 1921 was the inevitable reaction from the post-war boom in business of the last half of 1919 and the first half of 1920. Wholesale prices reached their peak in May, 1920, and then fell off rapidly. The incidence of the ad-

[3] We are not concerned here with the fact that Congress felt the deficits should be borne by taxpayers as a cost of the war instead of by shippers.

vanced rates upon the shippers thus came at a time when prices of commodities in general were dropping. Without expressing an opinion upon the reasonableness of the advances, it is clear that the regulatory process did not provide that coincidence of increased revenues with increased expenses which would have enabled the carriers to maintain their net revenues, and it failed to put the burden of increased transportation cost upon traffic *at a time when commodity prices were such that shippers would have been able to bear the burden of increased rates.* The anomalous situation was presented that, on account of the failure of the rate-fixing and wage-fixing powers to synchronize, justifiable advances in both wages and rates threw the industry into a turmoil of criticism.[4] Rate increases, though reasonable, were delayed due to ineffectiveness in the rate-regulating machinery. Wage increases, though reasonable, were delayed on account of the uncertainties growing out of the rate situation. When in the end wage increases were *forced,* rates were increased in the face of an industrial depression and collected upon a declining level of prices.

The two defects in regulatory institutions which this episode illustrates are, (1) the failure to secure flexible and speedy accommodation of the price fixing function under regulation to the ebb and flow of prices in the competitive commodity markets where the price-fixing function is free, and (2) the creation of an element of risk as to the certainty of earning a reasonable return when such deficiencies can not be recouped later on. They point to the need of developing definiteness and certitude in the adjustment of the relations between public utilities and their patrons.

The same difficulties arising out of the lag between costs and revenues obtained elsewhere. In 1921 when the price level broke, the utilities did not benefit immediately. Wages which make up a large item in the total expense bill did not drop rapidly or very much. There were deficits to recoup. When addittional increases were requested the commissions were inclined to hedge, for consumers were asking that utilities should share in the general retrenchment in profits, forgetting that they never were able to share with private industry in the general prosperity. Stabilization of earning power thus appears as a prime necessity. It may be accomplished best by creating rate-making machinery which is more flexible, and by creating equali-

[4] It is not implied that the Interstate Commerce Commission should be empowered to fix wages. *Cf.* Chapter XXIV, p. 538 *supra.*

zation funds out of excess earnings of one period which may be used during periods of revenue shortage.

Due to the lack of a probative rate-base all determinations of actual earning power in the past are difficult. An attempt has been made, however, to ascertain approximately what the situation has been by using only Census figures. Table XLIII shows the comparative rates of interest, dividends and return paid or earned. The rate-of-return is computed by dividing the net income by the investment in property and plant and hence tends to be lower than the actual rate-of-return. The figures are significant only because they show comparative changes.

TABLE XLIII

COMPARATIVE RATES OF INTEREST, DIVIDENDS AND RETURNS

	1922	1917	1912	1907	1902
	Average Rate of Interest				
Street Railway Utilities	4.62%	4.16%	4.30%	4.17%	3.73%
Commercial Light & Power Utilities	5.22	4.69	4.95	4.47	4.76
Telephone Utilities	5.87	5.10	4.41	4.52	4.74
Telegraph Utilities	4.56	4.18	4.41	4.07	4.24
Steam Railway Utilities	4.69	4.43	3.88	3.92 *	...
	Average Rate of Dividends				
Street Railway Utilities					
All Companies	2.30	2.96	2.98	2.60	2.64
Companies Paying Dividends	5.80	6.00	5.60	5.40	5.10
Commercial Light & Power Utilities	6.08	4.14	2.99	2.60	1.36
Telephone Utilities	6.98	6.79	5.95	5.12	5.47
Telegraph Utilities	6.05	5.87	3.78	4.82	5.34
Steam Railway Utilities	3.75	4.42	5.04	5.29 *	...
	Average Rate of Return				
Street Railway Utilities	4.43	4.12	4.34	4.04	4.25
Commercial Light & Power Utilities	7.51	3.89	3.81	4.72	4.53
Telephone Utilities	6.17	5.89	6.36	8.07	5.48
Telegraph Utilities	8.19	7.27	2.15	2.87	5.02
Steam Railway Utilities	5.31	6.76	6.16	4.93 *	...

* Figures are for 1908.

Sec. 3. **Some Fundamental Premises of Public Utility Economics**

Although the facts of public utility credit briefly outlined above appear to indicate that public service enterprises have

reëstablished themselves in the confidence of investors, there are enough dark places in the picture to indicate that the problems of establishing public utility credit are not wholly solved. Moreover, public utilities should not be regarded wholly from the point of view that they be safe havens for the investment of capital. The interests of workers and customers are entitled to at least equal considerations. Regulation was adopted primarily in the consumers' interest. But during the period of rising costs regulating authorities had to concentrate attention upon protecting investors in order to safeguard the future supply of capital. How service may be bettered, prices reduced, utilization extended, and other questions of like import, are the principal problems around which any critique of the workings of our public utility institution should revolve.

The time has arrived when the country must in some definitive way come to terms with its public utility problem. Perhaps it will not be seriously disputed that, by and large, and so far as concerns the immediate future, the problem must be worked out upon the basis of private ownership and operation. This does not preclude a considerable development of public ownership and operation in those localities where historical and other conditions are favorable. We shall very probably see the complete abandonment of private capitalism in the field of water supply. Further development of hydro-electric power and irrigation utilities may likewise be brought to some extent within the ambit of public initiative. It is even more certain that rapid transit facilities, elevated and underground railways, will have to be built at public expense, if we are to have them at all. The French system of operating public utilities as private concessions, which is closely analogous to service-at-cost, has certain very decided advantages from an administrative point of view. For the country as a whole, however, private capitalism and not public capitalism will be the rule.[5]

A second premise upon which the public utility economics of the immediate future will be based is monopoly, or at all events upon a stabilized competition which approaches monopoly. This implies further consolidations of enterprises, greater control of the market and larger aggregations of capital. It is certain that all the advantages of monopolistic organization have not been fully realized or utilized. For local utilities this movement is

[5] *Cf.* Interesting discussion of this problem by Ross, Edward A., "The Case for Industrial Dualism"; *Quarterly Journal of Economics*, Vol. XXXVIII, p. 384. May, 1924.

nearly completed. It has come, not in deference to legislative mandate, but by action of the public utilities themselves. Where competition still obtains, it has a precarious foothold. Only in the field of interstate transport does much remain to be done.

Yet the ancient prejudice against monopoly continues in spite of scientific opinion that monopolistic organization with regulation as to rates, service, and securities is the only avenue of escape from the evils of the competitive régime. This conception was given its severest jolt during the war when the transportation industry of the country was handled as a unit. The legislation of 1920 under which the regulatory mechanism was reconstructed, however, shows the influence of a changing point of view.[6] While Congress was not willing entirely to abjure its former faith in competition, it was at least willing to circumscribe its effect by giving greater power to the commission. The anti-pooling section of the Act of 1887 was so modified as to permit carriers to pool their freight or earnings, if the commission approved, on the ground that the step would result in better service, in economy of operation, and would not unduly restrain competition. The law also provides that the commission may approve, upon such terms and conditions as it finds just and reasonable, the consolidation of railroad properties by lease, purchase of stock or in any other manner so long as the consolidation does not create a single system. Such consolidations are specifically exempted from the provisions of the Sherman Anti-trust law of 1890. More than this, the act took the affirmative step of requiring the commission to adopt a plan for the consolidation of the railway properties "into a limited number of systems," but competition was to be preserved as fully as possible and wherever practicable the existing routes and channels of trade were to be maintained. These systems were to be so arranged that the cost of transportation as between competitive systems and as related to the values of the several properties should be so far as practicable the same, so that the systems might under uniform rates, with efficient management, move competitive traffic and still earn substantially the same return. All future voluntary consolidations of carriers were to follow this plan. This clearly pointed to a desire to eliminate the bad effects of competition by equalizing operating conditions. It remains to be seen whether these half-way measures will suffice or whether some more thorough-going consolidations will have to

[6] See also *Proc. of Federal Electric Railway Commission*, Vol. III, p. 2260, 1920

supplant them. Theoretical considerations point to the need for complete monopoly if regulation is to bear its full fruit.

If the development of public utilities with competitive profit as a guide is to come to a close and the idea of a regulated profit with assured credit and control of the market is to take its place, it is necessary to accept whole-heartedly the premise of governmental regulation as the only means of protecting the public interest. Since we are at the point of making far-reaching decisions throughout the field of regulated industry, it is highly important that the elements in this regulatory program be soundly conceived and generally understood. If such a program can be definitely adopted it should serve as a fixed point of reference from which to measure the rights and duties of public utilities in the future.

Sec. 4. **Necessary Changes in Regulatory Policy**

Such a development means also that we must reëxamine the institutional basis of public utility economics. What features of institutional developments that have come down from the past can we accept and what features must we reject? Those who have been in close touch with the problem feel that this development has been unduly delayed. They feel that the workings of regulation in the past have uncovered outstanding defects which should be eliminated as soon as possible. They rebel at the snail's pace and the muddle-headed way in which the regulatory structure has been unfolding. They deplore the indecision which has marked the statutory expansion of the scope of public utility regulation.[7] They point to the long period during which administrative commissions, particularly the Interstate Commerce Commission, were handicapped by want of power in control-

[7] This has been a piece meal process. The best commentary upon this situation is afforded by the present status of regulation of common carriers by motor vehicle. In twenty-eight of the forty-eight states there is no legislation regulating the rates and service of these common carriers. In four of the states the regulation does not go beyond requiring a special license to operate, at which time terminal points and routes are prescribed and some provision made for indemnity bonds as approved by the commission. In sixteen states the administrative commissions have been provided with more or less complete regulatory powers including control over rates and service. It is well known, however, that these powers have not always been fully exercised. There is ground to suspect that the public faith in competition has much to do with this tardy development. *Cf.* Lilienthal & Rosenbaum, "Motor Carriers and the State: A study in Contemporary Public Utility Legislation," *Jour. of Land and Public Utility Economics*, Vol. 2, p. 257, 1926. See also by the same authors, "Motor Carrier Regulation," *Columbia Law Review*, Vol. 26, p. 1.

ling rates. Sometimes the defect was merely statutory; sometimes the difficulty was that rates fixed in special franchises could not be changed; in a few cases legislatures, disregarding their own agents, fixed rates themselves.

The two systems of regulation which commend themselves for adoption are the system of continuous regulation by administrative commission—federal, state and local—and the system of contractual agreement, made flexible, indeterminate and amendable as in service-at-cost. The latter will very likely be adopted only in those localities where home rule sentiments are strong, and where operations are such that the future terms and conditions can be agreed upon and clearly and accurately expressed. In the main regulation will, as in the past, have to be exercised under the police power and by means of administrative commissions.

It is, therefore, imperative that commissions be in a position to do their work well. So far as the legislatures are concerned, the power of regulation is now quite generally accorded them. One danger in the situation, however, is that this power may be made ineffectual by decisions of the courts. If commissions are to be held responsible for the economic development of public utilities and for protecting the public interest in them, they must be free to adopt measures which in their opinion are calculated to bring results. These measures, administrative standards we have called them, should, of course, be subject to judicial review so that private property may not be confiscated and the initiative of private management not be taken away. But where their action is not palpably confiscatory, the judiciary should not substitute its own judgment for that of the commission as to what the administrative standard should be.

The greatest single contribution which the commissions can make toward putting the regulation of public utilities upon a satisfactory and economic basis, is the adoption of a definite standard for measuring the rate-base. In this the courts must coöperate. The limit of confiscation must be clearly defined by the courts. The commissions must then fix some figure for each public utility within their charge which represents a reasonable rate-base and which will be changed in the future, and under normal conditions, in accordance with some definite standard of valuation.

In the past commission regulation, like charter and franchise regulation, has been criticized because the earning power of public utilities has not been varied to take account sufficiently

of changing economic conditions. Along the same lines have been complaints that the machinery of regulation has been cumbersome and its workings slow, that nothing has been done to stabilize earning power. Nothing would be more conducive to improvements in these respects than the adoption of a definite rate-making rule for the future which will base earning power upon a proper standard of valuation and a proper standard of return. The delay and costliness of rate investigations can then be reduced, and definite engagements can be entered into which public utilities will be willing to accept upon the faith which they can repose in the ordered procedure of a responsible administrative tribunal.

It should be recalled that public service enterprises began as government functions. During the period of mercantilism franchises were treated as monopolistic special privileges of the crown. During the nineteenth century they were treated as contracts between governments and private parties. Recently, some courts in defining franchises have used language which indicated that they did not regard franchises as contracts but rather as delegations of government functions.

This idea is realized most completely in the indeterminate permit. In the Waukesha case [8] the effect of this form of franchise upon a distinct property concept for public utilities is well portrayed. As the court said: " . . . Under *Munn* v. *Illinois*, 94 U. S. 113, when a person dedicated his property to a public use by investing it in a public utility, he divides with the people the right to control the use of the property so dedicated and thereafter the public has an interest in the use of the property which it may within constitutional limitations assert. That so investing his property the investor has given to it a status is now well established and recognized in the law. He withdraws it from the great mass of property not so situated and subjects it to a degree of public control from that time on."

This decision recognizes the inevitable trend toward an interpretation of the relationship between a public utility and its customers outside the domain of contract. As this point of view becomes more general, we will reap the benefits of a legal institution, the essence of which, as Dean Pound says, is "relation," not "contract." The public utility is a legal relation into which persons may voluntarily enter but which entails a distinct system of rights and duties not originating in contract but in the requirements of public policy. Our subject thus awaits the

[8] See discussion in Chapter XXI, p. 471 *supra*.

inevitable next step in the decisions, so defining private property in relation to the Fourteenth Amendment as to put an end to a confusion between private property which acquires its value content "in the markets of the world" and that "private property" which is protected by government grant and receives its value content under regulation.

When indeterminate franchises for public utilities are adopted in recognition of the continuous nature of these functions, and when monopoly and consolidation are permitted to do their full work, the financial and corporate organization of public utilities can be very greatly simplified. This can only be of aid in the work of regulation. Certainly much of the regulatory complexity which now exists can then be done away with. If this happy circumstance can be quickly brought to pass, no further difficulties need stand in the way of the adoption of the going concern theory of regulation. Continuing functions will then be carried out by agents who have made continuous investments and give continuous service. These agents will, in turn, be controlled by permanent authorities having continuity of policy.

Though this be accomplished, much will still remain to be done. But at least all concerned will have the time to attend to other problems. New problems relating to service, to methods of doing work, are constantly arising. Commissions were created in order to make constructive investigations. However far reaching the changes affecting public utilities in the past decade, the work of public service commissions has little of this nature to record in this period. For them it has not been a period of growth. They have in the main been content to work in the accustomed groove. The fascinating question whether the system of regulated monopoly is a breeder of inefficiency and complacency has hardly been raised in the ranks of commissions, much less answered. Is it possible to embody in the regulatory program an incentive plan by which efficiency may be rewarded and inefficiency penalized? What are the ingredients of such a plan?

Sec. 5. **The Cost of Regulation**

Public service commissions in regulating public utilities are a substitute for the processes of self-regulation under competition. When functioning properly, they mitigate or do away entirely with the evils and economic costs of competition. They make possible the realization of those economies of joint cost, over-

TABLE XLIV

EXPENDITURES OF ADMINISTRATIVE COMMISSIONS AND GROSS REVENUES OF PUBLIC UTILITIES

	1917	*1918*	*1919*	*1920*	*1921*	*1922*
Expenditures						
Interstate Commerce Commission *	$1,898,286	$ 2,088,083	$ 2,245,781	$ 2,585,638	$ 3,465,055	$ 3,647,108
United States Shipping Board †..	75,721	359,786	828,716	758,976	446,133	381,761
Federal Power Commission	.....	.....	.....	.....	109,960	154,913
Expenditures for Valuation	3,283,884	3,384,444	3,525,899	2,956,736	2,728,656	1,595,489
State Administrative Commissions	3,853,997	4,323,644	4,509,615	5,021,547	5,549,068	5,743,386
Total	$9,111,888	$10,155,957	$11,110,011	$11,322,897	$12,298,872	$11,522,657
Number of State Commissions §.....	43	44	46	47	47	47
Gross Operating Revenue (in thousands)						
Electric Street Railways	$ 709,825	.....	.....	.....	.....	$ 1,016,719
Commercial Elec. Lt. & Power...	462,474	.....	.....	.....	.....	948,905
Telephone Utilities ‡	363,832	.....	.....	.....	.....	637,469
Telegraph Utilities	106,990	.....	.....	.....	.....	146,805
Manufactured Gas**	329,279	.....	.....	.....	.....	450,097
Natural Gas	142,089	.....	.....	.....	.....	221,535
Water Transportation	.....	.....	.....	.....	.....	564,000
Steam Railways ††	4,050,464	.....	.....	.....	.....	5,620,402
Express Companies	115,920	.....	.....	.....	.....	298,452
Pipe Lines	.....	.....	.....	.....	.....	128,059
Pullman Company	51,777	.....	.....	.....	.....	65,582
Total	$6,332,650	.....	.....	.....	.....	$10,098,025
Ratio of Regulatory Expense to Gross Revenues	.00144	.....	.....	.....	.....	.00113

* Excludes expenditures of Bureau of Valuation.
† National Security and Defense Allotments and expenditures of Emergency Fleet Corporation excluded.
§ Includes District of Columbia. No figures could be obtained for New Mexico, and Delaware has no commission.
‡ Includes Bell System and independent companies reporting revenues of $5000 and over.
** Figures are for 1919 and 1923 and reported as Values of Gas Products.
†† Excludes carriers classed as Switching and Terminal Companies.

head cost and large scale production cost which are available to public utilities in a greater measure than to other industries. The cost of this apparatus of regulation is therefore not a social loss as it is so often represented to be. Compared with the economic advantages which accrue to consumers under a policy of regulated monopoly the cost of regulation is slight.

Expenditures of administrative commissions, state and federal, are shown in Table XLIV, p. 750. The figures are for the six-year period from 1917 to 1922 when the system was fully developed. By including two census years the cost of regulation may be compared with the gross revenues of public utilities, so far as available. It is this flow of revenues which regulation is designed to control. The ratio of regulatory cost to gross revenues controlled is indeed small. For every dollar of revenue earned by public utilities, the government in 1917 spent .144 cents and in 1922 it spent .113 cents. The statistics of expenditures are, of course, incomplete. It was impossible to get expenditures by local units of government. In recent years these have not been heavy. Nor does the cost include expenditures by public utilities and by consumers in prosecuting or defending litigations. Much of this expense was incident to valuations and can be reduced after the importance of such work declines. A good deal of the expense also yields factual material as a by-product, which is an aid to management, and would be necessary in any event.[9]

It is a safe generalization that the appropriations for regulation have not kept pace with the growth in scope and importance of commission functions. Ascertained public expenditures in 1922 were less than $12,000,000, barely the cost of a second-rate modern cruiser. If commissions are to do their work well they must be more adequately financed. If they are to retain and develop an effective personnel they must be able to bid for specialized talent in competition with the public utilities, offering careers in the public service which will appeal to young men. Regulation cannot be effective if the eyes of commission em-

[9] The cost of enforcing the Packers' and Stockyards Act by the Department of Agriculture is not included in Table XLIV. Expenditures for this purpose increased from $174,118 in 1922 to $401,415 in 1926. Valuation expenditures by the Interstate Commerce Commission increased from $10,366 in 1913 to a maximum of $3,525,899 in 1919. With the completion of the field work, expenditures declined, amounting to only $1,064,655 in 1925. The total cost for this branch of the work was $26,662,197 at the end of 1925. Expenditures of the Interstate Commerce Commission for its normal activities grew from $113,008 in 1888 to $3,721,785 in 1925. The increase was greatest after 1906 with the expansion in power of the commission

ployees are constantly upon future positions with private companies.[10]

The importance of giving administrative commissions an independent status, protected alike from the undue interference and influence of politicians and of public utility officials, cannot be overemphasized. Commissions no longer bear aspects of novelty; they have, accordingly, lost much of the original glamour which attended their establishment. Their work will be observed less closely and there will set in a tendency toward degeneration. Though their duties are now more important and the reliance of the public upon them to protect the public interest is greater, the influences which pervert administrative agencies are also stronger. It would be a national calamity if the public should lose faith in agencies, which they have been creating and perfecting during the past three decades.

A good deal is said these days regarding self-regulation of industry in order to forestall governmental interference. This is, of course, entirely proper and sometimes very effective in competitive industry. Competition is here an abiding force and makes such self-regulation effective. There are those, however, who contend that self-regulation should be extended to monopolistic industry. In the absence of potential competition such self-regulation would tend to become nugatory, and would tend to lend color to the charge that public utilities are, in fact, controlled by a financial oligarchy. Public Utilities should coöperate with but not control administrative commissions. In the present writer's opinion, the emasculation of commission regulation, by whatever methods accomplished, is to be deplored; after all, "sweet reasonableness" thrives best under conditions of balance of power.

In closing this survey of public utility economics we desire to return once more to the public utility concept which dominates this study. In discussing the common law basis of public utility regulation [11] an interpretation was offered of historical developments. Public utility regulation was treated as centering in a new institution which gave tone and color to the economics of these industries. It was necessary to develop this institution be-

[10] *Cf.* Address by Chairman Eastman, Jos. B., "Public Service," *Proceedings National Association of Railroad and Utilities Commissioners*, 1926, p. 34.

[11] See Chapter VIII, p. 171 *supra*.

cause in the course of economic evolution freedom of choice had become restricted. Monopolistic powers were joined up with the exclusive possession of necessities of civilized life. Without restraints of a public character the attainment of that goal and the security of society was threatened. The supreme object of public utility economics and of the social regulation which fashions its processes is to achieve a progressive improvement in the standard of life.

APPENDIX A

AN ORDINANCE

CONSTITUTING A CONTRACT BETWEEN

THE CITY OF MILWAUKEE

AND

THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY

Passed by the Common Council of the City of Milwaukee, March 2, 1925.
File Number 28024a

AN ORDINANCE

Constituting a Contract between the CITY OF MILWAUKEE and THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY, its lessees, successors and assigns, providing for the furnishing of transportation and public utility service at cost, and for options to the City of Milwaukee to acquire an equity in and to purchase certain transportation and public utility property.

WHEREAS, THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY (which Company, its lessees, successors and assigns shall be hereinafter referred to as the "Company"), a street railway, a public utility and an interurban railway corporation organized and existing under the laws of the State of Wisconsin, is the owner of a transportation system and of a system for generating, distributing and selling electricity for power, light and other purposes, together with a system for supplying and furnishing steam heat, parts or the whole of each of which systems are located within the CITY OF MILWAUKEE and within the neighboring suburban districts, which City (hereinafter referred to as the "City") is a municipal corporation situated within the County of Milwaukee, State of Wisconsin; all of which systems are being operated under franchises of indeterminate duration granted and established under the laws of the State of Wisconsin; and

WHEREAS, It is the common desire of the City and of the Company to enter into a Contract whereby, while the management and operation of the property shall remain exclusively in the hands of the Company, unless and until taken over by the City in the event of purchase here-

under, the City shall be empowered, so far as legally authorized so to do, to prescribe the character and quality of the service rendered by the Company within the Metropolitan District, subject to the fixing of rates which will afford the Company revenues equivalent to the cost of the service, including a stipulated return on the Company's investment, subject to the express intention of both parties that throughout the period of this Contract the investment of the Company and the earning power of its property shall be maintained unimpaired, through the medium of charges to the cost of the service, and subject further to the express intention of both parties that the cost of the service shall throughout the contract period be met only out of the earnings derived from the operation of the Company's property subject hereto and that the City shall in no sense guarantee the earning of revenues sufficient to meet such cost of the service; and

WHEREAS, It is the common desire of the City and of the Company to agree upon the terms upon which, and the methods by which, the City may purchase the transportation and public utility property and may in the meantime participate in the financing of such property and may be credited from time to time with the revenues, if any, earned by the Company in excess of the cost of the service as aforesaid;

NOW, THEREFORE, THE MAYOR AND COMMON COUNCIL OF THE CITY OF MILWAUKEE, WISCONSIN, DO ORDAIN AS FOLLOWS:

ARTICLE I

GENERAL CONDITIONS

SECTION 1. *Purpose and Construction of the Contract.* In consideration of the mutual obligations herein assumed by each of the contracting parties, this Ordinance, upon the acceptance and approval thereof in the manner hereinafter specified, shall constitute a Contract made between the CITY OF MILWAUKEE and THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY, its lessees, successors and assigns, upon the terms and subject to the conditions hereinafter set forth, for the purposes specified in the preamble hereunto prefixed, which statement of purposes is hereby expressly incorporated into the body of this Contract and shall be resorted to in determining its construction and interpretation by the contracting parties, by any arbitral authority the jurisdiction of which is established as hereinbelow provided, and by any court of law or of equity, the jurisdiction of which is invoked by any person whomsoever.

The Company agrees that, in case the City of Milwaukee shall be succeeded, with respect to all of the subject matter of this contract, by another public corporation the charter or other organic law of which shall authorize it to become bound by the terms of this contract as successor to said City of Milwaukee and to perform all of the functions and to acquire and enjoy all of the interests of said city hereunder,

and in case such new public corporation shall have taken all such steps, if any, as may be required by law to make it a party to this contract as successor to said city, then the company shall continue to be bound by this contract as effectually as if it had been originally made between the company and such new public corporation.

Whenever mention is made in this Contract of any state or local board, commission or officer, such mention shall be construed also to include any board, commission, officer or other public authority at any time in the future performing substantially the same duties or functions by virtue of law.

In the event that the Railroad Commission of Wisconsin shall be abolished by law and no successor administrative authority shall be established in its stead, then, and in every such event, until the reëstablishment of such an administrative authority, all functions which under the terms of this Contract are to be performed by the Railroad Commission shall be performed by a Committee to consist of those persons who shall be the three senior Circuit Judges for Dane, Milwaukee and Racine Counties, respectively; provided, that if any of them shall at any time be unable or unwilling to serve he may designate an alternate to sit and act in his stead. The members of such Committee shall be entitled to receive fair compensation for all services actually rendered by them hereunder, the amount of such compensation to be paid by the Company as an operating expense.

SECTION 2. *Effective Date, Term and Renewal.* This Contract shall become effective July 1, 1925, and shall be in force for a period of ten years thereafter. As of the day of the termination of such period of ten years and as of the day of the termination of each successive period of ten years thereafter ensuing, this Contract shall, without further act, stipulation or proceeding, be renewed and shall continue in full force and effect for a further period of ten years from each such day, subject, however, to the power of the City to elect not to renew by serving on the Company, prior to the expiration of the eighth year of any such term of ten years, notice in writing of such election, expressed in an ordinance duly enacted by the Common Council and approved by a majority vote of the qualified electors of the said City voting thereon at a general municipal election or at a special election called for that purpose. Provided, however, that this Contract may at any time be terminated by the purchase on the part of the City of the property subject hereto, upon the terms and in the manner hereinbelow provided; and provided further, that this Contract may also be terminated at any time by mutual consent of the parties, the consent of the City in such case to be expressed by appropriate action of its Common Council approved by a majority vote of the qualified electors voting thereon at a general municipal election or at a special election called for that purpose.

SECTION 3. *Amendment.* This Contract shall under no circum-

stances be amended or modified in any way except by mutual consent of both parties, subject to approval by the Railroad Commission.

SECTION 4. *Property and Area Subject to the Contract.* The fixed property which constitutes a factor in the basis upon which the cost of the service is to be computed shall be identical with the fixed property which the City may at any time purchase pursuant to the terms of this Contract.

This Contract shall embrace within its terms (1) the transportation system of the Company, including therein its system or systems for transportation by street railway, by interurban railway, by motor vehicle and by any other means, (2) the Company's system for generating, transmitting and distributing electricity for power, light and all other purposes, and (3) its system for supplying and furnishing steam heat, to the extent that such systems or any of them are contained within the area hereinafter called the "Metropolitan District," and not otherwise, together with all the property, rolling stock, fixtures and equipment of every kind and description whatsoever now or at any time hereafter during the life of this Contract appurtenant to such systems or any of them. For all purposes of control, but not for the purpose of inclusion within the value of the Company's investment hereunder, there shall be included within said systems all leased property situated within the Metropolitan District, which is held in the custody of and operated by the Company.

The rolling stock and the motor traffic vehicles of the Company which are customarily employed in the traffic between terminal points one or both of which are situated outside of the Metropolitan District shall be taken as appurtenant to the transportation system of the Company situated outside of the Metropolitan District. All other rolling stock and motor traffic vehicles of the Company shall be taken as appurtenant to the transportation system of the Company contained within the Metropolitan District.

The Metropolitan District is hereby defined to include all the land now contained within the limits of the City of Milwaukee, together with the Cities of Cudahy, North Milwaukee, South Milwaukee, Wauwatosa and West Allis, the Villages of Shorewood, West Milwaukee and Whitefish Bay and certain unincorporated sections of Milwaukee County, viz.:

The following described district situated in the County of Milwaukee and State of Wisconsin, to-wit: Commencing at the point where the north line of fractional section number ten (10), township eight (8), north, range twenty-two (22) east meets Lake Michigan; running thence west on and along the north line of sections number ten (10), nine (9), eight (8) and seven (7), township eight (8) north, range twenty-two (22) east to the northwest corner of said section number seven (7); thence south on and along the west line of sections number seven (7), eighteen (18), nineteen (19) and thirty (30), township eight (8) north, range twenty-two (22) east to the southwest corner

of said section number thirty (30); thence west on and along the north line of section number thirty-six (36), township eight (8) north, range twenty-one (21) east to the northwest corner of said section number thirty-six (36); thence south on and along the west line of said section number thirty-six (36) and section number one (1), township seven (7) north, range twenty-one (21) east to the southwest corner of said section number one (1); thence west on and along the north line of sections number eleven (11), ten (10 and nine (9), township seven (7) north, range twenty-one (21) east to the northwest corner of said section number nine (9); thence south on and along the west line of said section number nine (9) and sections number sixteen (16), twenty-one (21), twenty-eight (28) and thirty-three (33) in township seven (7) north, range twenty-one (21) east and sections number four (4), nine (9) and sixteen (16), township six (6) north, range twenty-one (21) east to the southwest corner of said section number sixteen (16); thence east on and along the south line of said section number sixteen (16) and sections number fifteen (15), fourteen (14) and thirteen (13), township six (6) north, range twenty-one (21) east and section number eighteen (18), township six (6) north, range twenty-two (22) east to the southeast corner of said section number eighteen (18); thence south on and along the west line of section number twenty (20), township six (6) north, range twenty-two (22) east, to the southwest corner of said section number twenty (20); thence east on and along the south line of said section number twenty (20) and section number twenty-one (21), township six (6) north, range twenty-two (22) east to the southeast corner of said section number twenty-one (21); thence south on and along the west line of sections number twenty-seven (27) and thirty-four (34) in the township six (6) north, range twenty-two (22) east and sections number three (3), ten (10) and fifteen (15), township five (5) north, range twenty-two (22) east to the southwest corner of the northwest quarter of section number fifteen (15); thence east on and along the south line of the north one-half of sections number fifteen (15), fourteen (14) and thirteen (13) to Lake Michigan; thence northerly along the shore of Lake Michigan to the place of beginning; all as set forth on the map marked "Annex A" which is hereto attached and made a part hereof (provided, however, that in case of any conflict between the purport of any words in this Contract contained and the purport of the said map marked "Annex A," then the words of this Contract shall govern);

Together with any land at any time hereafter incorporated within the limits of any of said Cities and Villages. The foregoing area may be extended or reduced by mutual consent of the contracting parties.

The Company covenants that, except insofar as it shall act either with the express approval of the City or in compliance with an order of the Railroad Commission or other public authority having jurisdiction therefor, requiring additions, extensions or improvements to its property situated outside of the Metropolitan District, it shall at no

time make any such additions, extensions or improvements which shall result in increasing the value (as determined by the Railroad Commission) of the property of the Company situated outside of the Metropolitan District to an amount greater than one-third of the value (as determined hereunder) of the property of the Company situated within the Metropolitan District and subject hereto.

Anything in this Contract to the contrary notwithstanding, all contractual relations of the Company, other than such contracts with the City as are in conflict with the terms hereof, existing as of the effective date of this Contract in respect to or in any way concerning all or any part of the property subject hereto are by both contracting parties accepted and recognized as continuing in full force and effect. To the extent that any contracts heretofore made between the City and the Company are in conflict with any of the terms hereof, such contracts shall be deemed to be modified so as to be consistent with the terms of this Contract.

Nothing in this contract, however, shall be construed as granting a new franchise to the company or as modifying the duration of any franchise under which the company is operating on the effective date hereof.

SECTION 5. *Value of the Investment.* The value, as of July 1, 1925, of the investment of the Company in the fixed property within the Metropolitan District and subject to this Contract is hereby tentatively fixed, for the purposes of administration hereunder, in the sum of $56,456,506, which amount is agreed upon in that it affords the nearest approximation now obtainable to the actual historical cost of the said fixed property; provided, however, that it is mutually agreed by the parties hereto that the value, as of January 1, 1922, of the investment of the Company in the said fixed property is conclusively fixed at $42,382,995, and provided further, that the City and the Company shall proceed with due expedition to complete the audit now being made under the direction of the Railroad Commission to determine the cost of all additions, extensions, improvements and replacements made in or to the said fixed property subsequent to January 1, 1922, and prior to July 1, 1925, and to determine the value at which all fixed property within the Metropolitan District retired subsequent to January 1, 1922, and prior to July 1, 1925, has been included in such value of the investment.

The value, as of July 1, 1925, of the investment of the Company in the said fixed property shall be conclusively fixed by adding to the said value, as of January 1, 1922, of the investment of the Company in the said fixed property, the cost so determined of all the said additions, extensions, improvements and replacements made in or to the said fixed property subsequent to January 1, 1922, and prior to July 1, 1925, and by deducting from the resultant aggregate sum the value as determined at which all the said fixed property so retired subsequent to January 1, 1922, and prior to July 1, 1925, shall have been included in

such value of the investment. Upon their completion of such audit the contracting parties shall thereupon agree to a final adjustment of the value, as of July 1, 1925, of the investment of the Company in the said fixed property. In the event of the failure of both contracting parties to agree on such adjustment, either party may submit the matter to arbitration. Upon the effecting of such adjustment of the value, as of July 1, 1925, of the investment of the Company in the said fixed property, all charges to the cost of the service which shall have been made since July 1, 1925, shall be adjusted in accordance therewith.

At any time subsequent to July 1, 1925, the value of the investment of the Company in the said fixed property subject hereto shall be determined by adding to the value as of July 1, 1925, the cost, made of record and binding upon both the City and the Company in the manner hereinbelow provided, of all additions, extensions, improvements and replacements made since July 1, 1925, to the fixed property of the Company situated within the Metropolitan District and authorized by the City as hereinbelow provided, and by deducting from the resultant aggregate value the value at which all fixed property of the Company situated within the Metropolitan District which shall have been retired subsequent to July 1, 1925, shall have been included in such value of the investment, in amount to be estimated if not actually ascertainable, subject to the right of the City in case of disagreement to submit the matter to arbitration; provided, however, that if, at such time subsequent to July 1, 1925, as of which such value of the investment is to be determined, the Metropolitan District shall be of greater or less area than on July 1, 1925, then such value of the investment shall be increased or diminished, as the case may be, by the value of the Company's property situated in the area added or withdrawn, computed in like manner as of the date of such addition or withdrawal.

Provided, however, that at any time upon receiving express directions therefor from the City, the Company shall amortize out of earnings, if, as and when actually received by the Company in excess of the amounts from time to time requisite to meet the full cost of the service as in Section 6 hereinbelow defined, the whole or any part of any specific items of its property subject hereto so designated by the City, at the value thereof at which such designated items or parts thereof shall have been included in the value of the Company's investment hereunder.

For the purpose of computing the cost of the service as hereinbelow defined, the value, on a given date, of the investment hereunder of the Company shall be determined by adding to the value, as of that date, of the investment of the Company in the said fixed property subject hereto, a sum equivalent to the amount, if any, by which the balance, as of that date, in the Stabilizing Reserve shall be less than the amount at which such Reserve shall have been originally established as in Section 11 hereinbelow provided, together with a sum to represent the current assets employed by the Company within the Metropolitan

District, which sum shall consist of such proportion of the Company's total cash, materials and supplies on hand wherever situate, and accounts receivable arising in connection with or incidental to the operation of the Company's properties and the conduct of its merchandise business (all calculated as averages of the several items set forth in the three corporate balance sheets of the Company computed as of the last day of each of the three next preceding months, as in Section 10 hereinbelow provided), as the Company's gross earnings derived from within the Metropolitan District during the preceding calendar year bore to the total gross earnings of the Company for such year.

The value of the investment hereunder of the Company for the purpose of determining the price of the property subject hereto to be paid by the City upon purchase thereof under the terms of this Contract, but not otherwise, shall be identical with the value of the investment hereunder of the Company used under this Contract for the purpose of computing the return on such investment as one of the elements of the cost of the service.

In the event of termination of this Contract in any manner other than through purchase by the City, in accordance with the terms hereof, of the property subject hereto, it shall be expressly recognized that by entering into this Contract the Company shall in no way have estopped itself from insisting upon the inclusion of "going value" as an element in the value of its investment.

In consideration of the option herein granted by the Company to the City to purchase less than the entire property of the Company, the City, in the event of purchase by it, in accordance with the terms hereof, of the property subject hereto, shall thereafter from time to time, at the election of the Company, furnish to the Company, including any successor, assignee or lessee corporation which may subsequently to such purchase by the City acquire all or any part of the property then remaining in the hands of the Company, at reasonable costs, for the benefit of the property still remaining in the hands of the Company, all facilities, services, electric current, materials and supplies, tools and equipment, and labor (each of the foregoing terms being used herein in its most comprehensive sense and all of the said terms being in this Section 5 hereinafter collectively comprehended within the term "facilities") theretofore furnished or thereafter appropriate to be furnished through the use and/or operation of each and several of the parts of the said property so acquired by the City. Such reasonable costs shall consist of the equitable proportion applicable to the property still remaining in the hands of the Company, of the total actual cost to the City of such facilities.

In the case of the failure of both contracting parties to agree in specifying such facilities, and/or in fixing such reasonable costs, the Company may submit the matter to arbitration. In the event that the City for any reason is unable or fails or omits to furnish all such facilities or any of them at such costs so fixed by agreement or by arbi-

tration, in the further event that the Company shall thereafter have submitted the matter to arbitration and shall have obtained an award finding that such failure or omission to furnish any such facility or facilities constitutes a substantial breach of the obligation of the City hereunder and ordering the City to furnish such facility or facilities upon the terms and conditions therein set forth, and in the still further event that after service upon the City of such award, the City shall have failed to furnish and continue to furnish the facility or facilities in question in compliance with the order contained in the said award, then, in those events, the Company may, at any time not less than thirty days and not more than one year after such service upon the City of the award, determine that the City has terminated its said obligation, and thereupon the Company shall be paid by the City the amount of the loss and damage suffered by the Company through the division and separation of the property of the Company upon purchase by the City as aforesaid.

ARTICLE II

Cost of the Service

Section 6. *Definition of Cost of the Service.* Such rates for the several services rendered by the operation of the property of the Company situated within the Metropolitan District and subject hereto shall be fixed and put into effect from time to time in the manner hereinbelow provided as will reasonably insure sufficient income to meet the cost of the service which is hereby defined to include: (1) all operating expenses, rentals and taxes, of whatsoever nature, whether assessed or levied against the property or the Company, excepting only special assessments for actual benefits (2) the allowances for depreciation as fixed in Section 9 hereinbelow provided; and (3) the return upon the Company's investment hereunder at the rates fixed as in Section 10 hereinbelow provided.

Section 7. *Operating Reserves.* As of the effective date of this Contract the Company shall establish the operating reserves (other than for insurance) provided for in the accounting classification theretofore in use by the Company and shall tentatively adopt the specifications thereof theretofore in use by the Company. Thereafter the Company shall establish and maintain, by current charges to operating expense as an element of the cost of the service, such operating reserves for injuries and damages, for uncollectible accounts and for other purposes, as are reasonably requisite to the efficient conduct of its business and to the maintenance unimpaired of its investment.

Out of the stipulated return allowed the Company on its investment hereunder, the Company shall quarter-annually credit to each such operating reserve interest at the rate of four per cent per annum on

the average monthly credit balance in such operating reserve during the preceding calendar quarter-year.

It is mutually agreed that the assets against which the said operating reserves are established and carried shall be at the free disposal of the Company for use as working capital or for investment in the Company's fixed property subject hereto.

Within not less than thirty nor more than sixty days prior to the end of any calendar year of operation hereunder, the City may serve notice upon the Company that it deems the current credit balance in any such operating reserve or reserves unreasonably excessive in light of the then current value and condition of the respective assets and/or liabilities against which such reserves are established and in light of the need of maintaining unimpaired the earning power of the property subject hereto, together with the investment of the Company therein. Thereupon as of the end of such year the operating reserve or reserves in question shall be debited and the City shall be credited with the amount or amounts by which the City and the Company agree that the credit balance in such reserve or reserves is unreasonably in excess of such requirements. In the absence of such agreement, the City may submit the matter to arbitration.

Provided, however, that in case of termination of this Contract in any manner other than through purchase by the City, in accordance with the terms hereof, of the property subject hereto, all amounts, if any, theretofore credited by the Company to the City out of the operating reserves, or any of them, during the period of operation hereunder, together with all interest thereon theretofore actually credited, funded, accumulated and/or accrued during such period (but excluding interest at any time actually paid in cash to the City), shall thereupon be debited by the Company to the City and credited to the respective operating reserves. Both contracting parties hereby unite in requesting the Railroad Commission, in fixing the rate base to be effective after such termination of this Contract, to take account of any unreasonably excessive balance in any of such operating reserves, by utilizing the same for the purpose of amortizing in part the Company's investment in the property situated within the Metropolitan District.

SECTION 8. *Insurance.* For the purpose of providing protection against loss due to fire, accident or other calamity, with respect to its property subject hereto, the Company shall establish and maintain a funded Contract Insurance Reserve, by monthly charges to operating expense as an element of the cost of the service. During the first ten years of operation under this Contract, such Reserve shall be credited with one-half of one per cent of the gross operating revenue currently received by the Company from sources within the Metropolitan District. Thereafter the further amounts to be credited from month to month to such Reserve shall be subject to adjustment from time to time by agreement between the City and the Company so as to give effect to changed conditions of insurance risk, if any; and in case either party

does not accept, within thirty days, any such adjustment proposed in writing by the other party, the matter may be submitted to arbitration.

By current charges to the Contract Insurance Reserve, the Company shall at all times keep insured against fire hazard, in reputable insurance companies or mutual or reciprocal associations or by means of proper reciprocal contracts, all its property subject hereto, to the full extent that the same is insurable except such as shall, in the exercise of sound business judgment, be insured only by the credit balance from time to time in the Contract Insurance Reserve.

By current charges to the Contract Insurance Reserve, the Company shall likewise insure from time to time against hazards other than fire, such portions of its property subject hereto, for such amounts as shall be desirable and advantageous in the exercise of sound business judgment.

The Company shall invest and reinvest the Contract Insurance Reserve Fund in securities which are lawful investments for the reserves of fire insurance companies in Wisconsin. All interest, dividends and other income received from the securities constituting said Fund shall be added to and invested and reinvested with the corpus of said Fund, and shall be credited to said Reserve.

In case of loss incurred in respect of any of the property subject hereto, due to fire, accident, or other calamity, to the extent that such loss is not met by payments from insurers, it shall be met, first, by a charge of the Contract Insurance Reserve to the extent of the credit balance then in such Reserve, and secondly, as to the balance, if any, of such loss then remaining unadjusted, by monthly amortization charges to operating expense as an element of the cost of the service, not to exceed $25,000 in any one month. For the purpose of making the charges herein specified, the amount of loss, in the case of property wholly destroyed, shall be deemed to be the sum at which such property shall have been included in the value of the investment hereunder as in Section 5 hereinabove defined, after deducting from said sum the amount accrued depreciation chargeable against such property as in Section 9 hereinbelow provided.

When and as insurance payments are actually received by the Company for the adjustment of losses due to fire, accident or other calamity, or charges are actually made to the Contract Insurance Reserve or to the cost of the service for the amortization of uninsured losses incurred in respect of the Company's property subject hereto, the amount of such payments or of such charges shall be deducted from the value of the Company's investment hereunder as in Section 5 hereinabove defined, provided, however that whenever insurance payments actually received by the Company shall exceed the amount of loss as hereinabove defined, such excess payments shall be added to the Contract Insurance Reserve Fund and shall be credited to the Contract Insurance Reserve, and shall not be deducted from the value of the Company's investment hereunder.

In case this Contract shall be terminated in any manner other than through purchase by the City, in accordance with the terms hereof, of the Company's property subject hereto, any credit balance then in the Contract Insurance Reserve shall not become a part of the corporate surplus of the Company, but both contracting parties hereby unite in requesting the Railroad Commission, in regulating the affairs of the Company thereafter, to take account of said credit balance for the purpose of amortizing any uninsured losses thereafter incurred in respect of the Company's property situated within the Metropolitan District.

SECTION 9. *Depreciation.* As a reserve for the depreciation (the term "Depreciation" being used throughout this contract to comprise the elements of inadequacy and obsolescence as well as true depreciation) accrued to July 1, 1925, of the company's fixed property subject to this contract, the company shall establish a reserve in the amount of sixteen per cent of the value of the investment in its fixed property subject hereto, determined as in section 5 hereof provided. As of July 1, 1925, such depreciation reserve shall be tentatively established in the amount of $9,033,041; and upon the determination as in said section 5 provided of the conclusive value as of July 1, 1925, of the investment of the company in its fixed property subject hereto, the amount then in the depreciation reserve shall be adjusted in accordance therewith.

There shall each month be charged to the cost of the service and added to the Depreciation Reserve an amount computed on the basis of 2.82 per cent per annum on the value (computed as an average of the value as of the first and last days of such month) of the investment of the Company in the fixed property within the Metropolitan District subject hereto; provided, however, in case either contracting party at any time serves notice upon the other party that it deems the annual rate of allowance for depreciation then in force to be either excessive or too low in light of the condition of the property and the need of maintaining unimpaired the earning power of the property together with the investment of the Company therein, then, and in every such case, the said annual rate may be adjusted to be in effect as of the first day of the calendar year then next ensuing, by mutual agreement between the contracting parties, or in the absence of such agreement either party may submit the matter to the Railroad Commission for determination, and both contracting parties shall be bound by the decision of said Commission; provided, however, that the annual rate of allowance for depreciation shall in no event without the consent of the City be reduced below 2.82 per cent. Such adjusted annual rate of allowance for depreciation, so fixed by agreement or by order of the Railroad Commission, shall remain in effect until it in turn is adjusted as in this Section 9 provided.

Out of the stipulated return allowed the Company on its investment hereunder, the Company shall quarter-annually credit to the Deprecia-

tion Reserve interest at the rate of four per cent per annum on the average monthly credit balance in such Reserve during the preceding calendar quarter-year.

The cost of all property retired, computed as in Section 5 hereinabove provided, shall be charged from time to time against the Depreciation Reserve, as of the date when each such retirement actually occurs, and the estimated accrued depreciation on all property destroyed by fire, accident or other calamity shall be charged from time to time against the Depreciation Reserve as of the date when the Company is actually reimbursed for each such loss.

It is mutually agreed that the assets against which the said Reserve for depreciation is established and carried, whether derived from direct charges to the cost of the service or from credits out of the stipulated return of the Company, shall be at the free disposal of the Company for use as working capital or for investment in the Company's fixed property subject hereto.

Within not less than thirty nor more than sixty days prior to the end of any calendar year of operation hereunder, the City may serve notice upon the Company that it deems the current credit balance in the Depreciation Reserve unreasonably excessive in light of the condition of the property subject hereto and the need of maintaining unimpaired the earning power of such property, together with the investment of the Company therein. Thereupon as of the end of such year the Depreciation Reserve shall be debited and the City shall be credited with the amount by which the City and the Company agree that the credit balance in such Reserve is unreasonably in excess of such requirements. In the absence of such agreement, the City may submit the matter to the Railroad Commission for determination, and both contracting parties shall be bound by the decision of said Commission.

Provided, however, that the annual rate of allowance for depreciation shall not be fixed or maintained at less than 2.82 per cent. nor shall balances in the depreciation reserve be transferred to the credit of the city at any time when the credit balance in the depreciation reserve shall be in amount less than sixteen per cent. of the value of the investment of the company in its fixed property subject hereto or when the effect of such reduction or maintenance of rate or of such transfer shall be to reduce the credit balance in the depreciation reserve to an amount less than sixteen per cent. of the value of the investment of the company in its fixed property subject hereto.

In case of termination of this Contract in any manner other than through purchase by the City, in accordance with the terms hereof, of the property subject hereto, all amounts, if any, theretofore credited by the Company to the City out of the Depreciation Reserve during the period of operation hereunder, together with all interest thereon theretofore actually credited, funded, accumulated and/or accrued during such period (but excluding interest at any time actually paid in

cash to the City), shall thereupon be debited by the Company to the City and credited to the Depreciation Reserve. Both contracting parties hereby unite in requesting the Railroad Commission, in fixing the rate base to be effective after such termination of this Contract, to take account of any unreasonably excessive balance in such Depreciation Reserve, by utilizing the same for the purpose of amortizing in part the Company's investment in the property situated within the Metropolitan District.

SECTION 10. *Rate of Return.* For the twelve months period commencing July 1, 1925, and ending June 30, 1926, the company shall be entitled to a return at the annual rate of 7.7% upon the value of its investment hereunder, which rate is based upon the recognition of the allowances, heretofore fixed by the Railroad Commission, of 7.5% annually upon the railroad property and of 8.0% annually upon the electric and heating utility property.

For each quarter-year commencing on the first day of July or October, 1926, or on the first day of January, April, July or October of any year subsequent to 1926 during the period of operation under this contract, if the index interest rate (computed as in this section 10 hereinbelow provided) for the preceding quarter-year, shall be 5.7 per cent., the normal annual rate of return to be allowed the company hereunder shall be 7.7 per cent. For each such quarter year, if such index interest rate, for the preceding quarter year, shall be greater than 5.7 per cent., then the normal annual rate of return to be allowed the Company hereunder shall be greater than 7.7 per cent., or if such index interest rate shall be less than 5.7 per cent., then such normal annual rate of return shall be less than 7.7 per cent., by a sum in either case equal in amount to one-half the amount by which such index interest rate is greater or less, as the case may be, than 5.7 per cent.

The stipulated return for any such quarter year to be allowed the Company upon the value of its investment hereunder, as a component of the cost of the service as aforesaid, shall consist of the gross return calculated at the then current normal annual rate of return computed as aforesaid, diminished by a sum equal in amount to one-half the then current normal differential rate (computed as in this Section 10 hereinbelow provided) applied to the aggregate principal amount of the bonds of the Company, if any (not, however, exceeding in amount twice the credit balance, if any, at that time standing in the City Equity Account), secured by the Municipal Mortgage as in Section 22 hereinbelow authorized and on the first day of such quarter year outstanding in the hands of the City; provided, however, that the gross return calculated as aforesaid shall for no such quarter year be diminished pursuant to the foregoing provisions of this paragraph, to an amount which shall be less than an amount sufficient to enable the Company to pay dividends out of its current earnings for such quarter year upon such proportion of the Company's entire common stock then issued and outstanding as the value of the Company's fixed property

within the Metropolitan District, determined as in Section 5 hereinabove provided, then bears to the aggregate value of the Company's fixed property within and (as may be determined by the Railroad Commission) outside of the Metropolitan District, at an annual rate equal to the rate of interest which the credit balance in the City Equity Account then bears.

Provided also, in case such index interest rate of the Company computed for any quarter year shall be at a figure in excess of 6.3, then, and in every such case, the formula for computing the rate of return for the next succeeding quarter year, as in this Section 10 prescribed, shall not be employed, but the contracting parties shall forthwith negotiate and agree upon the rate of return to be allowed the Company for such quarter year upon the investment hereunder, and in the absence of agreement upon such new rate of return within fifteen days after the first day of such quarter year, the matter shall be submitted to the Railroad Commission for determination and both contracting parties shall be bound by the determination of said Commission.

The index interest rate, for any quarter year, shall be computed as an average (weighted as to the principal amounts of indebtedness to which the several annual interest rates are applicable and as to the periods of duration of such amounts during the quarter year) of the several annual interest rates applicable to (a) the several parts of the indebtedness of the Company outstanding at any time during the quarter year which shall be payable not less than one year from the respective dates on which the several parts thereof shall have been incurred, except those portions, if any, of such indebtedness which at that time shall be secured by the Municipal Mortgage and/or shall be represented by the credit balance in the City Equity Account hereinbelow authorized, (b) the several parts of the indebtedness of the Company outstanding at any time during the quarter year, which shall be owing to any banker, bank, trust company, corporate fiscal agent and/or moneyed institution and (c) all other indebtedness of the Company outstanding at any time during the quarter year, if any, which shall have been incurred by borrowing money, with the exception of Municipal Mortgage indebtedness and City Equity indebtedness as aforesaid. In the calculation of said index interest rate, there shall be included the respective specified nominal annual rates of interest, the quarter yearly cost of amortizing over the respective periods of the several items of indebtedness all bond and note discount and all expenses of issuance incurred, including therein all discount and expense theretofore remaining unamortized as a result of refunding operations, the cost incurred by the Company during the quarter year in connection with the administration of the respective trust estates established for the security of the several items of indebtedness, together with all expenses incurred by the Company during the quarter year, pursuant to the requirements of any contract with reference to any

such items of indebtedness, in paying and/or reimbursing taxes imposed upon the holders of any securities representing any such items of indebtedness.

The normal differential rate applicable as of any time shall be computed by subtracting the then current index interest rate from the then current annual rate of return.

The Company covenants that, throughout the period of operation under this Contract, the proportion of the Company's share capital (as in this Section 10 hereinbelow defined) to the Company's debt capital (as in this Section 10 hereinbelow defined) shall be at all times maintained at a ratio of not less than three to seven; provided, however, in the event that the Company at any time shall violate this covenant by issuing securities and/or incurring indebtedness in excess of the amount to be determined by applying such proportion, then, and in every such event, nothing in this Section 10 shall be construed in any way to impair or affect either the validity of such securities and/or indebtedness in accordance with the terms thereof or the obligation of the Company thereunder; provided further that nothing in the foregoing proviso shall relieve the Company from the imposition of any penalty to which it would otherwise be subject in accordance with the provisions of Section 21 hereinbelow.

For the purpose of this Contract, "share capital" is hereby defined to comprise (a) the aggregate par value of all the capital stock of the Company, currently issued and outstanding, (b) the amount of the current corporate surplus, surplus reserves and undivided profits of the Company, together with (c) the current credit balance in the City Equity Account. "Debt capital" is likewise hereby defined to comprise the aggregate amount of all those classes of indebtedness of the Company in this Section 10 specified for use in determining the index interest rate, together with all that indebtedness of the Company, if any, currently secured by the Municipal Mortgage.

In calculating at any time, in accordance with the provisions of this Section 10, the index interest rate, the several classes of indebtedness of the Company, the amounts of the share capital and debt capital, respectively, of the Company, and the amount of the common stock of the Company at any time issued and outstanding, the figures set forth in the then current corporate balance sheet of the Company shall govern. Such corporate balance sheet as of any given date shall be computed by making additions and subtractions, representing actual changes in the property or obligations of the Company, to or from the corporate balance sheet of the Company, as of December 31, 1924, a copy of which is hereto attached, marked "Annex B". Provided, however, that the value of the Company's investment hereunder to which such rates of return shall be applicable for the purpose of computing the stipulated return to which the Company shall at any time be entitled shall be determined as in Section 5 hereinabove pro-

vided, without resort to said corporate balance sheet of the Company except as in said Section 5 expressly provided.

SECTION 11. *Schedules of Rates.* That schedules of rates in force within the Metropolitan district just prior to the effective date of this contract, as at that time filed with the Railroad Commission, shall continue in effect until changed as in section 12 hereinbelow provided. Within sixty days after the effective date of this contract, the city and the company shall agree, subject to the approval of the Railroad Commission, upon a schedule of two different sets of rates covering each distinct class of service furnished within the Metropolitan district, one of which sets of rates shall be designed to yield more revenue and one of which shall be designed to yield less revenue than will be earned under the set of rates initially in effect; and when at any time a lower or a higher set of rates shall be put into effect as in section 12 hereinbelow provided, the city and the company shall within sixty days thereafter agree, subject to the approval of the Railroad Commission, upon an additional set of lower or higher rates, as the case may be, so that there shall always be available one additional set of rates lower and one additional set of rates higher than the rates at any time in effect. Each specific rate of any such set of additional rates shall be reasonable in amount with respect to the particular class of service to which it pertains. In case of the failure of the city and the company to agree upon any such set of additional rates within the time hereinabove specified, either party may submit the matter to the Railroad Commission for determination, and both contracting parties shall be bound by the decision of said commission.

Any rates at any time in force or the schedule of additional rates (viz., the sets of rates other than those then actually in force) may at any time be altered by agreement between the City and the Company, subject to the approval of the Railroad Commission. The schedule of additional rates may likewise be altered by an order of the City delivered after public hearing, in which event such altered schedule shall not become available for use as in Section 12 hereinbelow provided until three months shall have elapsed from the date of service upon the Company and of certification to the Railroad Commission of the City's order. At any time within thirty days after such service and certification thereof, the Company shall have the right to appeal to the Railroad Commission from such order. In the event of such an appeal the Railroad Commission shall be empowered to approve the new schedule of additional rates so prepared by the City, to reëstablish the old schedule of additional rates theretofore available for use, or of its own motion to prepare and publish a new schedule of such additional rates.

Provided, however, that it is the express intention of both contracting parties that each such additional set of rates whether determined by the city or by the Railroad Commission shall be so fixed with increment or decrement above or below the set of rates scheduled to be just

previously thereto in force, as to provide the company, upon the effecting of each such change of rates, with an annual increase or reduction in gross operating revenue estimated to be sufficient to increase or reduce the Stabilizing Reserve by approximately one-half of the sum in which the said reserve shall have been originally established as in section 12 hereinbelow provided.

Subject to the foregoing provision, and provided that each specific rate is reasonable in amount with respect to the particular class of service to which it pertains, the specific rates covering any specified classes of service may be lowered in the next higher set of rates or may be raised in the next lower set of rates.

Nothing in this Contract shall be construed to prevent any customer or group of customers of the Company from appealing to the Railroad Commission, as provided by law, for any cause whatever in respect of the fixing or charging of any rate or in respect of the furnishing of any service afforded or scheduled; provided that such customer, if a resident of the City, shall have first presented his complaint in writing to the City and the City shall have failed within ten days thereafter to effect or obtain such modifications in the rate or service complained of as to obviate the complaint in question. Except as otherwise provided in accordance with law by virtue of the express terms of this Contract or except as otherwise expressly provided by Section 197.10 of the Wisconsin Statutes, 1923, as applied to the provisions of this Contract by the terms hereof, all the laws of the State of Wisconsin which would be operative in the absence of this Contract shall remain fully applicable to the operation of the property subject hereto.

SECTION 12. *Stabilizing Reserve.* The Company covenants to establish, as of July 1, 1925, a Stabilizing Reserve in the amount of $700,000. Until this Contract shall have been terminated by purchase or otherwise, the assets against which the Stabilizing Reserve is carried shall be available for the purpose of making good any deficiency, necessary to meet the cost of service, in the income afforded by the operation of the property subject hereto. Such assets need not be segregated or funded by the Company. To the Stabilizing Reserve shall be periodically credited any excess of revenues over the cost of the service, other than such revenues as may from time to time be used as the basis of the charges, if any, made by the Company at the direction of the City for the amortization of specific items of the property subject hereto as in Section 5 hereinabove authorized. The Stabilizing Reserve shall likewise be periodically charged with any deficit remaining after the revenues shall have been applied to such cost of the service.

If, as of the last day of June or December of any year, the balance in the Stabilizing Reserve shall exceed $1,050,000, the company shall within one month thereafter put into effect the next lower set of rates promulgated and available for use as hereinabove provided for each class of service furnished; provided, however, that if during the preceding twelve months the gross income derived from within the Metro-

politan district shall not have exceeded the cost of the service hereunder by $350,000, such lower set of rates shall be put into effect only if requested by the city. If, as of the last day of any such period of six months, the balance in such Stabilizing Reserve shall be less than $350,000, and if during the preceding six months the total gross operating revenue derived from within the Metropolitan district shall have been less than the cost of the service hereunder as hereinabove defined, the company shall within one month thereafter put into effect the next higher set of rates promulgated and available for use as hereinabove provided for each class of service furnished.

If at any time when a change of rates is to be made as herein provided no additional set of lower or of higher rates, as the case may be, is available for use by the company, then, pending the adoption of such new set of rates as in section 11 hereinabove provided, the company shall put into effect new rates for electric and heating service, in amount five per cent. less or greater, as the case may be, than the rates theretofore in effect, and the company shall change its ticket rate for street railway service to one more or one less ticket for one dollar, as the case may be, than the number of tickets called for under the rate theretofore in effect.

Out of the stipulated return allowed the company on its investment, the company shall quarter-annually credit the city with interest at the rate of four per cent. per annum on that amount by which the average monthly credit balance in the Stabilizing Reserve during the preceding calendar quarter-year shall exceed $700,000.

Whenever on the last day of June or December of any year the balance in the Stabilizing Reserve shall exceed $1,050,000, said reserve shall be debited and the city shall be credited with the amount in which at such time the said balance shall exceed $700,000.

In case of termination of this Contract by any means other than through purchase by the City, in accordance with the terms hereof, of the property subject hereto, all interest on the Stabilizing Reserve theretofore credited by the Company to the City and all amounts, if any, theretofore credited by the Company to the City out of the Stabilizing Reserve during the period of operation hereunder, together with all interest thereon theretofore actually credited, funded, accumulated and/or accrued during such period (but excluding interest at any time actually paid in cash to the City), shall thereupon be debited by the Company to the City and credited to the Stabilizing Reserve. Both contracting parties hereby unite in requesting the Railroad Commission, in fixing the rate base to be effective after such termination of this Contract, to take account of any balance then in the Stabilizing Reserve in excess of the amount originally established, by utilizing the same for the purpose of amortizing in part the Company's investment in the property situated within the Metropolitan District, or in fixing the rates to be effective after such termination of this Contract, to take account of any deficit then in such Reserve below the amount originally

established, so as with reasonable dispatch to put the Company in the same position as if no such deficit in the said Stabilizing Reserve had been accrued and in existence at the time of such termination of this Contract

ARTICLE III

CONTROL

SECTION 13. *Control of the Service.* The company grants to the City the control, by specification of the quantity and quality, of the intra-Metropolitan District service to be rendered by the Company through the medium of its property subject hereto. This control shall cover all characteristics of the service, including schedules, stops, routes, terminals, voltage and pressure, subject to the limitation that the quantity and quality of the service ordered by the City to be rendered can be paid for out of the revenues as then being received or as may be received under other rates to be authorized; subject also to the physical limitations inherent in the properties; and subject further to such control as may be lawfully exercised within the Metropolitan District by other governmental authorities.

SECTION 14. *Control of Accounts.* The City is hereby expressly authorized to audit and to inspect at all times all accounts and all accounting and statistical records of the Company.

The Company shall submit to the City monthly statements of account which shall cover all components of the cost of the service as hereinabove defined and all income derived from within the Metropolitan District. In case the City shall disapprove any of the items or entries in any such statement of account, thereupon the City shall within twenty days after such statement shall have been submitted to it suggest adjustments. In the event of the failure of the Company to agree to any adjustment proposed by the City, the City may submit the matter to arbitration. In case the City shall not notify the Company of its disapproval of specific items or entries contained in any such monthly statement of account, within twenty days after its receipt, thereupon the said statement shall be deemed to be correct and both the City and Company shall be bound by it.

The Company shall also submit to the City each month a copy, in its standard form, of its financial and operating report for the preceding calendar month, including a copy of its corporate balance sheet as of the last day of such preceding month.

SECTION 15. *Control of Additions and Replacements.* Commencing January 1, 1926, additions, extensions, improvements and replacements chargeable to fixed capital account may be proposed by the city or by the company. In either event plans and estimates therefor shall be prepared by the Company. If proposed by either party, such proposal shall be approved or rejected by the other party within thirty days after

the submission of such plans and estimates. Failure by either party to reject within such thirty days shall be deemed to constitute approval by such party. If rejected by the City within such period of thirty days, such proposals shall not be executed. If proposed by the City, or if approved by the City, such proposals shall be executed by the Company unless the Company shall contend that the execution thereof will not reasonably be required for the purpose of serving the convenience and necessity of the public, or will interfere with the performance of the other terms and conditions of this Contract, including particularly the provision for the furnishing of service at cost as hereinabove defined.

In case of such refusal of the Company to act upon the City's proposal, the City may submit the matter to arbitration. If the arbitral authority shall find that neither of the foregoing contentions of the Company with reference to the proposed addition, extension, improvement or replacement is well founded, the Company shall proceed forthwith to construct or otherwise acquire the same. If, however, the arbitral authority shall find that either such contention is well founded, provided that the said arbitral authority further finds that the proposed addition, extension, improvement or replacement, if constructed or otherwise acquired, may be maintained and operated as a segregable and independent unit in the Company's system, the City may then, at its own expense, independently construct or otherwise acquire it, or the City may bear the cost of construction and require the Company to construct it or may require the Company to act as its agent, at the expense of the City, in the acquisition of it, after funds shall have been provided by the City. In the case of construction by either the City or the Company the detailed plans and specifications and the quality of all materials employed shall be subject to the reasonable approval of the Company's engineers. Such determination on the part of the City to construct or otherwise acquire at its own expense such addition, extension, improvement or replacement or to bear the cost of construction and to direct the Company to construct it, shall be made only through the adoption of an ordinance by three-fourths vote of the members elect of the Common Council of the City.

The City, whether it shall have constructed or otherwise acquired such additions, extension, improvement or replacement or required the Company so to construct it, shall then lease the resultant property to the company at a rental in amount to be fixed from year to year by arbitration in the absence of agreement between the contracting parties. Such rental shall be fixed in amount such as to allow the Company to retain out of the additional revenues derived from operating the leased property the cost of the service of such operation, including the stipulated return upon the Company's investment, if any, employed in connection therewith. Throughout the life of such lease, leased property shall be in the custody of the Company and shall continue to be operated by the Company as a part of the transportation or utility

system to which it appertains; provided, however, that if such leased property can be operated only at a loss, the Company shall nevertheless operate the same at a nominal rental of One Dollar per annum unless at any time operation at such rental shall jeopardize the earning by the Company of revenues hereunder equivalent to the full cost of the service rendered by the property of the Company subject thereto. Each such unit of property, the cost of construction or acquisition of which shall have been so borne by the City shall remain the property of the City until such time as it may be purchased by the Company at a price to be mutually agreed upon. Until such purchase shall have been effected, the cost of any such unit of property shall not be added to the value of the investment as hereinabove defined.

In the event of termination of this Contract in any manner other than through purchase by the City, in accordance with the terms hereof, of the property subject hereto, any outstanding lease or leases, as in this Section 15 authorized, shall at the option of the City be terminated or shall continue in full force and effect, subject to payment of the rental to be fixed from year to year as in this Section 15 provided, subject also to the power of the City to elect to terminate any such lease or leases at the end of any calendar year by giving to the Company six months' notice in writing, and subject further to the power of the Railroad Commission by its order to terminate any such lease or leases at the end of any calendar year on the ground that continued operation of such leased property imposes an undue burden on the remainder of the Company's system.

For the period commencing July 1, 1925, and ending December 31, 1925, both inclusive, the city hereby approves the expenditure by the company within the Metropolitan district for additions, extensions, improvements and replacements chargeable to capital account, in accordance with the company's own program, of sums not to exceed in the aggregate $4,000,000. For each month of such period the company shall submit statements of account covering all such capital expenditures. The city may propose adjustments as between charges to capital, to depreciation and to operating expenses, but only within thirty days after receiving any such statement; and in case the company shall not agree to such adjustments the city may submit the matter to arbitration.

After January 1, 1926, the company shall submit to the city monthly statements of account covering all expenditures for additions, extensions, improvements and replacements chargeable to capital account. In case the City shall disapprove any of the items or entries contained in any such statement, thereupon the City shall within thirty days after the statement shall have been submitted suggest adjustments. In the event of the failure of the Company to agree to the adjustments proposed by the City, the City may submit the matter to arbitration. In case the City shall fail to notify the Company of its disapproval of specific items or entries contained in any such statement within thirty days after its receipt, thereupon the statement shall be deemed to be

correct and both the City and the Company shall be bound by it. Provided, however, that as to any construction job which is not completed at the time of the making of any monthly report of capital charges thereto, the time of the City to notify the Company of its disapproval of any distribution of the charges upon such job as between operation, depreciation and capital, shall not expire until thirty days after the City shall have been notified of the completion of the job.

The city hereby consents to the renewal and extension of the terms of the lease and agreement dated October 1, 1920, recorded in Volume 868 of Deeds at page 213, in the office of the Register of Deeds of Milwaukee County, Wisconsin, and of the supplemental lease and agreement dated October 1, 1923, recorded in Volume 1016 of Deeds at page 14, in the office of said Register, made between Wisconsin Electric Power Company, as lessor, and the company as lessee, as modified with respect to rental rate by two letters exchanged by said lessor and said lessee on April 16, 1924, and approved by the Railroad Commission on May 15, 1924 (said lease and agreement and said supplemental lease and agreement and said modification thereof being hereinafter sometimes collectively referred to as the "Power Plant Lease"), from time to time when necessary in order that the same shall remain in full force and effect during the period of operation hereunder. The company covenants that, prior to the effective date of this contract, it will enter into an agreement with said Wisconsin Electric Power Company, supplemental to said Power Plant Lease, whereby it will have the option, at the expiration of said lease, to renew the same for such term or such successive terms as will keep said lease in force during the entire period of operation hereunder, at a rate of rental not higher than that fixed in the aforesaid modification of April 16, 1924, to said power plant lease; and the company further covenants that, unless it acquires said plant by purchase pursuant to the terms of said power plant lease, it will exercise said option or options so as to keep said lease in force throughout the period of operation hereunder.

The Company agrees that during the period of operation hereunder it will not consent, without the approval of the City, to the termination of said Power Plant Lease or to the making by the Lessor thereunder of any addition, extension or improvement to the leased premises, except such as may be made in compliance with the covenants of any present mortgage of said Lessor, or covenants of like tenor in any future mortgage of said Lessor, or such as may be made in compliance with an order of the Railroad Commission or other public authority having jurisdiction therefor, requiring the construction of additional power plant facilities with respect to the Company's property situated outside of the Metropolitan District.

Anything in this Contract to the contrary notwithstanding, the City hereby recognizes, and expressly assents to the exercise at any time of the option of the Company to purchase, in accordance with the terms and conditions therein set forth, the power plant and other property

specified in said Power Plant Lease; provided, however, in the event that the City shall at any time give the requisite notice to the Company of its intention to exercise its option to purchase, in accordance with the terms hereof, the property subject hereto, then, in that event, prior to the time fixed for delivery of such property to the City, the Company shall purchase, in accordance with the terms and conditions set forth in said Power Plant Lease, the said power plant and other property then owned by Wisconsin Electric Power Company and subject thereto, and shall deliver the same, and the same shall be accepted and purchased by the City, as part of the property then subject hereto.

SECTION 16. *Control of Methods and Practices.* The City shall be empowered to investigate any and all of the methods, practices and acts of the Company with respect to expenditures, construction, operations, accounting, maintenance of property, of working capital, and of operating reserves, and in all other respects whenever these shall affect the subject-matter of this Contract. The City may at any time submit to the Company such recommendations as it sees fit for the purpose of improving, altering or eliminating any such methods and practices. In the event that the Company shall fail to agree to any such recommendation within a time to be specified therein, the City may submit the matter to arbitration.

The gain sharing plan heretofore in effect under the existing agreement between the Company and its employees shall continue in force. Changes in such plan may be proposed by the City from time to time and if not approved by the Company may be submitted to arbitration.

Nothing in this Contract shall affect in any way the right of employees of the Company to organize.

SECTION 17. *Joint Use of Tracks and Facilities.* All appropriate services and facilities shall be rendered from time to time by the property of the Company situated within the Metropolitan District and by the property of the Company situated outside of the Metropolitan District, each to the other. The compensation therefor, to be credited or debited to the cost of the service hereunder when and as such services or facilities are rendered, shall be fixed from time to time by agreement between the City and the Company, or, in the absence of such agreement, by the Railroad Commission.

Subject to such regulations as may be prescribed by the Railroad Commission, nothing in this Contract shall be deemed to prevent the joint use throughout the period of operation under this Contract of any or all of the properties subject hereto by the Company and by any one or more affiliated companies or other corporations with which it may contract for such joint use, provided that throughout the period of operation hereunder the Company covenants to subject the said properties to no further rights of joint user except such as shall be terminable at the option of the City in the event of purchase by the City, in accordance with the terms hereof, of the said properties subject hereto; and more particularly, nothing in this Contract shall be

construed to prevent the use by the Company and/or by any other corporation or persons with whom it may contract for such use of any or all of the properties subject hereto, in respect of utility or any other service of a character not subject to this Contract, afforded or to be afforded by it or them; provided, however, that for such use by other or affiliated companies and for such use by the Company or by any other corporation or persons in respect of utility or any other service of a character not subject to this Contract, reasonable rentals or reasonable service charges to include all of the elements of the cost of the service as hereinabove defined shall be charged.

SECTION 18. *Machinery of Control by the City.* The City undertakes by separate ordinance to create the office of Public Utility Commissioner and to prescribe the powers and duties of such officer. The administrative duties imposed upon the City and the administrative powers vested in the City under this Contract shall be exercised by the Public Utility Commissioner, acting in obedience to such ordinances as the Common Council may from time to time enact. The salaries, office and other expenses of the Commissioner and of his staff shall be paid monthly by the Company upon approval by the said Commissioner and shall be charged as an operating expense; provided, however, that the aggregate annual amount of such expense shall not exceed one-third of one per cent of the gross operating revenues of the Company derived from sources within the Metropolitan District during the preceding year. It shall be the duty of the City and of the Company to coöperate in the methods and practices involved in the exercise of control by the City as hereinabove provided, to the end of eliminating avoidable duplication and of attaining the most economical administration by the City of its powers and duties, consistent with proper and efficient execution and enforcement thereof.

SECTION 19. *Corporate Autonomy.* Nothing in this Contract shall operate as an abridgment of the corporate rights or powers of the Company or of the discretion of its Board of Directors in the selection of managers and employees or of anyone performing any duties imposed upon the Company or its officers by law.

It is not the intention of the contracting parties to empower the City to execute any of the work upon, or operation of, the properties subject to this contract. Such execution shall be and shall always remain in charge of, and shall be carried out by, the Company acting through or by means of its own organization and plant. In case of any controversy between the representatives of the City and of the Company as to acts to be performed in respect of the properties subject to this Contract, in connection with service, construction, accounting or any other function of operation or of administration, the City may submit its proposal to arbitration, but the custody of the properties in the hands of the Company shall at all times be respected by the City.

Subject to the crediting of interest on the operating, Depreciation and Stabilizing Reserves as in Sections 7, 9, and 12 hereinabove pro-

vided, the income (including therein the amounts, if any, which may from time to time be credited to income out of the Stabilizing Reserve) which the Company shall receive hereunder as the stipulated return upon its investment shall be at free disposal of the Company for (1) payment of all its interest shall be at the free disposal of the Company for (1) payment of all its interest charges, (2) payment of its financing charges enumerated in Section 10 hereinabove in connection with the computation of the index interest rate and (3) distribution among its stockholders and/or use or retention as corporate surplus.

Subject to the provisions for maintaining the proportion of the share capital to the debt capital of the Company as in Section 10 hereinabove provided, nothing in this Contract shall be deemed a limitation at any time upon the amount of capital stock which may be issued, or upon the amount of indebtedness which may be incurred by the Company. The value of the Company's investment hereunder is fixed in this Contract only for the purpose of affording an element in the determination of (1) the stipulated return upon its investment hereunder to be allowed to the Company under the terms of this Contract, (2) the basis for adjusting the rates to be charged for service subject hereto during the life of this Contract and (3) the price at which the City may purchase the property herein specified, subject to all of the other terms and conditions of this Contract.

The issue and sale of stocks, bonds and other securities shall continue to be under the sole approval and control of the public authorities in which such functions may from time to time be vested by law, subject to the right of the City to participate in the financing of the property subject hereto as in Sections 22 and 23 hereinbelow provided.

Anything in this Contract to the contrary notwithstanding, the Company shall be saved harmless from any liabilities or penalties attaching or accruing because of acting or omitting to act under the terms of this Contract by reason of the obedience of the Company to any order or orders of any nature whatsoever promulgated by the Railroad Commission or by any other lawfully constituted authority of the State of Wisconsin or of the United States of America, until such time as the said order or orders shall have been revoked by said Railroad Commission or other authority or otherwise annulled by due process of law.

Anything in this Contract to the contrary notwithstanding, the Company may freely sell, transfer, assign or lease the property subject hereto, or any part of it, which property shall thereafter remain subject, nevertheless, to the terms and conditions of this Contract; provided, however, that in case the Company at any time gives notice to the City of its desire to sell, abandon, or otherwise dispose of any part of the said property which shall in the judgment of its Board of Directors or executive officers no longer be useful or necessary for the purpose of furnishing any of the service hereunder, and in case the City does not, within thirty days after such notice, advise the Company of its disapproval of the proposed action, then, and in every such case,

the Company may so sell, abandon, or otherwise dispose of such property in accordance with the terms and specifications set forth in its notice to the City, free and clear of any encumbrance, prohibition or obligation imposed by the terms of this Contract; also provided, that in case the City shall within thirty days after such notice advise the Company of its disapproval of the proposed action, the Company may submit the matter to arbitration; and provided further that, anything in this Contract to the contrary notwithstanding, the Company may at any time, without having given notice to the City and without having sought the consent of the City, so sell, abandon, or otherwise dispose of such property, free and clear of any such encumbrance, prohibition or obligation aforesaid, in an aggregate amount, computed by taking the cost at which such property shall have been included in the value of the investment hereunder, not to exceed $5,000 in any one calendar month, and the purchaser on any purchase for a consideration of less than $5,000 shall not be obligated to inquire into the Company's authority to make such sale. A certificate of the Public Utility Commissioner that the City has not disapproved a proposed sale, transfer, assignment, lease or other disposition of property shall be conclusive evidence of such fact and shall protect any person purchasing or acquiring such property from any claim under this contract; and it shall be the duty of such Commissioner to give such certificate and file the same with the City Clerk on request of the Company if within the thirty days' period hereinbefore provided the City does not advise the Company of its disapproval.

SECTION 20. *Arbitration.* Either contracting party may submit to arbitration any controversy arising out of the interpretation of, or administration under, this Contract or any of the terms thereof remaining in effect after this Contract shall have been terminated. Each award promulgated by the arbitral authority as in this Section 20 provided shall be binding upon both the City and the Company and shall forthwith be put into effect in accordance with the terms thereof, subject to the laws of the State of Wisconsin.

In each case the City shall elect whether the arbitral authority shall be the Railroad Commission or a temporary Board composed of three or of five members to be appointed for each case, the City and the Company each and severally to designate one or two members, respectively, the third or fifth member, who shall be the Chairman of the Board, to be chosen by unanimous agreement between his colleagues or, in the event that they shall have been unable to agree, by that person who shall then be the judge of the District Court of the United States for that District in which the City is located, or, if such person shall for any reason be disqualified from making such appointment, or shall refuse so to do, then by any person who shall at that time be a Judge of the Circuit Court of Appeals of the United States for that Circuit in which the City is located. Failure of the City to submit to the Company the name of one or the names of two members of a tem-

porary Board within ten days after the Company shall have notified the City of its intention to submit to arbitration any particular controversy, shall be conclusively deemed an election on the part of the City to submit that particular controversy to the Railroad Commission.

In the event that the Company shall fail to notify the City of its designation of the one or two members of the temporary Board requisite to be designated by the Company, within ten days after the service upon the Company of the complainant City's petition and of notice of the City's election to submit the matter to a temporary Board constituted as aforesaid together with the designation by the City of one or of two members thereof, then at the instance of the City such one or two members requisite to be appointed by the Company shall be appointed by that person who shall then be the Judge of the District Court aforesaid or in case of his disqualification or refusal to act, by any person who shall at that time be a Judge of the Circuit Court of Appeals aforesaid.

In no case shall any member of a temporary Board, constituted as in this Section 20, provided, be an officer of, an employe of, or a person under retainer from, either the City or the Company or any corporation affiliated with the Company in respect to the ownership or management of the property subject hereto, nor shall any member of such temporary Board be a stockholder of the Company or of any such corporation affiliated as aforesaid. If any member designated by the Company is a creditor of the Company he shall be disqualified from serving in case the City objects upon that ground within one day after the submission of the controversy. If any member designated by the City is an inhabitant of or a taxpayer in the Metropolitan District he shall be disqualified from serving in case the Company objects upon that ground within one day after the submission of the controversy.

Provided, however, that every controversy in which the dispute relates to wages or to conditions of employment shall be referred to the State Board of Conciliation, the award and findings of which shall be binding upon both the City and the Company.

Each controversy shall be submitted by service upon the respondent and upon each member of the arbitral authority of a duly verified copy of the complainant's petition, together with notification by the complainant of the City's election to submit the matter to the Railroad Commission as aforesaid or the designation of the respective members of the temporary Board as aforesaid. The respondent at its election may submit a formal answer within fifteen days after the submission of the controversy as aforesaid; provided that in case both parties shall have joined in requesting a summary award as hereinbelow provided, the time allowed the respondent in which to answer shall be limited to five days. A stenographic transcript of the evidence submitted to the arbitral authority shall be taken only in the event that one of the parties to the controversy requests it in the petition or answer. The record in each case shall consist of the instrument whereby the

complainant notifies the arbitral authority of the City's election to submit the matter to the Railroad Commission as aforesaid or of the instruments whereby the several members of the temporary Board are designated as aforesaid together with duly verified copies of the complainant's petition, of the respondent's answer, if submitted, of all exhibits submitted by the parties to the controversy, of the transcript of evidence, if made, and of the award of the arbitral authority together with its findings of fact. The arbitral authority, at its discretion, may adopt regulations for the convenient dispatch of its business consistent with the provisions of this Contract.

The arbitral authority shall be empowered not merely to decide the specific question presented to it, in favor of one or the other of the parties to the controversy, but either party, or the arbitral authority of its own motion, may propose an award in modification of the other party's contention, provided it be within the issues submitted by the complainant's petition. The arbitral authority shall be empowered to make its award only after a full and open hearing afforded both parties, but in each case it shall promulgate its award within ninety days after the submission of the controversy by the complainant, provided that in any case both parties may join in requesting a summary award to be made within thirty days of the time of submission. The arbitral authority shall grant no temporary relief, by way of injunction or otherwise, preceding such award.

In construing this Contract the arbitral authority shall always be guided by the statement of purposes hereunto prefixed by way of preamble; but in no event are the following matters to be deemed arbitrable:

(1) The right of the City to control the service as in Section 13 hereinabove provided, except when the Company shall allege that the City's requirements would jeopardize either the earning of the full cost of the service hereunder or the enjoyment of the right of the Company to the custody and management of the properties subject hereto;

(2) The sum fixed as the value, as of January 1, 1922, of the fixed property of the Company subject hereto and the rules as in Section 5 hereinabove prescribed in accordance with which the value, as of any subsequent date, of the Company's investment hereunder shall be determined for the purpose of use in computing the cost of the service as hereinabove defined;

(3) The formula, as set forth in Section 24 hereinbelow, in accordance with which shall be computed the purchase price to be paid by the City for the property of the Company subject hereto;

(4) The right of the City upon the terms and subject to the conditions in Section 24 hereinbelow provided, to purchase the property of the Company subject hereto; and

(5) The formula, as set forth in Section 10 hereinabove, to be used

in determining the rate of return at any given time to be allowed the Company upon its investment hereunder.

Coincidently with notice of the City election to submit any controversy to a temporary Board as aforesaid, the complainant shall request that person who shall then be Chairman of the Railroad Commission, or if such person shall for any reason be disqualified from acting or shall refuse so to act, then any other person who shall at that time be a member of the said Railroad Commission, to fix, within three days after request therefor, the compensation to be paid to the members of the said temporary Board for their services in arbitrating the controversy in question. The expenses of arbitration incurred by any arbitral authority, including the compensation fixed as aforesaid for the members of any temporary Board, shall be certified by such arbitral authority to both parties to the controversy and shall be paid by the Company as a part of the operating expenses constituting a component part of the cost of the service hereunder, subject to such other provision for the payment of such expenses as may be made by law.

SECTION 21. *Penalty.* The Company shall be liable to the City in respect of a penalty of not less than twenty-five dollars nor more than one thousand dollars per day, to be fixed and enforced in an action at law, in the event of any willful failure of the Company to comply substantially with the terms and conditions of this Contract. In any such action it shall not be necessary for the City to establish the damages incurred, but the court, sitting without a jury, shall fix the amount of such penalty in view of the gravity of the particular act or omission complained of and in view of the importance of securing the City against its continuance or repetition. In construing and applying this penalty provision, the act or omission of any officer, agent or other person acting for or employed by the Company while within the scope of his employment and in the execution of the Company's service, shall in every case be deemed to be the act or omission of the Company. The enforcement of any such penalty shall be without prejudice to the right of the City to apply to a court of competent jurisdiction to compel specific performance of any provision of this Contract in respect of which such right would otherwise exist. The amount of any judgment or judgments rendered in favor of the City under the terms of this Section 21 shall be a charge to, and shall constitute a deduction from, the stipulated return for the then current period of three calendar months ending on the last day of either March, June, September or December, allowed the Company as a component of the cost of the service as hereinabove defined; but in no event shall more than one such penalty be imposed upon the Company in respect of its acts and/or omissions to act in any one day. The amount of any such judgment or judgments shall be credited by the Company to the City.

Provided, however, in the event that the Company shall be liable to the State of Wisconsin, by virtue of law, in respect of a penalty for

the act or omission of the Company constituting any such failure aforesaid, then, and in every such event, the Company shall not be liable to the City by virtue of any provision of this Section 21 in respect of a penalty for the same act or omission.

Provided, moreover, in the event that the Company shall have been ordered by an arbitral authority to construct or acquire an addition, extension, improvement or replacement as in Section 14 hereinabove provided, and in the further event that the Company shall be able to show that it has failed to obtain the funds requisite for such construction or acquisition, after having made in good faith and with due diligence a reasonable effort to obtain such funds by selling available preferred stock, bonds and/or other securities representing funded indebtedness of the Company, then, and always in such events, the Company shall not be liable to the City in respect of any penalty by the terms of this Section 21 provided for failure to construct or acquire and/or operate any such addition, extension, improvement or replacement, unless the City shall have first tendered to the Company all funds requisite for such construction or acquisition, in consideration of the issue by the Company to the City, in the principal amount thereof, of mortgage bonds of the Company upon the terms as in Section 22 hereinbelow provided or, at the election of the City, in consideration of the credit by the Company of the principal amount thereof to the City Equity Account upon the terms as in Section 23 hereinbelow provided.

ARTICLE IV

Municipal Acquisition

Section 22. *Purchase of Mortgage Bonds at the Option of the City.* For the purpose of securing payment of the principal of, and of the interest upon, certain loans which may be made by the City to the Company in accordance with the provisions of this Section 22, the Company hereby covenants to execute and to deliver to such corporate trustee as may be mutually agreed upon, as of July 1, 1925, a mortgage (hereinafter called the "Municipal Mortgage"), all the terms and provisions of which mortgage shall conform to the terms and provisions of the Refunding and First Mortgage, dated June 1, 1921, made by the Company to Central Union Trust Company of New York, as Trustee, and the Company's Indenture supplemental thereto, dated September 12, 1923, insofar as the same shall be applicable, except as in this Contract otherwise provided.

The lien of the Municipal Mortgage shall attach to all that part of the Company's property which shall be subject to the terms of this Contract, owned by the Company on July 1, 1925, or thereafter required by it, subordinate only to certain mortgages and/or deeds of trust of the Company, its grantor, predecessor and constituent com-

panies, which mortgages, hereinafter called the "Senior Mortgages," are hereby enumerated to include the following, and no others: (1) The Consolidated Mortgage and Deed of Trust dated February 1, 1896, made by the Company to Central Trust Company of New York, as Trustee; (2) the Refunding and Extension Mortgage and Deed of Trust, dated January 1, 1906, made by the Company to the Trust Company of America and W. H. Leupp, as Trustees; (3) the General and Refunding Mortgage and Deed of Trust, dated December 1, 1911, made by the Company to Bankers Trust Company, as Trustee; (4) the Mortgage or Deed of Trust, dated March 15, 1899, made by Milwaukee Light, Heat & Traction Company to City Trust Company of New York, as Trustee; (5) the General Mortgage and Deed of Trust, dated November 1, 1918, made by Milwaukee Light, Heat & Traction Company to Bankers Trust Company, as Trustee; (6) the Refunding and First Mortgage, dated June 1, 1921, made by the Company to Central Union Trust Company or New York, as Trustee, together with four Indentures supplemental thereto, two of them dated June 1, 1921 (one of them executed by North Milwaukee Light & Power Company), one of them dated October 16, 1922, and one of them dated September 12, 1923, and all other indentures supplemental thereto which may be made from time to time hereafter in accordance with the terms of said Refunding and First Mortgage, to secure further series or issues of bonds thereunder; and also (7) any and all new mortgages which may hereafter, from time to time, be made by the Company to secure bonds of the Company which may be issued in principal amount, dollar for dollar, for refunding purposes or in principal amount equivalent to not more than eighty per cent of the cost to the Company of new additions, extensions and/or improvements; provided, however, that no such new mortgage shall be made by the Company without the consent of the City, unless the Railroad Commission, acting as an arbitral authority as in Section 20 hereinabove provided, shall determine that the execution of such new mortgage and of the bonds to be secured thereby will not substantially impair the status, with reference to security, otherwise possessed by the Municipal Mortgage and the bonds thereby secured.

Bonds secured by the Municipal Mortgage may be issued in an unlimited amount, all of one series, shall be payable as to principal twenty years after the date of termination of this Contract and shall bear interest at the rate of five per cent per annum payable semi-annually. Such bonds may be issued by the Company only to the City, and in the hands of the City shall not be negotiable or transferable so long as, but only so long as, this Contract continues in force.

Throughout the period of operation under this Contract the Company shall, within thirty days before the first days of January and July, respectively, in each year, notify the City in writing of the maximum principal amount of mortgage bonds which the Company

estimates it may deem advisable to issue during the ensuing six calendar months for the purpose of refunding securities then outstanding and issued under any of the said senior mortgages and/or for the purpose of providing or reimbursing funds necessary for additions, extensions, improvements and/or replacements made or to be made in or to the property of the Company subject to the lien of the said Municipal Mortgage and properly chargeable to fixed capital account. The City shall have the right, at its option, to be exercised within thirty days after the receipt of such written notice from the Company, to contract, subject to the approval of such public authorities as may be required by law, to purchase for cash on ten days' notice from the Company at par with interest accrued to the respective dates of purchase, when, as and if issued and tendered by the Company, the mortgage bonds first to be issued by the Company during the said six calendar months in any specified principal amount in multipies of $1,000; provided, however, that in lieu of contracting to purchase the whole or any part of the mortgage bonds so designated by the Company, the City shall have the right, at its option to be exercised within such period of thirty days, to contract, subject to the approval of such public authorities as may be required by law, to provide the Company with cash, when, as and if requisitioned by the Company on ten days' notice, in such sums as the Company may from time to time specify, not to exceed a total amount, in multiples of $1,000, to be fixed by the City for the said six calendar months, in consideration of credits by the Company to the City Equity Account, as in Section 23 hereinbelow authorized, of any sums so received by the Company from the City.

In any such contract to purchase such mortgage bonds of the Company, the City shall agree to accept delivery of bonds to be issued under the said Municipal Mortgage and/or bonds of any available series, to be designated by the City, bearing interest at the rate of five per cent per annum, issued or to be issued under the said Refunding and First Mortgage of the Company, dated June 1, 1921, or under any junior refunding mortgage of the Company then available, and the City shall specify therein the principal amount of bonds under each such mortgage which the City so covenants to purchase; provided that, in case at any time the Company shall, within thirty days after having issued and sold to the City in accordance with the terms hereof any such bonds issued or to be issued under the said Refunding and First Mortgage of the Company, or under the said junior refunding mortgage of the Company, issue and sell to any banker, bank, trust company, or moneyed institution any bond or bonds issued or to be issued under the said Refunding and First Mortgage of the Company at a price so fixed as to result in an annual yield to maturity on the said bonds either greater or less than five per cent per annum, then the price at which the City shall have acquired the said Refunding and First Mortgage Bonds or junior refunding bonds so purchased by the

City from the Company within the said thirty days shall be adjusted so that it will result in an annual yield to maturity at the same rate at which the said bonds shall have been sold to any such banker, bank, trust company, or moneyed institution.

Except for the purpose of refinancing, the Company hereby expressly covenants not to employ any funds derived from the proceeds of the sale of its Municipal Mortgage Bonds as aforesaid for the purpose of financing any of its property situated outside of the Metropolitan District.

In case of the failure of the City to exercise its option within the prescribed time, or in case of the failure of the City to contract to furnish the maximum principal amount of the funds so designated by the Company, through the purchase of mortgage bonds and/or the payment of cash to be credited to the City Equity Account, and/or in case of the failure of the City to purchase promptly for cash any mortgage bonds issued and tendered as aforesaid and/or to furnish promptly any sum or sums in cash requisitioned as aforesaid, the Company shall be free to provide for its requirements by the issue and sale, at its discretion during the said six calendar months, subject to the approval of such public authorities as may be required by law, of bonds to be issued under any of its said senior or other mortgages, with the exception of the said Municipal Mortgage, in principal amount not to exceed that portion of the said designated maximum principal amount of funds which the City shall have failed to furnish to the Company.

Whenever during the period of operation under this Contract the Company shall deem it advisable to issue during any six months' period, mortgage bonds for the purposes hereinabove specified in amount greater than the maximum theretofore designated by the Company for such six months' period, the Company shall submit its proposal to the City and may issue and sell such additional mortgage bonds only to the City or to other purchasers upon such terms and conditions as may be at that time approved by the City.

All credits to the City arising from any source whatever, other than interest accruing on mortgage bonds of the Company held by the City, other than rentals accruing in respect of leases of additions, extensions and/or improvements owned by the City as in Section 15 hereinabove provided, and other than credits to the City Equity Account as in this Section 22 and in Section 23 hereinbelow provided, shall be carried as a current liability by the Company on its books, bearing interest at the rate of five per cent per annum, until the end of the then current calendar year, at which time all such accumulated indebtedness in an amount of $1,000 or any multiple thereof shall be funded by the issuance to the City at par of Municipal Mortgage Bonds or, at the election of the City to be expressed in writing within thirty days prior to such time, shall be credited to the said City Equity Account.

SECTION 23. *City Equity Account.* For the purpose of recording certain indebtedness of the Company to the City as in this Section 23 and in Section 22 hereinabove provided, the Company shall open an account with the City to be known as the City Equity Account.

During the period of operation under this Contract, out of the stipulated return allowed the Company on its investment hereunder, and, in case this Contract shall be terminated in any manner other than through purchase by the City, in accordance with the terms hereof, of the Company's property subject hereto, thereafter, out of its general funds, the Company shall pay the City on the first days of January, April, July and October, respectively, in each year, interest upon the balance of such time credited to the City in the City Equity Account, at the quarter yearly dividend rate, computed as a weighted average, paid by the Company during the preceding quarter year on all its preferred stock then issued and outstanding; provided, however, that, during the period of operation hereunder, in respect of such portion of said balance in the City Equity Account as does not represent sums of money theretofore actually loaned by the City to the Company as in this Section 23 and in Section 22 hereinabove authorized, such interest shall not be paid by the Company in cash, but shall be credited to the City on the books of the Company.

In the event of dissolution of the Company or of the winding up and liquidation of its affairs by a receiver or in any other manner, the City shall be entitled to be paid the full principal amount represented by the balance at that time credited to the City in the said City Equity Account before any assets shall be distributed by the Company to the holders of its common stock; provided that in any such event the City shall be entitled to receive nothing in respect of such credit balance in the said City Equity Account until after the claims of all other creditors and of all holders of the preferred stock of the Company then issued and outstanding shall have been satisfied in full.

In case this Contract shall be terminated in any manner other than through purchase by the City, in accordance with the terms hereof, of the Company's property subject hereto, the Company shall fund that portion of its indebtedness to the City which is represented by the balance credited to the City in the said City Equity Account, by the issue and delivery to the City of mortgage bonds of the Company, to the extent that the Company may then lawfully issue such mortgage bonds; provided, however, that there shall be first deducted from said City Equity account the aggregate amount of all the items hereinbefore provided to be debited by the Company to the City in event of such termination; and if the aggregate of such debits shall exceed the total of said City Equity Account, the City shall surrender to the Company for cancellation a sufficient amount of Municipal Mortgage or other bonds, received from the Company, as the City may elect to meet such excess, any fractional parts of thousand dollar units to be adjusted between the parties by payment in cash. The City shall accept such

mortgage bonds at par and accrued interest to the date of such termination, and shall elect whether to accept bonds to be issued under the Municipal Mortgage or the Refunding and First Mortgage of the Company upon the terms as in Section 22 hereinabove set forth. The balance, if any, of such indebtedness remaining undischarged after the issue and delivery of such mortgage bonds as aforesaid shall be amortized by the Company by an annual payment in cash to be made to the City on the thirty-first day of January in each year thereafter, until such indebtedness shall have been completely discharged, in the amount by which during the previous calendar year the earnings of the Company available for distribution to the holders of its common stock exceeded six per cent of the par value of the entire amount of such common stock then issued and outstanding; provided, however, that at any time after such termination of this Contract, the Company may at its option redeem and satisfy the whole or any part of the then unpaid balance of such indebtedness by payment in cash to the City of the face amount of such balance or part thereof, together with interest thereon accrued to the date of such payment.

Coincidently with the notification by the Company to the City of the maximum principal amount of mortgage bonds contemplated to be issued during each period of six calendar months, for the purposes in Section 22 hereinabove specified, the Company shall notify the City in writing of the maximum principal amount of unsecured funded indebtedness and of the maximum par value of preferred stock which the Company estimates it may deem advisable to incur and/or issue during the ensuing six calendar months for the purpose of financing the Company's property subject hereto and/or the operation thereof. The City shall have the right, at its option to be exercised within thirty days after the receipt of such written notice from the Company, to contract, subject to the approval of such public authorities as may be required by law, to provide the Company with cash, when, as and if requisitioned by the Company, on ten days' notice, in such sums as the Company may from time to time specify, not to exceed a total amount to be fixed by the City for the said six calendar months. Upon the payment by the City to the Company of any sum in cash so requisitioned, the Company shall credit the City Equity Account with the principal amount thereof.

Except for the purpose of refinancing, the Company hereby expressly covenants not to employ any funds so furnished by the City pursuant to the provisions of this Section 23 for the purpose of financing any of its property situated outside of the Metropolitan District or for the operation thereof.

In case of the failure of the City to contract to furnish the whole of the maximum amount of funds so designated by the Company, and/or in case of the failure of the City to furnish promptly any sum or sums in cash requisitioned by the Company as aforesaid, the Company shall be free to provide for its requirements by the issue and sale at its

discretion, during the said six calendar months, subject to the approval of such public authorities as may be required by law, of unsecured bonds or notes and/or preferred stock in principal amount and/or par value not to exceed that portion of the said specified maximum amount of funds which the City shall have failed to furnish.

Whenever during the period of operation under this Contract the Company shall deem it advisable during any six months' period to incur unsecured funded indebtedness and/or to issue preferred stock for the purpose of financing the Company's property subject hereto and/or the operation thereof, in principal amount and/or par value greater than the maximum theretofore designated by the Company for such period of six months, the Company shall submit its proposal to the City and may incur such additional indebtedness and/or may issue and sell such additional preferred stock upon such terms and conditions as may be at that time approved by the City.

Provided, however, that nothing in this Contract shall limit the right of the Company at any time, subject to such regulations as may be prescribed by law, to issue and sell additional common stock, in case the aggregate par value of the entire issued and outstanding common stock of the Company (including therein such additional common stock), be not more than twenty per cent of the total of (a) the principal amount of the entire funded indebtedness of the Company, (b) the credit balance in the City Equity Account, and (c) the aggregate par value of the entire issued and outstanding capital stock of the Company. In case the Company at any time during the period of operation under this Contract shall deem it advisable to issue common stock in addition to the amount hereinabove specified, the Company shall notify the City in writing of its proposal and the City shall have the right, at its option to be exercised within thirty days after the receipt of such written notice from the Company, subject to the approval of such public authorities as may be required by law, to provide the Company with cash for all or any part of the amount so specified by the Company, in consideration of the credit to the City Equity Account, or the issue of Municipal Mortgage bonds (as the City shall elect), to the amount of the cash so provided by the City. In case of the failure of the City to furnish the Company with the entire amount so specified, the Company shall be free to issue and sell additional common stock in such amount as the City shall have failed to furnish.

Provided further, that nothing in this Contract shall limit the right of the Company at any time, subject to such regulations as may be prescribed by law, to incur, upon terms consistent with the exercise of sound business judgment, additional short term indebtedness other than through the issue and sale of securities, in case the aggregate amount of such short term indebtedness of the Company (including such additional indebtedness) be not more than fifteen per cent of the total of (a) the principal amount of entire funded indebtedness of

the Company, (b) the credit balance in the City Equity Account, and (c) the aggregate par value of the entire issued and outstanding capital stock of the Company. In case the Company at any time during the period of operation under this Contract shall deem it advisable to incur such short term indebtedness in addition to the amount hereinabove specified, the Company shall notify the City in writing of its proposal and the City shall have the right, at its option to be exercised within ten days after the receipt of such notice from the Company, subject to the approval of such public authorities as may be required by law, to provide the Company with cash in the amount so specified by the Company, in consideration of the credit of the amount thereof to the City Equity Account or the issue of Municipal Mortgage Bonds (as the City shall elect), to the amount of the cash so provided by the City. In case of the failure of the City to furnish the Company with the entire amount so specified, the Company shall be free to incur, upon terms consistent with the exercise of sound business judgment, such short term indebtedness in such amount.

SECTION 24. *Purchase of the Property at the Option of the City.* Upon giving six months' notice of its intention to exercise its option, which notice shall be expressed in an ordinance duly enacted by the Common Council and approved by a majority vote of the qualified electors of the City voting thereon at a general municipal election or at a special election called for that purpose, the City shall have the right to purchase on the first day of January or of July in any year during the period of operation under this Contract, as an entirety, with the exception of certain current assets including materials and supplies as in this Section 24 provided, all of the Company's property subject to this Contract and situated within the Metropolitan District as hereinabove defined, provided that in case the City shall fail to accept any substantial portion of such property on the ground that such acquisition is ultra vires or otherwise illegal, then, and in every such case, but only so long as the City shall so fail to accept such portion of such property, all rights of the City to purchase any of the property of the Company subject hereto shall forthwith lapse and become unenforceable.

In the event of exercising its option to purchase, the City shall forthwith (1) surrender to the Company for cancellation all mortgage bonds of the Company at that time held by the City as in Section 22 hereinabove authorized, together with all unmatured interest coupons, if any, thereto attached, (2) execute and deliver to the Company a release of (a) all interest accrued to the date of such exercise of the City's option to purchase, on the said mortgage bonds so surrendered for cancellation, which is not represented by the said unmatured coupons so surrendered for cancellation, (b) all the indebtedness of the Company to the City as shown by the balance at that time credited to the City Equity Account as in Section 23 hereinabove provided, together with all interest on the same accrued to the date of such exercise of the

City's option to purchase, and (c) all current indebtedness of the Company to the City as in Section 22 hereinabove provided, together with all interest on the same accrued to the date of such exercise of the City's option to purchase, (3) pay to the Company an amount in cash to be computed by debiting the City with the amount of the value at that time of the Company's investment hereunder as in Section 5 hereinabove defined, and by crediting the City with the following amounts, viz.: (a) the balance at that time credited to the Depreciation Reserve as in section 9 hereinabove provided (provided, however, that if notice of the city's election to purchase hereunder shall be served within ten years after the effective date of this contract, the depreciation reserve balance so to be credited shall be reduced by the amount by which the company's depreciation reserve accrued to July 1, 1925, as conclusively fixed pursuant to section 9 hereof, exceeds fifteen per cent of the value of the company's investment in fixed property within the Metropolitan district on July 1, 1925, as conclusively fixed pursuant to section 5 hereof), (b) the balance, if any, at that time credited to the Contract Insurance Reserve as in Section 8 hereinabove provided, (c) such proportions of the respective balances at that time credited to the several operating reserves as in Section 7 hereinabove provided, as the several portions so purchased or assumed by the City of the respective assets and/or liabilities against which such reserves are established bear to the several total values of the respective said assets and/or liabilities, (d) the balance, if any, at that time credited to the Stabilizing Reserve in excess of the amount at which such Reserve shall have been originally established as in Section 12 hereinabove provided, (e) the principal amount of all the said mortgage bonds at that time surrendered by the City to the Company, together with all unpaid interest on the same accrued to the date of such exercise of the City's option to purchase, (f) the said balance credited to the City Equity Account at that time released by the City to the Company, together with all unpaid interest on the same accrued to the date of such exercise of the City's option to purchase, (g) the said balance of current indebtedness of the Company to the City at that time released by the City to the Company, together with all unpaid interest on the same accrued to the date of such exercise of the City's option to purchase, (h) the principal amount of all the indebtedness of the Company then outstanding and secured by mortgage lien on the property subject hereto, together with the unpaid interest thereon, if any, accrued to the date of such exercise of the City's option to purchase, less all theretofore unamortized discount and expense incurred by the Company in connection with said mortgage indebtedness (including therein all discount and expense theretofore remaining unamortized as a result of refunding operations), and (4) execute and deliver to the Company appropriate indentures assuming on the part of the City, and covenanting to save the Company harmless from payment of the principal of the several items of the Company's mortgage indebtedness referred to in subdivision (h) above, together

with all interest thereon accruing from and after the date of such exe cise of the City's option to purchase, and payment of all proper e penses thereafter to be incurred in connection with the administratio of the respective trust estates established for the security of suc indebtedness, and in paying and/or reimbursing taxes imposed upo the holders of any securities representing any such items of indebtec ness, all in accordance with the tenor of the several outstanding ir struments then evidencing such indebtedness of the Company.

Coincidently with such payment and delivery on the part of th City, the Company shall deliver to the City by good and sufficier warranty deed all of the Company's fixed property so purchased, fr and clear of all liens except those liens securing indebtedness the pa ment of which shall be assumed by the City as in this Section 24 pr vided, together with accounts receivable derived from operation withi the Metropolitan District, materials and supplies and cash equal in th aggregate amount of face value as then being carried upon the book of the Company to the sum included in the said value of the inves ment hereunder to represent the current assets employed by the Cor pany within the Metropolitan District as in Section 5 hereinabov provided.

The Company covenants that at any time on or after the purcha by the City, in accordance with the terms hereof, of the property subje hereto, upon the request of the City and upon the Company bein furnished by the City with all funds requisite therefor, it will ca and redeem any of the securities of the Company specified by th City and then outstanding, the payment of which shall have bee assumed by the City in accordance with the terms of this Section 2 but only in accordance with the terms of such securities and the ir dentures securing the same.

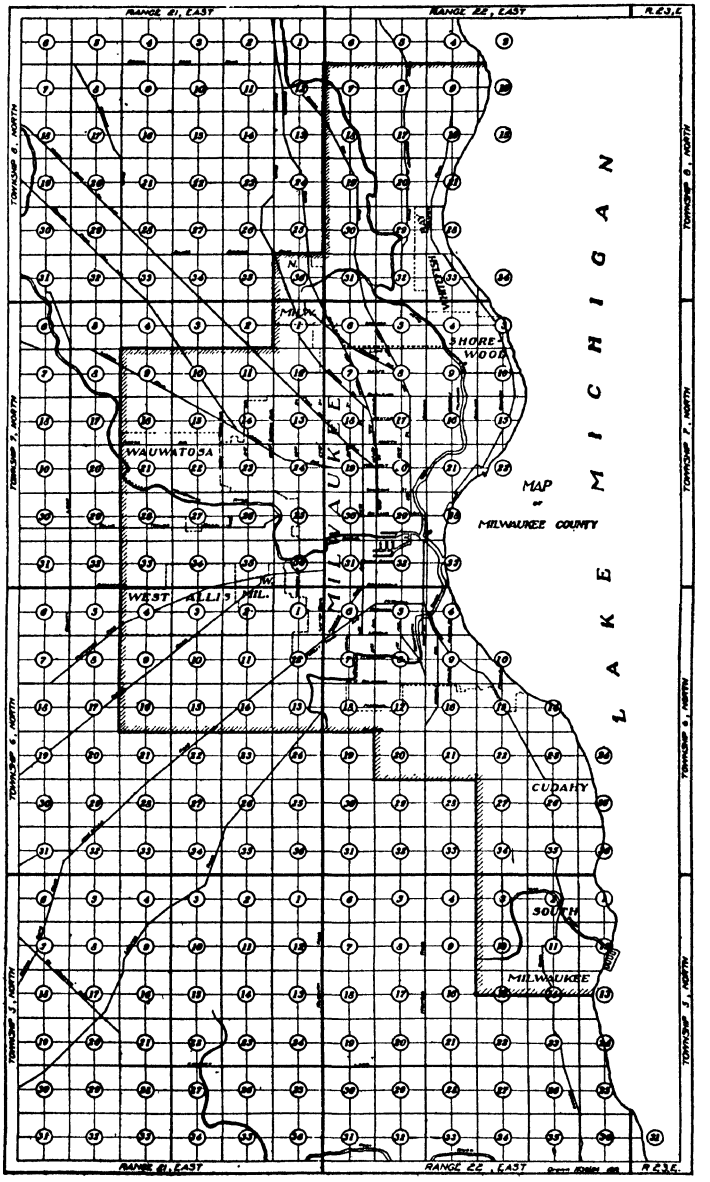
ARTICLE V

Effective Provisions

Section 25. *Effective Provisions.* Acceptance of this Ordinance b the Company shall be made by its officers thereunto expressly a thorized by resolution of its Board of Directors, approved by vote of i stockholders empowered to vote thereon, in substantially the followin form to be attached to a copy hereof:

> This is to certify that the Milwaukee Electric Railway an Light Company, for itself, its lessees, successors, and assigns, has a cepted and hereby does confirm its acceptance of the terms of the for going Ordinance No.....passed on the.....day of..... 192..., by the Common Council and approved by the Mayor of the cit of Milwaukee, to constitute a contract between the City and the Con pany in the manner therein provided.

ANNEX A


RANGE 21, EAST
RANGE 22, EAST
R.23.E
TOWNSHIP 8, NORTH
TOWNSHIP 7, NORTH
TOWNSHIP 6, NORTH
TOWNSHIP 5, NORTH
TOWNSHIP 4, NORTH
TOWNSHIP 3, NORTH
LAKE MICHIGAN
MILWAUKEE
WAUWATOSA
WEST ALLIS
MIL.
N.
SHORE WOOD
MAP
MILWAUKEE COUNTY
CUDAHY
SOUTH MILWAUKEE
RANGE 21, EAST
RANGE 22, EAST
R.23.E.

ANNEX

THE MILWAUKEE ELECTRIC

BALANCE

December

Assets

Property & Plant:		$79,152,772.94
General Account as of Jan. 1, 1924	$74,557,698.90	
Cap. Expenditures Jan. 1, 1924, to Dec. 31, 1924	4,595,074 04	
Treasury Securities:		10,985.62
Treasury Bonds	10,985.62	
Investments:		1,490,698.7
Stocks & Bonds of Affiliated Companies:		
Capital Stock—Milw. North. Ry.	1,206,000.00	
Capital Stock—Wis. Gen. Ry.	12,500.00	
Capital Stock—Lorena Tow Boat Co.	8,000.00	
Pref. Stock—Wis. Elec. Pr. Co.	210,500.00	
1st Mtg. 5% Bonds—Milw. North. Ry.	26,763.75	
Gold Notes—7% W. G. & E. Co.	13,600.00	
Sundry Investments:	13,335.00	
Reserve, Sinking Fund & Special Fund Assets:		329,239.0
Pension Reserve Fund Investment	251,676.78	
Special Funds	77,562.26	
Current Assets:		
Cash:		813,454.6
Cash in Banks	640,832.98	
Cash in Office	170,164.07	
Cash in New York	2,457.63	
Notes & Bills Receivable:		41,221.9
Sundry	41,221.97	
Accounts Receivable:		5,425,382.1
Electric	693,080.31	
Heating	139,061.75	
Inter-Company	3,606,139.75	
Merchandise & Miscellaneous	987,100.33	
Materials & Supplies (Stock on Hand):	2,788,992.61	2,788,992.6
Prepaid Accounts:		18,669.7
Insurance	18,653.13	
Interest & Rents	16.66	
Suspense Accounts:		3,949,196.4
Freight	1,648.17	
Outside Work in progress	140,984.55	
Work Orders	2,677.55	
Bond Discount & Expense	3,281,770.88	
Note Discount & Expense	82,249.45	
Reacquired Securities	9,599.61	
Sundry Suspense Debit Accounts	435,621.30	
TOTAL		94,020,613.9

B

RAILWAY AND LIGHT COMPANY

SHEET

31, 1924

Liabilities

Capital Liabilities:		
Capital Stock:		$24,148,195.60
Preferred	$12,898,195.60	
Common	11,250,000.00	
Funded Debt:		47,194,800.00
1st Consolidated Mtg. 5% Bonds due 2-1-26	6,500,000.00	
Ref. & Ext. Mtg. 4½% Bonds due 1-1-31	6,728,000.00	
Gen. & Ref. Mtg. 5% Bonds due 11-1-51..	5,819,000.00	
Ref. & 1st Mtg. Ser. B 5% Bds. due 6-1-61	12,250,000.00	
Ref. & 1st Mtg. Ser. C 6% Bds. due 9-1-53	9,900,000.00	
M.L.H.&T.Co. 1st Mtg. 5% Bds. due 5-1-29	5,000,000.00	
Serial Gold Notes 5% due 7-1-26	250,000.00	
Ten Year Gold Notes 6½% due 8-1-33...	747,800.00	
Current Liabilities:		4,307,243.68
Accounts Payable—Pay Rolls	345,710.47	
Accounts Payable—Vouchers	314,506.10	
Accounts Payable—Inter-Company	2,991,032.27	
Accounts Payable—Sundry	817.10	
Matured Interest on Funded Debt Unpaid	63,443.46	
Dividends Unpaid	2,220.00	
Deposits	93,929.23	
Ticket Sales (Unredeemed Tickets)	89,355.48	
Matured Funded Debt Unpaid	4,900.00	
Misc. Current Liabilities	401,329.57	
Accrued Liabilities:		1,193,394.34
Rentals	416.62	
Taxes	469,007.75	
Unmatured Int. on Funded Debt	628,255.37	
Dividends	95,396.50	
Sundry Liabilities	318.10	
Suspense Accounts:		433,353.49
Special Accounts	73,174.30	
Reserve, Sinking & Special Fund Investment Earnings	40,373.28	
Sundry Suspense Credit Accounts	319,805.91	
Reserve, Sink. & Special Fund Liabilities:		14,531,253.96
Depreciation Reserve—Railway	5,583,505.11	
Depreciation Reserve—Electric	6,913,293.47	
Depreciation Reserve—Heating	361,318.61	
Injuries & Damages Reserve	459,168.76	
Insurance Reserve	862,563.04	
Pension Reserve	251,676.78	
Sundry Reserves	99,728.19	
Surplus:		2,212,372.88
TOTAL		94,020,613.95

IN WITNESS WHEREOF, said The Milwaukee Electric Railway and Light Company has caused these presents to be signed in its corporate name by its President (or Vice-President) and impressed with its corporate seal, attested by its Secretary (or an Assistant Secretary), all on this .....day of ....., 192....

THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY,

By .....
(Vice-) President.

Attest:

.....
(Assistant) Secretary.

When this Ordinance shall have been accepted by the Company it shall be submitted to the Railroad Commission for its approval. Provided that this Ordinance shall have been before such day approved by the Railroad Commission, it shall be submitted to the vote of the electors of the City of Milwaukee at a special election to be called for that purpose on the 7th day of April, 1925, or on such other day in the year 1925 as the Common Council may by ordinance or resolution fix and determine; at such election the notice shall contain the ordinance in full and the question shall be submitted upon a separate ballot in substantially the following form:

Shall the ordinance constituting a contract between the City of Milwaukee and The Milwaukee Electric Railway and Light Company its lessees, successors and assigns, providing for the furnishing of transportation and public utility service at cost and for options to the City of Milwaukee to acquire an equity in and to purchase certain transportation and public utility property, which said ordinance was submitted to the Common Council of the City of Milwaukee by the Street Railway and Electric Power Acquisition Committee on or about the 29th day of September, 1924, and was passed by such Common Council on the.....day of March, 1925, and thereafter accepted by said The Milwaukee Electric Railway and Light Company and approved by the Railroad Commission of Wisconsin, be approved? and in no event shall the Contract herein contained take effect or become binding upon either of the contracting parties until it shall have been accepted by the Company, approved by the Railroad Commission and approved by a majority vote of the qualified electors of the City of Milwaukee voting thereon at such election.

APPENDIX B

REVIEW QUESTIONS AND EXERCISES

CHAPTER I

1. Explain the significance of the institution of property in the social control of economic functions.
2. What economic criteria distinguish public utilities from state services on the one hand and from private business on the other?
3. Explain the dependence of civilization upon public utilities.
4. What are private businesses in a twilight zone?
5. Are savings banks "affected with a public interest"? Are they public utilities?
6. In what respect does public utility regulation differ from other forms of public regulation of private industry?
7. Did the ancient world have public utilities in the modern sense of that term? Why or why not?
8. What part did nationalism play in the development of public utility regulation during the 17th and 18th centuries?
9. How did the industrial revolution affect the development of public utilities?
10. Prepare a table indicating the approximate chronological order in which the different types of public utilities have appeared in industrial history, using as a basis the functional classification given on page 8.
11. Illustrate the effect of technological changes upon public utilities.
12. What important event occurred in Europe about 1830 which profoundly affected the social control of public utilities?
13. What are the interrelations between the city planning movement and the development of public utilities?

CHAPTER II

1. Name five general economic phenomena which have conditioned the development of public utilities in the United States.
2. Trace the history of highway construction in the United States.
3. Show how railways, canals and inland navigation were designed to give the United States a national transportation system previous to 1840.

4. Trace the history of state aid for transportation utilities in the United States.
5. What were the advantages on the side of the railways in their struggle with canals for traffic supremacy?
6. Describe the forms of competition between transportation utilities and the effect of competition upon their development.
7. Prepare a table of important dates in the development of national utilities and tell why you regard these dates as important.
8. Distinguish the characteristics which dominate the intensive as contrasted with the extensive development of railways.
9. Trace the railway consolidation movement in the United States.
10. What were the outstanding abuses which accompanied the private development of railway systems? Should the railways alone be held responsible for them?
11. What agencies now divide among themselves the function of providing non-local transportation in the United States? How is the traffic handled by them differentiated?
12. What utilities are important in promoting the conservation of national resources? Explain when and why these utilities became important in the conservation movement?
13. What are the chief problems associated with utilities of conservation?
14. What considerations should control the further development of government reclamation projects?
15. What utilities provide communication? In what historical order did they appear? How do they now divide among themselves the service of communication?
16. Why are communication utilities best conducted as monopolies?
17. Mention outstanding improvements in the technique of national utilities.
18. Explain the economic characteristics of rate wars.

CHAPTER III

1. Why is urbanization an important economic phenomenon in the development of local utilities?
2. Why did the trend toward public ownership appear so early in the history of water utilities?
3. Describe the two types of water supply systems.
4. What were the more important problems which the water-supply industry had to contend with in its development?
5. What were the difficulties in the early history of the gas industry?
6. Describe the competition in service between gas and electricity.
7. What factors have contributed to the expansion of the market for electric energy? Classify the main utilizations.
8. What are the by-products of local utilities?

How may electric utilities aid in the movement for conservation ural resources?

Explain the advantages and limitations of super-power systems?

Trace the historical order in which the various agencies of urban ortation appeared and why they were developed.

Describe a coördinated system of urban transportation for a metropolitan area, bringing out the economic superiority of the nt kinds of transportation facilities.

How does the conflict between the Bell System and the inde- at telephone companies illustrate the conflict between an old idea new idea in the organization and social control of public utili- What dangers are suggested in this transition and how are these rs met?

Construct a table of important dates in the development of local es and tell why you regard these dates as important.

Mention outstanding improvements in the technique of local es.

What are the important aspects of inter-public utility compe- ?

What utilities appear to offer the largest room for expansion in facilities?

Illustrate and explain the trend toward monopoly in the field al utilities.

What are the economic limitations under which public utilities together their factors of production?

Classify public utilities from the point of view of the character demand for service and explain the significance of this classifi- .

Predict the future use and development of facilities for urban portation (a) in large cities (b) in small cities. Give reasons for prediction.

Why have public utility services in the United States been sup- chiefly by private corporations?

CHAPTER IV

Define the "corporation" from a legal point of view.

Why is the corporate form of business organization so well ed to public utilities?

Contrast the corporation with the trust as a form of public organization.

Explain the nature and purpose of public utility holding com- s, indicating from the point of view of regulation and manage- the contrasting advantages and disadvantages.

Explain the economic nature of the capital of a true holding any.

6. Under what circumstances is the holding company device illegal? Does this apply to public utility holding companies?

7. Distinguish the different types of holding companies.

8. What criticism has been made of recent developments which restrict the voting power of stockholders? What is the nature of these restrictions?

9. Should stockholders be held accountable for the management of public utility enterprises? What influences are at work which tend to make directors on the one hand responsible and on the other hand irresponsible?

10. In what way may intercorporate relations of public utilities jeopardize public interests?

CHAPTER V

1. Explain cost and income bargains. Why call these transactions bargains? To whom have they significance, and why?

2. Describe the structure of a going concern from an economic point of view and tell how its various parts function.

3. Why must government regulation aim to bring about an economic balance between revenues and expenses of public utilities? Under what circumstances would there be difficulties?

4. What is "the general level of rates"? Are class rates relative rates?

5. Why was the investment bargain the most important public utility bargain in the past?

6. Distinguish four phases in the life history of a business unit from its inception to its operation as a going concern.

7. During what historical periods in the development of a going concern do the following typically make their appearance: (a) working capital, (b) deficits below a compensatory return, (c) operating organization, (d) dividends, (e) the capitalization of interest charges, (f) the going business, (g) options for land, (h) franchises, (i) piecemeal construction, (j) expenditures for "adaptation and solidification"?

8. Why is preliminary investigation and planning so important in the development of a going concern?

9. Criticize the statement that "a corporation is an artificial being, invisible, intangible and existing only in contemplation of law." Explain in this connection the definition of a going concern quoted from Professor Commons.

10. How do you know when you are dealing with a going concern? When is an enterprise not a going concern?

CHAPTER VI

1. To what extent, if at all, should a public utility corporation claim a legal right to secrecy as to its transactions? Why or why not?

2. Why was it deemed necessary to insist upon publicity of accounts for purposes of regulation and what were the steps in this development?

3. What are the uses of uniform systems of public utility accounts?

4. Briefly characterize the income statement, balance sheet and profit and loss statement, indicating the purpose of each and how the different statements are interrelated.

5. What is the economic significance of the accounting distinction between fixed and current assets?

6. Explain and distinguish fixed charges and fixed expenses.

7. Explain the function of depreciation expenses and of depreciation reserves in the accounting of public utilities.

8. Indicate the historical order in which the different accounting statements of public utility enterprises become important, and as they pass through the different periods in their life history, what facts would they tend to show?

9. What accounting statement would establish whether a public utility's rates should be raised or lowered? Describe what the showing would have to be in either case.

10. What accounts indicate whether a business is keeping up the operating efficiency of its fixed properties?

11. What accounts give evidence of the amount of working capital?

12. How would an accountant know when he is dealing with a going concern? When is an enterprise not a going concern?

13. To what accounts and accounting statements would you look for information regarding (a) expenditures in connection with the going plan, (b) expenditures for the acquisition of a going business, (c) the cost of the going plant, (d) interest during construction, (e) deficits below a compensatory return, (f) interest payments on bonds?

14. Trace the connection between the legal theory of a corporation, its power to make contracts that are not "ultra vires", the transactions which it makes as a going concern, and the financial statements which it renders to the public.

15. What are the sources of capital for a public utility concern and what accounts record the amount received from various sources?

16. Why is it important to have uniform reports and statistics for public utilities?

17. How does uniform accounting help in ascertaining the degree of efficiency or inefficiency of operations?

18. Analyze the make-up and significance of the operating ratio.

19. Explain the ratio of turnover of investment in fixed capital. What is its significance?

20. Would a public utility, whose labor bargain is financially more important than its investment bargain, show a high or a low operating ratio and why?

21. Does a high ratio of investment turnover go with a low or a high operating ratio? Explain fully the reason for the relationship.

22. Why does the ratio of investment to operating revenues change from year to year? Why does it vary with different types of public utilities? (See Tables XIII and XIV.)

CHAPTER VII

1. How is the "just price" idea connected with the development of public utility regulation?
2. Under what circumstances should a business which is affected with a public interest be classified and regulated as a public utility?
3. What rights and duties are attached to the public utility status? Why have they been recognized in law?
4. What were the important issues in the case of *Munn* v. *Illinois* and how did the court decide them?
5. Explain the conflict between the majority and minority opinion in *Munn* v. *Illinois*. Why is this case a mile-stone in the history of regulation?
6. Distinguish the legal relationship existing between a public utility corporation and its customers on the one hand and a mercantile corporation and its customers on the other hand.
7. What economic tests of public utility have been applied in the various cases dealing with business affected with a public interest? What is the purpose of these tests?
8. What makes the public utility concept dynamic?
9. Name callings which were once public and are now private?
10. What is meant by the expression "a business clothed with a public interest"? How and with whom did it originate? How has it been applied and expanded in this country? How can it be distinguished from the narrower concept of public utility?
11. Banking is a business affected with a public interest. It is carried on by permission of the state and is subject to regulation. Is banking a public utility? Why?
12. What was the common law conception of a public or common calling?
13. What element did feudalism contribute to the legal institution of public utility? What element did mercantilism contribute?
14. What effect did the philosophy of laissez faire have upon the later development of this concept?
15. What is a public utility?
16. Account for the peculiar blending of compulsion and volition in the public utility institution.
17. What decision of the United States Supreme Court advanced the proposition that a public utility is in reality a public function delegated to a private corporation? Explain fully.
18. Distinguish the legal doctrines of "public utility" and "public use" and show how each is used in bringing about the social control of economic functions.

19. What were the important issues decided in the Wolff Packing Company case? Why is this case important in the history of public utility regulation?

20. A makes a contract with B to supply him with machinery. C owning water power rights decides to supply D, a new community, with electric energy. His offer is accepted by the issuance to him of a franchise. In both cases there is offer and acceptance. In both cases the supplying parties give goods or services and have a legal right to compensation therefor. Is there any difference in the rights of the parties in the two cases? Why?

CHAPTER VIII

1. What is the basis of the division of powers between the States and the Federal Government?

2. Explain the purpose and function of the police power in the regulation of industry.

3. Relate public interests and private interests to the principles of interference and non-interference.

4. What are the limitations upon the police power in regulating public utilities?

5. Explain the doctrine of "judicial review" How would it be applied in the case of public utilities?

6. Distinguish the police power as exercised in public utility regulation from the power of communities to maintain a police system for the protection of citizens and their property.

7. Why is the taxing power and the borrowing power of the state important in a study of public utility economics? Explain the constitutional limitations upon these powers.

8. What bearing do the military and war powers have upon public utility regulation?

9. What is the purpose of the power of eminent domain? Explain the relation of this power to public utilities. What are the specific constitutional limitations upon this power?

10. In what way is the proprietary power different from the general powers of government?

11. Why is the definition of property and liberty by the courts the center of conflict in regard to governmental powers? What effect does this have upon the economic value of goods and services?

12. Show by means of an illustration how public utility regulation may affect economic value.

13. How may the compact clause of the federal constitution become the basis of a distinct form of public utility regulation? Why is this clause so important at the present time?

14. What is your understanding of the phrase "due process of law"?

CHAPTER IX

1. What were the outstanding defects of the system of judicial regulation?
2. Explain the distinction between the general and special franchise.
3. Distinguish between charter regulation having its source in a special legislative act and regulation by means of special legislation.
4. What has been the effect of the movement for home rule upon the development of public utility regulation?
5. Appraise the effectiveness of charter regulation of public utility rates.
6. Explain the effect of the Dartmouth College decision upon the regulation of public utilities by means of the charter.
7. What are general incorporation laws? When and why were they enacted? With what epoch in the development of regulation do they correlate?
8. Show how the terms of early charters offered inducements for starting public utility enterprises.
9. What significant change in the policy of granting franchises did the Dartmouth College decision provoke?
10. What is the importance of the case of *Olcott* v. *Supervisors* in the history of regulation?
11. What was the "Granger Movement"? What distinct type of regulation did this movement beget? Against what "abuses" did the Grangers protest? Were they right in their protests?
12. Appraise the Granger Movement as a social force in the history of public utility regulation.
13. Explain the distinction between mandatory and advisory commissions. How did it happen that this distinction arose?

CHAPTER X

1. Trace the significant changes in the policy of local governments in granting special franchises. What economic groups have special interests in the terms of franchises and how were these special interests manifested?
2. Do you regard the submission of proposed new franchises to popular referendum as a necessary element in a constructive franchise policy?
3. Should franchises be exclusive? What limitations upon exclusiveness, if any, do you regard as necessary?
4. Appraise the comparative effectiveness of long and short-term franchises.
5. What influence may the term of a franchise have upon the financing of public utilities?
6. Why did regulation of public utilities by means of the special franchise fail?

7. By means of cases trace the development of the doctrine that a franchise is a contract the obligation of which may not be impaired by subsequent legislation.

8. What was the effect of war-time conditions upon the contract theory of the franchise and upon the general efficacy of local regulation?

9. Criticize the action of the parties and the decisions of the state and federal courts in the Columbus case.

10. Why are franchises valuable to public utilities? Upon what does the economic value of franchises depend?

11. Should a city exact compensation for a franchise to operate an urban electric railway? For a franchise to operate motor vehicles as common carriers? Should they be made to pay for street pavement?

12. When a franchise expires and a city fails to renew it, what is the legal position of a local public utility? What happens as a practical matter?

13. How was it possible for public utilities to practice discrimination in rates under the system of regulation by franchise? Is discrimination an evil? Why was it practiced?

14. Why is the regulation of service difficult of accomplishment under the special franchise?

15. Why is public control over street uses important?

16. Do you see reasons why regulation of local utilities by special franchises might succeed now, although it was a comparative failure in the past?

17. What provisions looking toward public ownership and operation did special franchises contain? Were they adequate? Are such provisions necessary?

CHAPTER XI

1. What effect did the dissatisfaction with special franchise regulation have upon the powers and jurisdiction of administrative commissions?

2. Trace the development of the idea that administrative commissions are the best agencies for carrying out the various forms of regulation of industry.

3. Why is continuous regulation necessary for effective control of public utilities?

4. Why is it incorrect to say that the mandatory commission system dates from the establishment of commissions in Wisconsin and New York in 1905?

5. In what respects are the present state public utility laws like the common law?

6. Indicate the variation in scope of jurisdiction of administrative commissions at the present time.

7. What are the principal elements in the regulatory program contained in *state* statutes since 1905?

8. Contrast term franchises and indeterminate franchises as instruments of regulation.

9. How is the general standard of reasonableness applied to the rate and service problem under the commission system of continuous regulation?

10. In what respects is the indeterminate permit type of franchise superior to predecessor types of franchises? Your answer should bring out what defects, if any, were remedied by the indeterminate permit.

11. How does legislation providing for certificates of convenience and necessity safeguard the interests of consumers and of public utilities?

12. How did the indeterminate permit meet the franchise problem which arose under the state commission system of regulation?

13. How does a utility obtain control of its market under a system of regulation such as is now in force in Wisconsin? What peculiar conditions gave rise to the anti-duplication law in that state?

14. Explain fully the effect of the indeterminate permit law upon the financial arrangements of public utilities, contrasting it in this respect with the term franchise.

15. How was the transition from special franchise regulation to regulation under the indeterminate permit accomplished in Wisconsin?

16. What are the legal limitations upon the monopoly conferred under an indeterminate permit? Is this form of monopoly desirable? May a city erect a plant which will compete with a plant operated by a private corporation under an indeterminate permit?

17. Appraise the objections to the indeterminate permit.

18. Describe the organization of a state public utility commission.

19. What are the steps in the procedure by means of which the rights and duties of public utilities are *conclusively* adjudicated under the system of regulation by administrative commissions?

20. What is the relation of a public service commission to the courts on the one hand and to the legislature on the other hand?

21. Wherein does the administrative superiority of the commission system reside?

22. How did the Wisconsin Supreme Court overcome the objection that the Railroad Commission law constituted an unlawful delegation of legislative power?

23. How is publicity of rates secured at the present time? Why is the lack of it regarded as an evil? Is all discrimination in rates and service unlawful?

24. Should municipally owned and operated public utilities be placed under the jurisdiction of state commissions? If they are not subject to commission jurisdiction are they freed from regulation?

25. What legal objections did the administrative commission meet? Upon what theory was the conflict finally decided by the courts?

26. Enumerate the more important qualifications which commissioners must have according to law and tell why they are imposed.

27. Why is it important that commissions have the power to initiate investigations upon their own motion?

28. The law provides that certified copies of the opinions and orders of commissions be regarded as *prima facie* evidence of the facts found upon investigation, if the orders are taken into the courts for judicial review. Explain the procedure which fortifies and simplifies this requirement.

29. By what means is the enforcement of commission orders secured?

30. What are the influences which may undermine the effectiveness of commission procedure?

CHAPTER XII

1. Into what periods may the history of railroad regulation be divided?

2. Explain important steps leading up to the passage of the act to regulate commerce in 1887.

3. Trace the evolution of judicial interpretation of the power of Congress over Interstate Commerce.

4. Explain the principal provisions of the act to regulate commerce of 1887.

5. What elements of control over rates were added to the program of regulation by the following legislation: (a) the Elkins law; (b) the Hepburn act, (c) The Mann-Elkins act, (d) the physical valuation act?

6. Show how judicial interpretation of the act to regulate commerce of 1887 thwarted effective regulation by the Interstate Commerce Commission. Why was it necessary to "put teeth" into the Interstate Commerce law?

7. Why was the Hepburn law of 1906 important in the history of federal railway regulation?

8. How did the rate-making problem change after 1900? What cases are important evidence of this change?

9. Characterize the purpose of rate-regulation previous to 1906 and the change in objective since that date.

10. What is the purpose of the long and short haul clause as it now stands in the adjustment of freight rates?

11. What was the condition of the railroads at the time the United States entered the World War? To what extent did the policies of regulatory agencies contribute to this situation?

12. Characterize the operation and regulation of railroads during the war period.

13. What legislative acts, court decisions and events in the history of railroad regulation show the persistence of the ideal of competition?

14. What are the important provisions of the transportation act of 1920?

15. Explain the operation of the "recapture clause" in the transportation act of 1920.

16. In what respects does the transportation act of 1920 inaugurate a new policy in the regulation of railroads?

17. Trace the steps by which the jurisdiction of the Interstate Commerce Commission over different kinds of public utilities attained its present scope.

18. What conflicts regarding rate-making powers arose between the Interstate Commerce Commission and the state commissions?

19. What defect in the system of regulation did the shipping act of 1916 aim to correct?

20. Why was the federal water power act of 1920 the beginning of a new epoch in the federal control over water power?

CHAPTER XIII

1. What are the dangers of excessive centralization of regulatory functions?

2. Describe local regulation as an adjunct to state commission regulation. Has it been successful?

3. State the arguments against local regulation as contrasted with the arguments for the state commission system of regulation for public utilities. With which side in the argument do you agree?

4. Where was the plan of regulating local utilities by means of local commissions tried? How did it differ from service-at-cost?

5. Why did the "Official Revision System" fail?

6. By means of what expedients do service-at-cost franchises aim to improve the procedure of regulation under the state commission system?

7. Outline the essential features of the "sliding scale" plan of rate adjustment.

8. Define the phrase "cost of service" as used in typical service-at-cost franchises.

9. Compare the operation of the sliding scale franchise with the service-at-cost franchise as to rate-making.

10. Under what conditions does service-at-cost promise to become an effective substitute for the system of state commission regulation?

11. Wherein is the transportation act of 1920 similar to service-at-cost?

CHAPTER XIV

1. Explain rate-making as a governmental process and contrast it with price-fixing in competitive industry.

2. From the private point of view are public utilities valued differently than private businesses?

3. What is the connection between the problem of the rate-base and the investment bargain?

4. Upon what factors does public utility credit depend?

5. Trace the emergence of judicial review of public utility legislation?

6. Show that the legal doctrine of "fair value" is a consequence of the assumption of judicial review.

7. Explain what is meant by the "zone of reasonableness". When are rates confiscatory?

8. Why must reasonable rates be defined in terms of reasonable earning power? What relation has scientific management to the governmental regulation of rates?

8a. How may the reasonable worth of the service to the customer become a test of the reasonableness of rates?

9. Trace the development of the movement for physical valuation outside of the courts. Why was the emphasis placed upon *physical property?*

10. Indicate the purposes for which valuations are made. Would it be proper to call the resulting figures economic values? Will the figure representing "value" for these various purposes be the same? Why?

11. What is the "unit rule" of assessment and why is it more equitable than a piecemeal assessment? How is it related to the going concern theory?

12. Explain how the "unit rule" is applied to a railroad and to an express company.

13. State the rate-making rule laid down in the leading case of *Smyth* v. *Ames.*

14. Contrast the three standards of cost of reproduction, capitalization of net income and investment as measures of the rate-base for public utilities.

15. How has the rate-making rule been modified by administrative commissions?

16. In what respect does a physical valuation fall short of being reasonable?

17. The A.B.C. corporation was organized in 1900 with capital stock issued and outstanding of $1,000,000, subscribed at par. Bonds were sold at par to the amount of $4,000,000. With the proceeds an electric plant was built during 1900. The net changes in the property and plant account are as follows:

1903	$ 100,000	
1904	200,000	
1905	400,000	
1909	200,000	credit
1912	1,000,000	
1918	500,000	
1920	100,000	

Using the investment standard of valuation what is (a) the original cost and (b) the historical cost of the plant? If the index number of construction costs in 1900 be taken as 100, construction costs in 1920 may be represented by 250. (a) What is the cost of reproduction of the original plant using current (1920) market prices? (b) What is the capitalization of the corporation? If the average rate of return upon the investment in the plant has been 10% when the normal competitive return at present and for some time past has been 7%, then, (a) What is the valuation of the property using the capitalization of income standard? (b) Would the market value of the stocks and bonds be greater or less than the historical cost? (c) Where did the additions to property and plant from 1903 to 1920 come from? Under what conditions as to price changes would consumers favor the cost of reproduction standard?

CHAPTER XV

1. Classify the causes of insecurity of investment.
2. Distinguish the physical and the economic aspect of depreciation. What conception of capital underlies this distinction?
3. Classify and explain the factors which bring about depreciation.
4. Why should foreshortened life be considered a cost of rendering service in the future?
5. Enumerate causes of the loss of capital other than depreciation. How are these losses met?
6. Distinguish between repair and depreciation.
7. What is the proof of the proposition that the interests of investors and consumers as to depreciation are not antagonistic?
8. May the state of Michigan lay down a policy regarding depreciation for its automobile industry?
9. Is a fall in the imputed market value of land depreciation? Why?
10. Describe methods of measuring depreciation.
11. Explain some of the current misconceptions regarding depreciation.
12. Trace the steps in the accountancy of depreciation.
13. Distinguish depreciation and amortization. Does depreciation decrease the capital investment in a public utility?
14. Explain the three methods commonly used in financing depreciation.
15. Is it good policy to require a railway company to set up a reserve to cover depreciation?
16. Show that the sinking fund reserve method is an economical method of providing for depreciation.
17. In what respects are depreciation and life insurance analogous?
18. Criticize the reasoning of the court in the excerpts quoted on pp. 356 and 358.

19. What decision of the courts would you quote as authority for considering depreciation as an operating expense?

20. Have customers any claims upon reserves set aside by public utilities to cover depreciation? Explain fully.

CHAPTER XVI

1. What legislative acts tend to safeguard a public utility's control of the market?

2. How does control of the market become a factor in providing security of investment?

3. Is it advisable that an urban electric railway go into the business of operating buses and taxicabs? Should steam railways buy out competing water carriers?

4. Under what circumstances should a commission grant a certificate of convenience and necessity to a competing utility?

5. Why does public control of "abandonments of service" by public utilities prove that their legal rights and duties are different from those of other enterprises?

6. Under what circumstances, if at all, may a street railway which is not earning enough to meet its bond interest requirements abandon (1) a 10 minute schedule and substitute one of 15 minutes, (2) abandon a single line which is not paying operating expenses, (3) abandon service upon all non-paying lines, (4) abandon service throughout the city substituting bus service, (5) abandon service entirely? Can it be compelled to continue operation at a loss?

CHAPTER XVII

1. Discuss the general principles which should underlie the financial plan of a newly organized public service corporation.

2. Enumerate the more common classes of public utility securities. What are the reasons for variations in return to each type of security?

3. By what means do courts protect the creditors of corporations?

4. Contrast methods of financing a public utility employed in the past with present-day methods.

5. Discuss the importance of maintaining a proper proportion between stocks and bonds.

6. What standard of valuation should be used by investors in determining whether the capitalization of a public utility is reasonable?

7. How would you provide for a limitation upon the indebtedness of corporations which is flexible and yet safeguards the principal and income of the loan?

8. Under what circumstances may collateral trust bonds be less secure than preferred stocks?

9. Should the practice of authorizing (a) common capital stock of

no-par value and (b) common capital stock without voting rights be extended or applied to *operating* public service corporations?

10. Account for the recent development in the widespread sale of preferred stock to customers and employees of public service corporations. What criticism may be made of the practice?

11. Distinguish between the "yield rate" and the "nominal rate" of interest on securities. What costs are included in the "cost of capital"?

CHAPTER XVIII

1. Explain the financial practices that brought about the public regulation of security issues.

2. What are the objectives of security regulation?

3. Does the government by regulating the issuance of securities guarantee the income upon these issues?

4. What steps were taken by pioneering states in inaugurating public control?

5. For what purposes may securities be issued? What sources of capital are not affected by security regulation?

6. Explain the procedure by means of which commissions administer statutory provisions relating to control of security issues.

7. What vital differences exist in the laws regulating security issues in Massachusetts, New York and Pennsylvania? Wherein are they similar?

8. Why is it particularly important to control security issues at the time of effecting consolidations and reorganizations?

9. Why was it necessary for the federal government to undertake the regulation of railway securities?

10. What are the provisions of the federal law upon this subject?

11. Show how commission regulation of security issues may protect the interests of minority stockholders.

12. What limitations upon the power of commissions in regulating securities do the courts recognize?

13. Why was it impossible to correct the mischief of past overcapitalization?

14. Why is publicity more effective in regulating security issues than in regulating rates and service?

15. What expedients have commissions adopted in order to make security regulation flexible?

16. What is the function of valuation in the regulation of security issues?

CHAPTER XIX

1. When translated into terms of money return, what payments is the rate-of-return supposed to cover?

2. What is the general standard upon which commissions predicate the rate-of-return?

3. What is the relation between salaries and inter-company payments and the rate-of-return?

4. What is meant by "trading on the equity"?

5. The commissions tend to set up an undifferentiated rate-of-return based upon "fair value". Would it be better if commissions ascertained the amount of securities outstanding and set up a separate rate-of-return for each class of securities?

6. What risks attend the investment in public utilities?

7. In the public utility field should the rate-of-return vary directly with the risks involved? Why?

8. What factors would a public service commission have to take into account in fixing the reasonable rate-of-return for the following classes of public utilities: (a) water utilities (municipally owned), (b) gas utilities (privately owned), (c) electric and street railway utilities (operated and owned jointly by a single private corporation)?

9. In administering control over the investment bargain would you fix the rate-of-return at just that point which would cover the reasonable cost of capital? Or would you favor the accumulation of a surplus? What are the arguments in favor of building up a surplus? To whom would the surplus belong? Is it properly included in the rate-base?

10. What is the difference between a rate-of-return which is economically reasonable and one which is legally non-confiscatory?

11. Is it always good policy for regulating authorities to attempt to keep the common stock of a public utility at par in the markets?

12. Analyze the validity of using actual returns in the field of competitive industry and commerce as standards upon which to base the development of a fair rate-of-return for public utilities.

13. How may the rate-of-return be expressed in a formula which provides for a return which is both reasonable and flexible? What are the advantages of such an arrangement?

14. How is it possible to determine whether the rate-of-return of a regulated public utility company is higher than is economically necessary?

15. To what extent should efficiency in management be recognized in fixing the rate-of-return? What has been the policy of commissions in the matter? Why?

CHAPTER XX

1. Describe the appraisal process.

2. How does an appraisal differ from a valuation?

2a. What descriptions of property are generally classed as non-operating?

3. Enumerate the different uses to which an appraisal may be put.

4. Explain the meaning and purpose of the expression "property used and useful."

5. Why should improvident acquisitions of property and engineering mistakes be excluded from an inventory?

6. How should the following classes of property be treated in inventories for the purpose of rate-making: (1) property built out of earnings, (2) donated property, (3) superseded property, (4) property invested in outside operations?

7. What is the function and make-up of unit prices?

8. Explain the purpose of an allowance for "omissions and contingencies".

9. What items are included in the "general overhead"?

10. Define and explain various concepts which appraisers use in ascertaining the accrued but unmatured depreciation.

11. Outline the steps which are usually taken in estimating the accrued depreciation. What criticisms have been made of these estimates?

12. What is the meaning of "working capital" as used by appraisers? How is the allowance for working capital ascertained?

13. Should an allowance be made in appraisals for building up an efficient operating organization?

CHAPTER XXI

1. Explain how the "fair value" rule in *Smyth* v. *Ames* reflects the transitional character of the period of its origin.

2. Why is it necessary to distinguish between the past and future aspects of the valuation problem? Is it possible to lay down a consistent rule of valuation for the future?

3. Why did the figures representing investment and normal cost of reproduction sometimes correspond closely during the years immediately preceding the rise in prices which accompanied the World War?

4. Explain the shift in the position of consumers and of public utility operators regarding the investment and cost of reproduction standards.

5. Why was the "split inventory appraisal" introduced during the period of the war?

6. Explain the effect of changes in the level of prices upon the following standards of valuation, (a) the investment standard, (b) the cost of reproduction standard (c) the capitalization of net income standard.

7. In what particular did the Southwestern Bell Telephone Co. decision modify the "fair value" rule? What appraisal practice was disapproved in this case and what reason did the court assign?

8. State Justice Brandeis' criticism of the "fair value" rule. Con-

trast his property concept for public utilities with that of the majority opinion. Which interpretation comes closer to adopting the "going concern" point of view?

9. Criticize the hypothesis which underlies the cost of reproduction standard of valuation from the going concern point of view.

10. How did Justice Rosenberry criticize the "fair value" rule in the Waukesha case? What conclusion did he arrive at and upon what economic reasons was his conclusion based? Wherein does he agree or disagree with both the majority and minority opinion in the Southwestern Bell Telephone case?

11. Explain how regulation under the indeterminate permit is well adapted to an application of the going concern theory of valuation.

12. What standard of valuation is adapted to the going concern theory? Give reasons for your opinion.

13. What are the desirable characteristics of a public utility rate-base?

14. What criticism directed against the investment standard of valuation has real economic validity? How may this criticism be met under the going concern theory?

15. What effect will the decision of the United States Supreme Court in the Indianapolis Water Company case have upon the rate-base of public utilities and upon the rate-making procedure of public service commissions? Explain fully.

16. What is the present judicial status of the "fair value" rule first announced in *Smyth* v. *Ames,* citing cases?

CHAPTER XXII

1. What are "retrospective valuations" and why are they necessary?

2. Why is the "fair value" doctrine well adapted to the need of making reconciliations between the equities of the past and the new institutional arrangements of the future?

3. Contrast the treatment of franchise value under a system of special franchise regulation with the treatment of franchise value under the system of commission regulation with indeterminate permits.

4. What is your understanding of the purpose of a franchise in the regulation of public utilities at the present time?

5. Explain the legal and economic concept of "good will". What position have the courts taken as to the valuation of good will for rate-base purposes?

6. Distinguish going value, franchise value and good will.

7. Discuss the concept of "going value" as developed by the Railroad Commission of Wisconsin. How is it related to the theory of the going concern?

8. Explain the various methods of computing going value.

9. What criticisms have been directed against the measurement of going value by using (a) the cost of reproduction, (b) the investment standard, and (c) the capitalization of net income standard?

10. Trace the treatment of "going value" in judicial opinions.

11. Must "going value" be allowed in a rate-base in order that rates may not be confiscatory? What light does judicial opinion throw upon this question?

12. Justify an allowance for going value from an economic point of view.

13. Under what circumstances is there no going value?

14. Indicate the propriety of capitalizing expenditures for (1) land, (2) organization expenses (3) franchises (4) patent rights (5) contract rights (6) good will (7) working capital.

15. How should "appreciation" (so-called) in land values be treated in fixing valuations for rate-making?

16. How should accrued depreciation be treated in establishing a rate-base? Explain fully the two conflicting points of view upon this question.

17. How is the question of making a deduction for accrued depreciation in fixing a rate-base bound up with the question whether an allowance is to be made for going value?

18. Why is the cost of reproduction standard inconsistent with the valuation and regulation of public utilities as going concerns?

19. How would you apply the doctrine of "fair value" in the case (a) of a public utility organized and built previous to the era of state commission regulation? (b) Of a public utility organized and built under that system of regulation? (c) Same as case (b) when accrued depreciation amounting to $2,500,000 is offset by a depreciation reserve of $1,500,000? (d) Should earnings accruing previous to regulation in excess of a standard 7% return be deducted from the rate-base under commission regulation, assuming the utility had been operating under a franchise granted by the community?

20. The property of a public utility corporation, consisting of a consolidation of previously competing utilities, is appraised as of Jan. 1, 1913. The consolidation was effected in 1912. The appraisal of the cost of reproduction new yielded a figure of $30,000,000. The reasonable investment cost appraisal yielded a figure of $29,000,000. The following is a schedule of audited annual additions to capital:

1913	$1,500,000	1918	$ 750,000
1914	750,000	1919	1,250,000
1915	250,000 credit	1920	1,000,000
1916	700,000	1921	800,000
1917	300,000	1922	1,500,000

What would be the appraisal of cost new on the basis of the split inventory method? What is the "fair value" at Jan. 1, 1923, assuming

a "condition per cent" (cost new less depreciation) of 80% and that the excess of annual deficits over annual surpluses in the history of the company has been $2,000,000. Would you deduct the accrued depreciation? Would you allow depreciation charges on a straight line or sinking fund basis? Why? Would you have the property reappraised as of Jan. 1, 1923? Discuss fully all your conclusions, and state all assumptions which you are making in arriving at your conclusion.

21. A public utility corporation was organized in 1895. Its earnings until 1900 were less than a fair return upon the investment. The rates were fixed in a franchise expiring in 1915. In 1907 complaint was made to the public utility commission that the rates were unreasonable. (a) Was the commission empowered to change the rate? Could the rates be raised above those specified in the franchise? (b) Outline the investigation to be made by the commission. (c) What principles of valuation should the commission apply? Would different principles apply if the complaint were made in 1916? (d) The company had failed to set aside a depreciation reserve though earnings had been adequate. How should the commission treat this feature of the case? Would the situation be different if the reserve had been provided? (e) The property being a large one, ought the commission to require that depreciation be set aside on the straight line or the sinking fund basis? (f) If the case involves the adequacy of street railway service, what preliminary study should be made in these premises? Discuss fully all your conclusions and state all assumptions which you are making in arriving at your conclusions.

22. The Wisconsin Electrical Corporation under date of June 1, 1926, has applied to the Railroad Commission for an increase in rates, alleging that rates now in effect are unreasonable. The uncontroverted evidence in the case reveals the following situation:

The annual net income of the company since the date of its organization is shown in Table I:

TABLE I

Year	*Operating Revenues*	*Operating Expenses Incl. Depreciation*	*Average Interest Rate Paid*	*Net Income*	*Aver. Investment in Fixed Property Incl. Working Capital*
1910	$ 5,000,000	$ 6,000,000	5%	$ 1,000,000*	$28,000,000
1911	6,000,000	5,900,000	5	100,000	28,000,000
1912	7,000,000	6,000,000	5	1,000,000	28,000,000
1913	7,500,000	6,300,000	5	1,200,000	30,000,000
1914	8,000,000	6,400,000	5	1,500,000	32,000,000
1915	9,000,000	6,500,000	6	2,500,000	35,000,000
1916 to 1925 incl.	100,000,000	60,000,000	6½	40,000,000	50,000,000
5 mos. 1926....	5,000,000	4,000,000	6	1,000,000	51,000,000

* Deficit.

A joint board of appraisers reports the figures shown in Table II:

TABLE II

Cost of reproduction new as of June 1, 1926	$70,000,000
Cost of reproduction new less depreciation (same date)	60,000,000
Cost of reproduction new (average of unit prices for 1916-1925, as of June 1, 1926	80,000,000
Cost of reproduction new less depreciation, as of June 1, 1926.	67,000,000
Cost of reproduction new Jan. 1, 1916	36,000,000
Additions to property from Jan. 1, 1916, to June 1, 1925 according to an audit of the property and plant account	15,500,000
Estimated working capital	500,000
Depreciation reserve balance (excessive)	20,000,000

In addition the company contends that it should be allowed $1,000,000 for the value of its franchise and $2,000,000 for good will.

(a) Upon the basis of the above information establish a rate-base for the utility in question. List *every* element that ought to be considered or disallowed and the weight to be given it, if any. Defend every step you take. What ought to be the rate-of-return? Would you increase the rates of the company or would you deny the application? Give reasons for your answer.

(b) It appeared at a hearing in the above case that the company's annual charges for depreciation have been too heavy. Consequently, the commission decided that the depreciation reserve listed above was several million dollars larger than experience and reason showed necessary to take care of replacements and maintain security of investment. Hence the commission ruled that, if earnings for 1925 do not yield a fair rate-of-return, the company would be ordered to make the necessary accounting adjustments and make up the deficit out of the excess in the depreciation reserve. Since the funds upon which the depreciation reserve represented a claim had been reinvested in the business, the result aimed at would be accomplished as follows: The annual charge for depreciation, which had been revised by the commission, would not be made in full against yearly operating revenue as is the usual procedure. After deduction of the variable operating expenses and taxes, gross operating revenues would first be drawn upon to yield the fair rate-of-return. What remained out of the original gross operating revenues could then be used to satisfy the annual depreciation charge. To the extent that such residue did not satisfy the annual depreciation requirements, as fixed by the commission, they should be satisfied by a proper charge against the excess in the depreciation reserve, this excess being treated like available income, disposable for such purposes. The company contended that it could not be compelled to make up the deficits in future net earnings out of depreciation reserves accumulated in the past. Is the contention of the company justified in view of the legal nature of public utility property and the going concern theory of regulation?

Discuss fully all your conclusions and state all assumptions which u are making in arriving at your conclusion.

23. The Wisconsin Electric Light and Power Company has applied the Wisconsin Railroad Commission for authority to increase its tes. In presenting its case to the commission, the following facts peared:

(a) The properties of the company were constructed or acquired ring a period beginning with the year 1890. The audited cost of operty additions by five-year periods shows the following:

90–1895	$3,000,000	1910–1915	$ 6,000,000
95–1900	4,000,000	1915–1920	15,000,000
00–1905	6,000,000	1920–1925	10,000,000
05–1910	6,000,000		

(b) The normal cost of reproducing the property, as of Dec. 31, 1915, ing five-year averages for prices, was appraised at $26,000,000. "The ot cost of reproduction" as of Dec. 31, 1925 was appraised at 5,000,000.

(c) After paying all operating expenses, including a reasonable owance for depreciation, the net income available for return for the lendar year 1925 was $4,000,000. The amount of interest payment $40,000,000 of bonds outstanding was $2,400,000. The financial story of the company shows that there has been a reasonable margin return from the outset.

Neglecting working capital, what would be the "fair value" for rate-aking purposes of the company under the following assumptions:

(a) that the "fair value" is determined under the rule of *Smyth* v. *nes*?

(b) that the "fair value" is the prudent investment?

(c) that the "fair value" is to be determined in accordance with the cent decision of the United States Supreme Court in the Indianapolis ater Company case?

(d) that the "fair value" is determined by the split inventory method, ing 1915 as the dividing line?

Compute the *rate-of-return* earned in each case. Compute the re-rn *earned upon stockholders' equity* in each case. Should the Com-ission increase the rates? What rate-base should the commission use deciding this case?

If the Commission refuses to increase rates will the courts compel to increase them? Give reasons for your answer and state all rea-nable assumptions which you are making in arriving at your con-usion.

CHAPTER XXIII

1. Why has the labor bargain of public utilities been subjected to ss regulation than its other bargains?

2. What is the basis of the recent preponderant interest in questions concerning labor relations?

3. Range public utilities in the order of financial importance of (a) the labor bargain (b) the investment bargain. Why is the labor bargain less important than the investment bargain in the case of hydro-electric power utilities? What would be the effect upon the labor and investment bargains if telephone utilities, operating as local exchanges, should adopt automatic equipment?

4. Why is it that public utilities are able to "pose" as good employers?

5. What are important limitations on conditions in public utility employment?

6. Sketch the transition from the individual to the collective bargain.

7. What are the outstanding developments in public utility unionism?

8. Discuss company unions versus trade unions as types of labor organizations in the public utility field. Contrast the kind of "coöperation" between employer and employee which may be obtained by collective bargaining with each type?

9. What are the outstanding points of conflict between the public, the public service companies, and the employees in the adjustment of labor policies?

10. What instrumentalities are necessary in adjusting a public utility wage bargain?

11. What are the chief points to be considered in the adjustment of the wage bargain?

12. What are the functions of a bonus or profit sharing plan?

CHAPTER XXIV

1. What are the objectives of public utility labor legislation? How does this type of legislation differ from labor legislation in general?

2. What are the legal limitations upon the employees' right to quit the services of a public utility?

3. What was the principal provision touching labor relations in franchises? What is the characteristic attitude of labor and capital toward this issue at the present time?

4. Explain the effect of war-time influences upon public utility labor policies and labor legislation.

5. Is the cost of living a desirable standard for the adjustment of wage scales? Why, when and by whom was it used?

6. What are the varying degrees in which compulsion and volition may be mingled in the social control of public utility labor relations? What illustrations may be cited?

7. Contrast the three kinds of public interference with the labor

bargain which are known as "conciliation", "voluntary arbitration", and "compulsory arbitration."

8. Trace the development of railway labor legislation from non-interference with the labor bargain to compulsory wage fixing and back again to voluntary arbitration.

9. Outline the labor policy in force during the period of federal control.

10. What were the labor provisions in the transportation act of 1920? How did they operate? Give reasons for the comparative failure or success of this policy. What did judicial decisions have to do with this result?

11. State the case for and against compulsory arbitration of labor disputes for public utilities.

12. State the facts, the decision and reasoning of the United States Supreme Court in the case of *Wilson* v. *New*.

13. Why is the decision in the Wolff Packing Co. case no conclusive proof that the United States Supreme Court will declare unconstitutional legislation providing for compulsory arbitration of labor disputes for public utilities?

14. Is compulsory arbitration for public utilities desirable? Does it prove workable under normal conditions? What have abnormal conditions to do with the use of compulsion? Is the use of compulsion characteristic for the solution of economic or political questions? Why?

CHAPTER XXV

1. By using illustrations explain the kinds of transactions which come under the price bargain. Why is the price bargain so important in the case of manufactured gas utilities?

2. How do commissions secure jurisdiction of the price bargain?

3. What part does competition or monopoly play in the adjustment of the price bargain?

4. Outline the principal functions involved in the administration of the price bargain.

5. Why is a study of price movements important in the administration of the price bargain?

6. What is the effect of continuity of service upon the price bargain?

7. Discuss the economics of standardization.

8. What dangers and difficulties inhere in vertical integration so far as the price bargain is concerned, giving illustrations?

9. How do control over service and rates afford means of indirectly influencing the price bargain?

10. How is control exercised directly?

11. How is a division effected between the responsibilities of management and those of regulating authorities?

12. Mention types of special legislation affecting the price bargain.

CHAPTER XXVI

1. Distinguish the volitional elements in the tax bargain.
2. Indicate the significant facts regarding the burden of taxation upon public utility industries.
3. Outline successive stages through which the taxation of public service corporations has passed in the United States.
4. What underlying factors have brought about changes in tax legislation as applied to public utilities?
5. What motives were at work in the development of the system of franchise taxation?
6. Describe the Massachusetts system of taxing the "corporate excess" as applied to public utilities.
7. Indicate the chief merits and demerits of the gross earnings tax on public utility corporations.
8. How may the present-day system of ad valorem taxation be distinguished from its predecessors?
9. Mention miscellaneous kinds of public utility taxes.
10. Under what special tax burdens do public utilities labor? Are these ever just?
11. Explain the gross-net system of earnings taxation. Why is it advanced as a desirable form of public utility taxation? What criticism has been directed against the plan?
12. What standard of valuation best meets the requirements of tax policy?
13. Outline three theories of public utility taxation and give an illustration of a tax levied in accordance with each of them. Which theory under present conditions best meets the requirements of justice in taxation?
14. Explain the inequalities of taxation to which public utilities are exposed as compared with other forms of property.

CHAPTER XXVII

1. How does modern public utility legislation enforce the common law duty of a public utility to provide reasonably adequate service and facilities?
2. Explain the regulation of service by means of standards of service. What are the difficulties encountered in setting up such standards?
3. What problems are involved in securing good service under the following headings (a) the measurement of service? (b) the payment of bills (c) safety and continuity of service? (c) the application for and discontinuance of service?
4. Explain outstanding characteristics of service for (a) gas utilities, (b) water utilities, (c) electric utilities, (d) telephone utilities?

5. What is the purpose of the experiment of grading public utilities upon their service performances?

6. Briefly characterize the elements of street railway service. What are the limitations affecting the grade of service which may be expected of different utilities?

7. What marked differences attend the handling of the service problem in the case of steam railways as compared with local utilities?

CHAPTER XXVIII

1. Why are public utilities best organized as monopolies?

2. Why is it so important that the conditions of demand and supply be ascertained?

3. What are the economic limitations upon the monopolists' power over prices?

4. Explain by means of illustrations the operation of the principle of diminishing utility as applied to public utilities. What elements of competition are present even though a utility has secured complete control of its market?

5. What is the meaning of "class price"? Why is classification resorted to?

6. Distinguish the economics of overhead costs, the economics of joint cost, and the economics of large scale production costs.

7. Apply the principle of decreasing cost in the supply of electric service.

8. Why is the telephone business an illustration of the law of increasing cost?

9. Under what circumstances does the principle of decreasing cost bring with it increasing returns?

10. What limits the operation of the law of decreasing cost?

11. Give illustrations of constant and variable costs. Are constant costs capacity costs? Are variable costs decreasing costs? Explain fully in each case.

12. Show that the concept of "joint cost" and of "overhead cost" overlap. Give an illustration of joint cost which is not at the same time an overhead cost.

13. When and why are monopolistic price discriminations an evil in the case of public utilities?

14. Why are discriminatory class prices of monopolies under regulation in the interests of consumers while uniform prices are not?

15. Show that competition among public utilities is slow to arise, limited in its operation and self-destructive.

16. What modification is introduced by regulation in the theory of monopoly price?

17. In what ways may surplus earnings be disposed of under regulation?

18. Justify the control by public authority of plant extensions f the point of view of the theory of regulated monopoly price.

19. Criticize "value of the service" and "cost of the service," v used as independent explanations of the basis of public utility structures.

20. Why do unit costs depend upon rates?

21. Why does the need of securing fuller utilization of plant pacity afford a coherent explanation of price-fixing under condit of regulated monopoly?

CHAPTER XXIX

1. When is an entire rate schedule reasonable?

2. Enumerate the factors which may affect the future net re of public utilities.

3. What is the purpose of a cost analysis as an aid in rate-mak What classes of facts are essential to scientific procedure in the cor of public utility rates?

4. Explain output and capacity costs. How are these costs rel to the practice of charging differential or class rates?

5. Explain the fundamental units employed in the measuremen the production of electric energy. How are these fundamental u combined into statistical units for the measurement of plant and o ating efficiency?

6. Distinguish the connected load and the maximum coinci demand.

7. Discuss the economic significance of the load factor and diversity factor in the management of electric utilities.

8. What is the effect of peak loads upon the cost of producing tric service? Enumerate measures adopted by electric utilities meeting this situation.

9. What is the purpose of the demand, output and customer classifications in the adjustment of electric rates?

10. How are railway costs classified in an effort to differentiate way charges?

11. Why are output costs less important for electric utilities more important for gas utilities? What effect does this differ have upon selling policies?

12. What are the practical limitations upon cost differentiation

13. Explain by means of illustrations or otherwise how cons and variable expenses are apportioned as a basis for building up electric utility rate schedule.

CHAPTER XXX

1. Explain two types of rate schedules which take account of readiness to serve element in the cost of electricity supply.

2. Why does a uniform rate per kw.-hr. fail to take into account differences in the cost of service?

3. Discuss the significance of the classification of freight in the adjustment of railroad rates. What considerations are important in granting commodity rates?

4. How do railways take into account the relation of the object of transportation to weight and space capacity? What allowance is made for liability to loss and damage?

5. To what extent can urban transportation systems make use of ability to bear and of differential costs in the construction of rate-schedules?

6. What is the place of special contract rates in electric rate-making?

7. How do "use classifications" reflect value of the service considerations?

8. Explain briefly the distinction between block meter rates and step meter rates. Justify the minimum charge from an economic point of view.

9. Why are flat rates uneconomical rate forms?

10. For what kinds of business and why are the following types of rate-schedules best adapted: (a) Flat rates? (b) the room-basis of electric rates? (c) Demand rates?

11. Explain the zone system of street railway fares giving chief advantages and disadvantages. Why was the five cent flat fare adopted?

CHAPTER XXXI

1. Develop the historical conditions which explain the predominance of private ownership and operation of public utilities in the United States.

2. Distinguish the different forms which public ownership may take.

3. Describe the machinery which has been provided for converting privately owned utilities into publicly owned. What position do the courts take concerning this question?

4. How does the claim for "severance damages" tend to impede the change from private to public ownership? What political device is designed to circumvent this difficulty?

5. How may the financial condition of cities operate as a check upon the public ownership movement? What measures may be invoked to improve the financial competence of cities in this respect?

6. Trace the progress of the public ownership movement in the United States. What is its present status in the different public utility fields?

7. What are the distinguishing characteristics in the organization and functioning of the Hydro-electric Power Commission of Ontario

as contrasted with the type of public ownership and operation of electric utilities with which we are familiar in the United States.

8. Illustrate the so-called "mixed system" of ownership in the case of urban rapid transit utilities.

9. As economic adviser to a city contemplating the acquisition of public utilities, what suggestions of an economic and administrative nature would you make in order to lay a basis for the success of the proposed undertaking?

10. Analyze the point of view of those, (a) who say that municipal ownership is political ownership while private ownership, with widespread distribution of public utility securities, is public ownership, (b) who say that private ownership is production for profit while public ownership is production for service. Is either position properly taken?

11. Contrast the alternatives of public ownership and private ownership as desirable policies when both are subject to regulation. Wherein do their comparative superiorities seem to reside, if any?

12. Is it conceivable that the public utility institution may be so developed as to combine the strong points of both private and public ownership, as we see them today?

13. Does public ownership alone provide social control?

CHAPTER XXXII

1. Describe *in detail* how the following questions are disposed of in accordance with the terms of the agreement between the City of Milwaukee and The Milwaukee Electric Railway and Light Company:

(a) the fixing of the rate-base
(b) the fixing of the rate-of-return
(c) the adjustment of rates
(d) the control of extensions
(e) the control over the cost of the service
(f) the investment of funds by the city as a creditor
(g) the investment of funds by the city as co-owner
(h) the purchase of the property by the city.

2. What are the outstanding difficulties with which a service-at-cost plan may have to contend at the present time?

3. How did the Milwaukee contract make use of the going concern theory in the following connections?

(a) the terms as to tenure
(b) the method of fixing the rate-base
(c) the computation of the rate-of-return
(d) the terms of purchase
(e) the machinery of regulation

4. How does the contract fix the purchase price?
5. How was operating efficiency safeguarded under the contract?
6. What advantages would the public utility and the consumers enjoy under the contract which they did not already have under state commission regulation?
7. Explain how the negotiations and facts in this instance illustrate the desirability of dividing the rate-base problem into one aspect which requires retrospective valuations and another aspect which requires the drawing up of a valuation rule for the future.
8. What jurisdictional problems did the contract aim to settle and how was a settlement effected?
9. What criticism would you make of the contract as an instrument for local regulation?
10. Assume that the contract has been operative for eight years and that all its provisions have become effective. The city then decides to purchase the property, because the operation of the property has proven in the meantime that more than the cost of the service can be earned. Draw up an imaginary balance sheet in a condensed form which will show all items that ought to appear. Compute the balance of the purchase price that ought to be paid by the city in accordance with your assumed figures. State all assumptions which you are making in drawing up the balance sheet.

CHAPTER XXXIII

1. What can you point to in the historical and present economic background of public utilities which warrants the conclusion that public utilities may look forward to economic stabilization?
2. Trace the outstanding developments in public utility credit.
3. Outline the weaknesses which have been uncovered in the present system of regulation.
4. Explain fully the defect in the operation of our federal system of railway regulation which was revealed by the rate advances of 1920. What remedies would you suggest?
5. With what fundamental economic premises may we reckon in the development of public utilities and their regulation, so far as the immediate future is concerned?
6. Outline what you think should be done in order to make public utility regulation effective.
7. Should the administration of regulation for national utilities be regionalized?
8. Should some of the cost of regulation be charged to public utilities as an operating expense?
9. Read the article by former President Hadley of Yale in the Yale Review for February, 1927, and comment upon his suggestions.
10. In a recent address former Justice Hughes made the following comments upon the policy of regulation:

"Where schemes of control are needed either in national or local affairs, we find it necessary ever to be on the alert against insidious encroachments under the guise of official discretion—against the armored cars of bureaucrats which run so freely without showing a head to hit. We have had to overcome our reluctance to invest administrative officials with adequate power to control abuses. We have escaped our denunciation of the multiplication of laws by passing laws under the guise of regulations. If science and the artifices of the unscrupulous have disclosed new perils they have also shown the impotence of mere general legislation. Legislators have little time to follow the trails of expert inquiry and so we turn the whole business over to a few with broad authority to make the actual rules which control our conduct. The exigency is inescapable but the guardians of liberty will ever be watchful lest they are rushed from legislative incapacity into official caprice. If we escape bureaucracy it will not be because of dissertations on delegations of legislative authority. We are a practical people and necessary delegations will not fail to find reasons to support them. It will be only because we never lose sight of the ultimate purpose of government, because we would rather take some risks than give too much leeway to officialism, because we refuse to establish or maintain power for its own sake, and because we have the assertiveness of the unbroken will of free men who will insist that every public officer must constantly feel that he is a servant and not a master, the servant of an intelligent community which is content with thorough investigation and impartial findings and scientific applications, but is not servile and is able and quick to detect favoritism or arbitrariness. It will be for the reason that we are not willing to exchange our birthright for a mess of administrative pottage, no better for being prepared by democratic cooks".

Critically examine these statements and take a stand upon the question whether the warning implied is one that should be heeded so far as public utility regulation is concerned.

APPENDIX C

SELECT PUBLIC UTILITY BIBLIOGRAPHY AND SOURCE MATERIALS

The following is a list of references and sources which are serviceable for further study of public utility problems.

A. General Works

BEALE & WYMAN, *Cases on Public Utilities,* 2 volumes, 1920

BUCK, S. J., *The Granger Movement,* 1918

CARVER, T. N., *The Business Revolution,* 1921

CLARK, J. M., *The Economics of Overhead Cost,* 1923

CLARK, J. M., *Social Control of Business,* 1926

COMMONS, J. R., *Legal Foundations of Capitalism* (1924)

COMMONS, J. R., *Industrial Good Will,* 1919

COMMONS, J. R., and ANDREWS, J. B., *Principles of Labor Legislation,* Rev. Ed., 1927

DEWING, A. S., *Financial Policy of Corporations,* Rev. Ed., 1926

ELY, R. T., *Property and Contract,* 2 volumes, 1914

FRANKFURTER, FELIX, *A Selection of Cases under the Interstate Commerce Act,* 2nd Ed., 1922

FREUND, ERNST, *The Police Power,* 1904

GRAY, J. N., *Limitations of the Taxing Power and Public Indebtedness,* 1906

JOYCE, J. A., *Franchises,* 1909

KIRSCHMAN, J. E., *Principles of Investment,* 1924

LASKI, *Authority in the Modern State,* Chapter 1, 1921

POND, O. L., *Public Utilities,* 1926

POUND, ROSCOE, *Spirit of the Common Law,* 1921

RIPLEY, W. Z., *Main Street and Wall Street,* 1927

ROBINSON, G. H., *Cases and Authorities on Public Utilities,* 1926. Contains valuable classified bibliography of Law Review references.

SMITH & DOWLING, *Cases on Public Utilities,* 1926

WYMAN, BRUCE, *Control of the Market,* 1911

WYMAN, BRUCE, *Public Service Corporations,* 2 volumes, 1921

B. Special Works

TRANSPORTATION

AGG & BRINDLEY, *Highway Administration and Finance,* 1926

CUNNINGHAM, W. J., *American Railroads: Government Control and Reconstruction Policies,* 1922

DIXON, F. H., *State Railroad Control,* 1896

DIXON, F. H., *Railroads and Government,* 1922
JOHNSON, E. R., *Ocean and Inland Water Transportation,* 1906
JONES, ELIOT, *Principles of Railway Transportation,* 1924
JONES and VANDERBLUE, *Railroads, Cases and Selections,* 1925
MEYER, B. H., *Railway Legislation in the United States,* 1903
MILLER, S. L., *Railway Transportation,* 1924
MOULTON, H. G., *Waterways versus Railways,* 1912
RIPLEY, W. Z., *Railroads: Rates and Regulation,* 1913
RIPLEY, W. Z., *Railroads: Finance and Organization,* 1915
SHARFMAN, I. L., *The American Railroad Problem,* 1921
TURNER, *Story of the Western Railways,* 1925
VANDERBLUE, H. J., & BURGESS, K. F., *Railroads: Rates, Service, Management,* 1923

LOCAL UTILITIES

BAUER, JOHN, *Effective Regulation of Public Utilities,* 1925
COOKE, M. L., *Public Utility Regulation,* 1924
KING, C. L., *The Regulation of Municipal Utilities,* 1912
NASH, L. R., *The Economics of Public Utilities,* 1925
Proceedings of Bell System Educational Conference, "Economics and Business," 1926
RAYMOND, W. G., *The Public and its Utilities,* 1925
SPURR, R. C., *Guiding Principles of Public Service Regulation,* 3 volumes, 1924 et seq.
STEHMAN, J. W., *Financial History of the American Telephone & Telegraph Company,* 1925
WHERRY, W. M., *Public Utilities and the Law,* 1925
WILCOX, D. F., *Municipal Franchises,* 2 volumes, 1910, 1911
WILCOX, D. F., *Analysis of the Electric Railway Problem,* 1921

C. Monographs

BAILEY & KNOWLES, *Accounting Procedures for Public Utilities,* 1926
BARKER, H., *Public Utility Rates,* 1917
BLAKE & JACKSON, *Electric Railway Transportation,* 1922
CLARK, H. C., *Service-at-Cost Plans,* 1920
Consolidated Gas Company of New York, Brief prepared by J. E. ALLISON, *In re Theoretical Depreciation,* 1916
DOOLITTLE, F. W., *Studies in the Cost of Urban Transportation,* 1916
EISENMENGER, H. E., *Central Station Rates in Theory and Practice,* 1921
ELY, OWEN, *Railway Rates and Cost of Service,* 1924
FLOY, HENRY, *Value for Rate-Making,* 1916
FOSTER, E., *Engineering Valuation of Public Utilities,* 1912
GRUNSKY, C. E., *Public Utility Rate Fixing,* 1918
HARTMAN, H. H., *Fair Value,* 1920
HAYES, H. V., *Public Utilities, Their Cost New and Depreciation,* 1914
HAYES, H. V., *Public Utilities, Their Fair Present Value and Return,* 1915

HOLMES, F. L., *Regulation of Railroads and Public Utilities in Wisconsin,* 1915
IGNATIUS, M. B., *The Financing of Public Service Corporations,* 1922
JACKSON & MCGRATH, *Street Railway Fares,* 1919
KERWIN, J. G., *Federal Water Power Legislation,* 1926
KNOOP, D., *Principles and Methods of Municipal Trading,* 1912
LAGERQUIST, W. E., *Public Utility Finance,* 1927
LAUCK, W. J., *Political and Industrial Democracy,* 1926
LINCOLN, E. E., *The Results of Municipal Electric Lighting in Massachusetts,* 1918
LYNDON, LAMAR, *Rate-making for Public Utilities,* 1923
MCFALL, R., *Railway Monopoly and Rate Regulation,* 1915
MALTBIE, W. H., *Theory and Practice of Public Utility Valuation,* 1924
MAVOR, JAMES, *Niagara in Politics,* 1921
MORGAN, CHARLES S., *Regulation and the Management of Public Utilities,* 1923
MURRAY, W. S., *Super-power, its Genesis and Future,* 1925
RIGGS, HENRY E., *Depreciation of Public Utility Properties,* 1923
SHAW, G. B., *Common Sense of Municipal Trading,* 1906
SIMPSON, H. D., *The Taxation of Public Service Corporations,* 1927
SPLAWN, A. W., *Railroad Consolidation,* 1923
THOMPSON, CARL D., *Public Ownership,* 1925
VANDERBLUE, *Railroad Valuation,* 1919
VANDERBLUE, *Railroad Valuation by the Interstate Commerce Commission,* 1920
Various Authors, *The Development of Scientific Rates for Electricity Supply, Reprints of Selected Original Rate Papers,* Edison Illuminating Company of Detroit, 1915
WATKINS, G. P., *Electrical Rates,* 1921
WHITTEN, R. H., *Regulation of Public Service Companies in Great Britain,* 1914
WHITTEN, R. H., *Valuation of Public Service Corporations,* 2 volumes, 1912, 1914

D. Miscellaneous List of Source Materials

STEVENS, D. L., *A Bibliography of Municipal Utility Regulation and Municipal Ownership,* 1918
Constitutions, statutes, franchises, ordinances, etc.
National Association of Railway and Utilities Commissioners, *Survey of Public Utility Laws,* 1923
Reports of State public utility and railroad commissions—Decisions, statistics and annual reports
Reports of City Commissions
Reports of Interstate Commerce Commission—Decisions, statistics and annual reports
Public Utility *Reports*—Annotated, 1915 to date
Bureau of the Census

Census of Electrical Industries—Central electric light and power stations, street and electric railways, telegraphs and telephones
Census of Manufacturers—Artificial and natural gas
Statistics of Cities
Proceedings of the following associations:
American Electric Railway Association
American Gas Association
Public Ownership League of North America
National Electric Light Association
American Institute of Electrical Engineers
American Society of Civil Engineers
American Railway Association
Various State Associations of Public Utilities
National Association of Railway and Utilities Commissioners
Poor's Manual of Public Utilities (annual volumes)
Moody's Analysis of Investments, Public Utilities (annual volumes)
Brown's Directory of American Gas Companies
McGraw's Directory of Street Railways
McGraw's Central Station Directory and Data Book
Proceedings of Federal Electric Railway Commission, 1920

The following list contains the more important periodicals which should be consulted:

Aera (American Electric Railway Association) New York, monthly
American City, New York, monthly
American Economic Review, quarterly
American Gas Association, New York, monthly
Bell Telephone Quarterly, New York
Bulletin of National Electric Light Association, New York, monthly
Electric Railway Journal, New York, weekly
Electrical Review, Chicago, weekly (discontinued)
Electrical World, New York, weekly
Gas Age Record, New York, weekly (Formerly Gas Age and Gas Record)
Journal of American Water Works Association, New York, quarterly
Journal of Electricity, San Francisco, biweekly
Journal of Land and Public Utility Economics, Chicago, quarterly
Journal of Political Economy, Chicago, quarterly
Law Journals—*Harvard Law Review,* Pennsylvania, Michigan, Illinois, Columbia, Yale, Cornell, Wisconsin, and others.
National Municipal Review, New York, monthly
Political Science Quarterly
Public Service Magazine, Chicago, monthly
Quarterly Journal of Economics, Cambridge
Railway Age, Chicago, weekly
Stone & Webster Journal, Boston, monthly
Utilities Magazine, Philadelphia, monthly (discontinued)

INDEX

A

Abandonments of service,
control of, 367-369
economic limitations of, 369-370
Accounting, 126 ff.,
budgetary control, 132
functional cost, 131
relation to security control, 405
Accounting statements,
balance sheet, 133-137
illustrations of, 142-145
income, 143 ff.
interpretation of, 133 ff.
profit and loss, 140-141
Accounting, uniform, 128-129
extent and advantages of, 129-131
Accounts,
development of control over, 126-129
income, 138-140
Active connected load, 650
Adamson Law, 537
Ad valorem system,
of taxation, 585-588
Ad valorem tax laws, 321-322
Advanced Rate cases, 321
significance of, 274-276
American Bar Association,
draft of uniform regulatory act, 238-239
American Electric Railway Association, 130, 558
American Gas Association, 130
American Railway Union, 518
American Telephone & Telegraph Co., 76, 509-571
Anti-duplication laws, 249-250
Apportionment, of appraisals, 450
Appraisals,
of accrued depreciation, 451-452
ascertaining final figure in, 449-450
cost of making, 439
definition of, 436
distinguished from valuation, 437
effect of price changes on, 462-464
Appraisals,
intangible value in operating organization, 454
place in valuation, 436-438
purpose of, 438-440
split inventory method, 460
working capital, 452-454
unit prices, 444-445
composition of, 444
contractor's profit, 444
inventory, 440-444
omissions and contingencies, 443-444
engineering mistakes, 443
improvident acquisitions, 442-443
non-operating property, 440-441
property retired from service, 441-442
Property used and useful, 440
reinvested earnings and donated property, 443
general overhead charges, 445-449
preliminary expenditures, 446
expenditures during construction, 446-447
omissions and contingencies, 447
range of allowances, 448-449
Arbitration, compulsory,
of industrial disputes, 545-546
(*See also* Legislation, labor)
judicial review of, 546-548
Assessment of taxes,
centralized, 586-587
under unit rule, 586-587
Atlantic Coast Line Co., 92
Audit, continuous,
in Milwaukee Operating Agreement, 718-720

B

Balance sheet,
fixed capital, 134
Baltimore and Ohio Railway Co.,
coöperative labor plan, 530
Bargaining,
importance and scope of, 102-105

Bargains, cost, 105-106
financial importance of, 108-112
investment, 105-106
analysis of, 313-314
general summary of, 504-507
labor, 106, 508 ff.
price, 106 (*See also* Price)
tax, 106
Bargains, income,
rate, 107
Bell system (*See* Telephone Utilities)
Blue sky laws, 391
Bonds, utility,
comparative yield with municipals, 421
Borrowing power,
relation to public utilities, 188
Brotherhoods, railway, 517-518
Business unit,
size of, 83-85

C

Cables (*See* Communication)
Callings, public, 166-168
Canadian Industrial Disputes Act, 544
Canals (*See* Waterways)
Capital and income,
distinguished, 121
Capital stock,
responsibility of stockholders toward, 99-100
voting power of, 87
Capital, working, 121
cash, 453
control of, 566
materials and supplies, 453
in appraisals, 452-454
Capitalization,
of deficits, 123-124
of net income, 374
Capitalization of income standard,
explanation of, 322-333
Capitalization, reasonable (*See* financing)
Carriers, water,
regulation of, 284-286
Central stations, origin of, 20
Charles River Bridge case, 206
Charters (*See* Franchise)
Cities, growth of, 16, 18
City planning, 20
Classification,
of local utilities, 79-80
Classification, consolidated freight, 663
Classification of customers,
according to use, 666-667
as basis for differential rates, 662-667
relation to monopoly price, 620-621
relation to rate-making, 660-675
Classification of freight, 662-665
Clayton Act, 572
Cleveland service-at-cost franchise, 306
Closed mortgages, 377
Collateral trust bonds, 380, 382
Collective bargaining, 515 ff.
Colorado industrial disputes act, 545
Commissions, administrative,
control of security issues, 403-407
control over price bargain, 563-572
control over service, 616-617
mandatory and advisory distinguished, 213-215
origin of, 212-213
reaction against mandatory, 215-216
reëstablishment of mandatory, 234
relation to rate of return, 410
standard of fair return, 414
Commissions, federal,
origin of system, 263-267
Commission, Federal Power, 287-288
Commissions, state,
administrative superiority of, 250-251
supplanted by I.C.C., 283
regulation by, 233 ff.
rate control, 261-262
organization and procedure, 255-258
miscellaneous duties, 261
legal status, 252-255
franchise problem under, 241-250
expansion in scope of, 234-235
enforcement of orders, 261
Commodity rates, 663
Commons, John R., 113, 243, 696
Communication, **14,** 20
development of local, 72-77
national and international, 44-45
radio, 44
Community of interest,
and price bargain, 569
Compact clause,
relation to regulation, 190-191
Competition,
relation to general incorporation laws, 202-204
self-destructive nature of, 630-634

Compulsory investigation,
of labor disputes, 544-545
Concerted movements, 536
Condition per cent, 449-452
Control, federal,
railway labor policy under, 537-538
Conservation (*See* Irrigation, Hydro-electric power and Drainage)
Consolidation, 22
relation to security control, 396
relation to security issues, 390
telephone utilities, 75-76
relation to financing, 377
Construction, 118-121 (*See also* Going plant)
Construction cost,
composite index of, 463, 464
Construction, period of,
in valuation, 459
Construction, piecemeal (*See* Going concern)
Constitutional Law,
judicial interpretation of, 182-183
Contracts, dual systems, 689-690
Control of operation,
under Milwaukee Operating Agreement, 710-711
Control over service (*See* Service)
Convenience and necessity,
certificates of,
purpose, 247-249
Corporate excess,
Massachusetts tax on, 583
Corporate form of organization,
advantages of, 83-88
Corporation, public service,
borrowing power of, 87
nature of, 82
origin of, 159
Cost,
of debt and risk capital, 431
Cost analysis,
adjustment of class rates, 643-644
as applied to rate schedule as a whole, 640-643
electric utilities, 645-648
diversity factor, 649-652
load factor, 648
relation to selling policies, 640-659
rate-making
illustration of, 641
difficulties of forecasting costs and income, 642
Cost and income,
balance of, 107-108
Costs, apportionment of,
illustration of, 655, 656, 659
Costs, capacity,
as fixed expenses, 643
Cost, constant and variable, 644
Costs, customer, 653, 660
Costs, demand, 653, 660
Cost, determination of,
difficulties, 632
Costs, differential,
electric service, 653-659
illustrated, 661
limitations of, 654-655
railway traffic, 652-653
related to rate structure, 660-661
Costs of capital,
distinguished from yield to investors, 387-388
Cost of money, 413
Costs, out-of-pocket or direct, 623-624
Costs, output, 653, 660
Costs of production,
influence on monopoly price, 621-626
Cost of reproduction standard,
based on "spot" prices, 477
conflict with investment, 457-462
equivalent plant hypothesis, 333
explanation of, 333
fallacy of, 470-471
Cost of service, 638-639, 663
in Milwaukee, 709-710
Cotting *v.* Kansas City Stockyards Co., 176
Credit, public utility,
effect of regulation on, 733-738
effect of security control on, 405
relation to security regulation, 391-392
Credit, railroad, 397-398
Cullom Report, 238, 265
Customer ownerships,
methods of sale, 387 (*See* Securities)

D

Dartmouth College case, 82, 205
effect of, 206-209
effect on taxation, 579
Debenture bonds, 382
Debt, funded,
ratio to capital stock, 381
Decreasing costs, principle of, 622-623
Demand factor, 650
Depreciation, 139, 339 ff.
accountancy of, 352-355
causes of, 340-343
consumers' interest in, 345

Depreciation,
distinguished from amortization, 346-347
distinguished from appreciation, 346
distinguished from maintenance, 343-344
emergence of, 123
explanation of, by Justice Brandeis, 354-355
financing of, 348-351
judicial interpretation, 355-359
kinds of, 341-342
relation to fixed capital, 134 ff.
renewal method, 349-350
retirement expense method, 350
scrap value, 349
sinking fund method, 350-351
straight-line method, 350-351
treatment in Milwaukee Operating Agreement, 722-724
Depreciation, accrued
concept of, 501-502
in appraisals, 451-452
present value interpretation criticized, 502
relation to rate-base, 501-504
Depreciation and insurance, 344
Depreciation reserve,
relation to mortgage bonds, 380
treatment of balances, 357-359
Dewing, A. S., 563
Differentiated return, 410
Discrimination,
forms of, 265, 266
Discrimination, price, 633
Discrimination, rate,
prohibition of, 237
Diversity factor, 649-652
Drainage, 13, 42

E

Earning power,
effect of regulation on, 738-743
stabilization of, 742-743
Economics of monopoly, 633
Economics, public utility,
fundamental premises of, 743-746
Efficiency, reward for, 432-433
Electric utilities,
capital invested, 58-59
cost analysis, 645-647
development of, 57-67
differential costs of, 653-659
gross revenues, 58-59
power resources, 61-64
development of, 62-63
Electric utilities,
regulation by federal commissions, 287-288
sale of by-products, 61
security sales, 386
service standards, 608-609
units of capacity and of output, 645-646
utilization of service, 58-60
load curves, 646-648
load factor, 648-649
Elkins Law, 268-269
Ely, R. T., 7, 185-186
Eminent domain, 189-190
Employees Mutual Benefit Association, 521
Employment, public utility,
social importance of, 511
Employment, regularity of, 510-511
Enterpriser,
government as public service, 676 ff. (*See also* Public ownership)
Equipment trust certificates, 382
Erdman Act, 536
Erickson, Halford, 248, 498
Expenses, fixed,
capacity costs as, 643
Expenses, variable,
output costs as, 643-644
Express service, 32
Extension bond, 377
Extensions,
special case in theory of monopoly price, 636-637

F

Fair return, 412
Farming out system,
origin of, 676
Federal Electric Railway Commission,
on service-at-cost franchises, 307
Financial policies, corporate, 371 ff.
control by commissions, 403-407
Financing,
by sales of stock, 384-387
certainty of principal and income, 378-379
direct, by electric utilities, 386
general plan, 375-376
government and corporate, 734
mortgage bonds, 378-380
past methods of, 376-378
present-day problems of, 378, 382
securities classed according to safety, 374-375

Financing, corporate,
legal restrictions on, 371-372
reasonable capitalization, 372-374
Financial plan (*See* Financing)
Financial practices,
leading to security regulation, 389-391
Financial scandals, railway, 398
Fixed capital (*See* Accounting statements)
Foreshortened life, 342
Franchise,
defined as contract, 205 ff.
defined as special privilege, 205
nature of, 82
(*See also* Charter, Dartmouth College case)
Franchise, indeterminate, 220
Franchise value, 482-485
Franchises,
and control of market, 362
distinguished from licenses, 175-176
general and special distinguished, 198
labor provisions in, 532-535
Franchises, blanket, 223
Franchises, compensation for,
in rate of return, 420
Franchises, exclusive, 223-224
Franchises, flexible rate, 299 ff.
service at cost, 304-310
criticisms of, 308-309
development of, 304-305
economic interpretation of, 309-310
sliding scale, 299-304
in Great Britain, 300-302
in Massachusetts, 302-303
Franchises, service-at-cost (*See* Milwaukee Operating Agreement)
Franchises, special,
compensation for, 229-230
perpetual and long-term, 220-221
short-term, 221-223
taxation of, 584
tenure of, 220-224
Franchises, taxation of, 583-584
Franchises, term,
control over service under, 228 (*See also* Public Ownership)
discriminatory rates, 227-228
municipal corruption under, 231-232
regulation of rates under, 224-226
Functions, economic, 6-8
Functions, public and private, 5, 15, 21, 676 ff.

G

Galveston Electric Co. case, 496-498
significance of, 497
Gas, artificial, 20
Gas, manufacture of, 55-56 (*See also* Technology)
Gas Utilities,
competition with electricity, 53-54
development of, 52-56
development of new uses, 54-55
sales of manufactured gas, 55
service standards of, 605-607
General incorporation laws,
effect on regulation, 202-204
Going business,
going value or cost, 123, 125
period of acquisition, 121-124
relation to good will, 122
unutilized capacity, 122
Going concerns,
life history of, 114 ff.
operation as, 124-125
piecemeal construction of, 124
preliminary organization of, 115-118
public utilities as, 102 ff.
reserve capacity of, 124
theory of, 112-114
in regulation and valuation, 468-475
judicial approval of, 471-475
relation to labor legislation, 548-549
relation to valuation doctrine, 322-324
Going plan (*See* Promotion)
Going plant,
construction of,
durable portion, 118-119
non-durable portion, 119-121
Going rate, 408
Going value, 487 ff. (*See also* Going business)
Good will (*See* Going business)
in valuations, 485-487
no allowance for, 486
Government enterprise,
forms of, 678-680
Government, industrial, 527-530
Government operation,
of railways, 278-279
Government ownership, 676-701 (*See also* Public ownership)
early failure of, 27
legality of expenditures for, 680
Governmental powers,
relation to public utilities, 184 ff.

Gross earnings,
system of taxation, 584-585
Granger movement, 34, 210, 216

H

Hazards, industrial,
elimination of, 526-527
Hepburn Act, 271-272
commodities clause, 572
Hepburn report, 34
Highways,
development of, 37-39
mileage constructed, 38
federal aid law, 38
traffic, 39
(*See also* Turnpikes)
Highways, public,
railways as, 210-211
Holding companies,
advantages of, 94-96
criticisms of, 97-98
fees for management services, 412
finance and management, 93-94
history, 89-90
license contracts of, 569-571
nature of, 89-90
relation to financing, 378
transportation, 92
Holmes, Justice O. W., 186, 189-190
Home rule, 220, 296
Hopkinson, Dr., 671
Hours of labor,
standardization of, 524
Hydro-electric power,
development of, 64-66
Hydro-electric utilities,
federal regulation of, 287-288
public ownership, 678 ff.

I

Identical plant, hypothesis of, 471
Illumination, 15
Indianapolis Water Co. case, 476
Individualism *vs.* collectivism, 181-182
Industrial revolution, 17
Integration, vertical,
effect on purchasing, 561-563
limits of, 562
Intercorporate relations,
control of, 400
Interstate Commerce Act,
defects and early amendments, 268
emasculation of, 267-270
long and short haul clause, 267, 270, 272, 281
rebates and discriminations, 268
Interstate Commerce Clause, 186
interpretation of, 266-267
Interstate Commerce Commission,
control of securities, 398 ff.
development of rate-making powers, 273-278
extension of jurisdiction, 282-284
powers in 1887, 252-253
Inventory, 440-444 (*See also* Appaisals)
Investment Bankers Association, 384
Investment bargain,
general summary, 504-507
Investment, insecurity of,
causes, 339-340
Investment standard,
conflict with cost of reproduction, 457-462
explanation of, 329-332
in Milwaukee Operating Agreement, 716
Investment standard, prudent, 473
Irrigation, 13, 20
development in U. S., 41-43

J

Joint cost, principle of, 624-626
Judicial review,
emergence of, 315-317
of commission decisions, 258-259
Just compensation, 189, 194
Just price, 157-158

K

Kansas Court of Industrial Relations, 546
Knoxville *vs.* Knoxville Water Co., 357

L

Labor bargain,
continuity of service, 512-513
effect of legislation upon, 531-549
effect of regulation upon, 512
financial importance of, 509
fundamental conditions affecting, 510-513
individual, 513-515
evils of, 514-515
industrial government, 527-530
interest in, 508-509
methods of bargaining, 513-530
collective bargain, 515-516
individual bargain, 513-515
regularity of employment, 510-511
social importance of utility employment, 511

Labor bargain,
standardization of, 523-530
trade agreements, 521-530
unionism, public utility, 516-521
war-time influences, 533-535
Labor Board, Railroad, 540
labor code, 541
Labor organizations, public utility membership, 518, 520
Labor relations, policies of, 508-530
Laissez-faire, 18, 19, 21
effect on regulation, 160-161, 170
peculiarities in U. S., 170-171
relation to general incorporation laws, 202-204
Land,
easements, 119
Land grants, 29-30, 119
Legal organization, 82 ff. (*See also* Corporation, Trust, Holding companies)
Legislation, enabling,
public ownership, 680-685
Legislation, federal,
controlling security issues, 399-400
Legislation, federal, labor,
Adamson Law, 537
Erdman Act, 536
Newlands Act, 536
preceding Federal Control, 536-537
Watson-Parker Act, 542-543
Legislation, labor, 531-549
special, 535-546
affecting local utilities, 544-546
Legislation, maximum rate, 214-215
Legislation, special,
affecting price bargain, 572-573
affecting steam railway service, 616
Liabilities, capital, 135-136
Liberty,
constitutional protection of, 192-194
License taxes, 590
Life expectancy, 451-452
Load, active connected, 650
Load curves,
in cost analysis, 646-648
Load and diversity factors,
significance of, 651-652
Load factor, concept of, 648-649

M

Maltbie, Milo R., 243
Managerial responsibilities in price bargain, 553
Managerial services, 412
Mann-Elkins Law, 271-272
Market, open and controlled, 161
Markets, expansion of, 23
Market; control of,
administrative aspects, 365-367
and competition, 365
and security of investment, 362 ff.
of local utilities, 366
Marshall, Chief Justice, 113
Massachusetts Board of Railroad Commissioners, 214
Mill, John Stuart, 697
Milwaukee, Wisconsin,
general survey of public utility situation, 702 ff.
Milwaukee Electric Ry. & Lt. Co.,
description of system, 703
Milwaukee Operating Agreement,
appraisal of provisions, 714-724
aspects of public finance, 720-722
continuous audit, 718-720
control of operations, 710-711
cost of service, 709-710
criticisms of service-at-cost contracts, 715-716
depreciation, 722-724
formula for flexible return, 429ff.
fundamental purposes, 714-715
important provisions of, 704-714
investment standard, 716
machinery of control, 712-725
municipal purchase and financing, 712-714
origin of, 704
probable operating result, 724-732
property and area under, 706
rate-making provisions, 710
rate of return formula, 721
result of referendum, 730-731
tenure, 705-706
theory of valuation, 717-718
value of investment, 707-709
Minimum charge, in rate schedules, 672
Monopolies,
public utilities as, 618-639
Monopoly, early opposition to, 160
under indeterminate permit, 244-245
Monopoly price,
diagrammatic representation of theory, 627-630
discriminatory, 629
influence of cost of production on, 621-626
theory of, 619-620
effect of regulation on, 634-636
Monopoly price, uniform, 628

Monopoly and discrimination, 626-627
Mortgage bond, 376-377
Mortgage bonds, adequacy of depreciation reserves, 380
restrictions on additional issues, 379
sinking funds, 380
Motor bus, interurban, 39-40
Motor truck, 40
Motor vehicles, competition with electric railway, 70-71
Munn *vs.* Illinois, 162-163, 316

N

Nash, L. R., on depreciation, 360
National Association of Railway & Utilities Commissioners, 130, 503
National Civic Federation, 223
National Electric Light Association, 130
National Municipal League, 221
National Tax Association, 597-599
National War Labor Board, 533
Net income taxes, 589-590
Newlands Act, 536
Nickel permit, 674
Nickel Plate Merger case, 400
North American Co., 91
Northern Securities Co., 92

O

Official revision system, 299-300
Olcott *vs.* Supervisors, 176-177
Omissions and contingencies (*See* Appraisals)
Ontario Hydro-Electric Power Commission, 678, 687
Organization, economic, 104-105
Organization, operating, 120
Over-capitalization, 372-373
relation to rate of return, 410
relation to security control, 405
relation to security regulation, 389-390
Overhead charges, adaptation and solidification, 121
in appraisals, 445-449
Overhead costs, 622-623
Ownership and operation, government, 676 ff.
Ownership, municipal, Milwaukee Operating Agreement, 712-714
Ownership, public participation in, 688-689
Ownership, public, water utilities, trend toward, 50

P

Paving obligations, 420, 591-592
as form of tax, 591-592
Permit, indeterminate, 242-246
and control of market, 363
judicial and economic interpretation, 243-245
objections to, 245-246
Persuasion and compulsion, 175-176
Philadelphia plan of collective bargaining, 521
Police power, 184-186
Pool, railway, 34
Postal service, 44-45
Pound, Roscoe, 167-182
Public calling, 16
Public ownership & operation
general summary and conclusion, 697-701
movement for, 685-692
statistics, 690-692
need for scientific attitude toward, 677-678
obstacles to, 682-683
remedies for, 684-685
problems of, 692-697
economic, 692-695
administrative, 695-697
regulation under, 296-297
relation to term franchises, 230-231
Public works, 12-16
Preferred stock,
sales to customers and employees, 384-386
Price, bargain, 550 ff.
basis of controlling, 551-552
commission control over, 563-572
financial importance of, 550-551
special legislation, 572-573
Price, bargain, control of
through control over service, 564
through control over rates, 565
Price, regulated monopoly, 618-639
Price discrimination, and monopoly, 626-627
Price level, general, in valuation, 457-462
Price level, general, trend of, 460-461
Prices, average of,
relation to normal value, 459
Prices, changes of,
effect on appraisals, 462-464
effect on price bargain, 553-555

Prices, trend of,
comparison with interest rates, 506
in valuation, 459
Prices, wholesale,
Index of, 458
Profits, risk theory of, 434
Promotion,
economic and financial plan of, 116
going plan, 118
industrial plan, 117
legal plan, 117
and control of security issues, 389
Property, private,
constitutional protection, 192-194
control of, 6-8
Property, public, 6-7
Proprietary power, 192
Purchase, municipal,
in Milwaukee Operating Agreement, 712-714
Purchases, inter-utility, 568 ff.
Purchases, standardization of, 559-561
Purchasing,
compared with self-supply, 561-563
Purchasing activities,
classification, 555-556
relation to business cycle, 556-557
Purchasing function,
administration of, 555-559
Purchasing methods, 557-558
Purchasing power, 479

R

Railway, construction, 29
Railway abuses, 32-33, 211-212
Railways, electric,
mileage, 69
public ownership of, 687
interurban,
development of, 39-40
under I. C. C., 284
urban,
development of, 68-70
service characteristics, 613-615
Railway electrification, 59
Railway Employees Department, 518
Railways, steam,
abandonment of mileage, 35
consolidation, 33-34
development of, 20, 28-36
in United States, 26-28
expansion since 1860, 29-31
differential costs, 652-653
Railways, steam,
government operation, 35
rate problems, 674
regulation of, 263 ff
service, 616-617
improvements, 32
special labor legislation, 535-544
transcontinental lines, 29-30
capital invested, 35
Rapid transit, 71
Rate-base,
accrued depreciation in, 501-504
(*See also* Valuation)
Rate of return, 408 ff.
analysis of, 408-411
as fixed by commissions, 428-429
compared with competitive return, 424
determinants of, 414-423
rate of interest, 414-415
risks of investment, 415-417
special burdens, 417-423
formula of flexible, 429-432
formula in Milwaukee Operative Agreement, 721
general principle for determining, 411-414
judicial standards of, 426-428
quantitative measures of, 423-426
regulatory and customary standards, 425
reward for efficient management, 432-433
Rate schedules,
relation of cost analysis to, 640-643
Rate systems, 667-675
Rate making,
as governmental process, 311-313
judicial rule of, 326-328
Milwaukee Operating Agreement, 710
modification of judicial rule, 336-338
necessary reconciliation for future, 481-482
Rates, class,
and cost analysis, 643-644
Rates, control of,
by commissions, 261-262
Rates, demand or readiness to serve, 669-672
Rates, differential, 660-675
based on customer classifications, 662-667
illustrated for railways, 664-665
Rates, fixture, 667-668
Rates, flat, 667
Rates, gas, 672

Rates, general level,
definition of, 108
relation to cost analysis, 641
Rates, meter, 668-669
Rates, room basis of, 671
Rates, telephone, 674-675
Rates, theory of,
misconceptions analyzed, 637-639
Rates, transportation and telephone, special considerations affecting, 672-675
Rates, weekly ticket, 666-673
Rates, zone, 673
Ratios, financial, 146 ff.
capital to revenue, 149-151
cost of borrowed capital, 148-149
fixed expenses to property investment, 154-155
operating, 152-154
rate of return on capital, 147-148
return on equity, 147
Ratios, wage, 525
Reasonableness, legislative standards, 236-237
Reclamation
(*See* Drainage and Irrigation)
Refunding bond, 377
Regulation,
by federal commissions, 263 ff.
by state commissions, 233 ff.
centralization *vs.* decentralization, 290-292
common law basis, 156 ff.
constitutional basis, 181 ff.
cost of, 749-753
criticism of, 740 ff.
effect on earning power, 738-743
effect on monopoly price, 634-636
evolutionary stages of legislative, 196
general summary and forecast, 733-753
going concern theory of, 468-475
historical background, 156-162
judicial, 195-197
of labor bargain, 512
of local utilities, 290 ff.
pre-commission system, 195 ff.
purpose of, 108
rebirth of, 34
necessary changes in policies of, 746-749
of price bargain, 551-552
of steam railway service, 616-617
security issues, 389 ff.
significance of no-par stock in, 383
Regulation, charter,
constitutional reservations affecting, 199 ff., 207-208
judicial interpretation of, 205 ff.
local utilities, 201-202
transportation utilities, 199-200
weakness of, 200
Regulation, federal, of security issues, 396-401
Regulation, legislative, early forms, 197 ff.
Regulation local,
adjunct to state commissions, 292-297
by local commissions, 297-299
by service-at-cost franchises, 702-732
defects of, 294-295
special franchises, 217 ff.
Regulation, price,
American colonies, 161-162
in Rome, 157
mercantilism, 158-159
medieval times, 157
Regulation, rate under term franchises, 224-228
Regulation, security, purposes of, 319-392
Regulation, self-, 752
Regulation, special franchise, changing
objectives of, 218-220
underlying conditions affecting, 217-218
Regulation, state,
failure to control security issues, 397
Regulation, statutory, scope of, 240-241
Reports,
annual, 127
uniform, 145-146
Reserves, 136-138
Ripley, W. Z., 100-101
Risks,
from character of industry, 415
from historical conditions, 415-416
from location, 416
from operation, 415
relation to rate of return, 403
Rosenberry, Justice M. B., 472-475, 502
Rural electrification, 60

S

Sanitation (*See* Water utilities)
Scrap value, 440

Securities,
classification of, 374-375
distribution of, 86
rates of yield, 736
relation between price and rate of return, 425
Security issues, control of, 389-407
relation to price bargain, 566
judicial and economic interpretations, 401-407
by federal agencies, 396-401
retroactive regulation, 406
statutory provisions, 393-396
steps in movement for, 392-393
Security of investment, 408
Selling policies,
significance of costs in, 640 ff.
Service, control over, 600-617
Service, grading of, 611-612
Service problem, peculiarity of, 239
Service at Cost (*See* Franchises, Flexible Rate, Milwaukee Operating Agreement)
current criticisms of, 715-716
in regulation of local utilities, 702-732
Service, continuity of, legislation safeguarding, 535-544
Services, free, 422
Service standards,
electric railways, 613-615
electric utilities, 608-609
gas utilities, 605-607
telephone utilities, 609-611
water utilities, 607-608
Service standards, common
extensions, 605
measurement of, 602-603
payment of bills, 603-604
safety and continuity, 604
supply and discontinuance of, 604-605
Service standards, reasonable, defined, 600-602
Sherman Anti-Trust law, 34
Short term debt, 382
Smith, Adam, 160
Smyth *vs.* Ames, 193, 326, 408, 456-457, 460, 465, 467, 468, 475-476, 481, 500, 502
Socialization, meaning of, 19-21
Southwestern Bell Telephone Co. case, 177, 465-467, 472, 477, 571
Standard Gas & Electric Co., 91
Standardization, influence on purchases, 559-561
Statistics, uniform (*See* Reports)
Stock, common, equity, 410
Stock, no par value, 382-384
criticism of, 383
Stoic philosophy,
origin of rate theory, 637
Store-keeping, 558-559
Strikes, 533-535
Subsidies in rate-making, 642
Subway contracts in N. Y., 688
Super-power systems, 66-67

T

Taussig, F. W., 263
Tax bargain, 574 ff.
financial importance of, 575-578
Tax base *vs.* rate base, 595
Tax burdens, comparative, 577
Tax exemption,
effect on income, 418
effect on yield, 419-420
Tax policies, stages in development of, 578-582
Taxation, relation to rate of return, 417-419
franchise, 583-584
license, 590
Taxation, policies of,
general summary and criticism, 595-599
period of exemption, 579-580
period of special taxation, 581-582
period of subsidy, 578-579
period of uniformity, 580-581
Taxation, systems of,
ad valorem, 585-588
capital stock and securities, 589
gross earnings, 584-585
gross-net earnings, 592-594
net income, 589-590
Taxes,
as special contributions, 591-592
Taxing power,
relation to public utilities, 187-188
Technology,
development of, 19-23, 29
electric railways, 68-69
electric utilities, 57
gas utilities, 55-56
hydro-electric, 65
relation to excessive security issues, 390
telegraph utilities, 20, 45
telephone utilities, 20, 72, 73, 77
water utilities, 51
Telegraph utilities,
development of, 45
Telephone utilities,
competition, 74-75

Telephone utilities,
development of, 45
exception to decreasing cost principle, 622
growth and extent, 75-77
local exchanges,
development of, 72-74
rates, 672-675
service standards, 609-611
criticism of, 610-611
under I. C. C., 284
Trade agreements, 521-530
Trading on the equity, 410
Traffic, What the . . . will bear, 637, 638, 663
Transport,
American development of, 24
ancient, 13-14, 17-18
influence of frontier, 23
rates, 672-675
(See also Railways, Waterways)
Transportation Act of 1920, 35, 279-282
certificates of convenience and necessity, 367
control of security issues, 397-400
fair return provisions, 429
labor policy of, 538-542
rate-making provisions, 280-281
responsibility of directors under, 100
Transportation, urban
(*See* Electric Railways, Motor Vehicles, Rapid Transit)
Trust fund doctrine, 371-372
Trust, Massachusetts, 88-89
Turnpikes, 24-26

U

Uniformity clauses,
relation to taxation, 581
Unions, company, 520
Unions, national trade, 517-519
Unionism, public utility, 516-521
United Gas Improvement Co., 90-91
Unit prices
(*See* Appraisals)
Unit rule, in tax assessment, 323-324, 586
Urbanization,
effect of, 47-48
Utilities, local,
economic characteristics of, 77-81
regulation by service-at-cost franchises, 702-732
Utilities, private, 5-6
Utilities, public,
associated with franchise, 163
Utilities, public,
classification of, 6, 8-9
financial importance of, 9-10
historical development of,
ancient times, 12-15
medieval period, 15-16
modern, 16-22
rights and duties of, 174-175
Utility, public,
as economic institution, 175-179
as legal institution, 171-172
distinguished from public use, 166
economic definition, 178-180
judicial meaning of, 162-166
legal tests of classification, 172-174
medieval origins of, 168-169
meaning of, 2-12
United States Shipping Act, 286

V

Valuation,
as legislative policy, 319-321
legal doctrine of, 317-319
movement for, 311 ff.
purposes of, 320
Valuation Act, 275-276, 321
Valuation, physical,
history of movement, 315-322
Valuation, standards of, (*See* Investment Standard, Capitalization of income, Cost of Reproduction)
Value, fair,
doctrine challenged, 464-468
Value, franchise, 482-485
in purchase cases, 484
position of commissions, 483
Value, going, 487-501
and confiscation, 496-499
definition of, 495-496
economic interpretation of, 499-501
judicial opinions concerning, 489-491
legislative policy toward, 498-499
measurement of, 491-495
method of estimating,
comparative plant, 491
criticism, 492-495
exchange value, 492
Wisconsin concept, 487-489
Value, good-will, 485-487
definition of, 486
Value, normal,
in valuation controversy, 459
Value of service, 637, 663
Valuation,
for taxation, 586, 594-595

Valuation,
under going concern theory, 468-475
past and future aspects of problem distinguished, 456-457
retrospective, 481-507
accrued depreciation, 501-504
Valuation, standards of,
conflict between investment and cost of reproduction standards, 457-462
critique, 455-480
fallacy of cost of reproduction, 470-471
present position of U. S. Supreme Court, 475-480
Valuation, theory of,
in Milwaukee Operating Agreement, 717-718

W

Wages, railroad,
war-time increase of, 539
Wages, standardization of, 523-524
Wages, prices and cost of living, 534
War power,
relation to public utilities, 187
Water Power Act, Federal,
provisions of, 287-288
Watered stock, 384
Water utilities,
ancient, 12 13
medieval, 16
modern, 20
Water utilities,
development of, 49-52
number of, 50
service standards, 607-608
Waterways, 13-14
inland, 25-26, 28, 36-37
Watson-Parker Act, 542-543
Waukesha Gas and Electric Co. case, 471, 478
Wearing value, 449
What the traffic will bear, 637, 638, 663
Wilcox *vs.* Consolidated Gas Co., 427, 466
Wilcox, Delos F., 222, 295
Windom report, 34, 238
Wolff Packing Co. case, 164-166
World War,
effect on federal regulation, 277-278
effect on franchise rates, 225-227
effect on labor, 533-535
effect on price bargain, 553-554
Working conditions,
standardization of, 524-530

Y

Yield, rates of,
public utility securities, 736
Yield to investors,
distinguished from cost of capital, 387-388

Z

Zone of reasonableness, 334-335