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PUBLIC UTILITY ECONOMICS

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PUBLIC UTILITY ECONOMICS

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PUBLIC UTILITY ECONOMICS

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PREFACE

This is a book on public utility economics designed primarily for college students, although it may also be read by others interested in the subject. The need for another text in the field of public utility economics requires no demonstration. The march of events since 1933 has obviously antiquated all publications prior to that time. Thus it is to be expected in a field so dynamic, so changing, as public utilities that new analyses will from time to time appear.

At the beginning of this venture, it was necessary to establish a basic pattern of presentation. Specifically, it was necessary to choose between the extremes of generalized discussion and documented analysis. Although the former has the advantage of smoothness of reading, it has seemed nevertheless essential to choose the latter pattern. In fact, we have attempted to combine these choices by placing in footnotes all minor points and data, thereby preserving a maximum of smoothness of thought in the body of the writing. The necessity of documentation arises from the fact that forty-seven state and four federal commissions, one federal and forty-eight state judicial systems, and many trade and semiofficial organizations have contributed to the literature on public utilities. If it appears that we have been guilty of excess documentation, may not the fault lie with the subject matter?

We have followed but two fundamental assumptions in this writing. First, we have accepted the dominance of private ownership in all but water supply and on that basis have attempted to set out the many problems that exist. Choosing this position, we do not necessarily defend it or deny the possibility of other (and possibly more adequate) types of ownership and operation. Second, we have assumed that our study is basically a study in economics. True, it is not a study in competitive economics; nevertheless, it is part of economics because it treats of a portion of our productive capacity using scarce resources to satisfy human wants. As we show more in detail in Chap. I, our study is primarily an illustration of institutional economics.

One more word of explanation: A reading of this text may leave the impression that too much emphasis has been placed on state regulation, too little on federal regulation. If this is so, it can be defended on the ground that state regulation is now approaching its fortieth birthday, whereas federal regulation in the same area is still in its

infancy. The place of the state commission thus can be easily mapped, whereas that of the federal bodies is in the making. When the pattern of federal regulation becomes established, a better picture of it will be made. In the meantime let us remember that we have this dual regulatory arrangement and that the complete control of public utilities requires the continued and complementary development of both.

This book is the product of 10 years' work and planning. It was initially conceived by its senior author when he was working on educational materials then used by the Commonwealth Edison Company of Chicago. In 1938, the junior author, Wendell R. Smith, joined the enterprise, contributing especially the material on utility organization and finance, the public power projects, and the Tennessee Valley Authority, as well as assisting in the final phases of preparation of the manuscript.

In such a venture many have assisted in one way or another. First and foremost has been the inspiration of the senior author's father Dean C. M. Thompson of the University of Illinois. Next he wishes to acknowledge the important contributions of the following persons: Dorothy Palmer Thompson, Robert S. Johnson, Joe L. Zachary, George W. Hartman, C. Emery Troxel, Melvin Wren, and Verle McElroy. Last, but not least, thanks are due the many students of the University of Iowa on whom the authors have from time to time imposed portions of the manuscript.

Many institutions and agencies have given us invaluable assistance. Among them are:

Bureau of the Census.
Tennessee Valley Authority.
Bureau of Reclamation.
Public Works Administration.
Work Projects Administration.
Wisconsin Public Service Commission.
Edison Electric Institute.
American Gas Association.
Federal Power Commission.
Federal Communications Commission.
Securities & Exchange Commission.
Commonwealth & Southern Corporation.
The Stone & Webster organizations.

Especially do we wish to thank the National Youth Administration for invaluable stenographic and research assistance. The completion of the book at this time has been possible only because of the skilled service supplied by that agency.

Finally, we have a special debt to acknowledge, namely, the contribution of Glaeser's *Outlines of Public Utility Economics.* One cannot use a book for years without being at least unconsciously affected by its viewpoint and pattern. Although our venture has been written without reference to it, we nevertheless feel that justice demands this acknowledgment.

Naturally, however, while we gratefully acknowledge our debt to these and many other sources, we assume full responsibility for the viewpoint here presented.

C. Woody Thompson,
Wendell R. Smith.

Iowa City, Iowa,
February, 1941.

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PART I

FUNDAMENTALS

CHAPTER I

PLACE AND IMPORTANCE OF THE PUBLIC UTILITIES

This book deals with those American industries commonly known as "public utilities," or, as they are sometimes called, the "public service corporations." This latter phrase is less used, though it is more descriptive, because the corporate form of organization is practically the only type that will be found in use today. Only in rare cases will a public utility be controlled by a single enterpriser or a partnership; and thus for all practical purposes, we may consider the field of public utilities to be in one sense a study of corporation economics. Of course, it is more than this, but the predominance of the corporate form has created problems that would not exist under the older and simpler forms of business organization.

The phrase public utilities is of modern origin, and it attaches to a group of industries equally recent in creation. Yet the idea of subjecting certain occupations and activities to special treatment, such as regulation of their rates and conditions of service, is old—so old, in fact, that one could trace it to the ancients. We need not, however, go that far back. We shall begin our search for the public utility idea in the early common law of England, where the doctrine of public interest was developed to justify special price and service regulations of barbers, surgeons, innkeepers, gristmillers, wharfingers, and carriers. In the course of time most of these have lost their public interest status, and others have emerged to take their place. Likewise, with the passing of time the public interest occupations in the United States have come to be called public utilities.

Today, the basis for classification of businesses as public utilities may be a broad or a narrow one. In its narrower sense, which is its more common usage and the one that this text adopts, the designation includes the agencies for the production of the following goods or services:

Water.
Gas (manufactured and natural).
Communications.
Electricity.
Urban transportation.

Our study of public utilities will, then, be generally confined to these five. But one must be aware that there is a broader classification of public utilities, one that includes many more industries in addition to these. Among those are the rail, motor, and air carriers; grain elevators, stockyards, gristmills, cotton gins, ferries, irrigation works, toll bridges, and milk retailing. Even rates for fire insurance and rentals during emergencies have been included. Diverse as these seem to be, they have had several things in common to account for their grouping. For one thing, they have dealt in important goods or services (at least to those who resort to them), and competition has not been too effective in the fixing of their prices.

In this book, however, we shall follow the common practice of confining our attention to the smaller group. We do this for several reasons. In the first place, this broader class is simply too large to be brought within the confines of a single volume. An adequate treatment of the carrier would itself be a proper subject for one or more books. In the next place, many of these industries have only limited interest, being confined to certain geographic areas or to times of economic emergency. Cotton gins are a requirement of the cotton states only, and rental regulation is necessary in emergency periods only. Third, those industries of our selection have the common characteristic of universality of existence. Wherever people are found living in villages, towns, and cities, those industries will likewise be found. Finally, in one degree or another these businesses have been closely interrelated with the industrialization that has been sweeping the United States, especially since the turn of the century.

Let us examine, then, more in detail the connection between our utilities and urbanization. It is no exaggeration to say that they have been intimately related to urban development; in fact, divorced from cities and towns, they would in most instances disappear. Gas is almost entirely a product of urban use, the amount sold in rural areas being insignificant. Electricity, where it is not a by-product of irrigation or a phase of a multipurpose project involving navigation and flood control, has been definitely a city product. Since 1935, under the leadership of the Rural Electrification Administration, electricity is being extended to the countryside in increasing volume; yet were it not integrated with the present network of lines already built for urban service, this development would not have been generally possible. The telephone has been primarily a city device, and waterworks are entirely so. Of course, by its very nature, urban transportation is confined to cities and towns. The conclusion is warranted, therefore, that public utilities are products of urbanization, and their

importance is directly proportional to the ratio of urban to total population.

The full picture can best be shown by a comparison of urban growth to total population. In the year 1880, 29 per cent of the people of the United States lived in urban communities. Each decade, this percentage has risen until the census of 1940 showed that almost 60 per cent of the total population resided in urban areas.[1] During the same period of years, the percentages of the population living in cities of 8,000 and over show equally significant changes, as seen in Table 1. Not only has this city development rapidly increased, but the growth of the larger cities has been even more rapid. Table 1 shows that the number of cities with 8,000 or more population increased over nine times in the years since 1860. It shows that in 1930 almost half the people of the United States lived in those cities. The metropolitan areas of Chicago and New York, alone, contain about 10 per cent of the population. There can be no question, then, that increasing urban life has been a most significant feature of our economic history.

TABLE 1.—POPULATION IN PLACES OF 8,000 INHABITANTS OR OVER

Year	Total population	Places 8,000 or over		
		Population	Number of places	Percentage of total population
1860	31,443,321	5,072,256	141	16 1
1870	38,558,371	8,071,875	226	20 9
1880	50,155,783	11,365,698	285	22.7
1890	62,947,714	18,244,239	445	29.0
1900	75,994,575	25,018,335	547	32.9
1910	91,972,266	35,570,334	768	38.7
1920	105,710,620	46,307,640	924	43.8
1930	122,775,046	60,333,542	1,208	49.1
1940	131,669,275			

The relation between urban growth and utility growth is not hard to discover; it has features of both cause and effect. The movement to the cities began to speed up after 1880. Between 1875 and 1890, there emerged the commercial generation of electricity, the telephone

[1] The census gives the following figures for percentage of population living in urban areas:

1910	45.8	1930	56.2
1920	51.4	1940	56.5

exchange, and the first successful electric street railway system. Thus, the urban movement set in motion economic forces that produced these utilities of urban need; city growth would have been impossible without them. In turn, the growth of the cities made those industries possible and speeded their development. In short, utilities and cities are so interdependent one upon another that their progress is inseparable.

Even more significant has been the relation between utilities and industrialization. Industrialization went hand in hand with city growth, and both were made possible by the appearance of the utilities. Movement of people to and from work, power supply for industry, intercommunication of buyers and sellers—all required certain facilities. Remove them, and city life with its present industrial organization collapses, and, of course, the need for the utilities disappears. At least, if the need does not disappear, its economic basis does. Therefore, the growth and future prosperity of utilities, cities, and industry are dependent upon a harmonious balance among them.

In the past, utilities facilitated city development. Now it appears that they may play a new role, that of helping to overcome the social consequences of the concentration of people in our metropolitan areas. This may take either of two directions. First, utilities have enabled people to move miles away from the site of their work. This resulting suburban growth, 10 to 50 miles from the center of large cities, has been possible though the development of cheap and rapid transportation facilities and has been made desirable by the extension of other utilities to these areas. Second, utilities are making the decentralization of industry possible. Two major reasons for the location of industry in urban areas have been the presence of supplies of cheap labor and cheap power. But cheap labor is no longer confined to the cities; and with the countryside covered with networks of high lines, power is about as cheap in the smaller towns as in the large ones. Thus, some of the major economic advantages of the very *large city* may have been lost. In this trend of industry to the smaller towns, the public utility has played a very significant role. In short, it is probably correct to say that, without the improvements that these utilities have undergone, the trends toward suburban growth and decentralization would have been impossible.

A few facts will indicate something of the importance of the public utility within our economic organization. The following figures of investment and income for the years 1927, 1932, and 1937 (Table 2) show something of their size and worth. Taken as a group, they are surpassed only by agriculture. Measured in terms of the normal

figures of American wealth and income, their place is significant, accounting for about 10 per cent of the wealth and about 6 per cent of the income.

RELATION TO OTHER FIELDS OF STUDY

The study of public utilities carries one into at least four fields of knowledge: economics, engineering, law, and political science. To the *engineer*, the public utility is a mechanism to be understood, controlled, improved, perfected. The engineer made possible the public utility as a living organism, and he will ever be indispensable to it. Since the engineer was the pioneer of the modern utility, he has left his indestructible influence upon its traditions, organizations, and language. In the eyes of the *law*, the public utility is a corporate person; and although its personality may not be permitted unlimited choices of conduct, yet it cannot be deprived entirely of whatever rights might yet belong to it. Thus, the law has tried to define the place of the utility within the total social fabric, and no one can be a student of the field of public utilities and ignore the impress of the law and lawyers in that area. To the *political scientist*, the public utility is an organization creating a problem of control. Since it has not been accorded the same privileges of business corporations generally, how should it be restricted, and what governmental agencies can best be devised to control it? To the political scientist, the modern public utility corporation may have set a problem more fundamental than a mere study of instrumentalities of control. The corporation in general and the public service corporation in particular may be the twentieth century threat to popular government. Thus is the specialist in the field of politics interested in our field of study.

Finally, we come to the relation of *economics* to public utilities. By whatever definition we may choose, public utilities are properly a part of the field of economics. They produce goods and services that satisfy wants; these products are sold at a price; these industries are constantly competing with other business for both productive resources and consumer outlets. Our approach will definitely be the economic one. Thus, we shall emphasize the organization of public utilities, the pricing of their services, and the means of their control. In this, there can be no disregarding of related fields. The engineer, the lawyer, the political scientist have each made their contribution in matters of terminology and ideas. No complete economic approach can ignore them. Especially must the legal approach be reckoned with because of the authoritative contribution of the Supreme Court of the United States in matters of economics. In the words of Prof. Com-

TABLE 2.—FINANCIAL STATISTICS OF PUBLIC UTILITIES
(000 omitted)

	1927	1932	1937
Investment in plant and equipment:			
Electricity	$9,297,458	$12,664,377	$12,940,993
Electric railways	4,296,743	4,267,505	4,937,872
Motorbus			394,415
Telephone	3,548,875	4,791,903	5,001,803
Telegraph (including cable)	426,699	506,445	506,765
Gas, manufactured	1,825,503	1,998,979	1,997,534
Gas, natural			2,414,484
Annual operating revenues:			
Electricity	$1,802,655	$ 1,975,304	$ 2,356,513
Electric railways	927,774	566,290	513,129
Motorbus	68,121	99,884	219,521
Telephone	1,023,574	1,061,530	1,180,028
Telegraph (including cable)	177,589	114,656	135,792
Gas, manufactured	408,737	381,711	357,530
Gas, natural	376,250	342,651	443,408

NOTES OF EXPLANATION

1. SOURCE. Quinquennial Census of Electrical Industries, except otherwise indicated.

2. There are varying figures of investment and income within the quinquennial reports of the Bureau of the Census. Therefore, when forced to select one set of data as against others, we have relied upon the 1937 Census of Electrical Industries; Electric Light and Power Industry, 1937; Telephones and Telegraphs, 1937; and Street Railways and Trolley-bus and Motorbus Operations, 1937. These 1937 reports are not always comparable to earlier ones. One further official source of data is the Federal Power Commission. It has reported for 1937 the following figures for over 90 per cent of the electrical industry:

Electric plant	$ 9,614,615,750
Total plant	13,851,583,019
Total revenues	2,157,277,266

3. The 1937 figures for investment in road and equipment of street railways are not directly comparable to those for 1927 and 1932. The 1937 total, above, breaks down as follows:

Rail system	$3,431,279,850
Motorbus system	140,118,350
Trolley-bus system	28,020,837
Other	1,338,453,066

The 1937 census figures separate certain motorbus companies. These companies have total assets of $394,414,945, of which investment in motorbuses amounts to $128,412,901.

4. Gas figures from American Gas Association, *Statistical Bulletins* 36 and 37, October, 1939. Figures shown under 1927 are for the year 1929. The statistics for natural gas exclude gas used in field operations, carbon black manufacturing, and by distribution companies in the conduct of their operations. Estimates of investment in natural gas companies begin with 1934. The figure for that year was $2,330,984,000.

mons, " . . . that court occupies the unique position of the first authoritative faculty of political economy in the world's history."[1] To ignore that body would be fatal to a complete understanding of the economics of public utilities.

[1] *Legal Foundations of Capitalism*, p. 7.

One comes, therefore, to the logical conclusion that the study of public utility economics is but an aspect of the broader field of *institutional economics*. Our study is in that area in which the forces of custom and law, rather than primitive unchecked forces of economics, are the major controls of prices and service. This is not to contend, however, that public utility economics ignores the orthodox relations between buyers and sellers as they are developed in the theories of competitive economics. Obviously, the characteristics of the demand for services and the costs of those services are significant, and to ignore these data may be to create a situation destructive to further economic activity.[1] The utility, for instance, left to itself, without institutional control, could quickly exert its economic power to withhold its product unless buyers paid the monopoly price that could be exacted. Instead of permitting such an arbitrary exercise of economic power, we shall see how the superior force of the state steps in to equalize the bargaining process; and because of such "ceilings" as the law creates, we shall find that most of the public utility problems relate to the reasonableness and adequacy of these limits. The public utility has been definitely subjected to the institution of legal control; and in the place of the "automatic" controls of the unhampered competitive area, several substitutes have been devised. Of course, within the limits of these institutional enclosures the forces of economic action can and do operate. Our problem, therefore, is twofold: first, to find and account for these institutional limits and, second, to show how the interplay of economic forces which act and react within these legally defined boundaries.

THE PUBLIC UTILITY PATTERN

Since the inauguration of the Roosevelt Administration in 1933, there has been much discussion of the possibility of sharply extending the public utility pattern to many other businesses. There has been an inclination to point to the theory and practice in the field of public utilities as a possible pattern by which to reorganize American economic society. It has been suggested, for instance, that agriculture be made a public utility, that all basic industries have their prices

[1] An illustration of the misunderstanding of the place of economics in the field of public utilities is seen in a speech before the American Bar Association in 1938, the speaker saying: "Many other economic principles such as the law of supply and demand are more or less inapplicable to public utility services. . . . " Cooper, "New Horizons in Public Utility Control," reprinted in *Public Utilities Fortnightly*, **22**:267, Aug. 18, 1938. The speaker is probably attempting to say that competition cannot be relied upon to set prices. That point, however, is quite different from the statement that he actually made.

fixed by government agencies. Assuming for the moment that the regulation of the price and conditions of utility service has been effective, does it necessarily follow that it is either possible or desirable to extend to all industry this form of organization and its controls?

Although this is scarcely the place to exhaust this question, it is properly raised at this time so that the student, as he progresses in the study of public utilities, can keep in mind this problem and formulate an adequate answer. Certain points can, however, be suggested here. The public utility, although an important fraction of the productive wealth of the United States, is nevertheless a minor fraction. It lives and moves within an economic society organized essentially upon the competitive principle. As will be more apparent later, the basic theory of regulation has been the approximation of this competitive ideal. Commissioners ask themselves, "Under ideal competition, what would be the level of utility prices (rates)?" Then they set out to find the answer to this question and on the basis of their findings to establish rates. Thus the theory of utility regulation is not a substitute for the competitive order but definitely is based upon it.

What can be our tentative conclusions? Can the utility pattern be expanded broadly to include a major fraction of our productive wealth? The theoretical answer seems to be that it cannot, because to do so would be to impair, if not to destroy, the goal toward which regulation has been pointed—the competitive norm—and regulation has nothing as yet to offer as a substitute. If the utility pattern seems to be a preferred one, before it can be broadened materially, new and different objectives for an economic society must be found. We conclude with the observation that public utility theory and practice in the United States have not been at variance with prevailing economic theory but rather dependent on and complementary to it.

AN AMERICAN PROBLEM

Although public utilities are found the world over wherever people live in towns and cities, their position in the United States (and a few other places) is unparalleled. Let us make this point clear. From a technical or engineering standpoint, any electric central station or telephone exchange may offer identical problems, whether located in Salt Lake City or in Johannesburg, South Africa. The same skills in construction and the same type of equipment may be involved in hydrodevelopments on opposite sides of the globe. The American problem, then, is in no way caused by engineering or other technological differences. The difference is created by our efforts to harmonize the essential public nature of utility service and its (up to

now) predominant private ownership. In other words, with the exception of waterworks and to a lesser extent electricity supply, we have relied on the primary economic motivation of corporate enterprise, controlled, to be sure, by certain state and federal agencies, to render services that by their very nature border on the area of governmental functions.

This experiment is interesting in several ways. In the first place, it inevitably produces conflicts of interests. Private ownership has as its objective maximum profits, whereas the public interest demands the lowest possible price. Between these objectives there may be a broad gulf. In our study, we shall see how these antipodal ends have been compromised. In the second place, this experiment has left the public utility subject to many of the vicissitudes of the competitive economic system. It must bid in the capital and labor markets in competition with all other bidders. In that area, its relation to government gives it no immunity. If that relation has meant anything to the bargaining power of the utility, it has often been a handicap. Another risk inherent in the economic system is fundamental changes in demand. Peoples' habit patterns change for a variety of reasons. What may be a well-nigh indispensable service to one generation may be almost ignored by the next. The electric street railway is an excellent illustration of this fact. An indispensable element in city organization and growth from 1890 to 1920, it has since become quite obsolete in all but the largest American cities. Thus the utility under private ownership is not immune from the destructive force of changing demand.

These liabilities have their advantages and disadvantages. The main advantage lies in the lack of public obligation to continue a business no longer able to compete in the economic arena. If demand for street railway service no longer is sufficient to make that a profitable business, then it can be easily abandoned. Public ownership, on the contrary, might cause such a service to be continued indefinitely by means of public subsidy. On the other hand, the prime disadvantage lies in relying on profitableness as the only basis of continued operation. The essential nature of an obsolescent public utility to some of its former patrons may justify its subsidation, at least until an adequate and equally cheap substitute becomes available.

In still another way, the American treatment of public utilities is unique. Being private corporations, in the main, they possess many of the protections that our judicial system has thrown around private property. Instead of being subject to the unquestioned fiat of administrative and legislative edicts, public utilities may contest every

order, every decision. In no other country in the world is this refuge available. Therefore, we find no examples in regulatory practice in the court decisions of foreign judiciaries. Our experiment is further complicated by the division of sovereignty between a national government and forty-eight state governments. This very division creates problems that can exist only in the United States.

We conclude, therefore, that public utility economics, the study of the economic motivations of private corporations rendering a public service within a governmental framework largely under the supervision of a supreme judicial system, creates an area of study unique to the United States. Although operating methods and engineering construction and practice of similar industries in foreign lands may be helpful in the improvement of American methods and engineering construction and practice, foreign experience in the regulation of public utilities is of utterly no value to us. We (and a few other countries) are in the process of an experiment in politics and economics that is unique, and the outcome of which is yet uncertain. Eventually this experiment may fail. If it does, then foreign experience will be of value—but until there has been an admitted failure, it will seldom help us to turn beyond our own borders for example and precept.

PLAN OF STUDY

We have attempted to develop this book on public utility economics around a definite functional pattern. The material has been divided into four major sections. Our first section deals with basic principles of legal and economic nature and is introduced by a brief sketch of the high lights of the history of the utilities. The next part considers the legal basis of regulation and the agencies of regulation. Part II accepts the predominant private ownership in the field and presents the steps in the development of regulative controls. This section closes with a description of the techniques of control.

The third section is confined to the primary problems with which regulation must deal. First and foremost is the problem of reasonable rates, one that occupies much of the time of the regulatory bodies. Under this problem fall the questions of valuation, rate of return, depreciation, and rates and rate making. A second primary problem relates to service standards. Logically, it is as important as reasonable rates; but since it has occasioned so little dispute, it can be disposed of in a short chapter. The third primary problem relates to security regulation. Although historically not a problem of the first water, it has become so because of the significant position that the billions of dollars of utility securities play in our American investment fabric.

Finally, we have elevated the holding company to the rank of a primary problem of regulation. Definitely, the holding company has assumed such a ranking only since 1920. Formerly, its consideration would have been in the final section of this book. But as a result of the evidence gathered by the Federal Trade Commission in the investigation of the utility holding company and subsequent federal legislation, this problem has become one of primary importance. Although it may not be a logical successor to those of rates, service, and securities, its close relation to them justifies its new position.

Finally, we present in Part IV a group of special public utility problems. An examination of the Table of Contents will disclose the number of them. There is, of course, no set number. For instance, it is only within the past few years that there has been a special problem of the street railway. Similarly, one cannot deal with rural electrification or public power developments until they become definite problems. Both are of recent origin and a few years hence may have become so commonplace as to justify their omission. We have intentionally reserved for this section the discussion of public ownership. This book proceeds on the premise that public utilities, with one notable exception, are and will continue to be privately owned and operated. We do not, however, ignore the possibility of public ownership, and the reader will see that three chapters are devoted to that question. It is fair to say that the present problems of utility control arise because of private management; and therefore, until public ownership becomes the rule, our approach is certainly defensible. At this point, we express no view on the desirability of either form of ownership.

CHAPTER II

THE HISTORY OF THE PUBLIC UTILITIES

We shall begin our study of public utilities by sketching briefly the story of their origin and growth. In the order of commercial origin, their beginnings are as follows: The waterworks is the oldest, the first American water plant having been built in Boston in 1652. Manufactured and natural gas are next; the first American commercial manufactured gas plant was built and placed in operation in the city of Baltimore in the year 1816. Commercial use of the natural product came a few years later. The telegraph and telephone were third, having their commercial founding dates in 1844 and 1879, respectively. In the latter year, the first commercial telephone exchange was established in New Haven, Connecticut. Electricity followed closely upon the telecommunications utilities; in 1882, Edison opened in New York the first commercial generating station. The urban transportation utility could be placed next to water supply in age. Nevertheless, we have intentionally placed it last, because any significant development in that industry was dependent upon the discovery of a satisfactory power supply. Such was finally furnished by the electric central station; and in Richmond, Virginia, in 1888, was placed in operation the first successful electric railway system. With this brief sketch, let us turn to a study of each of these industries.

WATERWORKS

Though the oldest of the public utilities, the available data on waterworks are far from complete. It appears that the first American waterworks was organized in Boston, in 1652, for the dual purpose of fire protection and domestic use, the first of these probably being the more important. The source of water supply was from near-by springs and very soon became inadequate. Other American cities, such as New York and Philadelphia, organized waterworks, and the first successful municipal plant was begun in the latter city in 1798. As might be expected, the number of water plants continued to grow as cities were organized; in fact, one of the real evidences of urban-mindedness has been the organization of a waterworks company.

At the beginning of the nineteenth century, of the sixteen plants then in existence, fifteen were privately owned. The privately owned

works continued to be predominant until after 1890, although their number compared with the total declined from over 90 per cent in 1860 to 57 per cent in 1890. Since 1896, municipally owned waterworks have accounted for more than half the total, the percentage rising with each succeeding year. The latest figures show that out of a total of 204 plants in places exceeding 30,000 population, 155 of them were municipally owned in 1920.[1]

Technical Problems.—There have been two common sources of water supply. The first is near-by springs, underground water strata, ponds, and rivers from which water can be pumped directly into city mains. The second source has involved the tapping of distant supplies and often has required the building of enormous reservoirs and conduits. The water supplies of New York, San Francisco, and Los Angeles are of this second type. Suffice it to say, water supply of this type involves the expenditure of tremendous sums for facilities and large annual maintenance charges.

Because of the close relation of water supply to at least two admitted functions of government, fire and health protection, the ordinary needs of domestic and commercial water users alone will not usually determine the size of the plant capacity. Each of these major interests will contribute its part to a complete system. For instance, water must be delivered free from pathogenic bacteria. Next, if there are industrial users, water must be as free as it is economically possible to make it from harmful and corrosive chemicals. This latter point is quite important to any community that has or expects to have certain types of industries. Finally, the plant must be at least large enough to supply water at the required pressure to give the maximum of fire protection.

Water supply is not only the oldest American utility but the most stable and secure. So long as cities continue to exist, there will be a need for water that can be satisfied only by centralized waterworks systems. Furthermore, there appears to be no prospective water substitute whose use may make obsolete present plants. This utility is the least likely of all to have any startling changes in technology. It is this stability that causes many to lose sight of the fact that the waterworks supply the most essential service of all public utilities.

MANUFACTURED GAS

This section on gas will be confined to the study of manufactured or artificial gas, deferring to the following section the discussion of

[1] For an explanation of the strength of municipal ownership in the water supply utility, see Chap. XXVIII.

natural gas. Although both types of gas have come into active competition and cooperation since the middle 1920's, their respective histories and technical problems have been distinctly different.

Experimental Period.—Tradition credits Jan Baptista van Helmont of Brussels, Belgium, with the discovery of artificial, or manufactured, gas. In the year 1609, in his experiments with fuels, he discovered that some of them gave off a "wild spirit," and to this substance van Helmont gave the name "gas," derived, it is said, from the German word for spirit, *Geist.* For the next 200 years after that discovery, gas continued to be a laboratory toy. Toward the end of the eighteenth century, interest in it was revived, thus laying the groundwork for the commercial experiments that were soon to follow.

The pioneers in the commercial adaptation of gas were the Scottish engineer William Murdock and the German inventor Frederick Albert Winsor, both of whom conducted their experiments in the British Isles. Murdock, in 1798, built an apparatus to manufacture gas for his factory. In 1804, Winsor was granted the first English patent for gas making. These and other experiments were conducted under the sting of popular ridicule, the opposition of the clergy, and the derision of such celebrities as Sir Walter Scott and Napoleon. The latter had nothing but contempt for such a *grande folie.* Winsor's many efforts were rewarded, however, in 1812, when he secured a charter for the world's first commercial gas company, the London and Westminster Gas Light and Coke Company.

Commercial Use of Gas.—The commercial development of gas in the United States followed closely its English beginnings. The first American gas plant was established in Baltimore in 1816. By 1830, gas plants had been established in Boston and New York, though the people of Philadelphia were still opposed at that time. Chicago was a rather small city of 23,000 inhabitants when its Peoples Gas Light and Coke Company was organized in 1850. During this period, gas had only one use, lighting. In the larger cities, streets and the homes of the more well-to-do were lighted by gas. Because of high rates, its use was not extensive, and at best gas was poor in quality and inadequate as an illuminant.

Beginning with about 1850, the gas industry entered into its second period of commercial development. Shortly after that date, the tempo of American urbanization and industrialization was accelerated, and of course the development of gas was no less affected. Following the War between the States, the price of gas began to fall, and with this decline came a marked increase in its use. In fact, it was during these years before 1880 that the upper middle classes began to use gas

lights. The invention by Bunsen, in 1855, of the blue flame burner largely made this growth possible. This invention produced a hot, smokeless flame, which was not only a more efficient but also a cheaper illuminant.

The experiments in the field of electricity, which culminated in the first central generating station in 1882, quickly changed the future for the gas industry and started it into a 30-year period of competition and readjustment. It is said that the announcement on the British Stock Exchange in 1882 of the success of the commercial experiments in the production of electricity caused the prices of gas company stocks to decline sharply. Had it not been for Welsbach's invention of the gas mantle, or, as it is usually called, the "Welsbach mantle," gas would have been shortly doomed as an illuminant. As it was, that invention enabled the industry to compete with electricity for the illuminating business until sometime after 1900. But with the development of the tungsten type electric lamp, the struggle was over —gas had lost.

If the gas business was to continue as a going concern, substitute uses must be found. At the Philadelphia Centennial Exposition in 1876, a baking powder company demonstrated the qualities of gas as a baking fuel. It was not until 20 years later, however, that concerted efforts were to be made to popularize this use. Since then, it has become the predominant fuel for urban domestic and commercial cooking. Since 1910, the manufactured gas industry has specialized in the fields of heating and cooking, leaving the lighting field in the sole hands of the electric central stations. In this readjusted area, gas has been highly successful. Something of the present position of gas and its successful readjustment, may be gathered from the following figures.

Total annual sales of manufactured gas increased each year until the peak year, 1928, was reached, when almost 500 billion cubic feet were sold. Since then, the annual figure has been lower, reaching a low of slightly over 300 billion cubic feet in 1933. Since 1933, annual sales have amounted to approximately 350 billion cubic feet. These figures indicate a definite replacement of manufactured gas by natural gas and renewed inroads by the electrical industry. A comparison of sales figures for 1927 with 1937 shows significant changes in the use of gas. In both years, slightly over two-thirds of the total was used by domestic and house-heating customers. During the intervening years, however, house heating rose from a fraction of the total to about 13 per cent. During this period, revenues varied directly with the volume of sales. In 1929, revenues totaled slightly in excess of 400

million dollars, then declined to 350 millions in 1933. Since then, annual revenues have not risen significantly from the 1933 low. The summary of pertinent statistics for 1938 is as follows:

TABLE 3.—CONSUMPTION OF MANUFACTURED GAS, 1938*

	Customers	Sales, thousand cu. ft.	Revenue
Domestic	9,248,000	197,052,000	$258,357,000
House heating	227,000	47,918,000	31,030,000
Industrial and commercial	457,000	101,430,000	69,573,000
Miscellaneous	9,000	2,244,000	1,534,000
Total	9,941,000	348,644,000	$360,494,000

* American Gas Association, *Statistical Bulletin* 36, October, 1939.

NATURAL GAS

To most of the people of the United States natural gas appears to be a rather new utility service. This is not the case, because natural gas has been known and used almost as long as manufactured gas. Until the late 1920's, however, its use was restricted largely to those areas adjacent to the gas fields. Since 1928, the area of consumption has been broadened by the use of high-pressure pipe lines, with the result that at the present time practically every large city within 1,200 miles of a major gas field is now so served.

Development.[1]—A casual study of natural gas shows it to have been known to the ancients, it being the hypnotic substance inhaled by the Greek priestess at the oracle of Delphi. In the records of the Royal Philosophical Society in England, in the seventeenth century, is found a reference to a spring "where the water did burn like oyle," which "oyle" was very likely natural gas. In the United States, the first well for natural gas was drilled near Fredonia, New York, in 1821. This well was 27 feet deep; and by 1824, the product was in use as an illuminant. Common consent seems to give to one William Tompkins of West Virginia the credit of first adapting natural gas to industrial use. He used it as a fuel for heating his furnaces and his evaporating salt pans. In the year 1840, approximately, the first gas well in the state of Pennsylvania was drilled near the city of New Castle. Such are a few of the high lights of the early history of natural gas.

[1] Two articles, Hendee, "Natural Gas in the United States," *Natural Gas*, October, 1930, and October, 1931, are used for some of the material for this section on natural gas. Acknowledgment is also made to Troxel, *Public Utility Aspects of the Natural Gas Industry*, 1935. This is a Ph.D. thesis, deposited in the University of Iowa Library. Subsequent reference to it will be cited by author's name only

The commercial history of natural gas may be said to have begun with the formation in 1865 of the Fredonia (New York) Gas Light and Waterworks Company, organized to distribute gas to domestic users. Long-distance transmission was soon attempted, though most of the early efforts failed. The early pipes were made of selected pine logs, turned and bored to the proper inside and outside dimensions. Not many years ago, in Marietta, Ohio, this type of pipe was removed after 73 years of satisfactory service. The first successful long-distance cast-iron line, a 2-inch line completed in 1872, was built from a well to near-by Titusville, Pennsylvania, a distance of 5 miles.

A study of a map of natural gas fields will show that natural gas is found in twenty states. Of these, Oklahoma, California, West Virginia, Texas, Louisiana, and Pennsylvania possess approximately 80 per cent of the total supply. These states are located in the four great gas fields: the Appalachian, Mid-continent, Texas, and California fields. From the beginning of the industry until 1909, Penn-

TABLE 4.—CONSUMPTION OF NATURAL GAS SINCE 1929*

Year	Customers	Gas sales, million cu. ft.	Revenue
1929	5,896,000	991,036	$376,250,000
1930	6,223,000	990,066	385,857,000
1931	6,223,000	908,270	366,246,000
1932	6,128,000	834,010	342,651,000
1933	6,177,000	862,388	329,889,000
1934	6,391,000	976,141	347,067,000
1935	6,605,000	1,053,806	376,388,000
1936	6,817,000	1,215,930	412,444,000
1937	7,066,000	1,314,907	443,408,000
1938	7,231,000	1,213,352	416,580,000

* American Gas Association, *Statistical Bulletin* 37, October, 1939.

sylvania was first in output. In 1909, West Virginia came into first place, to hold that rank until 1924. With the opening of the Mid-continent field, Oklahoma took first place in 1924, only to lose that ranking in 1930 to the state of Texas. Texas continues to be first, producing about 30 per cent of the nation's total natural gas. In 1931, California moved into second place, thereby shoving Oklahoma into third place. Thus has the leadership in the industry shifted from the Northeast to the Southwest and Far West.

The production and value of natural gas has grown enormously since the turn of the century. In 1906, almost 400 billion cubic feet of gas, valued at approximately 50 million dollars, was consumed. By

1910, the 500 billion cubic foot mark had been passed; and in 1923, the trillion cubic foot mark was reached. The figures since 1929 are as shown in Table 4.

Natural gas has a variety of uses. In the first place, it is the usual practice to extract its gasoline content. Since 1925, almost all natural gas sold has been so treated. Breaking down the sales figures into major divisions, since 1930 approximately 16 per cent has gone into domestic use, 5 per cent into commercial use, and the remainder into industrial uses. These latter uses can further be divided into field use, carbon-black production, petroleum refining, electricity production, cement making, etc. Of these, consumption in the field is the largest. One significant use is in the production of carbon black, that outlet taking 13 per cent of the 1936 gas marketed. In Louisiana, for instance, it has absorbed about 25 per cent of the state production. If the field, carbon-black, petroleum, and electric plant consumption of natural gas is classified as nonutility in nature, then less than half the annual production finds its way into public utility uses.[1] The rank of the states for 1937 in terms of domestic and commercial customers (definitely public utility users) and the value of their respective consumption is shown below. It will be noticed that two states not important in gas production—Ohio and Illinois—are important gas markets.

TABLE 5.—LEADING NATURAL GAS MARKETS, BY STATES, 1937

State	Domestic customers		Commercial customers	
	Number	Consumption, million cu. ft.	Number	Consumption, million cu. ft.
California	1,373,220	53,101	83,270	15,958
Illinois	1,086,330	17,379	60,940	3,341
Ohio	1,109,030	54,575	107,200	11,032
Oklahoma	212,620	18,114	28,109	7,022
Pennsylvania	619,760	32,847	53,760	7,209
Texas	511,380	25,835	56,930	12,081

Problems in the Use of Natural Gas.—The widespread use of natural gas since 1928 has been the result of certain significant technological developments in pipe-line construction. At the end of 1929, it has been estimated that there were 40,000 miles of such lines, which, with the plants involved, represented an investment of about 2 billions of dollars. In 1930, for instance, 8,300 miles of primary

[1] TROXEL, *op. cit.*, p. 57.

lines were built at a cost of 100 million dollars for the pipe alone. By the end of 1933, the American transmission pipe-line mileage had risen to 78,200 miles. The growth of transmission and distribution mains since then is shown below in Table 6. This increase was possible only by the investment of large sums of new capital. The factors of pipe and installation costs, thus, are important in determining the economical limits of the market. Of course, other factors are involved, such as the estimated life of the gas supply, the cost of manufactured gas and alternative fuels, and the general level of rates that the market will stand.

TABLE 6.—MILES OF MAIN IN USE BY THE NATURAL GAS INDUSTRY IN THE UNITED STATES, 1933–1937*

Year	Transmission mains, miles	Distribution mains, miles	Total, miles
1933	78,200	92,800	171,000
1934	78,800	94,200	173,000
1935	79,600	95,400	175,000
1936	80,500	98,500	179,000
1937	81,000	101,000	182,000

* RYAN, "The Natural Gas Industry," *Gas*, May, 1939.

Before 1928, transmission of natural gas as far as 250 miles was an engineering feat. To transport it further was not justified because of the costs incurred. Since then improved techniques have made it economical to pipe gas in excess of 1,000 miles. Chicago and Detroit, for instance, are now supplied with gas from the Mid-continent field. Many other important cities of the United States located miles from the fields are now served with natural gas. These include Memphis, St. Louis, Birmingham, Washington, Denver, New Orleans, Atlanta, Pensacola, Minneapolis, St. Paul, and Indianapolis. Practically every California city of consequence has natural gas service.

With this rapid extension of the market have come new engineering problems. There are the questions of the size of the lines, the weight of the pipe, the optimum pressures to be maintained. As one writer has so aptly put it, the principal cost is for the pipe.[1] This varies directly with weight, which itself is a function of the diameter of the pipe times the thickness of the walls. Within limits, an increase in diameter increases capacity more rapidly than the cost increases. For that reason, it has become common practice to use 24-inch pipe carrying upward of 600 pounds pressure. Such lines as these will

[1] VOSKUIL, *Minerals in Modern Industry*, p. 168.

cost, depending on the factors of terrain and bridging, between $30,000 and $60,000 a mile. The figures for the Natural Gas Pipe Line of America show an estimated average cost per mile of line of approximately $45,000. As a consequence of such investments, the fixed costs per unit of delivered product become quite significant. It has been calculated that these charges on a 500-mile pipe line with a 33⅓ per cent load factor average 20 cents per 1,000 cubic feet.[1]

Another series of problems arise in those situations in which natural gas replaces the manufactured product. Since the heat value of the former is much greater than that of the latter,[2] there is likely to be a decline in revenue after a change-over, unless there are either increases in use or increases in rates. This possibility follows from the simple fact that the higher the heat value of gas the less the cubic footage required to perform a given task.[3] This problem has been further aggravated by the element of mystery that has grown up around the introduction of natural gas into new communities, which has led many to expect immediate decreases in the older cubic footage rates. Another problem concerns the adaptation of domestic and industrial equipment built to burn manufactured gas. Not inconsiderable difficulties are to be faced in making such equipment equally efficient for burning natural gas. More important from the utility viewpoint is this question: Shall natural gas be substituted for manufactured gas, or shall it be used simply as an enriching agent? In Chicago and a few other large cities, it is used as an enriching agent; but in most places where it has been introduced, it has entered as a substitute.

If natural gas is to replace the manufactured product, the question arises of the disposal of the older equipment. Should it be junked, or should it be kept in condition as a stand-by? The answer depends upon the possibility of interruptions in service and the anticipated life of the supply of natural gas. In either case, the value of the old equipment will be materially reduced, thereby raising the question of proper accounting procedure. Shall the company immediately

[1] TROXEL, *op. cit.*, pp. 116, 118.

[2] VOSKUIL, *op. cit.*, p. 164, gives the following table showing the heat value of various kinds of gases. The measure is in terms of British thermal units per cubic foot:

Natural gas	868 to 1,027
Coke oven gas	583
Coke gas	573
Carbureted water gas	503
Blue gas	300
Producer gas	150

[3] Provided, of course, the efficiency of utilization remains the same.

bear the loss of the property value, shall it be amortized over a period of years, or shall the equipment be carried indefinitely on the books as an asset? These are some of the financial and regulatory problems that natural gas brought to those sections of the country which previously had been served adequately by the manufactured product.

Another series of problems arise in connection with the conservation and regulation of natural gas. There seems at present to be evidence of a reversal of our traditional policy of competition in the production of petroleum and natural gas. As a review of the history of the industry will show, this older policy has resulted in almost criminal waste and in no small measure accounts for the present decline in importance of the Appalachian field. Unless effective legislation is adopted for the newer fields, the same results are inevitable. The record of the McKeesport wells, near Pittsburgh, furnishes one of the worst examples of waste. In 2 years' time, because of excessive drilling and sheer waste, the rock pressure there dropped from 1,400 pounds to almost zero, and production declined from 31 million cubic feet a day to nothing. Yet in this short time, the field produced 22 billion cubic feet. The experience in the Scenery Hill field in California is another glaring illustration of waste. Sixteen of the thirty wells drilled were dry holes from the start; and one year later, only four were producing as a result of excessive pumping.

Excessive drilling coupled with facilities even in excess of the predepression gas market left the industry in a desperate situation when the depression of 1929 was at its worst. After having several of its legislative attempts to meet this situation invalidated by the courts, Texas, despairing of controlling the problem, finally passed its "sour gas" law permitting the stripping of natural gasoline from natural gas. In 1934, for instance, 73.5 per cent of all gas produced in the Texas Panhandle was delivered to gasoline stripping plants which proceeded to waste (blow into the air) a major portion of it. In terms of the total gas produced in the Panhandle that year, over 40 per cent of it was wasted. In 1935, it was estimated that the daily waste in Texas alone exceeded by 60 per cent the daily consumption of the entire United States; in fact, one day's waste would have supplied Chicago for one year. Such waste, it was further estimated, was equal in thermal power to the contents of 740 cars of coal, enough to make a train 8 miles long.[1] In addition to this type of waste, the use of natural gas to produce carbon black is questionable from a conservation standpoint and is usually regarded by the experts as a wasteful use.

[1] *Public Utilities Fortnightly*, **16**:326, Sept. 12, 1935.

As was shown above, a significant proportion of the total production goes into the making of carbon black. Some policy of conservation, therefore, must be substituted for competition and its resulting criminal waste of a precious natural resource. It is a hopeful sign that in recent years several natural gas producing states have finally succeeded in designing gas conservation laws that have withstood court test.

TABLE 7.—CONSUMPTION OF NATURAL GAS, 1938*

	Customers	Gas sales, thousand cu. ft.	Revenues
Domestic	6,665,000	352,964,000	$242,658,000
Commercial	524,000	100,951,000	47,240,000
Industrial	42,000	589,398,000	126,682,000
Electric generation	.....	170,039,000	
Total	7,231,000	1,213,352,000	$416,580,000

* American Gas Association, *Statistical Bulletin* 37, October, 1939.

Natural vs. Manufactured Gas.—At no time since 1900 has the production of manufactured gas equaled the total for natural. In the years since 1915, for instance, manufactured gas production has risen from 200 to over 400 billion cubic feet in its peak year. Natural gas, on the other hand, during the same years increased from more than 600 billions to 2,175 billions (over 2 trillions) in 1936. Thus, in that year, over 85 per cent of the total gas produced in the United States was natural gas. When one compares only the domestic and commercial users of these gases, the ratio was nearer 50 per cent before 1930. Since then, the natural product accounts for almost two-thirds of the total gas consumed by these customers.

As these figures indicate, natural gas has made heavy inroads since 1928 upon the manufactured product. In hundreds of places large and small, the latter has been replaced either entirely or in part. In most of these there has been no competition, however, because the existing gas company has simply substituted the newer gas for the old. In general, the natural product has been favored because it is a cheaper fuel. At the point of consumption, for domestic users it averages around 70 cents per thousand cubic feet; for commercial users, about 50 cents; and for industrial users and electricity generation, about 16 cents. Comparable figures for manufactured gas show average prices for domestic users well in excess of a dollar per thousand cubic feet; and for industrial, commercial, and house-heating customers,

about 66 cents.[1] Considering the heat value of the respective fuels, the manufactured product costs on the average at least four times more per heat unit.

Manufactured gas, however, will not be eliminated. It will still be used in those places too far from natural gas lines and fields, and in some of the largest cities it will continue to be mixed with the natural product. In 1937, for instance, 60 billion cubic feet of the mixed product was sold by twenty-eight companies formerly distributing manufactured gas. Although this is small in comparison to the total, it is suggestive of what the future may hold. Manufactured gas plants will often be kept as stand-by to help carry the peak load or to serve in the event of serious interruption in supply. When the natural gas supplies are diminished, as they must inevitably be, then, and until some more economical heating fuel is produced, manufactured gas will be assured an indefinite life. When natural gas is gone, we may have developed a process of capturing the energy of the sun and transmitting it economically by radioactivity. Who knows?

THE FUTURE OF GAS

The present place of gas in the economic life of the American people is illustrated by the well-known slogan, "If it's done with heat, you can do it better with gas." Gas practically dominates the field of domestic cooking, and there are an indefinite number of industrial uses to which it is and may be adapted. A few of them are steelmaking, metalworking, bread baking, enameling, brickmaking, and the ceramic and graphic arts. With the coming of natural gas to many industrial centers, the future of the gas industry has been assured. Between the two gases, the field is unlimited. For instance, house and factory heating is one of the potential markets only now being exploited. In one year, in Chicago and suburbs, the equivalent of 22,000 individual central heating plants were converted to gas fuel. At the end of 1938, in the United States 825,000 central gas heating installations were in operation. At the same time, there were also in use 1,659,000 oil burners and 337,000 mechanical stokers. Thus, gas furnaces account for approximately one-third of the total of automatic furnaces. Another important field of gas utilization is water heating. Here, gas and electricity compete sharply; yet ordinarily not less than two to three times as many gas heaters will be installed each year. A third special area of gas consumption has been in mechanical refrig-

[1] These figures are based on data reported by American Gas Association, *Statistical Bulletin* 36 and 37, October, 1939.

eration. Although not so popular as the electric refrigerator, yet for years the gas refrigerator has accounted for approximately 10 per cent of all mechanical refrigerator sales.

There will always be some competition with electricity. One of these areas of competition is in the field of metallurgy, in which either the electric or the gas-fired furnace may be used. Another is in the far West, where cheap electricity and a relatively mild climate encourage electric cooking and house heating.[1] These points of competition with electricity are not likely to assume major proportions. In fact, the one situation that is most serious to the future of the gas industry exists in the widespread combination electric and gas company. Too often the management of such a combination company has the electric viewpoint, with the result that gas promotion has taken second place to electricity. The Public Utility Act of 1935 recognizes this problem; and in so far as the utility is subject to federal jurisdiction, such combinations are outlawed except as state commissions may permit.[2] Left on its own feet, there is no reason to believe that gas will not continue to be our chief fuel second to coal for industrial and domestic cooking and heating.

TELECOMMUNICATIONS

In the communications conference in Madrid, Spain, in 1932, the word "telecommunications" was coined, and it was defined officially as "any telegraph or telephone communication of signs, signals, writings, images, and sounds of any nature, by wire, radio, or other systems or processes of electric or visual (semaphore) signalling."[3] More specifically, this term covers the business of telegraph, both by land and by oceanic cable, telephone, and wireless or radio. In this discussion of telecommunications, we shall confine ourselves to the development within the United States, giving some attention to the telegraph but more to the telephone. We shall not discuss radio communications and broadcasting because of radio's recent origin and its quite technical and special problems. It scarcely qualifies under our classification laid down in the first chapter as an industry closely related to the factors of urbanization and industrialization.

[1] Significantly enough, however, the California Railroad Commission has issued a certificate of convenience and necessity to a gas company rather than a competing gas and electric company to serve the rural area around the city of Fresno. See *Re Gas Fuel Service Co.*, 3 P.U.R. (N.S.) 55.

[2] Public No. 333—74th Cong. (S. 2796), Title I, §8.

[3] Quoted in Herring and Gross, *Telecommunications*, p. v.

Telegraph

The story of the telegraph can be briefly told. Although one might start with a description of ancient and early modern experiments in the art of communications, we shall begin with the work of Samuel F. B. Morse. In 1844, over a line from Baltimore to Washington built by a special appropriation of Congress, was sent the first telegraph message. Failing to become incorporated within the postal system (as it probably should have been because of its close relationship), the telegraph soon entered into a period of rapid expansion and exploitation. By 1851, fifty companies had been created, mostly using Morse patents and all operating over short distances.[1] In that same year was organized the predecessor of the Western Union Telegraph Company, which with its principal rival (the Postal Telegraph-Cable Company), incorporated some years later, soon dominated the American domestic telegraph business. In one important respect, the American Telephone and Telegraph Company has been the only serious competitor to these two companies. The latter does no commercial telegraph business, but it does furnish telegraph circuits to private organizations; and since 1930, its teletypewriter system has been a serious rival. Furthermore, the telephone is always an indirect substitute for the telegraph and thus ever a competitor.

The following statistics for the years 1927, 1932, and 1937 demonstrate something of the size and importance of telegraph.

TABLE 8.— LAND TELEGRAPH COMPANIES*

	1927	1932	1937
Number of companies	18	17	17
Miles of pole line	254,720	256,215	250,880
Miles of single wire	2,138,259	2,259,827	2,301,532
Number of offices	27,530	25,901	25,453
Number of messages	215,595,494	147,941,047	206,987,290
Revenue, operating	$159,682,419	$ 97,729,160	$117,031,930
Investment, plant and equipment	$338,143,146	$415,694,458	$418,231,449

* Census of Electrical Industries: 1937, Telephones and Telegraphs, p. 46.

Although the foregoing table shows seventeen telegraph companies in 1937, as a matter of fact two of them, Western Union and Postal Telegraph, control almost the entire telegraph business within the United States. Of these, the former is definitely the larger, having approximately 80 per cent of their combined business. The Postal

[1] *Ibid.*, p. 1.

Telegraph-Cable Company is confined to the larger American cities where it has been a more nearly equal competitor to the Western Union Telegraph Company. In summary, it must be said that although the telegraph seems to have a permanent place within our economic structure, it is ever subject to telephone competition and may in time succumb to it. Its service is likewise limited distinctly to the transmission of messages and news and therefore cannot have the universality of use of the telephone. For these reasons, the eventual merger of all domestic wire communications facilities—telephone and telegraph—is both likely and desirable.

Telephone

The telephone was a logical outgrowth of the telegraph. If messages could be sent in code over a wire, why not the sound of the human voice? To this problem a teacher of speech, an expert in acoustics by the name of Alexander Graham Bell, addressed his attention. In addition to his interest in the problem of electrical transmission of speech, Bell also experimented with the construction of a musical telegraph. It was in this latter work that he developed the broader and far more important principle of the telephone. In the spring of 1876, Bell and his assistant, Thomas A. Watson, succeeded in their experiments. Of course, their early instruments were not at all like the present ones in appearance. The transmitter and receiver were one instrument, and one had to shout several times before the listener finally deciphered the conversation.

At first, the telephone was regarded as a child's plaything and would have encountered considerable popular resistance but for the favorable publicity that Bell's "toy" received at the Philadelphia Exposition of 1876. The first telephones were conceived as a two-way means of communication between two houses or between one's house and factory. The first line built exclusively for telephone use, for instance, was built between a home in Somerville, Massachusetts, and a factory in Boston.[1] The early advertisements of the Bell associates show clearly that such was to be its use. The idea of a central exchange through which to "switch" connections later developed from a burglar alarm installation in Boston in 1877. Several business houses were connected with a burglar alarm company, which enabled them to be connected one with another for purposes of business communication. It was but a short step from this experiment to the

[1] STEHMAN, *A Financial History of the American Telephone and Telegraph Company*, pp. 4, 5.

opening in 1879 in New Haven, Connecticut, of the first telephone system with a central exchange.

The Bell associates decided early in their work upon a policy of licensing the use of their patents and equipment rather than their outright sale.[1] This soon required the organization of a corporation to carry out the necessary financing. Finally, in 1879, after two other corporate ventures for licensing equipment had been tried, there was organized the National Bell Telephone Company, a Massachusetts corporation. This was a small company, indeed, having a capital stock of $850,000. The new company quickly won complete acceptance in the eyes of the investing public and had no difficulty in raising the funds necessary to begin the real expansion of the telephone.

As was to be expected, other companies selling telephone service were soon organized, some of them using valid non-Bell patents, some of them trying to infringe upon the patent rights of the Bell interests. Not the least interested in this new "toy" was the Western Union Telegraph Company, because it saw in the telephone a real threat to its hitherto unchallenged control of the communications field. Therefore, the Western Union Telegraph Company organized the American Speaking Telephone Company, utilizing mainly the patents of Thomas A. Edison. This company had a real advantage over the Bell interests until the latter acquired the improved Blake transmitter early in 1879, thus enabling them to meet this competition of the Western Union subsidiary. Out of this short-lived competition came an agreement (1879) between the Bell interests and the Western Union Telegraph Company whereby the communications field was divided between them, leaving the telephone to be exploited by the Bell group, while the Western Union Telegraph Company agreed to stay exclusively in the telegraph field. In the course of protecting their patents from interlopers, the Bell interests fought successfully over 600 patent suits. Out of this welter of threats of competition and patent suits, they emerged victors, and in their hands for the life of their patents they held a virtual monopoly of the telephone business.

The American Telephone and Telegraph Company.—The policy of owning a majority interest in the licensed or associated operating companies necessitated a continuous flow of funds. The provisions of the Massachusetts law concerning security issues were thought to handicap this expansion, so in 1899 the control of the Bell System

[1] The phrase "Bell associates" refers to the group of persons associated with Bell for the purpose of exploiting his patents. They included, in addition to Bell, his father-in-law Gardiner G. Hubbard, Thomas A. Saunders, and Thomas A. Watson.

was transferred from the successor of the National Bell Telephone Company, the American Bell Telephone Company, to a subsidiary New York corporation, the American Telephone and Telegraph Company.

As one might expect, the Bell System continued to expand into every part of the country and early to experiment with long-distance service. Even through the competitive years, to be described below, the American Telephone and Telegraph Company continued to dominate the telephone field. This competition was successfully met, later overcome through consolidation, so that at the outbreak of the World War the telephone industry in the United States was, as it is today, almost entirely in the hands of one enormous company. These years since 1900 have been years of system building and system consolidation. The units of the system, such as the Illinois Bell Telephone Company, the Pacific Telephone and Telegraph Company, and the New York Telephone Company, were created to consolidate the telephone service of the Bell interests. Long-distance connections were set up where the traffic seemed to warrant the expense and gradually extended until coast-to-coast service was inaugurated at the time of the San Francisco Exposition in 1915. More recently, long-distance connections, with the aid of radio, have been established with almost every important place in the world. The American Telephone and Telegraph Company has kept its long-distance lines under its direct ownership and supervision.

As was set out above, one of the early policies of the Bell System was to license each of its affiliates to use its instruments and patents. This policy was begun on a temporary basis in 1877 and made permanent in 1881. The initial charge was fixed at 4½ per cent of the operating revenue of the affiliate. This policy had the advantage of giving to every part of the system the best available equipment and service. As might be expected, this charge quickly became the center of much controversy. The main objection was that it bore no relation either to the cost of the service and equipment rendered to the affiliates or to the value of such service and equipment. Regulatory commissions attempted to modify this charge but with little success. In at least one case before the Supreme Court of the United States, it was upheld in its entirety.[1] Finally, to end at least in part the controversy that had been raging over this basis of charging, in 1927 the instruments were sold to the associated companies, and the service charge reduced to 2 per cent. Later, the charge was reduced to 1½ per cent.

[1] *Southwestern Bell Telephone Co. v. Public Service Comm.*, 262 U.S. 276 (1923).

To round out the Bell System, the Western Electric Company was acquired in 1882 and developed as its manufacturing unit. It has grown to be an enormous organization, with thousands of employees and major plants located at Chicago, Baltimore, and Kearney, New Jersey. Since this company manufactured the instruments used under the licensing practice described above, its costs have naturally come in for considerable discussion and have likewise been the basis of one major decision of the Supreme Court of the United States.[1]

Competition and the Independents.—From the settlement with the Western Union Telegraph Company to the expiration of the Bell patents in 1893 and 1894, the Bell interests had complete domination of the American telephone business. With the expiration of the basic patents in 1893 and 1894, many independent telephone companies were organized throughout the country, some in the Bell territories, some in new and untouched territory. The rapid development of the noncompeting companies "indicates that the selfish policy of the Bell interests which would not permit selling to them [the new noncompeting groups] during the previous monopoly period had served neither the welfare of the public nor the long-time interests of Bell development."[2]

The independents that emerged were of three types: commercial systems, mutual companies, and farmer associations. It was the first group that carried the battle against the Bell System; and compared with the other two groups, the commercial companies in 1902 owned 97½ per cent of the independent wire mileage. Between 1893 and 1902 they grew rapidly; there were 18 such systems in 1893 compared with 528 systems by 1902. To further the battle against the Bell group, the National Association of Independent Telephone Exchanges was organized in 1897. Plans were formulated to fight the Bell interests in the courts and to organize competing systems including long-distance connections.

The public antagonism that had developed as a result of the high-handed tactics of the Bell companies made it easy for the independents to obtain operating franchises. Many systems were thus organized to invade the East and Middle West. In New York was organized the Telephone, Telegraph and Cable Company, with an authorized capital of 30 million dollars. The Union Telephone and Telegraph Company was established in Baltimore. A group centering around Cleveland was called the Federal Telephone Company.

[1] *Smith v. Illinois Bell Telephone Co.*, 282 U.S. 133 (1930).

[2] STEHMAN, *op. cit.*, p. 52.

These are but a few of the companies organized during the years of competition.

These independent groups often held out allurements of reduced rates and new type of equipment such as the "automatic phone."[1] In those places in which the Bell interests were already operating, there

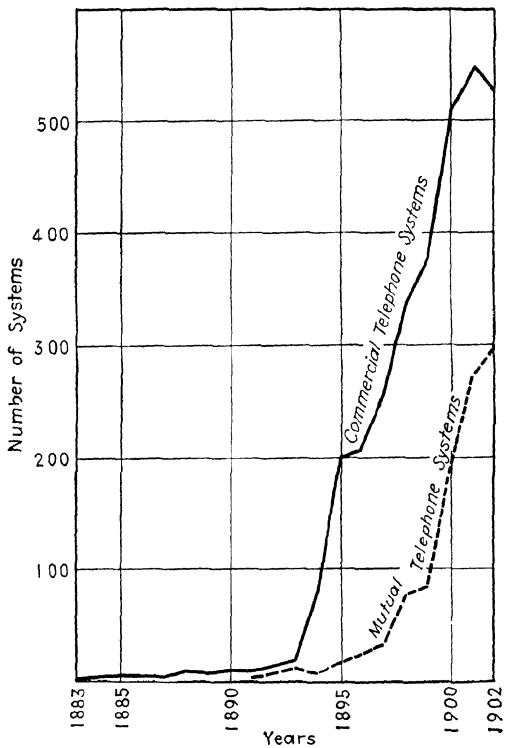

CHART 1.—Number of independent telephone companies existing in 1902, arranged according to the year of their organization. With the expiration of the basic Bell patents after 1894, note the sharp rise in number of competitor companies. (*Investigation of the Telephone Industry of the United States, Report of the Federal Communications Commission, House Doc.* 340, *76th Cong., 1st Sess., pp.* 126–128.)

were the resulting two systems with all the inconveniences attached. The enthusiasm of the independent groups often caused them to offer rates that would not cover operating costs, let alone depreciation and some return upon the investment. The final result was either higher rates, which city fathers were reluctant to allow, or else a deterioration in service and eventual absorption by the Bell interests.

[1] The old automatic telephone was the forerunner of the modern dial telephone.

Several results came out of this period of competition. In the first place, it was soon obvious that competition has no place in the telephone industry. Duplicate equipment was costly, and the service was inadequate. Merchants and other business people were put to the unnecessary expense of installing telephones of both companies. In the second place, it was rapidly discovered that many of these competing units were overcapitalized and thus too weak to carry on in the face of strong competition. Next, to meet this competition, the Bell interests reduced their rates sharply, as much as 50 per cent at times. And, lastly, the lesson of courtesy toward the public was learned by the Bell personnel, never to be forgotten. It must be said that the present superior public relations of the Bell System is one of the permanent products of this period of severe competition.

In retrospect, it can now be said that the threat to Bell control of the telephone business was more potential than actually effective. In 1907, the peak year of the independent movement, the American Telephone and Telegraph Company and its affiliates still controlled 51 per cent of the instruments in use and two-thirds of the wire mileage. After that year, the position of the independents declined steadily until today they control but 15 per cent of the commercial telephone business.

The Present Situation in the Telephone Business.—Competition has disappeared from the telephone business. An unwritten agreement seems to exist between the Bell System and the remaining independents whereby each keeps out of the other's territory. There is interconnection of facilities which from the operating viewpoint makes the American telephone service an integrated unit.[1] For the consumer, it is well that this competitive era came to an end. It meant poor and restricted service regardless of which company was patronized; and in view of its limitations, it was costly service.

The Bell System has continued to expand and improve its facilities. Long-distance and transoceanic service by means of radio short wave make it possible for any customer to talk to 90 per cent of the telephones of the world. Machine switching (a contribution of the independents during the competitive period) has been perfected and now is becoming standard equipment. Fear that the rate of growth in telephone installations in the larger cities would be more rapid than the probable available supply of operators is said to have been one of the reasons for this change to automatic machine switching. The time interval in making connections has been reduced, and the numbers

[1] Initially, physical interconnection of independent systems with the Bell System had to be forced by state statutes compelling such action.

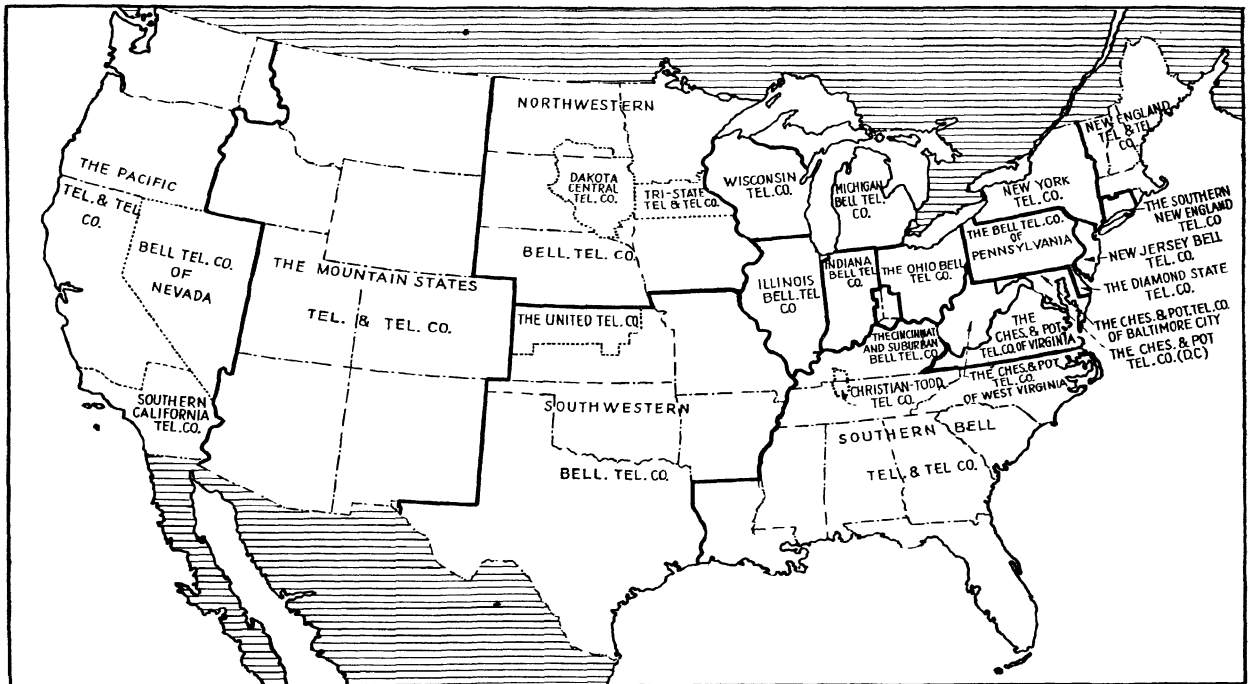

CHART 2.—Areas served generally by the principal telephone subsidiaries of the American Telephone and Telegraph Company; also areas served by The Southern New England Telephone Company and The Cincinnati and Suburban Bell Telephone Company, which companies are not controlled but have license contract arrangements with the American Company. Other telephone companies also operate in nearly all of these areas and have connecting arrangements with Bell System companies.

of long-distance calls completed without disconnecting the originating party is steadily increasing. One last indication of progress is the rapid substitution of cable for overhead open wires on the long lines. Well over 90 per cent of the toll lines of the Bell System is in cable.[1]

In the annual reports of the American Telephone and Telegraph Company, the current new developments are usually described. In the 1937 report, there is mentioned a new type of subscriber's handset which included in its base the mechanism formerly placed in a separate

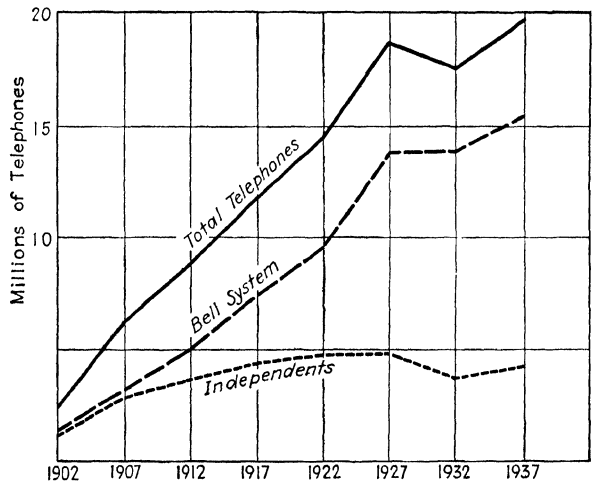

CHART 3.—Growth of telephone stations in the United States by five-year intervals from 1902. Note first the dominance of the Bell System, especially after 1922, and, second, the more severe setback to the independents by the depression of 1929. (*Census of Electrical Industries*. 1937, *Telephones and Telegraphs*, *p.* 28.)

unit attached to the subscriber's wall. A simpler form of the teletype-writer had been perfected, thereby making this service available to smaller communities. During 1937, there was placed in use a broad band carrier system "in which twelve telephone messages are carried simultaneously on a single pair of open wires, or on two pairs of wires in cable. . . . " A special experiment was tried between New York and Philadelphia by which a coaxial cable system capable of providing 240 telephone circuits was placed in use. It was successful even when used for transmission of television experiments, although its frequency is not yet sufficient to meet the probable future require-

[1] According to the 1937 Census of Electrical Industries, 83,457,378 miles of the 90,831,421 miles of single wire of all telephone systems is in cable. This means that 91.8 per cent of the single wire mileage is in cable. The percentage is even higher for Bell System lines, being 94.3.

ments of television. No doubt this defect will soon be corrected. These are but random samples of the annual progress made in the art of telephony.

The statistical tables set out here show something of the growth of the Bell System. To these should be added certain other figures for the independent companies, of which in 1937 there were 820 with annual incomes in excess of $10,000 and 49,714 with annual incomes of less than that amount. Most of these systems are interconnected to the Bell System. These independents control over 4 million telephones, making the American total approximately 20 millions, or one telephone for every six persons. The relative importance of the telephone to the American is seen in the fact that about 50 per cent of the telephones in the world are in this country.

TABLE 9.—TELEPHONE STATISTICS, 1937*

Item	All systems	Bell System	Systems $10,000 or more annual income	Systems less than $10,000 annual income
Number of systems	50,560	26	820	49,714
Miles of single wire	90,831,421	81,578,393	7,992,642	1,260,386
In cable	83,457,378	76,995,511	6,382,672	79,195
Central offices	18,967	6,945	5,594	6,428
Telephones	19,453,401	15,331,983	2,959,201	1,162,217
Dial (automatic)	8,485,899	7,633,278	847,002	5,619
Calls, originating (000 omitted)	33,618,333	27,666,718	5,265,405	686,209
Operating revenue (000 omitted)	$1,180,028	$1,051,379	$116,062	$12,586
Investment (000 omitted)	$5,001,803	$4,389,548	$551,737	$60,517

* Census of Electrical Industries: 1937, Telephones and Telegraphs, p. 3.

In conclusion, it should now be apparent that the telephone differs from all other utilities in that it is dominated by a single company. The nature of the telephone service makes this peculiarly desirable. Of course, such size creates problems of effective control, as we shall see later. At least there can be no dispute that we have an industry of national and international size and therefore one that must be dealt with through national agencies of control.

Bibliography

See bibliography on page 55, following Chap. III.

CHAPTER III

HISTORY OF THE PUBLIC UTILITIES—(*Continued*)

ELECTRICITY

As a commercial enterprise, electricity has now passed its fiftieth birthday; yet as a phase of science, the phenomenon of electricity is as old as civilization itself. The Greeks, for instance, marveled at the peculiar electric properties of amber, the "tears of the Heliades." With the rebirth of scientific interest in Europe came a series of experiments in electricity, a series indispensable to its final adaptation to central station generation.[1] In the years immediately prior to Edison's triumphs in 1879 and 1882, many important inventions and discoveries were made. Brush, in 1877, demonstrated his arc-lighting principle. Others, such as Wallace, Farmer, Thompson, and Houston, contributed to the practical knowledge of electricity. Thomas A. Edison, in 1879, patented his incandescent lamp, the greatest single forward stride in the history of illumination.[2] All that remained was to develop an economical source of electricity supply. During this period of discovery, the magnetic properties of electricity and the principles of the electric current, the battery, the dynamo, and the electric motor had become known. By the beginning of the 1880's, invention and discovery had progressed sufficiently and economic conditions were such that the time was right for the commercial utilization of this knowledge.

Commercial Periods of Electricity Generation.—The year 1882 marks the commercial beginnings of both steam- and hydrogenerated electricity. Edison, in order to demonstrate the commercial feasibility of electricity supply from a central electric station, opened in September, 1882, in Pearl Street, New York, America's first central generating station. This first steam plant was extremely small; it had a generator capacity of 560 kilowatts and served direct current to fifty-nine customers within a radius of not more than ½ mile. A

[1] During the seventeenth and eighteenth centuries experiments were conducted by such men as Gilbert, Franklin, Galvani, Volta, Davy, Ohm, Ampère, Faraday, and Gramme. From these names have come such scientific terms as "volt," "ampere," "ohm," and "gram."

[2] See Greenwood, *Amber to Amperes*, Appendix, for a discussion of the priority of Edison's claims as the inventor of the incandescent lamp.

few weeks later, operating under Edison patents, the first hydroelectric plant was placed in operation at Appleton, Wisconsin. Such were the beginnings of an industry that within the space of 50 years (1932) was to have plant facilities valued at $12,664,376,952.

1. *The Isolated Plant.*—Since 1882, the electrical utility has passed through several periods of growth. Obviously, the first period was that of the small isolated plant either of the Edison type, described above, or of the arc-lighting type. Each generated direct current and was thus limited to an area of not more than a mile in diameter. As might be expected, a large city would thus have many plants, each one a separate business organization. Since illumination was the sole use for electricity, each plant was operated during the early evening hours only. The service was poor and easily interrupted.

2. *Plant Interconnection.*—The second period, one of physical interconnection of plants, came early in the history of the industry and was made possible by the introduction of alternating current and the transformer. These changes in techniques permitted the expansion of the area of economical service and brought into active competition previously isolated plants. The final result in most places was a short period of competition followed by a consolidation of plants under common ownership. The less economical units were then closed, and the remaining ones were improved and interconnected to make a city system. Chicago, for instance, had at one time many electric plants, independently owned. After Samuel Insull became president of the Chicago Edison Company in 1893, he quickly set about acquiring his competitors and soon had an integrated electricity system under one management.[1] This stage in the growth of the industry was generally confined to the larger cities such as New York and Chicago.

The second period extends roughly from 1890 to 1910. During it, in the larger cities, service was expanded from its restriction to evening hours to a 24-hour basis, although it was not until after the first World War that restricted evening service generally disappeared.[2]

[1] For good reasons, the Chicago Edison Company was not consolidated with the Commonwealth Electric Company until 1907; but for all practical purposes, the two Insull-controlled companies functioned as a unit. The Chicago Edison Company controlled the "Loop" area; the other company, the outlying territory of Chicago. In 1907, they were merged into the Commonwealth Edison Company. Since the Commonwealth Electric Company franchise extended to 1947, the necessity of renewing the Chicago Edison Company franchise which expired in 1912 was avoided.

[2] One still finds isolated instances of partial electric service. For instance, in 1935, the Colorado Public Utilities Commission found one community being

In the meantime, many private electric plants had been built for hotels, for electric railways, and for industrial establishments. During this period, many of these, as they became antiquated, were closed in favor of purchased power from public utility central stations. Solicitations for the industrial load in particular began in earnest, but not until several years later was it generally acquired. All these changes demanded continuous and constant service, thereby requiring the creation of adequate reserve capacity and plant interconnection. During these years, generating facilities were undergoing revolutionary changes, and of course methods of utilization were being constantly improved. In 1905, for instance, the older reciprocal generating engine was outmoded by the steam turbine. The first steam turbines were no sooner placed in service than they were made obsolete by further improvements. Such has been the outstanding characteristic of the industry—swift and startling changes in technology.

3. *System Building.*—We give to the third period of electrical history the name "system building." This period had its beginnings with such experiments as that tried in Lake County, near Chicago, Illinois, in 1910. In that year, a group of towns in that county were interconnected by high line, and most of the previously used generating stations then dismantled. In other words, in place of many plants, each with a small area to serve, there were substituted a few large units interlaced with a network of high lines. With the success of this experiment, a new era in the history of electricity supply was begun; and with it, the physical basis for holding company development was assured. This period was a natural outgrowth from the previous period, because interconnection of adjacent communities was simply an extension of the techniques used in welding many city plants into one system. Towns and villages were thus tied together and served with fewer and better central stations, as parts of a city had been previously tied together and better served.

The advantages of this period are similar to those set out for the previous period. The old situation of oft interrupted evening service was generally replaced by continuous 24-hour service. In short, most of the smaller towns and villages within economical distance of a system began to receive the same quality of service as the cities had been securing and at rates not particularly higher. Such service improved their industrial prospects and may explain in

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served from 2 to 12 P.M. daily and on Tuesday mornings. The commission ordered daily service from 6 A.M. to midnight. See *Re Quinn*, 8 P.U.R. (N.S.) 134. The widespread use of the electric refrigerator, in particular, forced this lengthened service period.

part some of the decentralizing tendency in industrial location. System building permitted a decrease in total reserve capacities of a system yet increased the protection of each point within it. Furthermore, each important point of consumption could be supplied from two or more directions so that nothing short of a tornado could materially interrupt service.[1]

In one sense, this period is still in existence, because system building is never finished. If nothing else, legislation such as the Public Utility Holding Company Act of 1935 will continue to effect important changes. Yet the early rush to integrate independent central stations within some system is certainly past, because there is scarcely a privately owned electric plant not a part of one of them. It may be said, therefore, that the rush of system building passed its peak sometime after 1925.

4. *System Interconnection.*—We select 1925, therefore, as marking the close of one period and the beginning of another. By that date many of the present great systems had been established. Since 1925, several major trends have become evident. One of these has been system interconnection; another has been wholesale generation and bulk transmission of power. Both these developments are but logical outgrowths of the past and represent on a grand scale what had been taking place ever since the first isolated city plants were interconnected in the 1890's. But the present development has been spectacular, and therefore to it have been given such names as "superpower" and "giant power." Names must not mislead, however, because any system interconnection, no matter how small, designed to make possible a more economical power supply is an illustration of superpower. Thus, one cannot identify this present characteristic by a high-voltage line alone, because a 1,300-volt line may have all the qualities of a genuine superpower development.

The interconnection of systems by the use of the interchange contract involves the transfer of electric energy among systems in several directions, depending on variations such as seasonal changes in system demands. For instance, as between systems A and B, A may send excess energy to B during the day, whereas B may dump its excess to A for the latter's evening peak. Such would be quite possible, for instance, where one system serves a general commercial area, the other a mining community. Interchange may be seasonal, with one system

[1] Even storms of hurricane dimensions can be withstood without excessive service interruption. Those parts of New York served by underground cable withstood successfully the September, 1938, hurricane. See 1938 *Annual Report* of the Public Service Commission, State of New York, pp. 70–73.

selling its excess during the summer but buying from an adjacent system the latter's winter excess. Lastly, interchange may involve a period of years. Because of construction economics, a station may be built well beyond the immediate needs of the community that it serves. Thus, it will be able to feed its excess generation to an adjoining system so long as its maximum load remains less than its capacity. Eventually, this station may become unable to supply its own area and will then be obliged to call upon some other system that it has previously assisted.

Wholesale generation and bulk transmission of power, another trend, had its beginnings in such developments as that in 1912 at Keokuk on the Mississippi River, built to deliver large blocks of electricity to St. Louis. Since 1925, in various parts of the country, many large steam plants have been built designed to deliver wholesale power in bulk to one or more retail units. These plants have been the result of the high efficiency of large installations and the scarcity of acceptable building sites. A steam plant of modern dimensions requires a large volume of water for condensing purposes and thus must be located at or near an adequate water supply. For instance, almost as much water is pumped per day for the use of the Commonwealth Edison Company electric plants as is pumped by the water system of the city of Chicago. Thus, every modern steam plant lies alongside a lake or river. In the Insull system, as an illustration, wholesale units have been built at the south point of Lake Michigan and near Peoria, on the Illinois river. Similar illustrations can be found within every major electric system. As was suggested above, this latest movement, like all other steps in the progress of electricity, has been dictated by its profitableness. Bulk production at strategic points combined with high line distribution has been found to be the cheapest way of producing power.

A glance at any power line map shows that the industrial sections of the United States are completely covered by networks of high lines. Of course these sections were the obvious places for system building and system interconnection. As a result, there is continuous interchange in the eastern portion of the United States; and although electricity does not usually move any great distance, long-distance transmission is thereby made possible.[1] The advantages of these developments scarcely need explanation. Reserve capacities have been reduced to a minimum yet, because they can be mobilized to serve

[1] The outbreak of war in Europe in the late summer of 1939 caused the leaders of the electric companies to plan the immediate closing of those few gaps remaining in the eastern third of the United States.

any point of emergency need, are more effective than ever in curtailing service interruptions. Consequently, continuity of service approaches perfection. Costs have been reduced, which, combined with improved technology, has permitted continual reductions in rates.

Significant Changes in the Electrical Utility.—As was pointed out briefly above, soon after the inception of the central generating station, the business of electricity supply became highly competitive. The original direct-current plants could not serve an area more than a half mile in radius. The original arc-light plants, which grew up alongside of these direct-current plants, could not be adapted to furnish current for household uses because of their high-voltage output. Thus they were used almost exclusively for the supply of street light. As a result of these early technical limitations, stations of varying types were built, each serving its own restricted area and type of business. But with the introduction of alternating current and the transformer, the area of economical transmission was enlarged considerably, and either type of plant could supply both household and street lighting services. As a consequence, many of the former isolated noncompetitive plants came into active competition. In the effort to improve station loads, each operator was likely to bid for business within the area of another plant. The result was bitter competition, with the inevitable combination of these units under one management. By such combination, the less efficient plants were dismantled, and the enlarged area supplied from fewer but more economical stations.

The situation here described was confined to the larger cities and occurred mainly within the first 10 years of the commercial history of the industry. Since the early 1890's, competition between electric plants has become rare. In 1929, for instance, a study of the county-seat towns of Illinois, Iowa, and Wisconsin found only one place with competing electric plants. In that place were to be found a privately owned and a municipal electric plant. According to a study made by the Federal Power Commission in 1935, competitive electric service existed in 199 American communities, although in some of them the competition was not direct. In 73 of these places, a publicly and privately owned company were the competitors.[1] From these studies and other evidences available, it is safe to generalize that competition in electricity supply is rare—an exceptional, temporary situation.

A second significant change in the electrical industry concerns its load, or output. In the early years of the central station business,

[1] Federal Power Commission, *Power Series* No. 2, p. 1, 1935.

the major, if not the only, use for electricity was street and residence lighting. Service was restricted to the few hours between twilight and midnight and thus allowed but little diversity of use. Hence, load factors were low, and new business of that type would require additional generating equipment. There was no economy in that kind of load building; consequently, the leaders of the industry soon turned their efforts to the development of other load possibilities, especially daytime uses. As a consequence, the following markets have been successively explored: industrial power, transportation power, added off-peak domestic use, and rural electrification. Each of these markets will be analyzed in turn except the rural market. The intense exploitation of the rural area has received so much attention since 1933 that it is reserved for separate consideration in a later chapter.[1]

In entering the industrial sales field, there were two problems to be faced. In the first place, steam as the primary power supply for industry had to be displaced. This having been accomplished, the next step was to sell industry on the economy of purchasing its electricity supply from a public utility central station. This latter problem has been the more difficult of the two. Before 1914, the displacement of direct steam power by electrical power proceeded at a slow pace. In 1899, it was estimated that only 4 per cent of the total factory power was applied through electric motors. In 1904, the percentage had risen to 11; in 1909, it was 23 per cent; in 1914, it was 37 per cent. Following 1914, the substitution became more rapid. In 1919, 53 per cent of the factory power was electrical; in 1923, it was 65 per cent; in 1930, it was over 80 per cent. Reliable figures for years since 1930 are not available, but it is safe to estimate that upward of 90 per cent of all factory power is supplied by electricity. There are at least two reasons for this predominance of electric power. First, and obviously, electricity is cheaper. Other things being equal, no factory manager will replace steam power with a more expensive type of power supply. Secondly, electricity is the most flexible power supply known. It may be applied with ease in the amounts desired, and it can be brought to a point of utilization with no great expense or energy loss. The contrast between a complex series of shafts, belts, and wheels necessary for the application of direct power and the simple connection of movable electrical motors and electrical equipment is evidence of these points.

How has the electrical utility fared in this change from steam power to electric power? Has electricity been purchased from a central station, or has it been factory generated? The following table shows

[1] See Chap. XXVII.

something of the success with which the electrical utility has captured the major portion of the industrial load.

TABLE 10.—PERCENTAGE OF TOTAL ELECTRICAL ENERGY USED IN INDUSTRY PURCHASED FROM CENTRAL STATIONS

Year	Per Cent
1899	37
1904	28
1909	36
1914	44
1919	57
1923	60
1927	63

It is unfortunate that more recent figures are not available. The report of the National Resources Committee, entitled *Technological Trends and National Policy*,[1] has this to say: "No accurate data could be secured for 1935 but the figures for that year, it is believed, do not differ greatly from those for 1927." These figures indicate a steady growth in the share of the electric power used by industry supplied by the electric utility. It can be assumed that the percentage of purchased power will rise in the future, because it is a rare instance, indeed, for a new factory installation to include its own generating facilities.[2] The causes of this substitution of purchased power for factory-generated power are not difficult to discover. The off-peak characteristic, at least in the initial stages of this development, of much of the industrial needs made possible the quotation of rates for purchased energy much lower than factory generation costs. In addition to the price inducement, the service of the utility has been superior to that of factory-generated power service, because it was less susceptible to interruptions. It is now the usual thing to connect every important factory customer from two or more directions, thus ensuring continuity of service. This is of incalculable value to the modern factory with its precise organization and routine methods. Lastly, the factory is relieved of the risks of obsolescence of generating equipment, an important consideration in view of the rapidly changing art of electricity production. In the light of these considerations, the prediction is not unwarranted that shortly the amount of factory-generated power will be negligible.

[1] P. 251.

[2] We recognize, of course, that in some situations the diesel-operated private electric plant has been installed within a factory to supply electric power. This has been especially the case in periods of slack industrial production, during which the demand basis of billing for industrial power seems to create an excessive per kilowatt-hour cost. In the long run, however, such installations may not be economical.

This shift from a load that was mainly residential in nature to one in which the industrial demand takes a majority of the output has several important consequences. Table 11 shows the figures in 1937

TABLE 11.—PRIVATELY OWNED CLASS *A* AND CLASS *B* ELECTRIC UTILITIES IN THE UNITED STATES*
(Sales of electric energy, for year 1937)

Class of customers	Numbers of customers	Per cent	Sales, thousand kw.-h.	Per cent	Revenues	Per cent
Residential	19,627,633	80 5	14,821,890	12 3	$ 645,748,799	29 9
Rural	899,931	3.7	2,158,908	1 8	59,623,170	2 8
Commercial and industrial	3,763,308	15 4	65,202,088	54 0	1,105,092,543	51 2
Street lighting	21,906	0.1	1,551,556	1 3	63,852,764	3.0
Other public authorities	59,211	0.3	1,807,568	1 5	29,643,784	1 4
Other electric utilities	2,325		28,823,232	23 8	171,018,227	7 9
Railroads	659		5,558,895	4 6	46,824,954	2 2
Interdepartmental	196		860,690	0 7	4,274,789	0 2
Others	3,232		50,570		859,084	
Total	24,378,401	100 0	120,835,397	100 0	$2,126,938,114	98 6
Other electric revenue					30,339,152	1 4
Total electric operating revenues					$2,157,277,266	100.0

* As reported by the Federal Power Commission for the year ending December 31, 1937. These figures represent over 90 per cent of the industry.

of numbers of customers, sales, and revenues. Several important conclusions may be drawn from this table. Note, for instance, that approximately half of all electricity sold goes to commercial and industrial users. Stated in another way, 85 per cent of the 1937 sales of electricity went to users other than farm and home customers.[1] The effect of this shift of major use to commercial and industrial users is to make the electrical utility subject to the vicissitudes of the business cycle. Prior to 1915, electrical companies were not materially affected by the ups and downs of business, because their product was primarily home consumed. Since 1915, this stability has been increasingly lost. The new relation to the business cycle was forcefully demonstrated during the depression of 1929. Large commercial power consumption declined from the 1929 high of about 43 billion kilowatt-hours to a low in 1932 of about 31 billions, or a

[1] This conclusion assumes that none of the sales classed as "other electric utilities" found its way to such customers.

decline of 28 per cent. During these same 3 years, however, residential consumption rose from 9½ billion kilowatt-hours to 11½ billions, an increase of 21 per cent. Although the revenue receipts from this latter group of customers did not completely offset the revenue losses from the declining use of the former, they did hold the net losses to approximately 6 per cent. Had not many significant rate cuts been made by 1932, it is probable that the 1932 total revenue receipts would have at least equaled those for 1929. It is thus no exaggeration

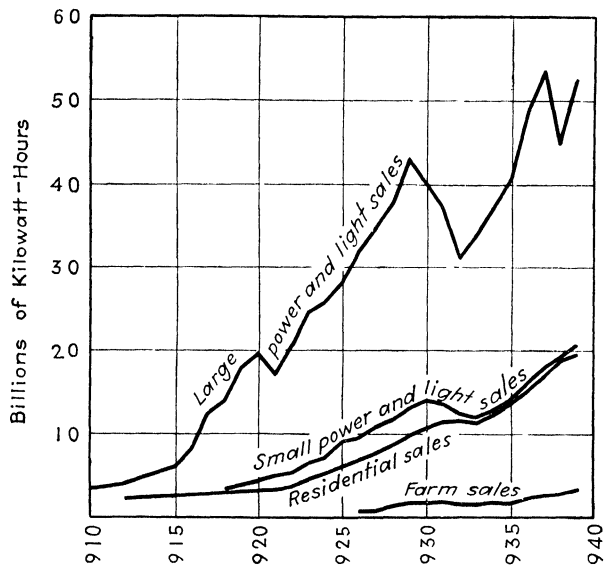

CHART 4.—Electricity sales by classes of customers. The large power sales correlate closely with business activity. Compare this curve with that for residential sales. (*Electrical World* and *Edison Electric Institute, Statistical Bulletin* 7.)

to say that domestic use "saved the day" for the electrical industry. From all indications, this recent correlation with business activity is permanent and therefore must bring new financial policies to the industry.

Other significant comparisons may be drawn from the foregoing table. Farm and residential consumers use 15 per cent of the output and pay about 32 per cent of the revenue of utilities. Large and small power users, on the other hand, although using the bulk of electric production, contribute slightly more than half the income. It must not be assumed from these comparisons that residential users pay too much for their share of the total. Theirs is an entirely different

load, and the costs per unit of output of serving them are higher than the costs of serving power users. On the other hand, they are in an exposed position because of a lack of acceptable substitutes; and therefore the prime duty of regulatory bodies is to protect them from exploitation.

Load building has taken other directions in addition to the search for industrial power outlets. As the previous table shows, electricity is sold to the farm, to the electric railways, and to the steam railways. The electric railway load was early acquired because of the ease with which it could be integrated with the ordinary utility load. In cities, where the electric railway has been used mainly for transport to and from work, its peak load usually followed the factory and commercial load. Therefore, electricity for urban transportation could be purchased from a central station under more favorable conditions than it could be generated by the street railway company. The steam railway market is of recent acquisition, and it is small in comparison to its possibilities. As metropolitan development requires the elimination of the dirty steam engine, the field for electricity supply to the steam railways will grow. The leaders in the electrical utility are quite aware of these possibilities and have made elaborate studies of the economics of their service.[1]

The latest effort in load building has been the "repioneering" of the area of domestic sales. With the marked decline in industrial sales after 1930, the industry was hard put to make use of the resulting idle capacity. One of the problems in public utility operation is the volume of fixed charges on capital equipment, and therefore there is always an incentive to find a market by which to use at least a part of idle capacity. Consequently, intensive efforts were made in the direction of increased residential sales, and the figures quoted above indicate the success of these efforts. One of the unique characteristics of electricity supply is the quantity of uses to which it can be adapted. It was thus possible for the industry to make the American people "light-conscious" and to stimulate the use of electrical equipment in the home. As a result, there have been marked increases in the sales of refrigerators, radios, cookstoves, water heaters, improved lamps, and other appliances. As an example, notice Table 12 which shows figures of annual sales of electrical refrigerators.[2]

[1] For example, see "Electrification of Steam Railroads," *Publication* 165, National Electric Light Association, 1931; and Federal Power Commission, "The Use of Electric Power in Transportation," *Power Series* No. 4, 1936.

[2] Edison Electric Institute, *Statistical Bulletin* 7, p. 15. We recognize, of course, that part of the explanation of the marked increase in refrigerator sales lies in its

TABLE 12.—SALES OF ELECTRIC REFRIGERATORS

Year	Number	Year	Number
1929	840,000	1934	1,372,596
1930	850,000	1935	1,590,023
1931	948,676	1936	2,079,535
1932	769,666	1937	2,369,025
1933	1,065,105	1938	1,279,202
		1939	1,956,002

Figures for other equipment show similar increases in sales. According to the best estimates, the sales by utility and other dealers of the principal electric appliances ordinarily amount to at least a half billion dollars a year. To this figure should be added a few more millions for jobbing and wiring costs. As a final illustration of the success of this reexploration of the residential field, note Table 13 showing average annual kilowatt-hours consumed by these customers.[1]

TABLE 13.—AVERAGE ANNUAL ELECTRICITY CONSUMPTION OF RESIDENTIAL CUSTOMERS

Year	Kw.-h	Year	Kw.-h.
1927	444	1933	595
1928	460	1934	624
1929	499	1935	672
1930	543	1936	727
1931	578	1937	793
1932	597	1938	845
		1939	890

In conclusion, it must be said that although notable progress has been made in this latest venture in load building, there remains an even greater potential market. If the goal is an "electrified America," as has been claimed, only a fraction of this market has been touched. For instance, there are still a third of our homes to be wired for electricity. For none of the principal appliances is the saturation point even in sight. If the goal of an all-electrified America is to be approached, the average annual consumption of electricity and annual sales of appliances must be sharply increased.

technical improvements and decreased selling price. It is quite impossible to allocate specific credit for this increase in sales to each of the mutual causes involved.

[1] *Ibid.*, p. 14.

Finally, we come to the significant changes in the generation and transmission of electricity. In this, we are treading in the field of engineering, and therefore we rely on the experts for such comments as we make. Obviously, the present hydro- and steam turbines used for the generation of electricity are a far cry from the machines of 1882. Each year, major and minor improvements in the art of electricity production are made. One evidence of this is the ever decreasing production costs per kilowatt-hour. Transmission techniques have undergone constant improvement. Since 1882, the limits of economical transmission have risen from a bare half mile to several hundred miles, with possibilities of marked increases in the near future. Line voltages have increased to the present 220,000 volts, and underground cables have been installed in congested areas. Alternating current early replaced the original direct current, although recent experiments look again toward direct-current transmission. We can do no better in closing this section than to quote from the report of the National Resources Committee:[1]

TABLE 14.—COAL CONSUMPTION FOR ELECTRICITY PRODUCTION*

Year	Pounds of Coal per Kw.-h.
1892	8 0
1902	6 7
1907	5 4
1912	4 4
1917	3 3
1922	2 5
1927	1 84
1932	1 50
1935	1 46
1936	1 44
1937	1.42
1938	1.41
1939	1 39

* Edison Electric Institute, *Statistical Bulletin* 7, 1939, p. 7.

There is much room for research in electric power transmission and distribution. Direct current transmission of electricity may become a reality in the near future. At a recent meeting of the National Academy of Sciences an engineer for a large electrical manufacturer has reported progress in the study of the application of thyratrons to the problem of changing direct current into alternating current and vice versa. Alternating current generation and direct current transmission of electricity at high voltages, and the substitution of vacuum tubes for present switching devices may tend to reduce cost

[1] *Recent Technological Trends and National Policy*, p. 269, 1937. Taken from Section V, "Power," prepared by Potter, dean of engineering, Purdue University.

of power. New knowledge is needed about electronic tube transverters and mercury arc rectifiers in connection with electric transmission.

URBAN TRANSPORTATION

The history of urban transport is as old as the oldest of our American cities. As soon as the eastern cities of Boston, New York, Philadelphia, and Charleston (South Carolina) had passed the 15,000 or 20,000 mark in population, the need for transportation between the business and shopping districts and the residential areas became pressing. In fact, it is not an exaggeration to say that further expansion in the areas of cities would have been impossible without some form of public transport. Had not this problem been met, city growth would have been even more vertical; congestion would have been intolerable.

The Period before Electric Power.—One of the first types of street transport other than the private carriage was the horse-drawn omnibus. Another of the early devices was the horse-drawn street car, a single, small car somewhat similar in appearance to the electric street car of 1900. The motive power was either horse or mule. The vestibules at either end were open, thereby exposing the driver to the vicissitudes of the elements. This type of locomotion was a vast improvement over the omnibus, because of its increased capacity and because of the smoothness of motion on rails compared to the roughness of the usual cobblestone pavement of the early 1800's. In 1830, for instance, an omnibus line was still operating along Broadway in New York City. In 1832, Manhattan Island was the site of the "first horse street-car line in the world."[1] By 1860, there were in the United States 40 such systems. By 1869, the popularity of this type of transport had spread to the Middle West, as is illustrated by the organization in that year of the Clinton and Lyons Horse Railway Company, capitalized at $25,000 to serve those two adjacent Iowa towns. By 1890, the year of the first street railway census, there were 769 systems, most of them powered by means other than electricity.

Two other kinds of power for the street railways deserve notice. Steam was tried, both for surface and for elevated lines. New York and Chicago had this type of railway. Next came the cable car developed in San Francisco in 1871. The power for this type of railway was supplied by a moving cable set into a slot or box below the level of the pavement. The car was equipped with a grip, fitted into the slot and attachable to the moving cable. From a financial standpoint, the cable-car system was costly to install and costly to

[1] KAEMPFFERT, *Modern Wonder Workers*, p. 113.

maintain. During the winter freezes and snows, the maintenance problem was especially severe. In Chicago, for instance, the first cable car was installed in 1882 and finally abandoned in 1906, the same year in which the last of the horse cars was removed from that city.[1] The cable car was never widely used, although had not electricity appeared after 1882 it might have become more popular.[2] No doubt the early operating problems could have been corrected, but the appearance of a more economical power supply made that unnecessary. Except for steam, these forms of power for urban transportation were either too expensive or too slow to compete with the electric motor, after it was perfected in the late 1880's. The steam locomotive was efficient; but because of its noise and dirt, it was never considered seriously as an acceptable form of power for urban transportation. Had these operating defects been removed, it still would have been replaced by electricity because of the advantages of the latter as quick-starting, rapid, and quiet power supply.

The Electric Street Railway.—During this long period of experimentation with steam and the cable as the motive power for the street railway, many attempts were made to adapt electricity to this purpose. The pure research of Henry and Faraday had established the principles of the electric motor, and therefore the problem was to design a workable motor and an adequate power supply. On the basis of this electrical theory, there began in 1835 a 50-year period of attempts to solve these twin problems. The name of Thomas Davenport heads the list of unsuccessful inventors in this field. In 1835, in his blacksmith's shop in Brandon, Vermont, he built his first working model of an electric railway. Two years later, at Springfield, Massachusetts, he propelled an electromagnetic engine over a short span of track. Another experimenter, in 1856, drove an electric car from Washington, D.C., to Bladensburg, Maryland, just outside the District of Columbia.

These early attempts failed mainly because of the inability to solve the problem of power supply. Prior to 1882, the only available

[1] New York had a horse-car line until the early 1920's. In the 1922 Census of Electrical Industries, 4.02 miles of such lines is reported. Many short horse-car lines were maintained because of antiquated franchise provisions. A complete discontinuance might have been reason to forfeit a franchise, thereby losing valuable concessions.

[2] The census figures show the following miles of cable-car systems:

1890	488.31	1922	45.90
1902	240.69	1927	42.95
1907	61.71	1932	39.39
1912	56.41	1937	No data
1917	45.32		

source was the electric storage battery, which was not only expensive to install but much too bulky to leave sufficient room for passengers. Its final weakness as a power source was the frequent need for recharging. Electricity, therefore, as a railway power supply had to await the development of the central power station and a method of overhead power distribution. To develop a power supply within a car or train of cars proved to be definitely out of the question.

Besides those mentioned above as experimenters in electric transportation, there must be added the names of others. A Belgian, Van Depoele, built a small road in 1883 and operated it at the Chicago Interstate Fair for a period of 50 days. Another, Henry, devised the principle of the overhead wire on which he ran a wheel attached to a pole extending upward from the car. He called his device a "troller," later corrupted to "trolley"—from which came the common name of trolley car for the street car. Building on all these attempts and surpassing all his predecessors was Frank J. Sprague. To him goes the credit of building and operating in 1888, in Richmond, Virginia, the first electric street railway. This line had forty cars, and the design of his electric motor was so successful that it set the standard for all future construction. This experiment was a decided success, and it set in motion a wave of street railway building which soon swept completely across the country. By 1890 over 200 companies had been organized, operating 1,300 miles of line. Four years later, there were 606 companies, and 10,860 miles of single track was either in use or under construction. By 1910, practically every city of 10,000 people and over had its trolley car system.

Following very closely upon the electric street railway development came the substitution of electricitity for steam power on the elevated railways. Again Sprague led the way, with his invention of the multiple-unit control permitting each car to be equipped with electric motors, under the control of one operator (motorman) seated in the front car. The first use of this new principle for elevated railways was made in Chicago in 1895. Following this demonstration, the elevated railways of Boston and New York were quickly converted. In a speech by Sprague in 1932, he made the following comment upon the Chicago installation: "The first equipment, one for one hundred and twenty cars, is still operating at high efficiency after thirty-four years of service."[1] This remark is both a tribute to the thoroughness of his original design and a commentary upon the alertness of that industry to new inventions and improvements! The elevated railway was of necessity confined to the few metropolitan areas and in recent

[1] *National Electric Light Association Bulletin*, **19**:461, August, 1932.

years has been under attack as a noisy and unsightly form of transportation. It has been abandoned in New York, and it appears to be but a matter of time before all elevateds will have been replaced by subway systems.

Electric power also made possible the subway as a convenient means of rapid transportation. Sprague had ridden in the old London "Underground" with its steam engines and smoke-choking rides, and he therefore proposed the substitution of electricity for steam. After 36 years of planning and construction, the first subway in the United States was placed in operation in 1904 in New York City. This system has grown until at one time it had over 600 miles of elevated and subway lines. Other American cities having subway systems are Boston and Philadelphia. In 1930, it appeared that Chicago was to begin construction of one, but the depression and the collapse of the Insull control of the elevated lines brought all plans to a standstill. In 1938, these plans were revived, and construction of such a system began in 1939.

The Interurban Electric Railway.—As a result of the success of the electric street railway, a movement began in the 1890's to build electric railways between towns, from which came the name "interurban." At first scarcely more than extended street car systems, the interurban served the important function of giving frequent service to its patrons. The type of service rendered is indicated by the title "farmers' street car" which is still applied to some of the lines. This type of transportation developed largely in the states of Ohio, Indiana, and Illinois, where it served to provide fast transport both from city to country and from town to town. As the interurban grew in importance, it began to use heavier equipment, multiple-car trains, limited service, parlor-car equipment, sleeping-car service, and sometimes a separate electric locomotive. Until the automobile ruined its business, the interurban was on the way to becoming a truly electric railway.

The heyday of this business came in the 10 years after 1905. During these years, thousands of miles of track were built, and many more thousands projected. The Census of Electrical Industries for 1922 showed 16,365 miles of track in 1912 and 17,807 miles in 1922.[1] After that, the mileage began to decline. In 1917, the total mileage was found mainly in the Middle Atlantic, East North Central, and Pacific states. As suggested above, the promotions were far more numerous than the realities. Practically every important town saw at least one big interurban promotion scheme. Let us illustrate with what appears to us to be a most dazzling example. In the newspapers

[1] See Table 11, Electric Railways, p. 19, 1922.

of 1907 appeared lurid advertisements of the Chicago and New York Airline Electric Railway, to be built in a straight line from New York to Chicago. Considering the topography of western Pennsylvania, such a line would have been an engineering feat, but this pales into insignificance when we note the proposed running time of 10 hours, a mere 100 miles an hour average. This railway finally opened its first "division" from La Porte to South La Porte (both in Indiana), only to be thrown into the hands of a receiver because of fraudulent stock sales.[1]

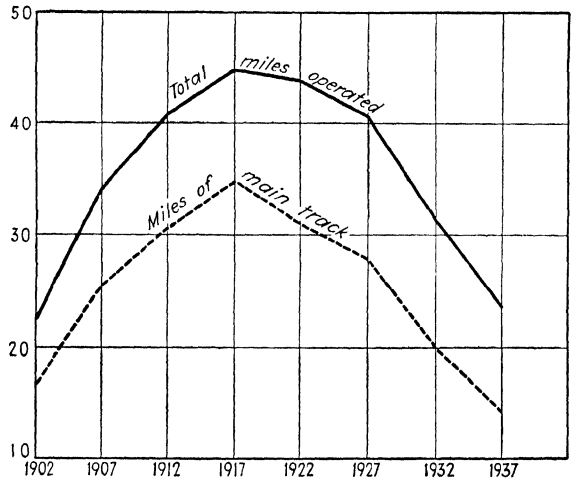

CHART 5.—Changes of street railway mileage in operation, by five-year intervals since 1902. In fact, this chart includes the major portion of the life cycle of that utility. The sharp decline since 1927 warrants its designation as a "decadent industry." For a discussion of the reasons behind this decline, see Chap. XXV. (*Census of Electrical Industries*)

The electric railway serving primarily rural areas is a thing of the past. The private automobile and the motorbus have taken its place. In those places where the interurban has survived, the old local service, stopping at every crossroads, has been replaced by rapid through service. In other words, the interurban has become a railroad. The old franchise rights permitting the use of city streets through town, thereby saving the costs of right-of-way, later became a boomerang because of time required to pass through towns. In more than one

[1] See several advertisements and stories in the *Des Moines Register and Leader*, Jan. 20 and Feb. 3, 1907. The advertisements were used as aids in stock selling. One device was to advertise stock at a given price, with a notice that in 30 days it would advance $2.50 per share. One advertisement in particular (Feb. 3, 1907) pictured the first spike being driven in the track.

place, the interurban company found it advantageous to acquire a private urban right-of-way or else to acquire operating rights on an adjacent railroad. In the congested metropolitan areas, the interurban has a definite place as an essential link in the chain of transport agencies. In those areas, traffic density justifies the high cost of right-of-way and the cost of overhead or third-rail electricity supply.

The Future of Electric Transport.—Since 1920, the whole field of urban transportation has been undergoing marked changes of almost revolutionary nature. The old monopoly of the street-car systems has been broken, and the future of the street car as a public utility is much in question. Except in the largest towns, it has lost out completely to other transport agencies. The many problems of adjustment since 1920 involve too many special details to be discussed here; therefore they are set aside for treatment in Part IV, in Chap. XXV, "The Decline of the Street Railway." In that chapter are considered the causes of the decline, the efforts made to meet the changing conditions, and the problems created by the substitutes that have been developed for the one-time dominant street-car companies.

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CHAPTER IV

WHAT IS A PUBLIC UTILITY?

What is a public utility? The simplest answer to this query is to say that public utilities are those American industries operating in urban (and, more recently, rural) places under grants of public privilege. In short, they are those businesses which possess special franchises issued by government, and which are generally monopolies or semimonopolies.

This definition would serve the purpose of designating those enterprises to be discussed in this book, but it is very inadequate because it falls into the fallacy of confusing cause and effect. As we show in detail below, the possession of a franchise is not the cause of the public interest status but the result of it. In other words, a business can be a public utility and still possess no special franchise. It is purely coincidental that the particular operating conditions of utilities generally require the possession of that grant of privilege. If a business has this special grant, it is only because it possesses those required characteristics which set public utilities apart from enterprises generally.

In truth, then, the concept of a public utility depends upon something more significant than the mere possession of a franchise. As we shall see subsequently, the public utility status stripped of its legal superficialities is a condition created by economic circumstances. Although we need not now discuss them, in general, the significant factor surrounding public utilities has been the imperfect operation of economic forces, thereby giving the utilities an excessive amount of economic power over those obliged to bargain with them.

This definition (if such it be) of a public utility in terms of disproportionate economic power must not be extended indiscriminately to all situations where it may be found. A glance at our economic institutions shows that not all such instances have called forth the public utility concept. Public policy has differentiated among groups holding such power. To one group, it pays no attention; another, it tries to stamp out; to a third, it extends the restrictive power of regulation.[1] Thus, the first group are left alone; the second are

[1] There are many illustrations of monopoly situations that generally do not occasion popular concern. One who possesses the only supply of an unusual good,

"trusts" to be "busted"; the third are public utilities to be regulated. In the final analysis, therefore, no matter in what legal and economic logic the public utility concept is clothed, it is one created by the public policy of the people of the United States.

Let us recognize at the outset that the public utility concept is not easily boxed about in a watertight fashion. It has been used to justify the regulation of apparently quite unlike businesses. Thus, it is a common practice to ridicule all efforts to define or characterize the concept. Professor Dewing, for instance, is "very skeptical of the success of formulating a definition which shall include all the so-called utilities and exclude all those that are not generally so considered. . . . "[1] He does not, however, hesitate to define a public utility "as a practical matter" as including those enterprises for which the state attempts to determine prices. This definition and ours are not very different. We have "arbitrarily" selected those industries closely related to urbanization and for which competition has been ineffective as a means of adequate price control. To state it in another way, then, we are to be concerned about those businesses both necessary to significant fractions of the American people and for which competition has been inadequate. It scarcely does violence to either definition that both may permit the inclusion of such odds and ends as milk retailing, irrigation works, and cotton gins. If these render a necessary service under conditions of inadequate competition, it matters little whether or not they happen to relate to urbanization. That restriction has been applied solely as a matter of convenience.

ORIGIN OF THE PUBLIC UTILITY CONCEPT

The legal antecedent of our modern public utility concept was developed in the early days of the formation of the common law in England and in a modified fashion was transferred to the British colonies in the New World. In its legal form, it is known as the "doctrine of public interest." Early in the development of the common law, certain callings or occupations were singled out and impressed with special rights and duties. Especially were the duties stressed.[2] These occupations became known as "common callings" and, as if to

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the only grocer in a small town, a brain specialist serving a medium-sized city—are all possessors of disproportionate economic power. Yet the ease with which their control, if abused, can be broken probably accounts for their being left undisturbed.

[1] *Financial Policy of Corporations*, 3d rev. ed., p. 201.

[2] Almost any law casebook on public utilities will contain several English cases illustrating these duties.

defend the imposition of these special obligations, were designated as being "affected with a public interest." This classification and the duties attaching thereto continued to persist even after the appearance of the laissez-faire philosophy and its emphasis upon nonregulation of business by government.

Thus, the doctrine of public interest was developed in an earlier period in which all business was subject to minute and authoritarian control. Although it was later narrowed in scope and subjected to close judicial scrutiny against undue extension, the doctrine nevertheless has persisted as a vital legal principle—has, in fact, become the cornerstone of modern American public utility regulation. At the time of its application by English courts, the callings impressed with a public interest were those of the surgeon, smith, baker, tailor, miller, innkeeper, ferryman, wharfinger, and carrier (especially by wagon). These occupations thus acquired a distinct position in the eyes of the law best described by the word "status"; all who by the nature of their callings fell under this classification were subjected to duties more rigorous in character than business generally, and these duties could not be escaped by means of alleged contract with a patron.[1]

THE GROWTH OF THE PUBLIC UTILITY CONCEPT IN THE UNITED STATES

With the settlement of the English colonies in North America, the same regulations of business as existed in the mother country were tried in the New World. Thus, in the years before the American Revolution, the common callings of that day were subjected to a variety of restrictions. In 1775, for instance, it was not uncommon to find the colonial legislatures fixing scales of bread prices and establishing rates for the various kinds of skilled and unskilled labor. Of course, the common callings of carriage by land and water had already been subjected to minute direction.[2]

With the westward expansion of the country following the War of 1812, many if not all of these restrictions were repealed or, if not repealed, allowed to become inoperative. This was a period of the westward movement and economic change. The force of competition was regarded as the best guarantee of low price and high quality, and the only public interest industries whose designation survived this period were the transport and waterworks groups. Such a survival was only because they required franchises to use or cross public streets,

[1] For further discussion of the origin of the common callings, see Swenson, *The National Government and Business*, pp. 133–143.

[2] HUNTER, "The Early Regulation of Public Service Corporations," *American Economic Review*, 7:569–581, 1917; reprinted in part in Dorau, *Materials for the Study of Public Utility Economics*, pp. 283–294.

highways, and waterways. Otherwise, the status of common calling would probably have disappeared by the time of the War between the States. In particular, the public interest obligations of the carrier during this time were not a burden. Whatever responsibility may have been imposed by the duties still adhering to that status, it was more than offset by the preferred position the carrier occupied in the public thinking. Regarded as a public benefactor, the carrier was the recipient of public subsidy of both land and money.

The War between the States changed this picture and marks the point of revival of the doctrine of public interest. From 1860 to 1880, industry grew rapidly, and the railroads began to occupy a prominent place in our economic structure. Couple this change with the postwar readjustment in agriculture and industry, and top it off with the longest depression then known in American history; the new attitude toward the one major surviving public interest industry—the carrier—can be easily understood. The Patrons of Husbandry, commonly known as the Grange, found an explanation of all their troubles in the current railroad practices; and therefore, beginning in the 1870's, they initiated a regulatory movement which has grown steadily with the years. The legal theory of the common calling with its many affirmative duties was revived; and, as we shall see later, it has been expanded since the first World War to include unusual and unique industries and economic activities.

Under the American theory of government, the imposition of the duties attaching to the public utility status would violate rights guaranteed by the Fifth and Fourteenth Amendments to the Federal Constitution, unless there is something unusual about the industries so affected. Regulation of rates and service does, in a substantial way, curtail property rights. The answer to this problem requires us to ask the question, therefore, "What is a public utility?" Or, to put it differently, "When is an industry so 'affected with a public interest' that the usual privileges of property give way to the more burdensome duties attached to public service?" Until we draw a distinction later, we shall assume that public utility status and public interest are synonymous phrases, the latter being the legal equivalent for the now more common expression "public utilities." The courts under our constitutional system have been called on to consider this question, and therefore let us sketch a few of their answers.

MUNN V. ILLINOIS

The first and most famous of the cases is that of *Munn v. Illinois*, decided by the Supreme Court of the United States in 1877.[1] The

[1] 94 U.S. 113 (1877).

Illinois Constitution of 1870 created the legislative power to prescribe rates and service for several businesses, among which were those of grain elevation and warehousing. Under the Illinois law of 1871, such regulation was established for those businesses in the city of Chicago. Munn and his partner Scott were operators of a grain elevator in that city, and from their protest came this famous case. The facts of the care are important and are essentially as follows: It was shown that the possible number of sites on which to build such elevators was strictly limited. It was also demonstrated that there were only a few elevator operators in this area, and they appeared periodically to agree to scales of charges for their services. This situation was aptly described by Chief Justice Waite in these words:[1]

> Thus it is apparent that all the elevating facilities through which these vast [wheat] productions "of seven or eight great states of the West" must pass on the way "to four or five of the states on the sea-shore" may be a "virtual" monopoly. . . . They stand, to use again the language of their counsel, in the very "gateway of commerce," and take toll from all who pass. Their business most certainly "tends to a common charge, and is become a thing of public interest and use." Every bushel of grain for its passage "pays a toll, which is a common charge," and, therefore, according to Lord Hale, every such warehouseman "ought to be under public regulation, viz., that he . . . take but reasonable toll." Certainly, if any business can be clothed "with a public interest, and cease to be juris privati only," this has been. It may not be made so by the operation of the Constitution of Illinois or this statute, but it is by the facts.

The Chief Justice recognized that unless the restrictions in question involved special and peculiar circumstances, such a law would operate to deprive the owners of property without due process of law, under the Fourteenth Amendment.[2] In his decision, he quoted extensively from the writings of Lord Hale, an English jurist of the sixteenth century. Chief Justice Waite said:

[1] *Ibid.*, at 132.

[2] Although more attention will be paid below in the discussion of the legal basis of regulation to the property concept of the Court, it should be noted here that at the time this case was up for decision, that body was holding to a more restricted definition of property than it subsequently adopted. Beginning with the *Slaughter-House Cases* [16 Wall. 36 (1873)], the Court chose as its definition of property rights the older concept of title and possession. Thus, since Illinois in no way infringed upon the title and physical possession of Munn's property, it was not difficult to sustain the act. Later, the Court broadened this concept to include its use and income. Under this broadened concept, many more infringements of rights under the Fourteenth Amendment could be alleged than under the older concept. See Commons, *Legal Foundations of Capitalism*, pp. 11–36. See also Mr. Justice Field's dissenting in *Munn v. Illinois*, 94 U.S. 113, 138–150 (1877).

Looking, then, to the common law, from whence came the right which the Constitution protects, we find that when private property is "affected with a public interest, it ceases to be juris privati only." . . . Property does become clothed with a public interest when used in a manner to make it of public consequence, and affect the community at large.

Mr. Justice Bradley, who concurred with the Chief Justice, said later of *Munn v. Illinois*:[1]

The inquiry . . . was as to the extent of the police power in cases where the public interest is affected; and we held that when an employment or business becomes a matter of such public interest and importance as to create a common charge or burden upon the citizens; in other words, when it becomes a practical monopoly, to which the citizen is compelled to resort, . . . it is subject to regulation by the legislative power.

From the Munn to the Nebbia Case

In the years since 1877, the courts of the United States have many times been called upon to state the characteristics of public utilities. In 1914, for instance, Mr. Justice McKenna, speaking in the German Alliance case,[2] referred to "something of more definite consequence" as establishing the concept. Then in desperation, baffled by the illusiveness of the problem, he concluded with the famous remark, "We can best explain by examples." He did one thing to the doctrine, however, when he enlarged public interest to include more than the mere rendering of service by means of tangible, physical property. In short, he said that it was the business that was affected with a public interest. Of course, in the case of *Munn v. Illinois*, the Court had spoken of the "business," not simply the mere instrumentalities of service, as being the thing impressed by the public interest. After the decision in the German Alliance case, there could be no doubt on that point.

In the first case after the first World War, the Wolff Packing Company case,[3] Chief Justice Taft said of the concept of public interest that it involved a "peculiarly close relation" between the public and those businesses so classified. He then proceeded to set up what has since become a famous classification of businesses impressed with public interest. First, there were railroads and public utilities operating under grants of privilege which imposed affirmative duties of rendering service. Next, there were those vestigial remnants of the common law callings, such as inns and gristmills, to which the common law

[1] *Sinking Fund Cases*, 99 U.S. 700, 745 (1878).
[2] 233 U.S. 389 (1914).
[3] 262 U.S. 522 (1923).

duties still adhered. Third, there were those businesses initially private in their origin but which had risen to the public interest status. Referring to this third group, he said:[1]

> In nearly all the businesses included under the third head above, the thing which gave the public interest was the indispensable nature of the service and the exorbitant charges and the arbitrary control to which the public might be subjected without regulation.

Although Justice Taft's classification of public interest industries is of no help whatsoever in answering the question "What are the characteristics of such enterprises?" the foregoing quotation is as good a general statement as is to be found in the cases.

Nebbia v. New York

The most recent attempt to define public interest is found in Mr. Justice Roberts' opinion in *Nebbia v. New York*. This case involved the validity of a New York statute regulating the retail prices of fresh milk. There the Justice said:[2]

> The phrase "affected with a public interest" can, in the nature of things, mean no more than that an industry, for adequate reason, is subject to control for the public good.

So far as we have gone, it would certainly seem that the cases give but an inadequate definition of this doctrine. Although the courts reserve to themselves the right to review its every legislative extension, they have hesitated to give tangible evidence of the characteristics that the principle requires in order to be valid. Fortunately, certain bases or criteria have been rejected. To quote from *Nebbia v. New York*:[3]

> The touchstone of public interest in any business, its practices and charges, clearly is not the enjoyment of any franchise from the state, *Munn v. Illinois*, . . . Nor is it the enjoyment of a monopoly; . . . *Brass v. North Dakota.*

Before the Nebbia case, it had been thought that the two "touchstones" requisite to an extension of the public interest status were

[1] *Ibid.* at 538.

[2] 291 U.S. 502, 2 P.U.R. (N.S.) 337, 352 (1934). This language seems to follow Mr. Justice Holmes' dissenting opinion in an older case in which he said: "The truth seems to me to be that, subject to compensation when compensation is due, the legislature may forbid or restrict any business when it has a sufficient force of public opinion behind it." *Tyson Bros. v. Banton*, 273 U.S. 418, 446 (1927).

[3] 2 P.U.R. (N.S.) at 351. See Table of Cases for the citation to *Brass v. North Dakota.*

economic necessity and monopoly. The older cases had stressed these, as is shown in the foregoing quotations from the Munn case and the Sinking Fund Cases. What else could Justice Taft have meant when he spoke of "exorbitant charges" and "indispensable . . . service"? It was upon the presence or absence of these points that several cases turned in the years before the Nebbia case in 1934. The majority, for instance, found either or both of these ingredients missing in the New York Ticket Agency case,[1] the New Jersey Labor Agency case,[2] and the Oklahoma Ice case.[3]

The decision in the Nebbia case, however, did not actually set aside these older principles. The necessity of an uninterrupted flow of fresh milk into the New York milkshed was easy to demonstrate. Although the case may seem to nullify the principle of monopoly, it actually relates that economic situation to the larger phenomenon of which it is but a part. This broader economic characteristic had been well phrased earlier by Mr. Justice Stone when he said:[4]

> Statutory regulation of price is commonly directed toward the prevention of exorbitant demands of buyers or sellers. An examination of the decisions of this Court in which price regulation had been upheld will disclose that the element common to all is the existence of a situation or combination of circumstances materially restricting the regulative force of competition, so that buyers or sellers are placed at such a disadvantage in the bargaining struggle that serious economic consequences result to a very large number of members of the community.

In a subsequent case, he restated this position as follows:[5]

> As I read those decisions, such regulation is within a state's power whenever any combination of circumstances seriously curtails the regulative force of competition, so that buyers or sellers are placed at such a disadvantage in the bargaining struggle that a legislature might reasonably anticipate serious consequences to the community as a whole.

In the Nebbia case, the problem was that of excessive or cutthroat competition in the marketing of fresh milk within the state of New York. Thus, Mr. Justice Roberts rightly discards monopoly as one of the touchstones of public interest, substituting by inference the principle of inadequate competition which covers both monopoly on the one hand and excessive competition on the other. To repeat,

[1] *Tyson Bros. v. Banton*, 273 U.S. 418 (1927).
[2] *Ribnik v. McBride*, 277 U.S. 350 (1928).
[3] *New State Ice Co. v. Liebmann*, 285 U.S. 262, (1932).
[4] 273 U.S. at 451.
[5] 277 U.S. at 360.

the bases of public interest seem to be (1) necessity *and* (2) inadequate competition. If in the mind of the Court *both* these conditions are present in any disputed situation, it will agree to a legislative designation of public utility status.[1]

THE FRANCHISE AS EVIDENCE OF PUBLIC INTEREST

Because the usual public utility possesses a special franchise to use and occupy public property, the presence or absence of such an instrument is often used as evidence of the presence or absence of public interest. This was one of the arguments advanced in *Nebbia v. New York*. In fact, the cases are themselves not free of suggestion that the franchise is an essential prerequisite to the public utility status. Although the foregoing discussion has answered this question, we believe it merits further exploration.

In the dissent to *Munn v. Illinois*, Mr. Justice Field not only objected to the general philosophy of the majority, but in particular he protested all price regulation in the absence of a franchise. After describing the permissible objects for which the police power could be invoked, he said:[2]

> It is only where some right or privilege [franchise] is conferred by the government or municipality upon the owner, which he can use in connection with his property, or by means of which the use of his property is rendered more valuable to him, or he thereby enjoys an advantage over others, that

[1] One problem not discussed here concerns the method of designation of public interest. In the case of the carrier, its status has been continued from the days of the common callings and, therefore, probably does not need special legislative action to impress it with special obligations. What of the other public utilities? How do they get their status as public interest industries? Obviously, they cannot be found within the category of the common callings except by questionable analogy. A majority of the court decisions on this problem indicate that it is the function of the legislatures, not the courts, to be making such designations. Some decisions definitely limit the function of the court to the review of the legislative fiat, thereby denying to it the right of such designation. See *Live Stock Comm. Co. v. Live Stock Exchange*, 143 Ill. 210 (1892); *Ladd v. Southern Cotton Press & Mfg. Co.*, 53 Tex. 172 (1880); and *State v. The Associated Press*, 159 Mo. 410 (1901). One decision to the contrary is *Inter-Ocean Publishing Co. v. The Associated Press*, 184 Ill. 438 (1900). It was suggested in the Munn case that the legislative fiat could not be extended to a business unless the facts indicated it to be clothed with public interest. As was said in the Wolff Packing case (262 U.S. at 536), "the mere declaration by a legislature that a business is affected with a public interest is not conclusive on the question whether its attempted regulation on that ground is justified." The courts always have the right to check this declaration against the facts. Failing so to find, they will rule such attempts to be unconstitutional.

[2] 94 U.S. at 146.

the compensation to be received by him becomes a legitimate matter of regulation. . . . When the privilege ends, the power of regulation ceases.

Since the Munn case did not involve a business needing a franchise, the majority must have felt that that instrument was unessential to the public interest status. Other illustrations can be found of the viewpoint expressed by Justice Field. In the postwar public interest cases (cited above), one of the arguments by which were overthrown attempts to regulate the prices of theater tickets, the charges of labor agencies, and the restriction of the numbers of ice plants was the absence of a grant of public privilege. If this is putting the case too strongly, at least the Court took the position that, not possessing franchises, regulation of these businesses could be sustained only by a showing of other evidence of public interest.

Fortunately, the decision in *Nebbia v. New York* again clarified this problem. The franchise is not the evidence of public interest—in fact, it can be possessed only as a result of that status. A review of the history of franchise grants will show the wisdom of this position. When privileges were the unrestricted prerogatives of kings to grant as they saw fit, their possessors acquired certain valuable powers of oppression and exploitation. It was only natural, therefore, when their issuance was transferred to legislatures, that such restrictions as public policy might dictate would be exacted from their recipients. In the United States, the system of judicial review has gone even a step further, namely, to require real evidence of public advantage as a condition precedent to the valid issuance of a franchise.

The essential fact behind the franchise and the right of government to restrict its holders is the superior position that has attached to its possession. Although the Court in *Munn v. Illinois* did not directly allude to this point, it certainly was aware of it because it stressed the "tolls" that the grain elevator operators could exact from the movers of grain. If the Munn case adds anything to the orthodox principles of law, it is this: It accepts the fact that, with or without the formal possession of a grant of public privilege, economic power may become under certain circumstances the basis of price regulation. Such an extension, however, is not a startling innovation because the same basic reasons lie behind the concession of the right to regulate a franchise holder. Thus the Munn and Nebbia cases stand for the proposition that economic power, whatever may be its cause, is an adequate basis for the valid extension of the doctrine of public interest. To attempt to make that principle turn on the presence or absence of a franchise is to be guided by superficial appearances.

REASONING BY ANALOGY

In concluding this portion of our analysis of the meaning of the public utility concept, we cannot refrain from certain critical comments on the failure of the judiciary to give a more precise statement of its characteristics. Our courts either have clothed their definitions in vague language or else have resorted to the process of analogy to avoid the issue. For instance, they have at times pointed to the special franchise to use the streets, the power of eminent domain, or the old English law of common callings and common carriers as the explanation of public interest. Thus do the courts confuse cause and effect.

Furthermore, the resort to analogy has furnished a convenient escape from this responsibility to define public interest. Although carriers undoubtedly possess all the economic characteristics of public utilities, to borrow without critical thought the common carrier analogy from the primitive days of English law as the present basis of carrier regulation is to beg the question entirely. Not content with this borrowing, the courts have often stretched the carrier analogy in other situations. If one is a carrier of intelligence or a carrier of electric or gas service, he is, *ipso facto*, impressed with a public interest. Such attempts have resulted in rather strained logic which could have been easily avoided had the courts set up a general principle that was truly a definition by which to determine whether or not an industry was a public utility.

THE ECONOMIC CHARACTERISTICS OF PUBLIC UTILITIES

Necessity.—We conclude that the cases indicate the economic characteristics of public utilities to be (1) necessity and (2) inadequate competition. Of these two, the first needs but little explanation. What is necessity is, of course, not always too obvious. The foregoing quotations suggest, however, that any good or service used by large numbers of people could qualify as necessary. In the German Alliance case, for instance, it was decided that fire insurance was a necessity to the businessman. Yet at times the Court seems to have strange lapses on this problem. When it faced the question of the regulation of the prices to be charged by theater ticket brokers, it could find no necessity in the business of entertainment. If this seems reasonable, note its refusal to accept the ice industry in Oklahoma as dealing in a necessity. The Court there spoke of it as an "ordinary business," in contrast to the cotton gin, which was related to the

"paramount industry" of the state.[1] If fire insurance is a necessity, certainly ice in Oklahoma is even more so.

Inadequate Competition.—Turning to the other characteristic, what constitutes inadequate competition? In general, two departures from the competitive norm are discernible in the cases. The first of these is monopoly or tendency to monopoly. The second is the more recent excessive competition found in the Nebbia case. This latter form of inadequate competition has not been defined by the courts; and until other cases involving this type of departure from the norm have been written, its exact content cannot be known.[2]

This leaves the monopoly variant to be considered. As was seen in the older cases, the phrases "practical monopoly" and "virtual monopoly" played important roles in the decisions. What, therefore, may be the kinds of monopoly that will be considered as the basis of the public interest status? At this point, it may be said that any monopoly capable of being broken by available satisfactory substitutes will not be accepted by the courts as a basis for public interest designation. In the New State Ice case, Mr. Justice Sutherland considered the possibility of mechanical refrigeration as a substitute for natural ice refrigeration to have destroyed the claim of monopoly of that business in Oklahoma.[3] Therefore, for an allegation of monopoly to have legal acceptance, it must be shown not only that monopoly exists but that no adequate substitutes for the product or service are available.

Several types of monopoly have been recognized by the courts, either directly or inferentially. First, there is monopoly based on the possession of a special, exclusive franchise. It has been maintained that the possession of such franchises confers upon the state the right of regulation. This reasoning, however, as we have demonstrated, is defective, in that the possession of such a franchise is the result, not the cause, of public interest. Therefore, although a legal monopoly obviously may be regulated under the doctrine of public interest, there must be other and more fundamental reasons why the industry in question is a monopoly.

Secondly, there is a monopoly based on natural limitations in supply or conditions of service. A company controlling the only available source of water of a community has a monopoly of supply. This same situation has often existed in the supply of natural gas. A

[1] 285 U.S. at 277.

[2] For a case since the Nebbia decision, see *Mayo v. Lakeland Highlands Canning Co.*, 60 Sup. Ct. 517 (1940) in which was considered a Florida citrus fruit minimum-price statute.

[3] P.U.R. 1932B at 438 and 285 U.S. at 278.

warehouse located at or near a railroad terminal has a natural situs monopoly. This was the situation in the Munn case. So also has a railroad that occupies the only available pass through a mountain barrier. In the case of the usual public utilities, each occupies some portion of city streets and alleys or other public property. There is definitely a physical and economic limit to these public facilities, and therefore, if for no other reason, their users have at least a quasi monopoly of situs. Some utilities deal in services that involve, in a sense, a limitation of time. Such are the services of the telecommunications companies. The matter of speed and lack of time to sample possible competing communication services give each of them a genuine monopoly.

More important, however, than all these causes of monopoly is the condition of economic monopoly, a characteristic of all public utilities. Although the economic circumstances making for this will be presented in the next chapter, suffice it to say there are many factors that tend to eliminate competition in the utility field, even though all other limitations were to be removed. The cost of construction, the low ratio of income to investment, the impossibility of ideal load factors, and the legal necessity of building in advance of needs, all tend together to make the utility operate under conditions of decreasing cost. Such a situation inevitably makes competition quite unstable and in the end, short of governmental interference, leads to combination and monopoly. Furthermore, the knowledge by promoters of this situation of decreasing cost would naturally make them hesitant, except for the nuisance value thereof, to invest their capital in a competing plant. Finally, the character of utility service makes for economic monopoly. In general, it is rather local in its nature. Equipment serving one town or group of towns has been of relatively little value to adjacent towns. Nor can such equipment be easily converted to other uses. Therefore, as a result of the fact that the usual public utility is a monopoly or is tending to be one, it has come to occupy a special place in our system of economic organization and has been subjected by public authority to minute rate and service regulation.

The public interest cases since *Munn v. Illinois* have mentioned all these types of monopoly, except the last one. Strangely enough, economic monopoly has been overlooked, except by Mr. Justice Brandeis. Dissenting in *New State Ice Co. v. Leibmann,* he said of the business of ice production:[1]

> The business of supplying ice is not only a necessity, like that of supplying food or clothing or shelter, but the legislature could also consider that it is

[1] 285 U.S. at 291, 292; P.U.R. 1932B at 446.

one which lends itself peculiarly to monopoly. Characteristically the business is conducted in local plants with a market narrowly limited in area, and this for the reason that ice manufactured at a distance cannot effectively compete with a plant on the ground. In small towns and rural communities the duplication of plants, and in larger communities the duplication of delivery service, is wasteful and ultimately burdensome to consumers. At the same time the relative ease and cheapness with which an ice plant may be constructed exposes the industry to destructive and frequently ruinous competition.[1] Competition in the industry tends to be destructive because ice plants have a determinate capacity, and inflexible fixed charges and operating costs, and because in a market of limited area the volume of sales is not readily expanded. Thus, the erection of a new plant in a locality already adequately served often causes managers to go to extremes in cutting prices in order to secure business.

Although Mr. Justice Brandeis is describing the economic instability of competition leading to monopoly in the ice business, his description applies equally to all public utilities. Why has this explanation of monopoly been so completely ignored by majority opinions in their search for the touchstones of public interest? Probably for two reasons. In the first place, there is no legal precedent in the older cases where economic power, per se, was the only basis of legislative action. Where such might have been found, other bases of regulation more familiar to jurists also existed. In the second place, the courts are adverse to accepting undisguised economic considerations as a basis for a decision. Only in a crisis situation, such as lay behind the case of *Nebbia v. New York*, does it come to the foreground in judicial analysis.

RIGHTS AND DUTIES OF PUBLIC UTILITIES

As a result of the dependence of their customers upon the common callings, or public interest occupations, the English courts evolved a group of duties, later borrowed by the American courts, that they attached to that status. These duties were not assumed as a matter of volition but were compulsory and could be avoided only by a withdrawal from service. When the doctrine of public interest was revived by the case of *Munn v. Illinois*, these duties, if indeed they were not already in force against carriers, were likewise revived and applied to American public utilities. Because of the new conditions

[1] This ease of entry into the ice business is probably overstressed. If in the past such appears to have been the case, it has occurred largely because of the ignorance of enterprisers of the extra hazards of competition in that business. The history of all public utilities discloses excessive competition in the early years of each of them.

faced in extending the public interest concept to industries unknown to the English common law, the ancient duties of public service were incorporated into and amplified by state and federal statutes. As a result of years of adaptation, the rights and duties of public utilities in the United States now exist mainly because of statutory definition rather than by means of judicial creation. Of course, the courts have retained their prerogative of reviewing the reasonableness of all statutory provisions and their administrative applications.

The significance of these duties can best be appreciated by their contrast to those which attach to business generally. In the field of unregulated enterprise, there are few legal rights and privileges. A merchant must fulfill his contracts; he must not misrepresent his goods or deal in things forbidden by law; and he must not defraud his customers. He may serve whom he wishes and (within limits) in whatever time, manner, or place he desires. Most of the restrictions thrown around him are *negative*, simply a few "thou shalt nots." His rights include those of demanding the letter of the bargains made by him and the usual police and fire protection. So long as he does not conspire with competitors in order to limit competition, he may charge as little or as much as he can get, and whether he prospers or fails ordinarily is of no concern to society. In other words, within these negative limits, competition is relied upon to insure customers of adequate supplies of goods and services at reasonable prices. But what of the public utilities? Ordinarily, they have a monopoly of their services. Because of the dangers to the public resulting from this situation, it has been necessary to subject them to rather minute regulation. Thus, in addition to being hedged around by the usual negative restrictions imposed upon all business, the utility has had imposed upon it a group of *positive* duties and rights.

Duties.—The first duty under public interest is to serve all who apply for service. This duty means simply that within reasonable limits all must be served regardless of race, economic and social status, or other differences. As is obvious, this same duty does not apply to competitive business, because a merchant, for any reason whatsoever, may legally decline to serve a would-be customer.[1] The evidence of this difference is to be found on the back of a theater ticket which ordinarily states that the management reserves the right to refund the amount of the purchase price for any (or no) reason whatsoever.

A second duty requires serving up to one's maximum capacity. Again, this requirement of maximum service does not apply to business

[1] Of course, this legal right is limited in actual practice by the possible loss of good will.

generally. But the utility, or public interest occupation, is under the obligation to use all its capacity if the demand warrants. This obligation has, in fact, been expanded by statute and commission practice to require the server to be prepared for all forseeable future increases in demand. This point might, therefore, be phrased to read that utilities must stand ready to give instantaneous (properly understood) service.

A third and corollary duty requires the rendering of safe and adequate service. The reasons for this should be quite apparent. With no satisfactory and immediately available substitute, users would be in a helpless position if utilities were permitted to render inadequate or dangerous service. For this reason, there exist regulations of voltage requirements for electricity, heat value and pressure for gas, street car schedules for urban transportation service, and speed requirements for telephone connections. And each of these services must be supplied by means of the safest equipment known to the arts.

The fourth duty forbids unjust discrimination. This prohibition of discrimination among customers does not forbid customer classification for purposes of rate making, but such a classification must be reasonable. But as to persons within each class, the same rate structures must apply. Again, this duty does not forbid the use of graduated rate structures. In common with the foregoing duties, this one does not apply to business generally. It has not usually been of concern to courts or legislatures that a merchant sells the same article under a similar conditions to various persons at different prices.[1]

Finally, no public service industry may demand more than a reasonable price for its service. Notice that this is the only duty to refer solely to price, the others being concerned, in the main, with the problem of service. Of course, such a duty could not apply to business generally. So long as business is truly competitive, its owners may legally charge whatever prices they see fit, subject only to the upper limit of customers' demands and the intensity of competition. But in

[1] The duty of serving all who apply, without discrimination, was involved in *State ex rel. Wood v. Consumers' Gas Trust Co.*, 157 Ind. 345 (1901). In that case a gas company, furnishing natural gas, had declined to serve all who applied, on the grounds that its supply of gas was inadequate for existing customers and that therefore the addition of new customers would result in poorer service for all. The Supreme Court of Indiana ruled that such a position was discriminatory to the new applicant Wood and ordered the company to serve the customer, regardless of the inadequacy of the supply. Such a refusal of the gas company was taking "the property of one and confer[ring] it upon another." The applicant, it was ruled, had as good a claim for service as the old customers.

the case of utilities, commissions and courts place definite maximum limits on prices, restricting them to a "reasonable level."

Rights.—It would be only fair to assume that if utilities were bound to serve under such duties as these, they would likewise possess certain rights not common to other business. The first of these is the right to charge a "reasonable rate." If a business is limited in its power of price determination, it seems only fair to permit it to insist upon nothing less than this reasonable rate. For business generally, there is no such guarantee, and sometimes it happens that a utility even under adverse economic conditions cannot insist upon this right. For the time being it will be assumed that a reasonable rate is one that, under prudent and economical management, covers all operating expenses including a return upon investment. If utilities cannot acquire monopoly profits, then they must not be denied this minimum of a fair return. Aside from the ethics of the situation, it is an economic necessity that such be allowed. Increasing demands for service require continuously expanding facilities. If utilities are confined to this minimum, their only source of new funds for expansion must be in the capital market. Since the best recommendation is a favorable earning record, the obvious conclusion is that utilities must have the right to charge rates that not only cover all operating expenses but also yield a fair rate of return upon their investments.

Finally, these industries are privileged to serve under reasonable rules and regulations. The obligation to serve all without unjust discrimination is limited by the right of the utility to insist upon reasonable rules and regulations. These include such items as office hours, prompt payment discounts, meter inspections, service deposits, extensions, contracts, and discontinuance of service. These rules and regulations are designed to protect the company and thus the great majority of its customers. Anyone failing to abide by them may be cut off after proper notice, subject always to the right of appeal to commission and court.

THE CHANGING CATEGORY OF PUBLIC UTILITIES

Although we shall confine our study to those public utilities which relate to urban growth and development, we recognize that others could be validly included. For instance, we do not include the railroads, and we shall pay but little attention to the telecommunications industries other than the telephone. Furthermore, we recognize that were we to have written this text twenty-five years ago or to write it twenty-five years hence, we could easily have omitted some that we have included or included some that we have omitted. The number

of the industries that we class as public utilities is not fixed but changes with economic conditions. As Mr. Justice Roberts has so aptly said, "It is clear that there is no closed class or category of businesses affected with a public interest."[1] With the exception of carriers and waterworks, industries now recognized as public service companies have become such within the past hundred years. There was a time, not so many years ago, when gas, electricity, and the telephone were regarded as private industries to be controlled by the force of competition. It was only after they had grown to a certain stage that they were properly said to be affected with a public interest.

In the same fashion as these businesses assumed the public utility status, so in the future other businesses now in the class of private industries may so emerge. In the years between 1920 and 1930, for instance, we have seen the radio industry become a public utility. The attempt of the state of Kansas following the first World War so to classify clothing manufacturing and food processing illustrates an unsuccessful effort to extend the public interest concept. At present, some believe that coal mining has the characteristics of a utility; some would even extend the utility status to all basic industries such as steel and oil.

If industries can grow into the utility status, they can likewise disappear from it. At the present time, some of the common callings such as those of the tailor and the doctor are not regulated as to price, and a few states for racial and color reasons have by statute removed the inns (hotels) from their lists of businesses subject to public interest regulation. The declining use of street transportation facilities in the small town is eliminating both the street railway and the bus in those places. Two general causes explain this disappearance of industries from the public service status. Some lose their economic usefulness, as has the street car. Other industries or occupations, because of changing economic conditions, lose their monopoly characteristic. In the days of horse transportation, the village inn and village doctor generally had a monopoly of their respective areas. Either was in a position to decline to serve or to serve only at unreasonable prices. From either decision there was no escape until the common law duties of public service were devised by the courts. But with the development of modern transportation and communications, the monopoly of these services has been broken. Competition among doctors and among inns no longer makes necessary the regulation of their charges.[2]

[1] 2 P.U.R. (N.S.) at 352 and 291 U.S. at 536.

[2] To clarify this point, let us say that both callings used here for illustrations

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are still subjected to many restrictions of law. Physicians are licensed and supervised in the matter of the dispensation of narcotics. Hotels still are hedged about by many restrictions relating to sanitary requirements, display of schedules of charges, and racial discrimination. For all these limitations, however, neither is subjected to the rigors of the price and service regulation of public utilities. Were the latter not one of the last of the common callings to lose its truly public interest status, it would doubtless be less regulated than it is at present.

CHAPTER V

ECONOMIC CHARACTERISTICS OF PUBLIC UTILITIES

This and the next chapter are designed to acquaint the student of public utilities with some of the fundamental factors affecting the organization, operation, and functioning of public service corporations, and therefore they are largely a review of basic economic principles. In addition to this review, we shall also emphasize some of the special problems involved in public utility service and point out such variations from the economic norm as we may find. Specifically, these chapters are concerned with a description of the corporate and financial organization and economic functioning of public utilities. For that reason, the description must be presented in general terms. Each of these industries has its special characteristics and problems which must be left to the interested student to discover for himself.[1]

PECULIARITY OF THE UTILITY PRODUCT

Although the goods and services of the public utility industries resemble, in many ways, the general mass of goods and services, they do have certain peculiar characteristics arising from the special conditions of their production. In the first place, they deal in services more than in products.[2] The telephone renders the service of communications; the street railway or bus performs a transport service. These are not something that can be bought, wrapped, and taken home to be consumed at the buyer's leisure. Electricity, gas, and water are more tangible and thus might be classed as goods. Yet, in the last analysis, these products are still closely akin to the service classification, although because of their dual nature they could be called "service-products."

Another peculiarity of the services and service products of utilities is their general lack of storability; or, to reverse the statement, they are, in the main, nonstorable. This characteristic of nonstorability

[1] For instruction in specific situations, nothing can substitute for personal and visual investigations of particular public utility companies, their plants, and organizations.

[2] We recognize that this distinction is fundamentally arbitrary. In the last analysis, bread, as well as grand opera, is desired for the satisfaction that its consumption will yield. Thus, all productive effort creates services for the satisfaction of human wants.

is especially applicable to electricity, telecommunications, and transportation. As a result, production facilities must be organized to produce the service at the time of need and at that time only. A study of peak and off-peak loads is necessary, and production schedules are adjusted accordingly. The street railways maintain rush- and nonrush-hour schedules. The telephone companies vary their shifts of operators daily and seasonally. Similar type of schedules are used by the electrical industry. Thoughtful managers observe holidays, weather conditions, and other special occasions in order to be ready to give service when it is needed.[1] Gas and water services have the same element of nonstorability though to a lesser extent. The limits of their exemption are determined by the storage capacity of their reservoirs and mains, and the size of these facilities is dictated by the savings thereby resulting, measured in terms of the equipment that would be required to meet the peak without such capacity. It may be possible as a matter of engineering ability to build these reserve capacities of such size as to permit production on an even keel, but their cost would be prohibitive. Consequently, the peaks of production are not eliminated, only modified. A gas utility schedules its operating force to meet the heavy days and heavy hours of demand. Likewise, a water company must be prepared for its peak demands and for those rare but very heavy times of fire disaster. Obviously, therefore, reservoirs assist only in reducing the strain of meeting peak load requirements.

How different is the production problem in business generally, and how significant the economic consequences that flow out of this difference. A box of breakfast food may be prepared months in advance of demand; commodities such as canned goods keep almost indefinitely, and the plant and employees may be miles away from the final consumer. On the other hand, utility production cannot be scheduled upon any such even basis as so much per day or per hour. Furthermore, the organization must stand ready to serve, more or less

[1] We have seen instances of this problem of meeting an unexpected load. On one occasion, a telephone company was caught definitely shorthanded one morning by an unexpected bank failure. The sudden increase in load swamped its small crew of operators. Now that machine switching is common, such a possibility has been reduced to a minimum. On another, we have seen a chief engineer of generating stations call his plants to warn of an impending summer rainstorm, the clouds of which were barely visible at the time of the call. Since then, it has become common practice for electrical companies to use commercial meteorological services in order to prepare in advance against wind and rain hazards. See Satterlee, "Weather for Sale," *The Saturday Evening Post*, vol. 212, no. 33, p. 14, Feb. 10, 1940.

instantly. This peculiarity arises out of the nonstorability of the utility service product. The public has been taught to expect and does expect electric light at the throw of the switch; it expects gas at the turn of the pet cock; it expects telephone service within a few seconds after removing the receiver or the completion of dialing; it expects water at the turn of a tap; and it expects a street car or bus at the scheduled time. This demand for instantaneous service is one explanation, for instance, of the program of the Bell System since 1927 of conversion of its equipment from the manual to the machine switching type.

In addition to being required to serve at the instant of demand, public utilities are expected to render continuous service. Electricity, gas, transportation, water, and telephone service from 8 A.M. to 5 P.M. or any other interval less than 24 hours per day is an unthinkable proposition. The major exception to this rule applies to the transportation companies which usually do not serve in the hours between midnight and early morning, unless the infrequent "owl" service in the metropolitan areas qualifies as continuous service. The utilities have been giving such continuous service with so few interruptions that this characteristic has been forgotten by most people—until a severe storm or natural catastrophe strikes.

Among other differences between utility service and industrial products is the uniform quality of the former, at least within the area of each company. A kilowatt-hour is the same day or night, winter or summer, in the East or in the West.[1] The same holds true for gas of a given heat content. To a lesser extent, a gallon of water is the same everywhere, though there are differences in mineral content and purity as among localities. This attribute of uniform quality, although not the sole possession of utilities, is more characteristic of their services and products than those of other businesses. No. 1 hard wheat is the same wherever it may be found; on the other hand, products such as oranges and muslin are not uniform.

THE DEMAND FOR UTILITY SERVICE

We can best approach our problem of the economic conditions of public utility operation by asking two questions: "What is the nature of the demand for utility service?" and "What are the cost circumstances under which it is supplied?" First, then, what are the characteristics of demand? Immediately, we discover that the demand

[1] Even here, there are differences. Some companies service their downtown areas with direct current, and a few still use 25-cycle alternating current instead of the usual 60 cycle.

for utility service is both direct and derived. Some customers, for instance, seek electricity for its immediate satisfaction of wants; others will install it only in the event of a favorable prospect of selling some good or service produced by means of it. Of course, the exact boundary between these two areas of demand cannot always be sharply drawn. One may use street car service in part for the direct satisfaction of personal wants, in part as an aid to further productive effort.

The significance of this distinction between direct demand and derived demand appears in their respective elasticities. A derived demand will tend to be both elastic and inelastic. It will be elastic in so far as power substitutes are available. For instance, if a manufacturer can install his own electric plant and produce his power at 8 mills per kilowatt-hour, obviously his demand will be limited by that substitute cost. If purchased at less than 8 mills, unless electric power were not an essential part of his production process, his demand for the central station product would tend to be inelastic. This generalization is itself subject to one qualification, namely, the importance of power costs to total production costs. These conclusions have assumed that power costs were but a minor part of total costs. There are those industrial customers, however, to whom power costs are a major part of total costs and for whom, therefore, minute changes in power rates would be significant. For these consumers, therefore, demand for utility service would tend to be quite elastic.

Direct demand for utility service tends to be quite elastic. Although no one can say with certainty, for example, what is the precise shape of the demand curve of residential customers for electricity, it does appear to be close to unity. As Chart 6 shows for the United States, from 1926 through 1939, average revenues for residential service declined from 6.98 to 4.05 cents, and consumption rose from an annual average of 428 kilowatt-hours per residential customer to 890 kilowatt-hours. For these same years, however, the average annual bill rose but little from slightly less than $30. to $36.05. Figures for every section of the United States show identical results. In 1929, the southern properties of the Commonwealth and Southern Corporation were charging residential customers from 5.56 to 7.67 cents per kilowatt-hour and selling annually per customer between 400 and 600 kilowatt-hours. For the 12 months ending in September, 1939, the figures for these properties were:

Average rate per kilowatt-hour, cents	2.7 to 3.8
Average annual residential consumption, kilowatt-hours	940 to 1,500

It is significant that data of domestic electricity consumption, when reduced to a time chart, follow a demand curve of elasticity (see Chart 7).

Strictly speaking, these figures set out above and in the supporting charts prove only one thing, namely, that in the past the price- and quantity-sold relationship happened to conform approximately to a theoretic curve of unitary elasticity of demand. Actually, then, they

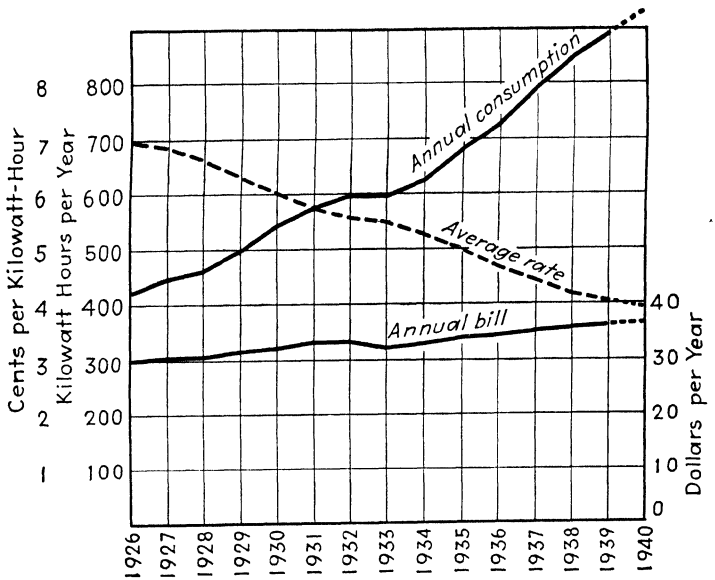

CHART 6.—Average annual consumption of electricity, average rate, and average annual bill of residential consumers. One relationship is significant, namely, the constancy of the annual cost of electricity although consumption more than doubled in a 15-year period. In short, the ratios of change in unit price and in quantity consumed have been almost exactly inverse.

are but a time series. On the other hand, the fundamental time assumption of demand analysis—the determination of the quantities of a good that would be taken at all possible prices *at a given instant of time*—cannot be easily applied in this problem. Therefore, our next best source of data is often a time sequence. In the light of the fact that many of the years since 1929 have been years of depression, it is remarkable that in only one of them, 1933, was there not a sharp rise of annual consumption coincidental with a sharp fall in average rates. Therefore, until other data disprove it, we shall assume that the direct demand for electricity is at least one of unitary elasticity.

If our assumption of unitary elasticity is correct, we have yet to explain the causal relationship between price change and quantity response. This may be no concern of ours, yet it could certainly happen that consumption of utility service is (within limits) independent of price stimulation. Specifically, figures for many communities will show rising annual domestic consumption during years of no rate changes. On the basis of this evidence, it has been argued that the primary factors in increased utility consumption have been good will, advertising, and lowering prices of utilizing devices. In

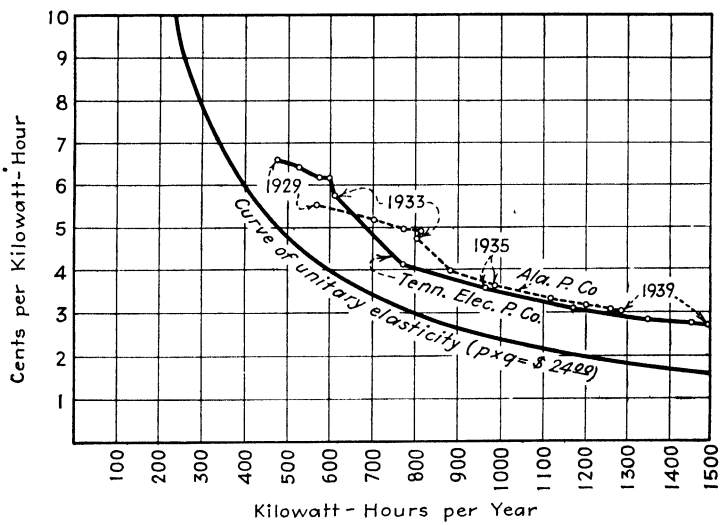

CHART 7.—Average annual residential electricity consumption and average price per kilowatt-hour of two southern properties of the Commonwealth and Southern Corporation. The curve of unitary elasticity is added solely to show its similarity to the first two curves. Its particular location on the graph is for clarity of illustration.

other words, the best stimulation comes as a result of intensive campaigns to sell new appliances or appliances at lowered prices. We would not for a moment minimize the validity of this position, yet we think that it loses sight of an unexpressed premise, namely, that *at present low utility rates* such sales campaigns can succeed. Otherwise, it would be fair to conclude that at 10 or 20 cents a kilowatt-hour, all one needed to sell 1940 quantities of electric service would be high-pressure campaigns. Thus, it would seem more accurate to conclude that a successful sales promotion of utility utilizing devices must be built upon a situation of proper rate levels; otherwise, such campaigns will be futile. Rate reductions and sales promotions must go more or

less together, with the latter the practical means by which a public utility realizes the sales potentialities within the price-quantity relationship of demand.

Finally, we hazard the observation that once individual consumption becomes established, it tends to become quite inelastic. For instance, I may be induced to buy an electric refrigerator by the twin stimuli of a rate reduction and lowered refrigerator prices. When that device has been integrated within my household, however, my use of it then becomes, broadly speaking, independent of changes in electric

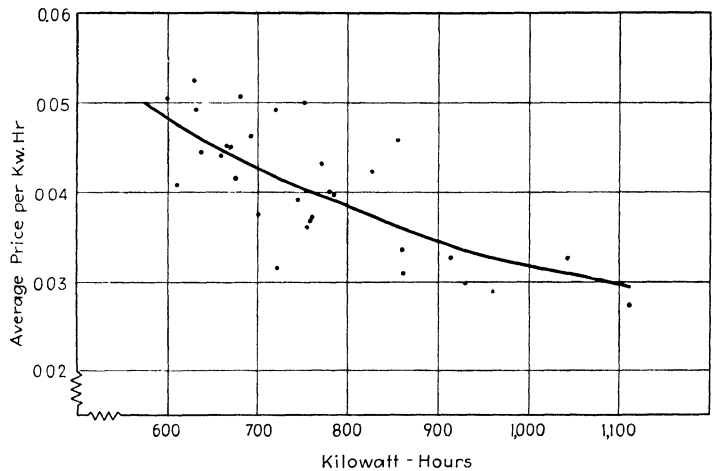

CHART 8.—A study of the 1936 average residential consumption of electricity in cities within the Chicago area of the Federal Power Commission. Each dot represents the price-quantity relationship of one city. The curve plotted through the date has slightly less than unitary elasticity. Later studies by the author of this illustration, Howard A. Cutler, tend to show the demand curve of residential customers to be approximately unitary in elasticity.

rates. In fact, the typical householder's use of utility service, once his habit patterns become fixed, is more or less immune from the influence of minor utility rate increases. Elasticity operates, then, more in the area of prospective consumption and much less on existing use. Of course, this proposition cannot be pushed too far. Continued rate increases (apart from general price-level changes) will certainly tend to curtail consumption.[1] Therefore, it is only within limits that this qualification is valid. Yet with all these reservations and exceptions in mind, it still seems proper to conclude that the direct demand for

[1] This generalization needs one further qualification. It is assumed that there is no significant change in demand itself. If such there were, then there could be increased consumption even in the face of rate increases.

utility service is generally elastic. All supporting data seem to point to that conclusion.

CONDITIONS OF UTILITY SUPPLY: CAPITAL REQUIREMENTS

Let us now turn to the other side of the problem by asking, "Under what conditions are utility services produced?" In the first place, one of the distinguishing features of the public utility is its high ratio of capital investment to gross operating income. As the accompanying illustration indicates, practically without exception, American retail and manufacturing concerns in the course of a year receive a gross annual income at least equal to the amount of their invested capital. For example, the annual income of the iron and steel industry has usually been twice its investment. Similar ratios are found in the automobile and paper and pulp industries. In meat packing and retailing, the ratio of income to investment is approximately 3 to 1. In the utility business, on the other hand, the reverse relation exists, with ratios on income to investment ranging as high as 1 to 8. Many studies have been made of this problem, one of the best being that reported by the Bureau of Business Research at the University of Illinois.[1] The financial statements of 200 companies covering the 10-year period 1915-1925 were analyzed for the purpose of establishing a variety of standard ratios in the public utility field. Among these ratios was that of gross operating revenues to total assets, which for our purposes is quite similar to the ratio of gross operating income to investment. The modal ratio for these 200 companies was 0.127, or put another way, about an 8-to-1 ratio. "This ratio may be looked at from two angles. One is that the typical company turns its capital once in 7.9 years, or that it takes 7.9 years for its gross revenues to equal its total capital. The second angle is that each dollar of capital invested in the enterprise produces 12.7 cents annually."[2]

This study shows that the most common ratios fall within the limits of 0.06 and 0.20, which converted to our form of expression would be between 16 to 1 and 5 to 1. Within these limits are found half of the 200 companies analyzed.

More recent data are available. A study of financial statements of electric companies for three selected years in Wisconsin, Illinois, and Iowa shows results similar to the Illinois findings.[3] These figures for

[1] *Standard Financial Ratios of the Public Utility Industry*, No. 26, Bureau of Business Research, University of Illinois, 1929.

[2] *Ibid.*, p. 29.

[3] KLADSTRUP, *Some Significant Ratios of Electric Light and Power Companies*, p. 24, a thesis deposited in the Library of the University of Iowa.

the three states are comparisons of gross operating revenues to fixed assets. It might be argued that fixed assets are not equal to the utility investment, because at least part of the quick assets are thereby

TABLE 15.—RATIO OF INCOME TO INVESTMENT OF ELECTRIC COMPANIES IN IOWA, ILLINOIS, WISCONSIN

Year	Ratio
1928	1 to 6.1
1933	1 to 7 8
1937	1 to 5.8

ignored, but the omission cannot be too serious, since they (fixed assets) account for 85 to 90 per cent of total assets. Another measure of the ratio of income and investment can be found in the combined annual figures of each of the utilities. Again their accuracy can be challenged because they include both nonutility investment and income. Be that as it may, they still illustrate this relationship. According to the Census of Electrical Industries for 1937, the ratio of income to investment in the telephone industry was 1 to 4.2, and in the telegraph 1 to 3.7. Using the figures of the Federal Power Commission for 1937, the investment in electric plant was 4.4 times annual income, whereas the total investment was 6.4 times that income. In terms of total assets, the electric plant alone accounted for almost three-fifths of the total; all utility plant was over four-fifths of that figure.

A COST CLASSIFICATION

In the production of any good or service certain costs are incurred, such as those for materials, wages, interest, maintenance, and depreciation. In this respect, the public utility is no different from other businesses. But as these costs have been listed, there is no order to them, and therefore they are of little value to a full understanding of the problem. The conventional cost accounting classification divides them according to phases of the business, such as manufacturing, selling, and general costs. The economist, on the other hand, is inclined to group costs into two classes: variable and fixed. We shall follow this latter form, subdividing the fixed costs into their two component parts. Our threefold classification becomes[1]

[1] The terms "fixed costs" and "variable costs" are used with reference to the effect of changing quantity of production upon the quantity of cost. Thus, fixed costs do not change with production changes. From the viewpoint, however, of the cost of a unit of production, these costs have the opposite relation. To double the quantity of production would halve the amount of fixed costs *per unit of output* while the amount of variable costs per unit would remain unchanged. This relationship is shown in Chart 9.

1. Capital costs.
2. Fixed operating costs.
3. Variable operating costs.

Capital Costs.—Capital costs are those outlays which exist whether or not a plant is in operation. They have one characteristic in common, namely, they vary but little, if at all, with the volume of production and are not appreciably affected by a complete shutdown of a plant. Thus, in this group are found bond and note interest, property taxes, depreciation expense (in part), insurance, rentals, and general contractual obligations. To these should be added watchman service and minimum amount of repair and supervision. Though

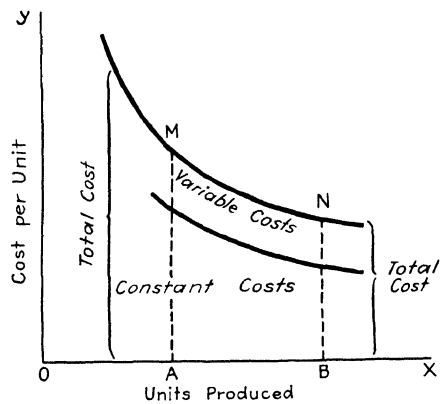

CHART 9.—Cost relationships under conditions of decreasing cost. Notice that variable costs are constant when measured in terms of cost per unit. Conversely, the constant costs average less as units of output increase.

not of the same legal status as interest, dividends might also be included. Of course, they can be avoided if they are unearned.

Fixed Operating Costs.—This second group of costs, fixed operating costs, resembles capital costs in that for the going plant their amount is independent of the volume of operation. They differ in that they could be eliminated were plant operation to be entirely discontinued for an indefinite period. Since this possibility is of no significance to the going concern, fixed operating costs have the same basic nature as capital costs—fixity. Dividends may be properly included here, because, in a strict economic sense, they are fixed costs of operations. As will be more apparent later, the maintenance of a good credit rating for purposes of new capital borrowings is best established by a long and unbroken record of interest and dividend payments.

Other fixed operating costs are the wages of the general office, superintendence costs, and basic maintenance costs. In the language of the accountant, the indirect manufacturing costs fall within this class. One rather important group are the "stand-by costs" which all going utilities incur. In an electric central station, for instance, they are represented by those outlays necessary to keep the boilers hot—in other words, a readiness-to-serve expense. This same situa-

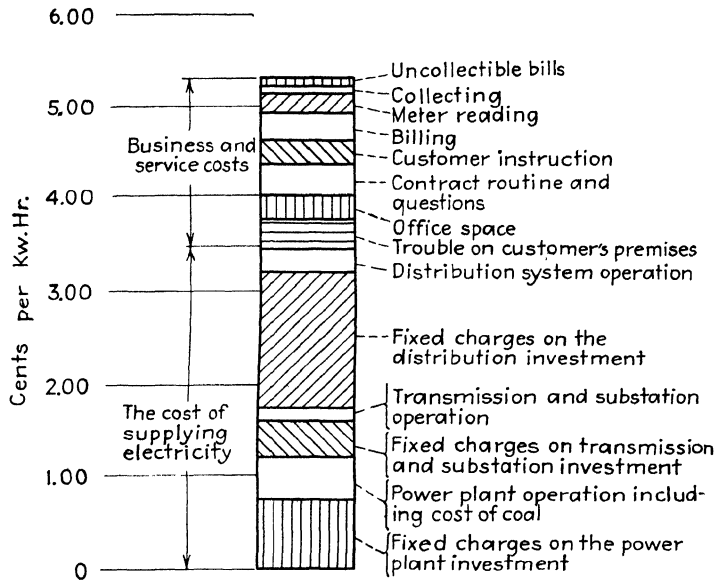

CHART 10.—The cost of residential service in a metropolitan area. In using this chart, one must be careful to note that the scale is expressed in cents per kilowatt-hour for an average unit use of 550 kw.h. per year at 30 per cent load factor. Furthermore, it will be observed that the subdivisions of cost, although proper, are not those adopted in the text. (*Marshall and Snow, "Distribution Costs—Resident Service," Proceedings, 54th Convention of the National Electric Light Association, p.* 110, 1931.)

tion is also found in the other utility industries. To repeat, these costs are incurred in the case of a going concern and could be eliminated only by a permanent closing of the plant. When an establishment is in operation, no matter how slight or how large, they are relatively fixed in amount.

Variable Operating Costs.—The third group of expenses that all utilities must meet are the variable operating costs. As the name implies, the characteristics of these are that they may be eliminated in case the plant is closed, and they vary more or less directly with the plant output. They correspond, in general, to the direct manufactur-

ing costs of the cost accountant. It must not be thought that there is mathematical precision between changes in plant output and the amount of these costs, for the relationship is only approximate. It is sufficiently close, however, to separate them from the previous two cost classes. The most important variable operating costs are wages (in general), fuel, raw materials, and maintenance (in part).

Considering only the going plant and therefore combining capital costs and fixed operating costs into one—fixed costs—they account for a large share of total utility expense. The accompanying diagram (Chart 10) illustrates this fact. It will be noticed that the divisions in the diagram do not correspond to our classification; yet a brief study of it shows results that can be interpreted in its terms. The three white areas under the "cost of supplying electricity" represent variable operating costs, and they total 0.92 cents, or less than 20 per cent of the total. Note, on the other hand, the percentage of the total absorbed by the obvious capital costs—2.54 cents, or almost 50 per cent.

One further illustration of the importance of the proportion of fixed to variable expenses can be found in the statistics of the Federal Power Commission for classes *A* and *B* electric light and power companies. Rearranged to fit our cost classification, the figures are as follows:

TABLE 16.—FIXED AND OPERATING EXPENSES OF ELECTRIC LIGHT AND POWER COMPANIES*

(Year ending December 31, 1937)

Item	Amount		Operating revenues, per cent
Total operating revenues		$2,532,444,360	100 0
Operating expenses		$1,187,485,381	46 9
Fixed expenses:			
Depreciation	$234,069,847		9.2
Taxes	349,811,279		13.8
Interest	282,905,347		11 2
Preferred dividends	126,910,566		5.0
Common dividends	305,751,113		12.1
Total fixed expenses		$1,299,448,152	51 3

* This table makes no pretense of following traditional accounting form of profit and loss statements. In such, the dividend payments would be in a separate section showing disposal of net earnings. Furthermore, the table omits a small amount of expense that cannot be classified as either fixed or operating.

According to these figures, at least half the utility income is spent upon items of fixed cost. This is, however, an understatement, because

many items included in "operating expenses" and other expenses not shown here are also fixed in nature. It is therefore safe to conclude that fixed costs often amount to 60 per cent or more of the total (see

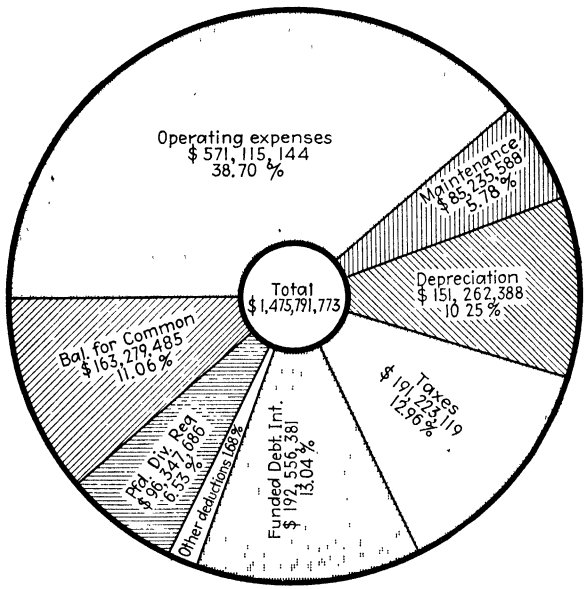

CHART 11.—This chart was prepared by the Securities and Exchange Commission to show the distribution of 1938 gross earnings of 177 operating utility companies. Can there be any doubt that they are industries of high fixed costs? The chart shows at least 60 per cent of their gross income to be so classified.

Chart 11). For such utilities as hydroplants, the ratio may run as high as 80 per cent.

ECONOMIC CONDITIONS OF OPERATION

At this point, it is appropriate to explore further the monopoly status of the public utility in order to discover its significance to users and to the public generally. Of course, of the types of monopoly discussed in the previous chapter, only one of them—economic monopoly—needs analysis, and to that we now address our attention. It should be remembered, however, that whatever may be the basic explanation of the monopoly in any given situation, the economic consequences are no different, and the need for control no less.

In the history of the American railroads and public utilities (as here classified), the public has been reluctant to recognize their true monopoly status—so much so that in at least one instance the Anti-

trust Law was invoked to break up a railroad combination.[1] Even yet, our national policy toward the railroads is one of enforced competition.[2] Since the late 1920's, the electrical industry has been the target of public attack on the grounds that it is controlled by a "power trust." Thus, the public seems to be reluctant to concede what we shall try to demonstrate, namely, the economy of the noncompetitive status of utilities. This reluctance may have been created either by a naïve belief in competition or by the fear that regulation cannot cope with this type of economic organization.

As one looks around, he finds practically no evidence of competition between corporations furnishing the *same utility service.* Competing electric companies, except in the areas of public power projects such as the Tennessee Valley Authority, and competing gas companies are practically unknown. Competing waterworks and competing telephone companies are unknown. In the case of the telephone, as was pointed out in Chap. II, there was a period of sharp competition between the Bell System and the independents, but that day has long since passed. Of course, there are competing types of urban transport agencies; but with the exception of the taxicab, they usually do not furnish identical service or serve identical areas. Thus, monopoly of utility service is the rule. At this juncture, it must not be presumed that utilities are not subjected to certain kinds of competition. In the telecommunications group, there is active competition among telephone, telegraph, and radio telephony. Gas and electricity compete in many types of service. Electricity, gas, oil, and coal, because any one of them may be substituted for another, compete as industrial and domestic fuels. To repeat, all that is meant by monopoly is that within each service area each public utility service is under the control of one corporation and one corporation only.

Decreasing Cost.—One way to demonstrate the desirability and inevitability of economic monopoly is to set up a hypothetical case of competition between two companies producing identical services. But before doing so, the economic conditions of operation must be understood. In the first place, a public utility operates under conditions of decreasing costs, or, in other words, its average unit cost declines as its output increases. Of course, such a tendency is confined within

[1] *Northern Securities Co. v. United States,* 193 U.S. 197 (1904).

[2] The Transportation Act of 1920, although a forward step in railroad regulation, did not contemplate the elimination of rail competition. Its basic philosophy was to permit the organization of several great competing railroad systems. Several plans to accomplish this have been drafted, but nothing significant has been accomplished.

the limits of plant capacity; production beyond this point would result in rising unit costs, at least for a short period. Public utilities are especially subject to this economic situation of decreasing cost. In the first place, service demands and the economy of large installations cause plant construction in advance of current needs. Since there is the legal necessity of serving future demands as they arise, it is easy to understand why plants will be built larger than present needs dictate, especially since the larger the unit the lower will be its unit cost of output. As a consequence, at the time of installation, there is almost always spare capacity, demanding new customers if it is to pay for itself. Furthermore, owing to the peculiar load requirements of the business, a utility must be prepared to meet its greatest probable peak load, although this peak may be of but a short duration.[1] Equipment to meet this load results in there being unused capacity the rest of the time. In terms of a theoretical maximum output, a utility will not, even under the most favorable circumstances, have an average use much in excess of 50 per cent of its capacity. Thus, any new business that does not increase the peak load will call into use some bit of unused capacity and as a consequence will be a factor in reducing unit cost.

TABLE 17.—A HYPOTHETICAL ILLUSTRATION OF DECREASING COSTS
(Manufactured gas)

Output, cu. ft.	Fixed costs per 1,000 cu. ft.	Variable costs per 1,000 cu. ft.	Total cost per 1,000 cu. ft.
1,000,000	$7.50	$0.25	$7 75
2,000,000	3.75	0.25	4.00
4,000,000	1.88	0.25	2.13
7,500,000	1.00	0.25	1.25
15,000,000	0 50	0.25	0.75
30,000,000	0.25	0.25	0.50

The analysis in the preceding section disclosed a situation of high fixed costs. For any unit of production, the amount of the total cost going for labor and other variable costs is relatively small. The following example will help illustrate our problem. A certain manufactured gas plant finds that it has fixed costs (capital costs and

[1] We do not overlook in this presentation the fact that in the electrical industry, for instance, a high peak of short duration can be met by "overloading" generating facilities Such overloading, however, cannot be sustained for long without danger to generators and is definitely an indication that the plant's reserve has been exhausted and that a program of new installation is imperative.

fixed operating costs) totaling $75,000. This cost is independent of the quantity of production, within the limits of its plant capacity. Let us suppose further that the variable operating costs amount to 25 cents a thousand cubic feet. If the plant output amounts to 1,000,000 cubic feet, the cost *per thousand cubic feet* will be $7.50 of fixed costs plus $0.25 of variable costs. A doubling of the output will materially lower the average unit cost to the sum of $3.75 for fixed costs plus the $0.25 for variable costs. Table 17 continues this illustration for various amounts of output.

There can be no question, then, of the aggravating effect of the high proportion of fixed to total costs. With an increase in output, the average unit costs fall rather sharply. The significance of this factor upon competition and rate making under competitive and regulated conditions will be discussed below. Before leaving this matter of decreasing costs, a word of caution should be added. In the foregoing illustration, it is assumed that the plant capacity is at least 30 million cubic feet. Next, it must be recognized that the variable costs are not quite so inflexible as the illustration would lead one to believe. An increase from 1 to 30 millions of cubic feet represents an increase of several hundred per cent and might result in a decline of variable unit cost, which would give an average total unit cost of the two lower brackets of something less than 75 and 50 cents, thereby accentuating the condition of decreasing cost.

On the other hand, in certain situations, significant increases within the limits of plant capacity may cause an increase in the variable and indirect operating costs per unit of output. . An extraordinary increase in production may increase disproportionately labor costs, especially managerial and other supervisory costs. A small labor force because of the intimate relations of employer and employee may need but little formal supervision and training. A large labor force, however, requires a supervisory overhead and may also require a special training organization. Notice that every progressive large public utility has its training division consisting of a group of several experts. Such a division is not needed in smaller units. The net result, however, of such increased cost will not ordinarily cause an actual increase in total unit cost—only retard the degree of decline of unit cost with increasing output.

The Special Case of the Telephone.—An apparent exception to the rule of decreasing cost is found in the telephone business. A simple example will suffice to demonstrate this argument. Suppose that there are only two telephones in a certain locality. The possible connections are one. Then a new subscriber is added. The possible

connections are now increased to three, but of course only one can be made at a time. Now let us add another telephone to make four. Six possible connections appear, with two at a time possible. A fifth telephone is added, increasing the possible connections to nine. The addition of still another telephone will increase the possible connections to fifteen. Thus, although the number of telephones in a system grows in an arithmetic fashion, the possible connections rise in a geometric ratio. One more illustration: In a city having 10,000 telephones (it would be a rather small place indeed), the possible connections reaches the total of 49,995,000. Because of this peculiar situation, the cost per telephone of rendering service rises with the increase in the system, and any economies resulting from larger operations usually have been more than offset by the rising costs that this relation of instruments and connections creates.

Thus, it would appear that the cost conditions of telephone service are contrary to the rule of decreasing cost. But the analysis loses sight of one factor. To use an extreme illustration, telephone service in Boston is not the same as that in Tupelo, Mississippi. Therefore, to compare them is to compare unlike things. Viewed from the standpoint of any community, the telephone industry is subject to the principle of decreasing cost. To render the telephone service of a town of 10,000 people, it would be cheaper to have one rather than two companies. Either one must be equipped to render service for the entire area; each one expects eventually to control the area; and therefore if each one spreads its full fixed costs over that portion of the service that it actually controls, its telephone rates must be higher than the rate that would be possible were one company serving the entire community. Or, to alter the argument, any telephone company with the usual number of customers has its periods of off-peak service, and any additional service at off-peak times will help reduce average costs. To repeat, the argument that the telephone service is exempt from the principle of decreasing cost is valid only when one compares quite dissimilar services. A similar comparison between electricity companies, one rendering carefully controlled service and one rendering haphazard service, would show the former to be operating at a higher unit cost.

Joint Cost.—In addition to operating under decreasing cost, public utilities also operate under conditions of joint cost; or, as it may be phrased, they are subject to a condition of common costs arising out of joint use. A gas or electric plant supplies industrial, commercial, and domestic customers, and the common costs of this plant must be shared on some basis among these classes of users. This situation is

not unique to utilities, because it exists in nearly all large industrial organizations. The presence of common costs would be less significant if utilities operated under competitive conditions or sold their services at a uniform rate to all users. But the fact is that, under either monopoly or competition, they sell their services under a variety of conditions and at a widely divergent scale of prices. Therefore, the problem of the distribution of these common costs among classes of users is vital, *and there is no invariable principle upon which the division may be made.* All notions to the contrary, every method of division is purely arbitrary, though this does not mean that such methods are unfair or unreasonable.[1]

THE INSTABILITY OF COMPETITION

The combination of decreasing cost and joint cost can lead to but one conclusion, namely, that competition cannot be relied upon to establish fair and equitable utility prices. Although it is true that each utility competes with every other business for a portion of the consumers' dollar and likewise that each utility, save the waterworks, has a supplier of a potential substitute lurking in its shadow, yet these limits are too broad to yield a truly competitive price. In short, they simply aid in defining the area of monopoly price. Within these limits, each utility service in the absence of regulation will eventually be furnished by a monopoly organization charging such monopoly price as it can exact. Of course, this economic power will be subject to the usual checks of threat of boycott, fear of regulation, and the possibility of substitute facilities. Yet for domestic customers, generally, these limits (except for possible regulation) are very broad. Any price fixed with regard to them is still a monopoly price.

Suppose that we premise, for the moment, two competing electric plants serving a community having a potential consumption of 10 million kilowatt-hours per year. To serve such a demand would require, say, installation of 3,500 kilowatts of generating capacity.[2] No competitive situation could involve the exact division of this business between each plant and therefore installations exactly sufficient to serve each share. Instead, each plant would be larger than its par-

[1] Speaking before the 1937 convention of the American Bar Association, Carl I. Wheat, discussing the problem of telephone toll rates, said, "When a large number of points are served, the question of separating joint costs [among] the various circuits soon becomes so intricate as to be largely insolvable." Reprinted in the *Public Utilities Fortnightly*, **20**:587, Oct. 28, 1937.

[2] Facilities of a rated capacity of 2,875 kilowatts, operated at a 40 per cent load, would be required to produce 10 million kilowatt-hours a year. We have assumed an additional installation of 25 per cent in capacity as reserve.

ticular share requires because of the economies of large installations and the hopes of increased business. Thus, each plant might have, say, installations amounting to 2,500 kilowatts, hereby causing this community to have a total installation of more than 40 per cent in excess of its normal requirements. If each plant charged, initially, a uniform rate for all customers, it should appear obvious that this rate would be higher than that of a single plant, because the fixed charges of the excess capacity would be included within the rates of each company. Thus, we have reason No. 1 why a monopoly of supply of utility service is economical.

In the next place, such a competitive situation is quite unstable. Operating as these two plants are, under decreasing cost, any increase in business would reduce unit costs, because the rates to be charged for new business will ordinarily pay some portion of the fixed charges. But the presence of joint costs makes it impossible to say what portion of total costs, other than incremental and direct costs, attaches to any one unit or class of service. Therefore, the inevitable consequence will be price inducements by one plant manager to the customers of the competing company. If the proposed rate for these new customers covers all variable costs and any part of the fixed and joint costs, it will be a profitable business addition and will bring down the average unit cost of service. The plant losing these customers, on the other hand, will find its unit cost increased, possibly to the point where what may have been a profitable venture now loses money. Its manager then has but one option—to use the tactics of his competitor. The immediate consequence of this is cutthroat competition which eventually leads to some sort of understanding, combination, or merger. In any event, competition, which at best was of an imperfect and unstable order in the utility field, is eliminated. To repeat, any industry such as a public utility, subject to the dual combination of production under decreasing cost and joint cost, cannot safely be left to the force of competition to fix its prices. Whenever competition has been tried, it has caused a multitude of price wars, with the resulting discriminations against persons and places, as the early history of the railroads and telephones so eloquently illustrates. From the public viewpoint, therefore, it is better never to allow such a futile, unstable, and temporary condition to exist.

A CASE STUDY IN COMPETITION

As a final bit of evidence on the question of the effect of utility competition, we present a case study involving two gas companies which for a time served several small communities in Montana. The

time of this story is late 1929 and early 1930.[1] The facts in brief are these: In 1923, the city of Glasgow voted a gas franchise to what was later known as the Bowdoin Utilities Company. Nothing was done by the company in the way of rendering service under this franchise until late in 1929. In the summer of that year, it also secured franchises from two other near-by places in Montana: Malta and Hinsdale. At about this same time, a competing company organized by gas drillers formerly employed by the Bowdoin Company had secured, in October, 1929, franchises to serve these same communities by promises of 15-cent gas. Thereupon began a fantastic race between them, which has been described by the Montana Public Service Commission in the following words:[2]

> November and the greater part of December, 1929, witnessed a race between the two utilities to lay their transmission lines from the same field to the same cities, to install duplicate distribution systems in Malta and Glasgow and to acquire customers for their respective systems. Neither the inclemencies of winter season nor darkness arrested their efforts—day and night shifts toiled in all sorts of winter weather. In the cities the potential customers were beleaguered by representatives of both utilities striving earnestly to attach business. The initial rate for natural gas having been approved by the Commission upon the same net basis—15 cents per thousand cubic feet, it was necessary for the competitors to offer other than rate inducements. The practice of requiring customers to pay for service pipe from the property line to the premises served and for all house installations and appliances—a practice that has the approval of the Commission—was utterly ignored. . . . [The Bowdoin Company] commenced furnishing natural gas to customers in Malta on the day preceding Thanksgiving and to customers in Glasgow on December 24th. The natural gas supply was not sufficient for their needs and to guarantee against a failure of fuel the utility provided many of its customers with coal. . . . The precise time at which the competing [company] actually began to furnish gas to Hinsdale and Glasgow is not in the record but it seems clear that it was during the month of December. It never completed its pipe line to Malta, although it had installed a distribution system.

There were two immediate consequences of this fierce competition. In the first place, these communities became overnight 100 per cent gas-serviced towns. In the second place, the competition lasted but a few months, terminating with a merger on March 1, 1930. Immediately, the successor company applied for an increase in rates to 75 cents per thousand cubic feet, an increase of 400 per cent. The request was opposed by the officials of the towns, but a majority of

[1] *Re Bowdoin Utilities Company*, P.U.R. 1931B 20 (1930).

[2] *Ibid.* at 25.

the commission found after careful investigation that it could not deny it because the proposed rate appeared to fall far short of covering a fair return upon the legitimate investment. Specifically, the commission found the utility entitled to earn about $50,000, whereas the rate increase was estimated to yield only about half that amount. The net consequences of this whole episode were unnecessary waste of investment in duplicate facilities, undue expansion of service under the stimulus of a 15-cent rate to persons who later discontinued service, and a general increase in public ill will. The commission was sharp in its condemnation of that competition but had been powerless to prevent it. In the end, after making every legitimate deduction in valuation and expense claims, the commission found it necessary to approve the proposed 75-cent rate, which incidentally was the generally accepted gas rate for other near-by Montana towns of similar size. Further comment is unnecessary—this case is simply illustrative of the same conclusions as set out above in our theoretic analysis.

THE PLACE OF REGULATION

On the other hand, the ultimate consequences of a monopoly situation must be considered. We have discussed this problem under the assumption of uniform price to all consumers. This is a very unreal assumption, however. Early in the development of utilities, it was discovered that consumers could be classified according to the elasticity of their respective demands, and a rate fitted to each class, or stratum. Any monopoly business, therefore, left to its own devices, would, within the competitive limits above set out, classify its users and tend to charge the full monopoly price to each group. Such a classification of consumers ordinarily results in relatively low rates to industrial users, each of whom has the protection of the threat of operating his own utility facilities, higher rates for commercial users, and still higher rates for domestic users. This last group has the highest intensity of demand because of the necessity of utility service and the scarcity or expensiveness of reasonably adequate substitutes.

The rule of pricing, *in the absence of regulation*, is to charge at least the direct costs of serving each segment of users plus as much more as the class demand will permit, so that the total return yields the maximum monopoly profit. Here, then, we find also a goal of regulation. The usual practice is for regulatory bodies to insist that rates be restricted, especially for those groups of high demand, to a point where total receipts from sales leave no monopoly profit. This

course is an attempt to approach in the utility field the competitive norm of pricing and may be called the usual rule of regulation. Under this method, the regulatory rule of pricing would be, first, to allow no service that does not cover its direct operating cost and, second, to permit each class of users to be charged, in accordance with its respective intensity of demand, no more than just enough to cover the total joint and fixed costs of rendering service. In essence, what commissions attempt to do is to strike an acceptable pricing level between the extremes of monopoly price on the one hand and direct or incremental cost on the other.[1]

THE GOAL OF REGULATION

As has been suggested, one goal of regulation is the approximation in pricing of the competitive norm. It may or may not be strange, but this is one of the most neglected topics in the writings on public utility economics. This neglect can be explained probably by the too rigid focusing of attention upon the diverse and complex problems of regulation. Obviously, regulatory agencies could choose any one of several goals (legal limitations disregarded). For instance, a policy of permitting utilities to charge monopoly prices might be adopted. Such profits as would result could be appropriated by taxation, absorbed by compulsory free service, or destroyed by compulsory service (at less than cost) to groups now considered submarginal. Or regulation might look toward maximum output regardless of cost. If service at rates fixed solely in terms of customer demand resulted in losses, some kind of public subsidy would be in order. So far as practice suggests a theory of regulation, it is, as we have seen, yet different from these. Regulation in the United States has been regarded as a substitute for competition. This is evidenced by the regulatory emphasis upon costs, upon the constant searching of the competitive area for working rules of conduct, for guides to action. For instance, a fair rate of return for public utilities is usually defined as one that can be earned by competitive business of similar risk in the same vicinity. Thus, it can be concluded inferentially that the American theory of public utility regulation in the pricing of utility services is the approximation of the competitive norm.[2]

[1] The problem of pricing has been presented here only so far as to show the inadequacy of competition as a regulator of price in the public utility field. Further exploration of pricing is reserved for Chaps. XIII, XIX, and XX.

[2] Professor Frank A. Fetter, in testifying before the Wisconsin Commission, was asked what was a reasonable rate. In reply he said, "There is no divine revelation to the commission and courts as to what fair and reasonable is. There is no abstract standard of fairness and reasonableness, and I submit that what the practice has

It is one thing, however, to define a goal of regulation, and another to attain it. As will be obvious, the emphasis has been in terms of price with but little regard to the quantity of production. The following diagram (Chart 12) illustrates the problem here involved. The demand and supply curves show a situation of hypothetical competitive price determination for public utility service. By reading the diagram, it will be seen that the competitive price will tend to be that measured by the distance *OP* and the quantity sold by *OB*. On the other hand, left to its own devices, a monopoly of this service would, let us assume, cause the price to be raised to point *P'*, with

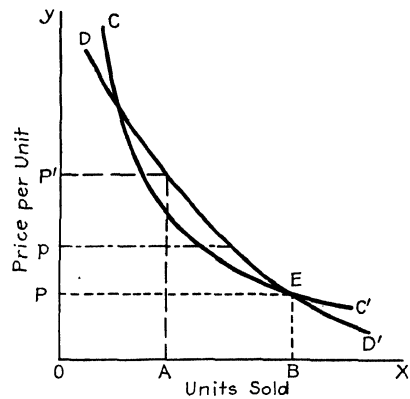

CHART 12.—A simplified comparison of utility pricing and sales under monopoly and under simulated competition Can there be any doubt of the social advantages of effective regulation?

the corresponding decrease in quantity sold to *A*. The problem, now, is to create a regulatory machine that will not only lower the actual price from *P'* to *P* but increase sales from *A* to *B*. So far, our American practice has been to concentrate attention on lowering utility prices to the competitive norm, ignoring the problem of the quantity of sales. If this goal is to be a real one, however, the regulatory force must operate in two directions, namely, the reduction of prices to the competitive norm (*P*) and the extension of sales to the amount that this norm would dictate (*B*). An inspection of this illustration sug-

been is in an experimental way to fix those rates at about what they would be if there were normal competition, when in fact there is not normal competition." During his testimony, he made this observation, "The public looks to the Commission to fix rates that are commensurate with ordinary competitive conditions instead of with monopolistic conditions." *Testimony in the Matter of . . . Rates . . . of the Wisconsin Telephone Co.*, 2-U-35, pp. 1167, 1168, 1932.

gests that the utility's own interest would cause it to increase its sales, under price regulation, from A to B, because at the established price (P) any less quantity of sales than the quantity OB would result in net losses. Therefore, it is to the advantage of the utility to increase its production to the amount of the competitive level. If management should be content, however, to produce only the units dictated by the monopoly price or some other restricted quantity, it should become the function of regulation to require otherwise.[1] To conclude, if the goal of the competitive norm is to be realized as a practical one, not only must price be restrained to the competitive level, but production must likewise be expanded to that level.

Bibliography

In addition to the footnote references accompanying this chapter, we suggest for further reading:

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[1] One reason for management to offer for sale less than the full amount (OB) that could be sold at the established rate level might be to discredit the commission. For instance, the sale of only OA units would show serious losses, thereby enabling it to claim confiscation. As we show below in Chap. XIII, courts are often impressed with this kind of argument. In terms of our diagram, courts might force price to be raised to Op, although at that price many more than OA units could be sold.

CHAPTER VI

PUBLIC UTILITY ORGANIZATION AND FINANCE

The production of utility service is not an accident but rather the result of careful planning and effort on the part of some one person or group of persons. First, it must be decided what is to be produced. Next, the type of business organization must be selected, and then such legal requirements as necessary must be observed. Specifically, if the corporate organization is chosen, a charter must be secured. For most utilities, there are the additional requirements of a franchise and a certificate of convenience and necessity. A most important prerequisite to the development of a proposed utility is adequate finance. Simultaneously, with preliminary plans and requests for charters and franchises, promoters will have begun to search out sources of funds to supplement whatever contribution they themselves have elected to make. These arrangements completed, the next steps are to acquire the necessary productive equipment, get it properly installed and functioning, hire and train an adequate labor force, and finally secure such customers as may be available.

Many of these steps involve a price bargain. The securing of capital, the hiring of workers, the purchase or rent of land and equipment, the attraction of customers all involve a process of bargaining. In each of these bargains, the public utility is definitely obliged to show the superiority of its offerings to those of alternate uses. This bargaining process is especially significant in the securing of customers. In this area, the usual assumption has been that the monopoly position of the utility gives it an unquestioned command over users of its service. Certainly this is not true. Utilities compete with all other businesses when they attempt to secure customers, and, having secured them, the competition continues. Customers may take large or small quantities of service, depending on the success of this competition. It seems, therefore, self-evident that much of the progress of the utility business depends upon the creation and development of an organization—a going concern. This organization must be the most efficient possible if it is to perform adequately the entrepreneurial functions of assembling the most economical combination of the factors of production.

In this chapter, attention will be devoted to two phases of the going concern, namely, the selection of the proper form of business organization and its financing. Other problems could be considered, but their discussion would lead into questions of technical layout of plant and office and type of equipment to be installed, thus carrying us too far afield.

THE CHOICE OF TYPE OF ORGANIZATION

In general, any business may be organized along one of three traditional lines. It can be a single or individual proprietorship, a partnership, or a corporation.

The Individual Proprietorship.—The individual or single proprietorship is a one-man business. The proprietor assumes the sole burden of business finance and operation and, as a result, "sinks or swims" by himself. If the business is successful, its profits accrue to him; if losses occur, they will be his alone to bear. This form of organization is most common in small establishments that require only a limited amount of capital, because the amount of capital available to that form of enterprise is limited by the amount of personal wealth plus the borrowing power of the proprietor. Upon this score alone, we may eliminate the individual proprietorship as not being well adapted to the utility business, since it ordinarily requires a greater amount of capital than can be furnished or borrowed by one person. Other disadvantages, such as unlimited liability and difficulty in providing for specialized management, also contribute to its lack of use for public utility enterprises.

The Partnership.—The second available form of organization, an expansion of the proprietorship, is the partnership. The partnership is usually based upon an agreement, written or oral, called "articles of copartnership," which states the terms of the partnership, specifies the duties and functions of each partner, and prescribes the basis for the distribution of profits and losses. This form of organization is generally more effective for a larger business than the single proprietorship, because it permits the assembly of a larger amount of capital and a greater degree of managerial specialization. If, for example, we were to set up an electrical utility in a very small community under this form of organization, we should do best to include at least one partner with executive ability, one with knowledge of the engineering side of the business, one skilled in accounting techniques, and others who would contribute capital rather than services and skill in return for a share in the earnings.

There are, however, serious disadvantages and limitations to the partnership form. In the first place, it is, like the single proprietorship, subject to the disadvantage of unlimited liability on the part of each of the partners.[1] A second disadvantage of the partnership form is that it is automatically dissolved upon the death of one of the partners. Finally, the partnership often acts more slowly than the individual proprietorship, because all partners must agree before a course of action may be adopted. In the individual proprietorship, decisions are made by one man and hence can be made more quickly. It should be obvious, therefore, that the individual proprietorship and the partnership are rarely used in the public utility field. Neither is adapted to one of the basic needs of the utility business—a continuous inflow of new capital.

The Corporation.—With the appearance of the Industrial Revolution, it became essential that a new type or form of business organization be developed. The establishment of factories and their equipment generally required large investments; and because of the risk involved in such undertakings, investors were not willing to subject their entire fortunes to the hazards of the individual proprietorship and the partnership. In response to this need, first came the joint stock company, as a transitional step, and finally the modern corporation.[2]

In the classic Dartmouth College case, Chief Justice Marshall defined a corporation as "an artificial being, invisible, intangible, and existing only in contemplation of law."[3] This definition emphasizes the distinguishing characteristic of the corporate form of business organization; namely, it is a *separate legal entity* quite apart from its owners. In other words, the corporation is, in the eyes of the law, a person with the power to contract, the power to sue and to be sued, etc. In the case of the partnership, the business organization legally is a group of persons, and litigation involving partnerships is concerned with partners as individuals; in the case of the corporation, its owners are not ordinarily directly involved. The owners of the corporation, the stockholders, therefore, have the advantage of limited liability in that their maximum possible loss from a business failure is measured

[1] There is a special type of partnership, the limited partnership, in which there must be at least one general partner subject to unlimited liability, but the liability of the others may be limited so long as they have nothing to say about the operations and policies of the business. In this form, the limited partners would, in case of failure, have their losses restricted to the amount that they had invested in the business.

[2] The joint stock company has largely disappeared in the United States, such ventures having generally been incorporated.

[3] *Trustees of Dartmouth College v. Woodward*, 4 Wheat. 518 (1819).

by the amount that they have invested in fully paid up stock of the company.

For the following reasons, the corporation seems to be the best choice as a type of organization for public utilities:

1. It makes possible the assembly of huge quantities of capital. Through the sale of bonds and stocks, the savings of many individuals may be assembled and put to work in the business. The success of customer ownership, discussed later, is evidence of this.
2. The characteristic of limited liability makes investors more willing to contribute to the capital of the organization.
3. It has the advantage of a specified period of life, sometimes perpetual.
4. The corporate form makes borrowing easier in that bonds may be used and sold to the public.
5. The corporate form makes possible the use of the holding company device for combination.

It is evident from the foregoing that the corporate device is particularly useful in the utility field because of its ability to attract large sums of capital. This point cannot be overemphasized, since the utility business is one that has required billions for plant and equipment and that must have, at its present rate of expansion, a steady inflow of new capital.

The corporate form is not without its disadvantages, although most of them relate to the social rather than the management point of view. For example, a corporation may become subject to "predatory control"; small stockholders may suffer in many ways because of the control exercised by a few holders of large blocks of stock. Furthermore, the corporation has made possible the development of large-scale business units in which there has been a loss of employer-employee contacts, with the result that their relations have become cold and impersonal. It should be pointed out that some of these are disadvantages not of the corporation but of large-scale business generally and might arise under any form of organization. The corporate device is only indirectly to blame.

It has been estimated that the corporate form of business organization employs 90 per cent of American labor and controls more than that amount of the output of American industry. In the utility field, the corporate control is even more complete, being, to all intent and purpose, 100 per cent. Although scattered illustrations of privately owned public utilities operated as partnerships or proprietorships may exist, and probably do, we have yet to discover one.[1] Therefore, we

[1] Since farmers' mutual telephone lines and rural electricity cooperatives are not organized for profit, we do not consider them as exceptions to this statement—they are not commercial ventures in the strict sense of the word.

think it no exaggeration to say as we said in the opening chapter that the study of public utilities is in one sense a study of corporation economics.

The Massachusetts Trust.—Occasionally, the laws of some of the states have limited corporate activities in such a way that special legal organization forms have been needed. The best illustration of this is the Massachusetts Trust, although its use has not been confined to the state of its name. In that state, at one time, corporations were not permitted to deal in or own land, and therefore railroads and public utilities (and other businesses as well) were obliged to develop a new type of organization. This new type was a trustee form; and since it was developed in Massachusetts, it thus takes its name of Massachusetts Trust.

The trust form of organization is established by the execution of a contract, called a "deed of trust," by which the property of a business and its management is turned over to a trustee or group of trustees. Those who have contributed become the beneficiaries of the trust and are given shares or "trust certificates." The management of the business resides in the hands of a trustee or trustees, who, in turn, are held personally liable for losses arising out of negligence or bad faith in the operation of the business. For all practical purposes, however, the business functions in the same manner as the corporation, particularly since the feature of limited liability attaches to holders of trust certificates.

From the point of view of the investor, this form of organization has the advantage of possessing practically all the powers of a corporation without some of its responsibilities. It is usually a "cheaper" form of organization in that no state license is required of it and it is normally not subject to some of the corporate taxes. From the managerial point of view, therefore, it has the advantage of concentration of power, because the trustees have almost unlimited authority and are a self-perpetuating body.

On the other hand, enterprises operating under this form are subject to some disadvantage because of the uncertainty of their legal status. There has been a striking lack of uniformity in court precedent in matters involving the trust. Furthermore, it is to be expected that it will, in the future, be called upon to assume more and more responsibilities, making it for all practical purposes identical to the corporation. From the social point of view, the Massachusetts Trust is less desirable than the corporation, because it has made possible an even greater divorcement of management responsibility and ownership. This separation has been one of the marked characteristics of the develop-

ment of large-scale business in the United States, especially in public utilities. Any legal form that can aggravate this problem is to be justly suspected.

The use of the Massachusetts Trust has been confined largely to the state of its name where it is found primarily in the textile, gas, oil, transportation, and pulp and paper industries and the real estate field where dealings in land are of primary importance.[1] Some of the Massachusetts electrical companies have been organized under this form.

The Cooperative.—Thus far, we have been interested primarily in the place of owner and manager in the types of business organization. We have not considered the place of the consumer of the product or service to be sold. Therefore, as a special form of organization, we shall mention briefly the cooperative. Here, the consumer group and the owner group blend into one, and each assumes some of the managerial functions of the enterprise. Under cooperative organization, the motive of business activity is somewhat changed in that the cooperative strives to provide goods and services to members at the lowest possible price rather than to make the largest profit for its owners.

In the typical cooperative, the capital necessary for launching the business is obtained through the sale of memberships in the organization. Once started, the business is operated by managers selected by the members. Major decisions are made in meetings of the members in which each has one vote regardless of the amount of his investment. Usually, the goods and services sold by the cooperative are available to members and nonmembers alike at prices that are comparable with those in competing places of business. At the close of the fiscal period, patronage dividends are distributed to the members in proportion to the quantity of their purchases for the period. The cooperative movement has advanced most rapidly in Great Britain and the Scandinavian countries. It is developing in the United States in the marketing of agricultural products, in the distribution of merchandise, and in retailing generally.

We have mentioned the cooperative, usually organized as a corporation not for profit, because it has been making rapid headway in the field of electric service to rural communities. Under the stimulus of the Rural Electrification Administration, organized in 1935, many thousands of rural homes have been furnished service. In this program, the administration has concentrated mainly upon assistance to public agencies, especially the cooperative organization of farmers. This emphasis is shown by the fact that 85 per cent of all loans have

[1] BISHOP, *The Financing of Business Enterprises*, p. 42.

been made to such groups. Since this is not the place to discuss the details of the rural electric cooperative program, we must be content with this brief sketch.[1]

Public Ownership.—Although not in a technical sense, yet in a real sense, a final choice of utility organization can be public ownership. The proprietor, partner, and corporate forms assume the profit motive and are therefore choices of private enterprisers. The cooperative, although clothed in the corporate form, is midway between these private forms and public ownership. It shifts the profit motive from a few to the consumers as a group, yet it is essentially a private form of organization, since it is not under the direct control of government. Utility service is of such a nature—its very name "public" suggests the fact—that it could also be organized as an arm of government. In that case, the profit motive may be completely discarded as a primary force in management and operation, and in its place the welfare of consumers can be substituted. Cost, then, would take definitely a second place in the pricing of its service.

Society, we may properly say, thus can choose from five possible forms of business organization. It could select one or more of them or leave to blind fate the choice. Left alone, private enterprise has chosen the corporation (except where laws have forced that other choice, the Massachusetts Trust). In recent years, the cooperative form for rural electric service has begun to occupy an important place. Conceivably, if trends set in motion after 1933 continue, the publicly owned organization may become the dominant form. If that time ever comes, we recommend the public corporation as superior to direct operation by some existing branch of government.

EARLY FINANCING OF UTILITY ENTERPRISES

As each of the utilities (possibly with the exception of water) emerged from its experimental stage to enter the first period of commercial development, it encountered a skeptical public. Both customers and investors had to be "sold" on the advantages of the new business. Although customers soon were acquired, the harder job was that of attracting investors. Contrary to most businesses, utilities have extraordinary capital requirements. As was pointed out in a previous chapter, for every dollar of annual income, several dollars must be invested in plant and equipment. Thus, the most pressing nontechnical problem of utilities has been the securing of adequate supplies of new capital.

[1] For further analysis, see Chap. XXVII, "Utility Service in Rural Communities."

The Financing of Electricity.—Because the evidence is better and the growth the greatest, we turn first to the electrical utility and second to the telephone to illustrate early financial problems. In electricity, the combination in the 1880's and 1890's of both utilization devices (such as the incandescent lamp) and production facilities furnished the basis for its development and expansion. The manufacturers of equipment quickly tackled the task of stimulating the building of generating plants. Finding investors skeptical of the electric light and electric street railway securities, especially stocks, these manufacturing companies were often obliged to accept the securities of operating companies in exchange for generators, transformers, and other facilities sold to them.

Such practice left the electric manufacturers with the problem of disposal of securities thus received, because they were in no position to tie up their working capital in that manner. Realizing that the investing public was not interested in securities of small, new, scattered, and oftentimes competing electric companies, the equipment houses early hit upon the plan of making their holdings the basis of collateral trust issues. These trust securities, ordinarily bonds, were then offered to the manufacturing company's stockholders. If the trust had been incorporated, common practice was to include its (the trust) stock as a bonus to bond purchasers. As an illustration of this practice, the Thomson-Houston Electric Company (one of the predecessors of the General Electric Company) organized trusts on four different occasions. This procedure proved satisfactory for a time. Soon, however, securities began to accumulate in the treasuries of the manufacturing companies in greater volume than could be handled conveniently through trust arrangements. Thus it became necessary to create other means by which the lighting and railway companies could obtain the necessary funds for their purchases.

As a consequence, the next step in electric company financing was taken in 1890 when the Thomson-Houston Electric Company organized the United Electric Securities Company, a separate corporation whose sole function was the financing of operating utilities. It was described some years later in these words:[1]

> [It was designed] to assist the financing of local lighting companies by purchasing all or some portion of the issues of bonds of those companies for which there was no general banking demand, deposit them in a trust company, and issue against them its own collateral trust bonds for which a considerable market was developed during succeeding years.

[1] Quoted by Federal Trade Commission, "Control of Power Companies," p. 70. *Sen. Doc.* 213, 69th Cong., 2d Sess.

This organization met with considerable success. Under this arrangement, thirty-nine series of bonds were issed and later retired by sale or maturity of the underlying collateral. Altogether, several millions of bonds were issued by the United Electric Securities Company.

Trusts of this type are especially significant because they marked the beginning of a method of disposal of securities of comparatively unknown companies by making them the basis of the securities of better known investment companies. Investors were willing to take the securities of the latter agencies because of their general good reputation and the safety offered by diversified collateral. Although we have cited but one illustration of this second step in early utility financing, it was by no means unique. As late as 1904, for instance, the General Electric Company organized one of these investment groups under the name of the Electric Securities Corporation.

The collateral trust technique for the disposal of the bonds of operating utility companies, however, left untouched the task of making attractive to investors the stocks of those companies. This was a significant problem, because the solvency of many operating companies had been threatened as a result of the large proportion of funds raised through the sale of bonds; and in many cases defaults had occurred, especially during the panic of 1893. The problem was made more immediate by the fact that buyers of public utility bonds had begun to insist, after 1893, that not more than a stipulated percentage (one-half to two-thirds) of the actual cost of plants and other facilities of operating companies be raised by means of bond sales. This meant that the balance must be raised by sale of stock. Although bonds and even stocks of utilities in the large cities were becoming generally marketable, it was still difficult to sell bonds on properties located in small communities, and to sell stock in such companies was quite out of the question.

One further circumstance complicated the problem of early finance. Early financial structures in the utility field were crude and quickly became unworkable. It had not been recognized that the prime financial problem would be the attraction of a continuous flow of funds in order to meet an ever growing demand for service. As a result, companies were burdened with unwise mortgage provisions and charter requirements. Particularly was the closed-end mortgage to be a handicap. In other words, the nature of the financial needs of a young industry about to enter a period of rapid expansion had not been appreciated. Hence, drastic reorganizations were often necessary, and it became obvious that the only permanent solution to the problem

was to be found in educating the financial world and the investing public to the view that there should be fewer creditors (bondholders) and more owners (stockholders) if the industry was to develop. In seeking to attain this objective, the equipment manufacturers, such as the General Electric Company, sought to impress upon investment bankers the necessity of framing their bond issues more in the public interest, avoiding closed mortgages and other objectionable forms and provisions which had been causing frequent refinancing. They also attempted to impress upon issuing companies the necessity of raising a larger percentage of their capital requirements through the sale of stocks. Thus it was hoped that bond money could be made cheaper because of the resulting stronger credit position.

One solution of the problem of marketing of operating utility stocks was found in the organization of the holding company. By this device many smaller local lighting companies acquired an outlet for their junior securities. One of the first holding companies created at least partially for this purpose was the Electric Bond and Share Company, organized in 1905 by the General Electric Company. This company began by selling to the public 1 million dollars of 6 per cent preferred stock and issuing an equal amount of common stock to the General Electric Company in exchange for local company securities in the latter's treasury. According to S. J. Mitchell, under whose direction it was organized, the idea of the new company was to apply the insurance principle to the common stock equities of electric power operating companies controlled by it. He stated this policy as follows:[1]

> In this rapidly growing industry if the common-stock equities of a large number of local operating companies that were so scattered geographically as to represent great diversity of climate, diversity of industry, diversity of Government regulation, etc., could be united there would be created assurance of a steady and increasing income and safety of the investment. For while a local company here and there might have a bad year, it is not likely that all of the companies would have bad years at the same time, and the net result would be a net income every year and a net income that would increase from year to year.

This "insurance principle" thus was applied by the formation of a holding company to acquire the common stocks of local operating companies, issuing in their stead its own securities. By this process, it became possible to raise funds from the sale of holding company common stock, although some continued to be obtained by the sale of

[1] *Ibid.*, p. 73.

collateral trust bonds secured by the pledge of operating company stocks.

The Electric Bond and Share Company, shortly after its organization in 1905, began a process of grouping its stock holdings under the direct supervision of intermediate units. These companies and the dates of their creation are as follows:

TABLE 18.—SUBHOLDING COMPANIES OF THE ELECTRIC BOND AND SHARE COMPANY

Company	Year Organized
American Gas & Electric Co	1906
American Power & Light Co	1909
Utah Securities Corp	1912
National Securities Corp	1914
Lehigh Power Securities Corp	1917
National Power & Light Corp	1921
Electric Power and Light Corp	1925

During the approximately 20-year period when the Electric Bond and Share Company was under the control of the General Electric Company, the Federal Trade Commission reported it to have earned an average rate of return per annum of approximately 11½ per cent. It is evident, them, that the rendering of financial assistance and service to operating companies was not an unprofitable venture.[1]

Bell System Financing.—Except for the brief period of telephone competition after 1894, the financial history of the American telephone industry is essentially the history of the Bell System. The Bell associates, described in an earlier chapter, took over the pioneering of the telephone business, and upon them fell the task of financing their venture. In the early days, they advanced their own funds. By 1879, several experiments had been tried; but even then, the prospects of the telephone were not yet "sufficiently bright to attract much capital."[2] The year 1879 marked a turning point in Bell System financing. On November 10 of that year, the threat of telephone competition by the Western Union Telegraph Company was removed once and for all. New blood came into the organization, and Bell securities soon became quite acceptable to the investing public. The number of stockholders grew from 600 in 1881 to 7,000 in 1900. Such public favor made possible the policy of large investment in common stocks of licensees, the actual operating companies. Table 19 shows

[1] These paragraphs make no pretense of analyzing the holding company or even describing all the reasons for its origin. For further discussion, see Chap. XXIII.

[2] STEHMAN, *Financial History of the American Telephone and Telegraph Company*, p. 12.

Bell System investment in securities of operating companies and the extent of its capital acquisitions.[1]

TABLE 19.—BELL SYSTEM HOLDINGS OF SECURITIES OF OPERATING TELEPHONE COMPANIES

Year	Total security holdings	Holdings of common stocks
1881	$ 1,196,638	$ 1,036,859
1885	22,351,730	22,351,730
1890	28,492,753	28,492,753
1895	34,487,194	34,487,194
1900	73,738,824	69,782,246
1905	191,575,560	145,943,634
1910	411,310,533	341,541,338
1915	514,693,517	399,927,765
1920	796,024,244	554,664,547

In order to secure funds for these securities, it was necessary for the Bell System to expand frequently its own authorized capital. Being a Massachusetts business, it was obliged to secure such permission from the legislature, and in addition it was required to observe strict laws on the method and public sale of securities. Finally, to escape these irksome limitations, the main control of the Bell System was transferred in 1899 to a New York corporation, the American Telephone and Telegraph Company. Between this date and 1907, the Bell financing was affected by competition of independents. After 1907, "banker control" took over its management, and the problems of both finance and competition were quickly solved.

In the first years of the development of the telephone industry, the Bell associates adopted the plan of license of its equipment, accepting stock of operating companies in exchange for a license. The usual agreement included the following provisions:[2]

1. The licensor was to receive (usually) 35 per cent of the common stock of the licensee.
2. The licensee could borrow only with the permission of the licensor.
3. Extensions were to be made through the proceeds of stock issues.
4. The licensor was to be represented on board of directors and executive committee of licensee company.

[1] "Investigation of the Telephone Industry of the United States," *Report* of the Federal Communications Commission, *House Doc.* 340, 76th Cong., 1st Sess., p. 46.

[2] *Ibid.*, p. 19.

By 1900, the Bell System had acquired in most of its licensees a majority of ownership of common stocks. The growth of the associated companies (operating subsidiaries) is shown in Table 20.[1] Comparing this table with the preceding one, it will be observed that the parent company has supplied an important portion of its operating

TABLE 20.—GROWTH OF ASSETS OF THE ASSOCIATED COMPANIES OF THE BELL SYSTEM

Year	Total assets	Assets of Bell System, per cent
1885	$ 54,450,537	90.8
1890	76,851,565	91 3
1895	101,602,885	84.2
1900	208,345,131	90 3
1905	400,311,052	88 6
1910	651,229,882	86.5
1915	935,717,396	88 4
1920	1,473,968,306	90 2

companies' needs. Nevertheless, in the early years, local financing was often a problem, especially when sudden increases in demand or repair of storm damages had to be met. The increases in the participation of the parent company after 1905 may have been forced in part by those difficulties.

Résumé.—From the preceeding discussion, it should be clear that the problem of public utility financing has been twofold. First, there was the necessity of providing sufficient capital for construction of plant and distribution system. This resolved itself into the task of marketing securities on favorable terms. Second, there was the problem of providing a steady flow of funds into the industry in order that its high expansion or growth rate might be maintained (see Chart 13, for illustration of this in the electrical industry). This problem has been, in other words, that of maintaining a good credit standing. It is in connection with this that the *special* problem of utility financing arises. The necessity of providing for a continuous flow of new capital would indicate that stocks should be relatively more important than bonds in the financial structure of public utility enterprises and that bonds could even be restricted to special purposes and strictly limited in amounts. A review of the evidence in these years before 1920, however, shows the general emphasis in public utility finance,

[1] *Ibid.*, p. 52.

with the exception of the Bell System, to have been upon bonds. Probably rapid growth and the general unwillingness of investors to accept stocks account for this overemphasis. As the period closes, the financing of the utilities by total and type of securities was as follows:

TABLE 21.—PRINCIPAL FINANCIAL STATISTICS OF PUBLIC UTILITIES IN 1920

Utility	Total assets	Capital stock	Long term (or funded) debt
Bell System	$1,634,249,533	$ 511,493,407	$ 595,924,216
Associated companies of Bell System	1,473,968,306	570,660,192	304,319,675
Electricity (40 per cent of industry)*	2,287,645,000	831,153,000	1,163,858,000
Electricity (1922)	5,793,237,945	2,125,316,139	2,355,329,817
Electric Railways (1917)†	5,532,223,818	2,473,846,651	3,058,377,167

* HARDY, *Recent Growth of the Electric Light & Power Industry*, The Brookings Institution, Pamphlet Series, Vol. 1, pp. 43, 44, Apr. 1, 1929

† Total asset figure is the sum of stocks and funded debt.

FINANCING, 1920–1930

So far, we have been content to discuss only the early financing of public utilities, leaning mainly upon the electrical and telephone businesses for our illustrations. Obviously, by sometime after 1900, all of them had passed through their periods of birth and early development. Their technical processes had already undergone significant changes; their permanency in the American economic fabric had become an established fact. Capital began to flow their way in greater volume. In these years, the normal rate of growth had been discovered, and the usual investment channels developed. At the opening of the first World War, the typical public utility had still the major portion of its capital structure in bonds, and its stocks (usually common only) were comparatively closely held. Something of this is illustrated by figures for the Commonwealth Edison Company of Chicago. In 1883, its predecessor company had 11 stockholders; in 1913, it had 2,045; in 1917, it had 4,528; and in 1919, it had approximately 7,000.

During the first World War, utilities, in common with all but the primary "war industries," had had but little in the form of new capital. These war industries had been given preference by the War Industries Board; consequently, with the "return to normalcy" after the war, utilities found themselves trying to meet an expanded demand with plants of prewar dimensions. Thus the need for new capital became imperative. Therefore, the period of the 1920's is one of

unusual interest because financing in those 10 years was characterized by great increase in volume and the introduction of many new and sometimes "exotic" types of securities. In the year 1924, for instance, the new security issues of public utility corporations in this country reached the impressive total of 1½ billion dollars, a sum just short of 40 per cent of all corporate securities issued that year.[1] This significant increase can be attributed largely to the rise in price of utility issues caused by falling interest rates and a swelling confidence on the part of investors in the stability and soundness of this public utility business.

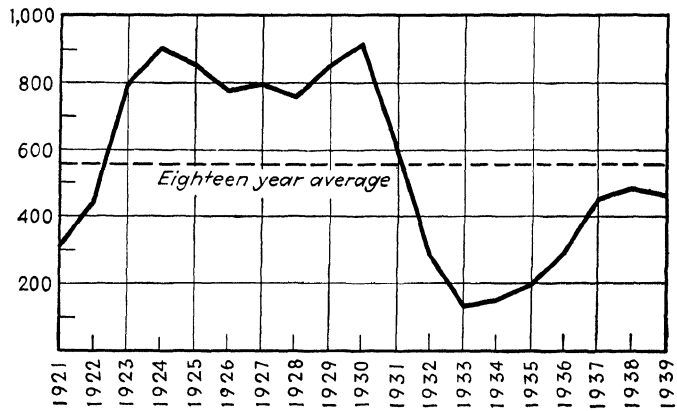


CHART 13.—This illustrates graphically the annual new capital requirements of the electric power industry after 1921. Prior to that time, in 40 years slightly less than 5 billions had been invested in that utility. Budget estimates for 1940 call for the expenditure of approximately $650,000,000. (*Edison Electric Institute, Statistical Bulletin* 7, 1940.)

Relatively little of the financing during the early part of this period was for refunding purposes. At no time prior to 1927 did refunding operations in the electrical industry account for more than 50 per cent of securities sold to the public. Immediately after 1920, because of falling interest rates, most bond financing was long-term, since the chief motive for short-term financing was gone for a time; but the latter again became significant during the closing years of the period. The sale of stock accounted for slightly less than 10 per cent in 1926 and slightly over half in 1929 of public sales of electric utility securities, indicating at best a continued unsatisfactory relationship between borrowing and equity financing.

[1] DORAU, "Public Utility Financing, 1919–1925," *Journal of Land and Public Utility Economics*, **1**:305, July, 1925.

TABLE 22.—ELECTRIC UTILITY SECURITY SALES BY CLASSES*

Year	Bonds†		Stocks†‡		Sales to customers		Total financing‡	
	Amount	Per cent of total	Amount	Per cent of total	Amount	Per cent of total	To public	Total
1924	$ 805,338,600	68 5	$175,582,200	14.9	$194,200,000	16 6	$ 982,420,800	$1,175,120,800
1925	668,524,500	52 3	313,698,510	24 5	296,000,000	23 2	982,223,010	1,278,223,010
1926	1,013,160,000	72 6	135,504,982	9 7	246,900,000	17 7	1,150,964,982	1,395,564,982
1927	1,528,632,500	71.8	360,276,764	16 9	240,000,000	11 3	1,743,634,700	2,128,909,264
1928	922,098,100	56 2	549,399,409	33 5	170,000,000	10 3	1,237,220,452	1,641,497,509
1929	523,407,500	35 8	792,051,262	54.2	145,000,000	10 0	881,776,000	1,460,458,762
1930	1,114,636,200	70 2	338,217,641	21 3	135,000,000	8 5	1,297,535,034	1,587,853,841
1931	1,090,584,000	72.3	258,658,193	17 1	159,000,000	10 6	1,182,904,000	1,508,242,193
1932	404,839,800	86 1	47,416,808	10.1	18,000,000	3 8	404,839,800	470,256,608
1933	53,725,000	95 5	2,147,778	3 8	375,000	0 7	53,725,000	56,247,778
1934	131,175,000	100 0	. . . . .	....	..... .	...	131,175,000	131,175,000
1935	1,067,670,700	100 0	. ..	. .	. ...	....	1,067,670,700	1,067,670,700
1936	1,279,681,200	96 1	52,258,963	3 9	. .....	...	1,331,940,163	1,331,940,163
1937	560,217,000	86 7	86,095,334	13 3	.. ..	....	645,682,394	646,321,334
1938	941,411,400	97.8	20,694,267	2.2	....	....	962,105,667	962,105,667
1939	620,205,000	83.9	119,517,000	16 1	.. ..	...	992,347,000	992,347,000

* *Electrical World*, **111**:117, Jan. 14, 1939; **113**:117, Jan. 13, 1940.

† To public and institutional investors.

‡ Including rights and warrants.

Customer Ownership.[1]—Probably the most outstanding event of the period of the 1920's was the discovery of a new source of capital and the development of a new type of security to attract that supply. This security was the preferred stock, one of the exotic types mentioned above, and the new source was the customer. To this has been given the name "customer ownership." Very simply, customer ownership was a program of selling stock directly through company employees to small investors, usually customers. By that process, the older investment channels for those securities were eliminated; thousands of new stockholders added; a good source of capital tapped and at no greater expense per share of stock sold.

The need for a new source of investment funds, as explained above, was a by-product of the first World War, and the methods of war finance set the example for the later customer ownership campaigns. During the war, millions of dollars worth of Liberty Bonds had been sold in small denomination to thousands of investors who formerly had never considered securities as a place for savings. In short, many people previously only "mortgage-conscious" had become "securities-conscious." To satisfy the two requirements of this new class of investors for security of investment and returns of a higher level than bond interest, the preferred stock became the usual security offered for sale.

The techniques used in selling Liberty Bonds were adopted and streamlined for customer ownership campaigns. Company employees were organized into teams with leaders—lieutenants and captains. Each employee was coached in the art of selling, often assigned a quota. He made a periodic report; team progress was conspicuously posted daily; and at the conclusion, the winning teams were often "wined and dined" by the losing teams. Newspaper, periodical, and even billboard advertising built up the background for a campaign. People were urged to "invest in a home enterprise," were assured of its permanency and stability. The utility was even pictured as the successor to Gibraltar. Nor were the "widows and orphans" overlooked. A common advertisement showed the mailman with umbrella on a rainy day handing the monthly dividend check to the retired old couple waiting within the shelter of the doorway of their modest home.

The results of the customer ownership drives can be easily measured statistically. Examination of Table 22 shows that between the years 1924 and 1931, approximately $1\frac{9}{10}$ billions of dollars was derived from sales to customers. During these years, thousands of customers

[1] For an excellent analysis, see Heilman, "Customer Ownership of Public Utilities," *Journal of Land and Public Utility Economics*, **1**:7, January, 1925.

became security owners. The Commonwealth Edison Company, mentioned above, for example, increased its number of stockholders in 1924 to 42,980 and on to a peak of over 83,000 by 1939. The Bell System showed similar results. Table 23, for selected years, shows the numbers of stockholders of the parent company, the American Telephone and Telegraph Company.

TABLE 23.—NUMBER OF STOCKHOLDERS OF AMERICAN TELEPHONE AND TELEGRAPH COMPANY

(As of December 31, of years shown)

Year	Number of Stockholders
1915	65,512
1920	139,448
1925	362,179
1930	567,694
1933	680,939
1935	657,465
1938	646,882

There were other results of a nonstatistical nature, some good, some bad. Viewed from all angles, the widespread sale of securities had three fundamental purposes:

1. Attraction of a new capital supply.
2. Creation of customer good will.
3. Reduction to a minimum of the investment of control groups.

We need say nothing more about the first of these. From that viewpoint, customer ownership campaigns were obviously successful. Likewise, in many instances, the good-will objective was accomplished but with risks disclosed only in the depression of 1929. Preferred stocks were sold to customers with the assurance that their incomes were certain and regular and under a promise of a ready resale market at a price only a few points less than par. Both these promises were broken during the depression of 1929. The resale market was the first to disappear. In many instances, preferred dividends were omitted.[1] Good will created under promises such as these quickly, then, became ill will. Foreseeing this possibility, the late Dean Heilman in 1925 sounded this note of warning, "No utility should embark on a program of customer ownership unless it is reasonably certain that it will be able to maintain dividends on the stock, *under any circumstances which may*

[1] At the end of 1938, the Securities and Exchange Commission reported on 177 operating electric companies of registered holding companies, showing 49 of them to have preferred stock dividend arrearage. The amounts of arrearage ranged from a few dollars to a high of $49 per share for the Central States Power and Light Corporation, a subsidiary of Utilities Power and Light Corporation.

conceivably arise."[1] In truth, the addition to capital structures of preferred stocks sold to customers "in a very real sense transforms dividends into fixed charges," a result of doubtful merit ofttimes.

The final purpose of customer ownership, the further thinning of the ratio of control investment to total investment, can never be defended. By a high percentage of total securities in bonds and non-voting stocks, it had become possible for the Insull family to dominate completely a 3-billion-dollar empire by a less than 10 per cent investment. Other examples of thinner equities can easily be found.[2] Since it was this third objective which was the most important in the minds of utility leaders, it is just as well that customer ownership as it was shown in the 1920's is now gone for good. The depression, then

TABLE 24.—CUSTOMER OWNERSHIP*
(Electric utilities)

Year	New stockholders	Shares sold	Value of securities sold
1914	4,044	92,310	
1916	3,681	38,183	
1918	5,186	42,388	
1920	53,063	454,139	
1922	156,174	1,450,707	
1924	294,467	2,478,165	$194,200,000
1926	248,867	2,686,187	246,900,000
1927	249,491	3,581,206	240,000,000
1928	202,380	2,081,070	170,000,000
1929	87,498	1,447,853	145,000,000
1930	115,013	1,671,616	135,000,000
1931	... ...	.....	159,000,000
1932	.. . .	.....	18,000,000
1933	.. ...	.. ..	375,000

* Report of Customer Ownership Committee of National Electric Light Association, abstract in *Public Utilities Fortnightly*, **8**:557, Oct. 29, 1931; and *Electrical World*, **111**:93, Jan. 14, 1939.

the Securities Act, and finally the prohibitions of house-to-house sales by the Holding Company Act of 1935 have combined to make it but a passing incident in the history of public utility finance.

FINANCING, 1930–1936

Public utility financing during the years 1930 to 1936 had two outstanding characteristics. First, there was an almost complete disappearance of equity financing; and, second, there was an overwhelming

[1] *Op. cit.*, p. 16. (Italics ours.)
[2] See illustrations in Chap. XXIII.

prevalence of refunding operations to the practical exclusion of new issues. According to Table 22, sale of stock to both institutional investors and the public declined from $792,051,262, or slightly over half of total electric utility financing in 1929, to zero for the years 1934 and 1935. This decline is probably attributable, first, to the depression, which removed the need for expansion and which for a time practically destroyed any market for stocks; and, second, to the Securities Act of 1933, which slowed all financing until uncertainty about its interpretation could be removed. The utilities were caught especially overexpanded by the depression of 1929. For the preceding 10 years, the annual rate of growth in the electrical industry had been approximately 10 per cent. Therefore, regularly each year, plans were laid for capital improvements in the coming year or two, and the flotation of new securities to cover those expenditures was of necessity begun in advance of construction. When the depression broke in the fall of 1929, President Hoover asked the leading industries to carry into 1930 their capital expansion programs as planned. The electrical utilities responded to this request and borrowed as a consequence in 1930 about 900 million dollars of new capital.[1] Production, on the other hand, declined steadily from the then all-time peak of October, 1929; and therefore the need for major plant additions disappeared until sometime in 1937. It followed, of course, that new security issues would practically disappear (see Table 25).

The reasons for the tremendous volume of refunding that took place in the 1930's are not difficult to discover. Maturity dates on many outstanding issues were being reached; and because of declining interest rates, the stage was set for reduction of costs on both callable and maturing issues through refunding operations. The former was largely responsible for refunding during 1932, 1933, and 1934, as prices were then too low for call financing; but the latter was more significant in the refundings of 1931 and 1935. The peak years with respect to refunding were 1934 and 1935, with such operations representing 98.1 and 97.5 per cent, respectively, of total public sales of electric utility securities in those years (see Table 25). Significant savings were affected by the refinancing of these years. The average interest rate paid on bonds called in 1935 was 5.14 per cent, and the average new money rate was 3.93 per cent.[2] Of course, because of the necessity of paying call premiums and other expenses, the net savings averaged

[1] It is probable that their program for 1930 construction was too far advanced to have been materially curtailed.

[2] WATERMAN, *Public Utility Financing*, 1930–1935, pp. 492, 493, Michigan Business Studies, Vol. 7, 1936.

considerably less than a comparison of the foregoing interest rates would indicate. Preferred stock calls by two companies were also made during 1935 at a premium expense of $1,528,170; nevertheless, an annual saving of $204,251 in preferred stock dividends was created.[1]

TABLE 25.—ALLOCATION OF PUBLIC SALES OF ELECTRIC SECURITIES*
(Not including stock rights and warrants)

Year	New capital		Refunding		Total issues
	Amount	Per cent of total	Amount	Per cent of total	
1924	$759,399,092	77 3	$ 223,021,708	22 7	$ 982,420,800
1925	726,958,210	74 0	255,264,800	26 0	982,223,010
1926	757,870,107	65.8	393,094,875	34 2	1,150,964,982
1927	830,439,960	47 6	913,194,740	52.4	1,743,634,700
1928	599,808,500	48 5	637,411,952	51.5	1,237,220,452
1929	624,174,000	70 8	257,602,000	29 2	881,776,000
1930	894,473,434	68 9	403,061,600	31.1	1,297,535,034
1931	424,163,000	35 9	758,741,000	64.1	1,182,904,000
1932	165,727,800	40 9	239,112,000	59 1	404,839,800
1933	6,812,500	12 7	46,912,500	87.3	53,725,000
1934	2,430,800	1.9	128,744,200	98 1	131,175,000
1935	26,496,111	2 5	1,041,174,589	97 5	1,067,670,700
1936	59,727,053	4 5	1,272,213,110	95 5	1,331,940,163
1937	81,983,646	12 7	563,698,748	87 3	645,682,394
1938	121,156,482	12.6	840,949,185	87.4	962,105,667
1939	16,219,000	1 6	976,128,000	98.4	992,347,000

* *Electrical World*, **111**:117, Jan. 14, 1939; **113**:117, Jan. 13, 1940.

The results of the refinancing of this period are significant. In the first place, the lower interest charges on refunding issues substantially reduced fixed charges. As a result, the credit position of refinanced companies was improved by this reduction. It followed, too, that reduced fixed charges improved the earning position of preferred and common stocks. Finally, some loss of earnings was experienced by institutional investors. On the other hand, one of the factors contributing to the success of refinancing was the necessity on their part for reinvestment of surplus funds. Acceptable securities were scarce generally; therefore utility issues were very much sought after.

To summarize, it is evident that most of the financing during the years from 1930 to 1936 was concerned with refunding of bond issues. There was, of course, some equity financing by such companies as American Telephone and Telegraph Company and the Edison Electric

[1] *Ibid.*, p. 495.

Illuminating Company of Boston. Preferred stocks were entirely out of the picture during this period, largely because of low earnings and the loss of customer market.

PUBLIC UTILITY FINANCING SINCE 1936

Although the Public Utility Holding Company Act was passed in 1935, it was not until 1938 that there was sufficient utility financing under the act to make any trends discernable. During 1936 and 1937, financing that would have required compliance was generally foregone, and the Securities and Exchange Commission joined the utilities in awaiting the Court's decision in the case of the Electric Bond and Share Company. This period of waiting, however, came to a close on March 28, 1938, when the Supreme Court handed down its decision in the case stating in effect that:[1]

A top holding company and associated public utility companies in a holding company system were held to be within the ambit of congressional authority where they or their affiliates conducted electric operations in a large number of states, some selling energy in interstate commerce, and where the carrying out of intercompany service contracts involved continuous and extensive use of the mails and instrumentalities of interstate commerce.

As Tables 22 and 25 show, for the electrical utilities, financing after 1935 returned to the predepression volume, with this difference—that most of it occurred on the operating company level. After the decision in 1938 in the Electric Bond and Share case, the electric utility holding companies proceeded to register with the Securities and Exchange Commission, and once more the holding company security began to be issued. During the years since 1935, the bulk of the financing has continued to be of a refunding type, and the rates have remained low. For electrical companies in 1939, the total financing of all types amounted to $992,346,900, of which only $16,219,177 was new financing. The analysis of these issues is shown in Table 26.

TABLE 26.—ELECTRICAL UTILITY FINANCING, 1939*

Type of security	Number of issues	Value of issue	Average yields
Mortgage bonds	42	$715,297,000	3 38
Debentures	10	157,033,300	3.54
Notes	1	500,000	
Preferred stocks	8	119,516,600	4.75

* *Electrical World*, **113**:117, Jan. 13, 1940.

[1] 22 P.U.R. (N.S.) 465 (syllabus).

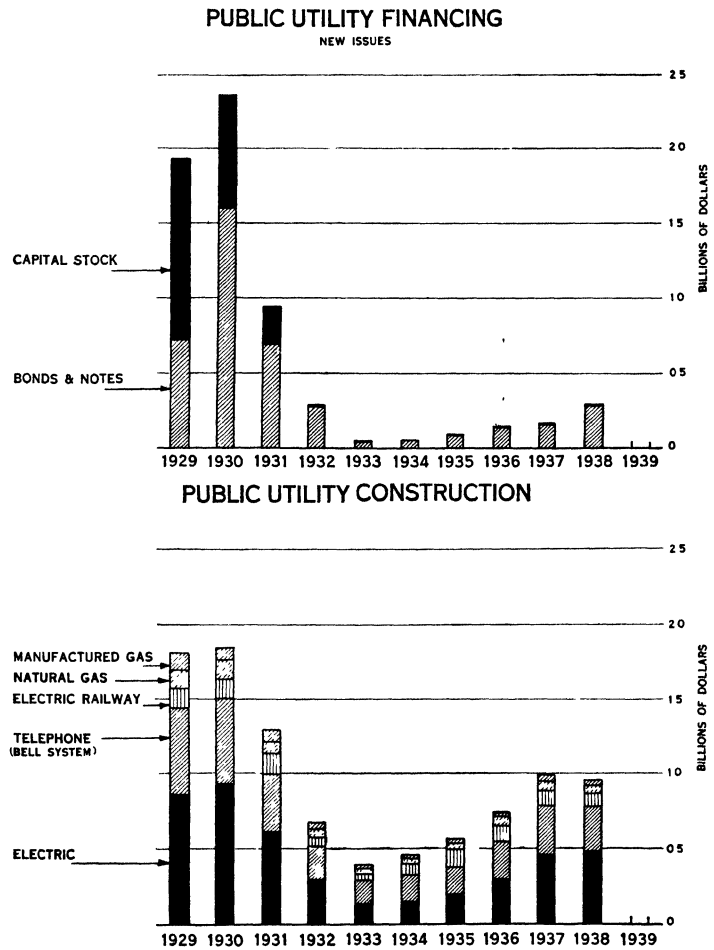


CHART 14.—This chart, prepared by the American Gas Association, shows two important aspects of utility finance. The upper portion shows types of new securities issued. Note that stock issues practically disappeared after 1932. The lower portion shows utility construction expenditures by types of utilities. Observe the importance of the electrical utilities, accounting for approximately half of each year's total.

PRIVATE SALES

One development since 1933 in public utility finance deserves special treatment, namely, the disposal of securities by means of private sale. By this process, utilities arrange with institutional investors to acquire entire issues, thus eliminating the necessity of

registration with the Securities and Exchange Commission. The following figures show something of the importance of this new method. In the years through 1939, a significant portion of all bond issues (commercial and utilities) was privately sold. The estimates for 1940 show a continuation of this, although one authority says,

TABLE 27.—PERCENTAGE OF BOND ISSUES SOLD DIRECTLY TO PRIVATE BUYERS*

Year	Percentage of all bonds	Percentage of utility bonds
1935	16	10
1936	7	12
1937	17	7
1938	39	20
1939	43	29
1940	30	

* MCDIARMID, "Why Private Utility Financing?" *Public Utilities Fortnightly*, **27**: 20–28, Jan 2, 1941.

" . . . there does seem to be a let-up in the trend toward private financing."[1] As an illustration of the importance of this new technique in utility finance, we list some of the largest of these private sales:

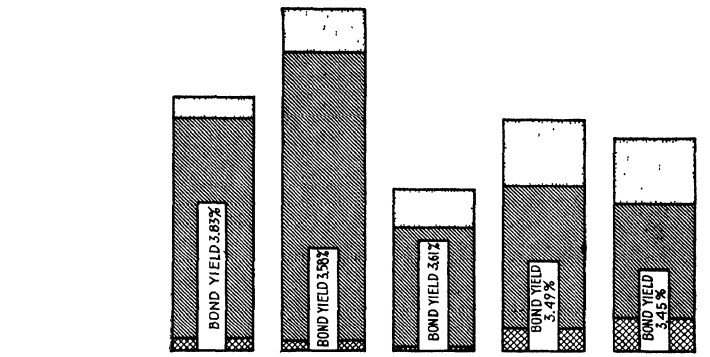
American Telephone and Telegraph Co	$140,000,000
Commonwealth Edison Co	114,500,000
New York Telephone Co	75,000,000
New York Power & Light Co	66,482,000
Carolina Power & Light Co	46,000,000
Southern California Edison Co	30,000,000
Indiana & Michigan Electric Co	22,500,000
Kansas Gas & Electric Co	16,000,000

The alternatives to private sale are negotiations with one or more recognized underwriting firms (such as Morgan, Stanley and Company) and competitive bidding. Although the first of these may be as non-competitive as a private sale, a security issued through either of these channels must be registered with the Securities and Exchange Commission. In this regard, these means of sale differ sharply from the sale by private negotiation which avoids all registration. Considering the latter of these alternatives, competitive bidding, where it has existed, it has been the result of legal requirement and commission order. The Interstate Commerce Commission, after several years of consideration, in 1926 set up the rule of competitive bidding for railroad issues of equipment trust certificates. The first state commission to require such bidding was the New Hampshire Commission, which in 1935 promulgated that rule to cover a refunding bond issue.[2] Other

[1] *Journal of Land and Public Utility Economics*, **16**: 483, Nov., 1940.

[2] *Re Public Service Co. of N.H.*, 12 P.U.R. (N.S.) 408, 410.

agencies to formulate the rule of competitive bidding include the Missouri Commission, the Commission of the District of Columbia, the Federal Power Commission, and the Securities and Exchange Commission. The rule of the Federal Power Commission applies to all securities sales regardless of the degree of bargaining between utility and underwriter. The rule of the Securities and Exchange Commission has had a more restricted application. By commission interpretation,



	Year 1935	Year 1936	Year 1937	Year 1938	Year 1939
Bond issues private sales	$ 53,500,000	$ 41,550,000	$ 12,876,000	$ 96,650,000	$ 141,355,000
Bond issues public offerings	910,658,000	1,194,841,951	521,168,000	584,057,000	469,727,000
Other security issues	84,528,400	176,759,600	130,260,635	272,245,995	267,949,600
	$1,048,686,400	$1,413,151,551	$ 664,304,635	$ 952,952,995	$ 879,031,600

CHART 15.—This chart, prepared by the securities and Exchange Commission, shows securities issues of registered public utilities. Note the importance of private sales and the low average bond rates.

it applies only where security sales involve affiliates and under conditions where there is an absence of arm's length bargaining.[1]

[1] *Northern States Power Co.*, Holding Company Act Release No. 1479, Mar. 20, 1939. Late in 1939, the commission split rather sharply on the problem of a public offering of bonds and stocks of the Consumers Power Company, an operating electric utility in Michigan. Specifically, that company proposed to float through Morgan, Stanley and Company a bond issue amounting to $28,000,000 and to sell its holding company, the Commonwealth and Southern Corporation, common stocks valued at $3,500,000. After protests against these proposed private sales, the majority of the commission approved the sale of the stocks and $18,000,000 of the bonds. The balance of the proposed bond issue was denied, since it represented company earnings previously invested in plant and equipment. Since the commission divided so sharply on this problem, it is likely that it will later issue new and revised rules governing the conditions and terms of security issues where the parties are affiliates.

At the outset, it must be recognized that although competitive bidding has been the rule for disposal of bonds of government and governmental agencies, it has been "the exception rather than the rule" for securities of public utilities.[1] Nevertheless, the problem of private sale or disposal by means of affiliated bond houses is more than an academic one. In fact, it can be said that competitive bidding has no standing whatsoever among the utilities. They prefer either sales through private negotiation or public offerings through an underwriting house, which is sometimes an affiliate. In defense of the first method, it is argued that the avoidance of the registration requirement eliminates significant flotation costs, costs that eventually fall upon the seller. In defense of reliance upon an investment banker, it is said that the capital requirements of utilities are best served by the liaison between the company and an underwriter, who can serve the credit needs of its established client, regardless of the state of the money market. Next, since utility securities are not standardized as are public bonds, close cooperation by such financial agents is required if the best price is to be secured. The final argument for either of these alternatives to competitive bidding is to deny that they have resulted in underpricing. On this point the evidence is not convincing and, historically, to the contrary.[2]

On the other hand, there has been a growing suspicion that the prime reason for the noncompetitive offering lies in its profitableness to the buyers. These fears have prompted the rule of competitive bidding on the part of several commissions. Even a journal sympathetic to the private ownership of utilities has voiced its opposition to private sales. The *Electrical World* has taken the editorial position that it would be to the long-run advantage of utilities to have the widest possible securities distribution. Apparently, this attitude is based upon a desire both for good will and for sales at the highest possible price.

There are both good points and bad points for each method of disposing of utility securities. The experience in the Interstate Commerce Commission shows that, after the requirement of competitive bidding for equipment trust certificates, there were declines in the cost of marketing. To be equally successful in the public utility field, competitive bidding must be limited to as narrow a class of securities.[3]

[1] *Report* of the Special Committee on Public Utility Finance, 1939 *Proceedings* of the National Association of Railroad and Utilities Commissioners, p. 185.

[2] For further defense, see McClintock, *Competitive Bidding for New Issues of Securities*, privately printed by Harriman, Ripley & Company, Inc.

[3] 1939 *Proceedings*, p. 196.

If the competitive bidding requirement can not be limited to one grade of securities but must be extended to all grades of securities issued by all types of public utilities, there is no reason to expect the degree of success experienced in the case of standardized equipment trust obligations or in the case of the high grade bond issues by certain New England utilities.

Thus the author of the *Report* of the Special Committee on Public Utility Finance of the National Association of Railroad and Utilities Commissioners concluded with the observation that "one must not expect too much from competitive bidding."[1] We do not take sides on this question of competitive bidding, although it does seem essential that private transactions should be carefully scrutinized in order to prevent undue price favors to buyers. By all means, utilities should secure the maximum price for their offerings; nothing should be permitted to interfere with that objective.

THE FINANCIAL STRUCTURE OF PUBLIC UTILITIES

At this point, let us stop and analyze the results of 50 years' financing of two of our utilities—telephone and electricity. During the years since 1920, they have passed through, first, a period of wild speculation, second, the worst depression on record; finally, they are now subjected to the strait jacket of federal regulation. Out of these years, the Bell System has emerged with the following structure:[2]

TABLE 28.—CAPITAL STRUCTURE OF THE BELL SYSTEM
(December 31, 1938)

Capital stock:	
American Telephone & Telegraph Co	$1,868,679,400
Premiums	269,975,028
Subsidiaries stock held by public:	
Common	85,798,561
Preferred	42,854,950
Total capital stock	$2,267,307,939
Funded debt:	
American Telephone & Telegraph Co	$ 430,170,700
Subsidiaries consolidated	524,462,035
Total funded debt	$ 954,632,735
Surplus, reserved and appropriated	$ 308,798,096
Total capital (including surplus)	$3,530,738,770

Similar figures have been compiled by the Federal Power Commission for 1937 for classes *A* and *B* electric light and power companies,

[1] *Ibid.*, p. 198.

[2] 1938 *Annual Report* of the American Telephone and Telegraph Company.

representing over 90 per cent of the industry. They are shown in Table 29.

From these two tables, one could conclude that the general financial picture of the telephone and electric utilities is sound although by no means ideal. Less than 30 per cent of Bell System securities is bonds, and the bond-stock ratio for the electric companies is the conventional 50-50 figure. Thus, the heavy bond financing since 1930

TABLE 29.—CAPITAL STRUCTURE OF CLASS *A* AND CLASS *B* ELECTRIC UTILITIES*
(December 31, 1937)

Item	Amount	Percentage of total liabilities	Percentage of total securities
Common stock	$ 4,306,363,835	25.5	32.2
Preferred stock	2,125,431,564	12 6	15.9
Premiums, etc	96,589,989	0 6	0.7
Total capital stock	$ 6,528,385,388	38.7	48.8
Bonds	$ 6,434,202,887	38.1	48.1
Other long-term debt	415,991,560	2.5	3.1
Total long-term debt	$ 6,850,194,447	40.6	51.2
Capital surplus	$ 223,998,297	1.3	
Earned surplus	802,280,641	4.8	
Total surplus	$ 1,026,278,938	6.1	
Total capital (including surplus)	$14,404,858,773		

* Although we do not wish to clutter this book with duplicating data, we feel we must refer to other data where differences exist. The Census of Electrical Industries: 1937, Electric Light and Power Industry, p. 14, gives the following figures for capitalization as of December 31, 1937:

Capital stock	$ 6,572,372,346
Long-term debt	7,380,714,561
Surplus	1,320,399,524
	$15,273,486,431

has not particularly increased the ratio of bonds to total securities, largely because of the preponderance of refunding operations. Yet generalities such as shown above do not tell the entire story. The Public Utilities Division of the Securities and Exchange Commission has made a detailed analysis of 177 operating companies of registered holding companies. The over-all picture for 1938 showed the funded debt of all companies to be 54.57 per cent of net property. Analyzed by companies, however, many of them had much higher ratios. Eighteen had ratios of funded debt to net property in excess of 70 per cent, and 40 had ratios between 60.0 and 69.99. Looking once more to Table 29, showing capital structure of electric companies, the

right-hand percentage column shows long-term debt to be 51.2 per cent of outstanding securities. If the percentage for preferred stocks is added, the total then becomes 67.1, or two-thirds of all securities represented by fixed-income types. The chief conclusion to be drawn, we think, is the constant need for as much equity financing by common stocks as is possible. This is fortified by the fact that 49 of the 177

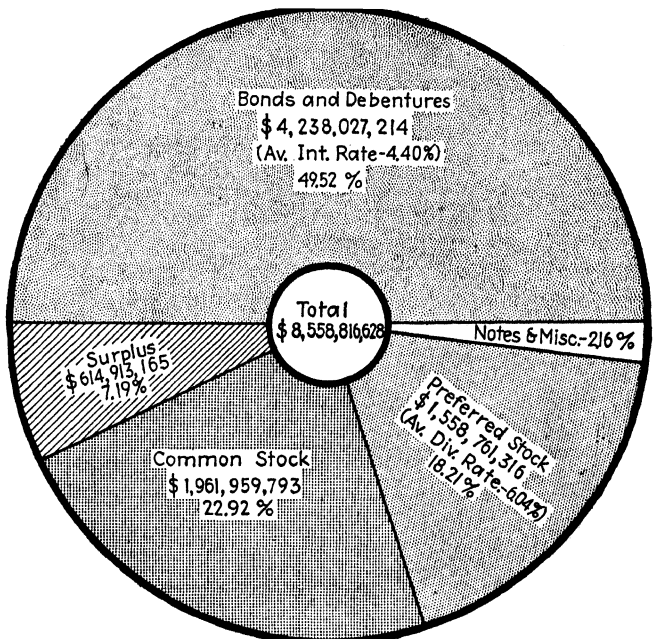


CHART 16.—This chart was prepared by the Securities and Exchange Commission In addition to showing the capitalization of 177 operating utility companies, it sets out the average interest rates on bonds and debentures, and the average dividend rates on preferred stocks. For both groups of securities, these rates are distinctly lower than 10 years earlier. (*Financial Statistics for Electric and Gas Subsidiaries of Registered Public-utility Holding Companies, Year* 1938.)

preferred dividend arrearages, a general evidence of too high a percentage of fixed obligations securities to meet depression periods.

One might well ask, "What is a proper capitalization?" We know of no rule to apply to this question, because any capitalization is a compromise between the extremes of 100 per cent bonds and 100 per cent stocks. If there were no risks at all, the larger the percentage of bonds the lower the capital cost would be and the greater would be the return to such stocks as were outstanding. On the other hand, there are risks, and the higher the percentage of stocks the

more easily depressions and other causes of income decline can be weathered. This type of structure, of course, demands a higher rate of return. Even so, we are inclined to favor financing by stocks if the market will take them, reserving bonds for special and emergency situations.

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LAGERQUIST, WALTER E.: *Public Utility Finance.* (Especially good for period prior to 1928.)

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PART II

THE AGENCIES OF REGULATION

CHAPTER VII

THE LEGAL BASIS OF REGULATION

In the preceding chapters (Part I), we presented the history and fundamental economic principles that relate to the organization, financing, and production of public utility service. We came to the conclusion that, as long as private ownership continues, these industries are best operated as monopolies and under the supervision of the state. Our next general problem, therefore, concerns the legal basis and the available agencies of regulation. Finally, we shall conclude the study of agencies with an analysis of the techniques of control actually in use. Let us begin this second part by inquiring into the legal basis of regulation. Because of the authoritative place of the judiciary in matters of public policy, we must turn to their decisions to discover this legal basis, its origin, extent, growth, and limitations.

THE LEGAL BASIS OF REGULATION

The starting point in this study is somewhere back in the formative period of English common law. During these years, there grew up a series of customs, later given legal sanction, that looked upon certain occupations as having peculiar rights and duties.[1] To these occupations was given the designation of "common callings," and they were said to be "affected with a public interest." To make evasion of these duties more difficult, the English courts accepted the argument that they adhered to the callings not as a matter of contract but as a matter of status. To enter the calling of a carrier, let us say, was to accept all the obligations attaching thereto, nor could they ordinarily be evaded under the guise of special contracts setting one or more of them aside.

The regulation of common callings was naturally carried over into the American colonies. As a segment of general price regulation, maximum rates for carriers and other callings were from time to time adopted by colonial assemblies or other ordinance-making bodies.[2]

[1] These were discussed in detail in Chap. IV and need not be repeated here.

[2] HUNTER, "The Early Regulation of Public Service Corporations," *American Economic Review*, 7:569. Printed in Dorau, *Materials for the Study of Public Utility Economics*, p. 283.

By the turn of the 1800's, most, if not all, of these general price regulations had been swept away. By that time, the older practice of state control, at least of internal economic affairs, had been replaced by a theory of unhampered individualism. It was argued that competition, if left to itself, would produce better results for people generally than the discarded system of state regulation. Of course, it must not be assumed that there were no efforts to regulate the one remaining common calling, the carrier. As Professor Hunter (cited on p. 131) has shown, many of the states continued to regulate carriers, bridge companies, and turnpikes in matters of rates, service, securities, and accounts. Compared with modern regulation, it must be admitted, however, that these efforts were more formal than effective. The history of the carriers and related occupations certainly suggests that public authorities preferred generally to rely upon the force of competition to secure adequate service and reasonable rates. Consequently, there is scarcely a trace of effective public utility regulation prior to the opening of the War between the States.

After that war, and as a result of its consequent economic dislocations, there began to develop demands for the regulation of the railroads. In 1868, there had been added to the Constitution the Fourteenth Amendment, which, in combination with the Fifth Amendment, gave certain protection to private rights. These amendments provide, in short, that no one shall be "deprived of life, liberty, or property, without due process of law."[1] Therefore, all regulatory efforts by state and federal governments could be challenged as violative of this protection; and beginning with the case of *Munn v. Illinois*, every advance step in regulation was obliged to clear this as well as other legal hurdles. As we shall see later, these amendments offer both procedural and substantive protection to persons and corporations alike,[2] although the protection of the latter has not

[1] Fifth Amendment: "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." Fourteenth Amendment: "No State shall . . . 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."

[2] Although the corporation had been given the status of a person as early as the *Trustees of Dartmouth College v. Woodward*, 4 Wheat. 518 (1819), it was not thought originally to be a person within the meaning of the Fourteenth Amendment. Mr. Justice Miller, speaking for the Court in the *Slaughter-House Cases* (83 U.S. 36) in 1873, said that in interpreting the Thirteenth, Fourteenth, and Fifteenth Amendments, " . . . no one can fail to be impressed with the one prevading purpose found in them all . . . ; we mean the freedom of the slave race. . . . " Although he also said that the amendments were not limited to the exclusive protection of the Negro, the whole case implied that only in situations

been without its challengers, the most recent being Mr. Justice Black.[1]

Munn v. Illinois

The first serious efforts at regulation were the various so-called Granger laws of the 1870's, passed by certain Midwestern states to control railroad rates and other related businesses such as grain elevators. These laws were immediately challenged on many points but mainly on the ground that they violated the property protection of the Fourteenth Amendment. In other words, the main question was, "Did this regulation deprive railroads and warehousemen of their property without due process of law?" The test cases on this question are called the "Granger cases"; the leading case is *Munn v. Illinois*.[2] The pertinent facts have been stated in a prior chapter, but they may be reviewed briefly here. The Constitution of Illinois of 1870 had been drawn to permit the regulation of railroads and grain elevators. Under this grant of power, a statute (1871) had been enacted to control these businesses, and a commission created to enforce its provisions. Certain maximum rates for the handling of

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of physical coercion could they be summoned for protection. After this case, the Court rapidly changed its position; and by 1886, we find Chief Justice Waite saying: "The court does not wish to hear argument on the question whether the provision in the fourteenth amendment to the Constitution, which forbids a state to deny to any person within its jurisdiction the equal protection of the laws, applies to these corporations. We are all of the opinion that it does." *Santa Clara County v. Southern Pac. R.*, 118 U.S. 394, 396 (1886). Although one might argue that this quotation applied only to equal protection, not to the due process provision, it is not so generally regarded. Every right under the Fourteenth Amendment applying to persons, except personal political rights, applies equally to the corporate person.

[1] See his dissent in *Connecticut Gen. Life Ins. Co. v. Johnson*, 303 U.S. 77 (1938). For a short account of the forces behind the form of the Fourteenth Amendment and the expectations of it, see Beard, *The Rise of American Civilization*, Vol. II, pp. 111–114. "By a few words skillfully chosen every act of every state and local government which touched adversely the rights of persons and property was made subject to review and liable to annulment by the Supreme Court at Washington, appointed by the President and the Senate for life and far removed from local feelings and prejudices. . . . Thus the triumphant Republican minority, in possession of the federal government and the military power, under the sanction of constitutional forms, subdued the states for all time to the unlimited jurisdiction of the federal Supreme Court."

[2] The Granger cases are: *Munn v. Illinois*, 94 U.S. 113 (1877); *Chicago B. & Q. R. v. Iowa*, 94 U.S. 155; *Peik v. Chicago & Northwestern R.*, 94 U.S. 164; *Chicago, M. & St. P. R. v. Ackley* 94 U.S. 179; *Winona & St. Peter R. v. Blake*, 94 U.S. 180; and *Stone v. Wisconsin*, 94 U.S. 181.

grain were established, and all storage and warehousing concerns in places over 100,000 population (Chicago) were required to secure licenses to do business. The private litigants in this case, Munn and Scott, partners in the grain elevator business in Chicago, refused to conform to the provisions of the law relative to charges and license.

The state of Illinois proceeded to enforce these provisions of its law, and the partners resisted on several grounds, the pertinent one being that they would be deprived of their property without due process of law. The state law was upheld by the Supreme Court of Illinois;[1] and upon appeal to the Supreme Court of the United States, it was again sustained, Chief Justice Waite writing the decision for the majority. From the decision in this and the other Granger cases came the judicial sanction of the regulation of those industries vested with a public interest (public utilities). It was established that it was due process of law for the legislature to curb the economic power of such businesses, the basis of that authority being found in the police power. Of course, as we shall see later, there are definite limits to that power, and efforts to extend it to industries not thought by the Court to be public utilities will be blocked as a violation of due process. Such has been the ruling in several cases.[2]

In the course of the decision in *Munn v. Illinois*, the Court spoke as follows:

> When one becomes a member of society, he necessarily parts with some rights or privileges which, as an individual not affected by his relations to others, he might retain. . . . This does not confer power upon the whole people to control rights which are purely and exclusively private . . . ; but it does authorize the establishment of laws requiring each citizen to so conduct himself, and so use his property, as not unnecessarily to injure another. . . . From this source come the police powers, which, as was said by Mr. Chief Justice Taney . . . "are nothing more or less than the powers of government inherent in every sovereignty, . . . that is to say, . . . the power to govern men and things." Under these powers the government regulates the conduct of its citizens one toward another, and the manner in which each shall use his own property, when such regulation becomes necessary for the public good. In their exercise it has 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, etc., and in so doing to fix a maximum of charge to be made for services rendered, accommodations furnished, and articles sold. To this day, statutes are to be

[1] *Munn v. People*, 69 Ill. 80 (1873).

[2] *Wolff Packing Co. v. Court of Industrial Relations*, 262 U.S. 522 (1923); *Tyson & Brother v. Banton*, 273 U.S. 418 (1927); *Ribnik v. McBride*, 277 U.S. 350 (1928); *New State Ice Co. v. Liebmann*, 285 U.S. 262, P.U.R. 1932B 433 (1932).

found in many of the states upon some or all of these subjects; and we think it has never yet been successfully contended that such legislation came within any of the constitutional prohibitions against interference with private property. . . .

From this it is apparent that, down to the time of the adoption of the fourteenth amendment, it was not supposed that statutes regulating the use, or even the price of the use, of private property necessarily deprived an owner of his property without due process of law. . . . The amendment does not change the law in this particular; it simply prevents the states from doing that which will operate as such a deprivation. . . .

[Following his inquiry into the types of businesses that may be subjected to rate regulation, the Chief Justice concludes:] Enough has already been said to show that when property is devoted to public use, it is subject to police regulation.

From these extracts of the case, it is clear that three questions and an affirmative answer to each were essential to sustain the contention of Illinois. In the first place, may any business ever be subject to the positive restriction of price regulation? The court answered this question in the affirmative. The police power permits such regulation, and therefore the Fourteenth Amendment is no bar. Secondly, under what conditions may the police power be so exercised? The Court made it clear that this power of state regulation could not be applied to business indiscriminately. The answer was found in the old English concept of public interest, by which, under certain conditions, private property became clothed with a public interest and thereby subject to special controls not otherwise valid. Thus, the basis of regulation was public interest, a special area and form of the police power.

With the legal theory of regulation established, the remaining question was one of squaring legal theory and economic fact. Was the business of grain elevation in Chicago by the facts of the case impressed with this public interest? The answer was again in the affirmative. The Court gave a detailed description of the strategic location of Chicago in the channels of wheat movement from field to market. Chicago, and especially the terminal facilities on which the elevators were located, constituted a "bottleneck" through which this movement must pass, and a few elevator operators could and did exact toll from all traffic in wheat moving of necessity through this location.

It is significant that the date of this decision was 1877,[1] four years after the decision in the *Slaughter-House Cases* which had attempted

[1] The case is usually dated 1876, because it was decided in the October, 1876, term of Court; the date of the decision, however, was March 1, 1877.

to limit the general application of the Fourteenth Amendment to the freedman and had defined property in terms of its use value, its title and possession; and liberty in terms of absence of personal servitude and physical coercion. The Munn decision, therefore, was logical because none of the then recognized property rights and liberties had been infringed. Illinois had not clouded Munn's title or taken possession of as much as a single square inch of his land and buildings. Although it is true that it had restricted the use of his facilities by imposing rate limitations on him, Illinois had done so only to offset the economic power that all public interest industries by their very nature possess. Therefore, the Court simply followed the accepted legal theory of its day, adding the element of economic power as a basis of validation of legislative efforts to control certain types of business. Had this problem arisen 20 years later, after the Court had shifted to an exchange value theory of property, the decision, though it might have been no different, might have been more difficult to square with this later theory. As it had been placed in the lawbooks, later jurists rather than overruling it—an embarassing act—were content to define stricter boundaries within which it was an acceptable rule of law.

Once the doctrine of public interest was given legal recognition, the legal basis of regulation was established. As the Chief Justice put it in the Munn case, "Enough has already been said to show that, when private property is devoted to a public interest, it is subject to public regulation." The basis of regulation being established, other questions followed as a matter of logical sequence. Where did final authority rest to make a declaration of public interest—with the legislature or with the judiciary? Next, what were the limits of the regulative authority? And, finally, what were the legally valid agencies by which to accomplish regulation?

The first of these has been answered in part, previously, and can be settled at this point. In the Munn case, the Court inferred its superior position to review legislative declarations of public interest when it said that the status of public interest "may not be made so by the operation of the Constitution of Illinois or this statute, but it is by the facts." If any doubt remained as to the position of the Court in this matter, it was certainly put to rest in 1923 by the following statement of Chief Justice Taft:[1]

> It is manifest . . . that the mere declaration by a legislature that a business is affected with a public interest is not conclusive of the question.

[1] *Wolff Packing Co. v. Industrial Court*, 262 U.S. 522, 536 (1923).

. . . The circumstances of its alleged change from the status of a private business and its freedom from regulation into one in which the public have come to have an interest are always a subject of judicial inquiry.

The second and third questions will be considered in this chapter. Before turning to them, however, our next step is to discuss the theory of the police power, because upon it the whole fabric of regulation has in the past been hung.

THE POLICE POWER

In common with many old and well-established legal and economic concepts, the expression "police power" is difficult to define in precise fashion.[1] Because of this, we are obliged to say, "We can best explain by examples."[2] Examining the cases, we find the following sample definitions:

> In a sense, the police power is but another name for the power of government . . . . (McKenna)[3]
>
> They [police powers] are nothing more or less than the powers of government inherent in every sovereignty to the extent of its dominions. . . . That is to say, [they are] . . . the power[s] to govern men and things. . . . (Taney)[4]
>
> It may be said in a general way that 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 strong and preponderant opinion to be greatly and immediately necessary to the public welfare. (Holmes)[5]

Since none of these definitions suggests the general objects for which the police power may be exerted, we turn to other authority. Freund has defined it as "the power of promoting the public welfare by restraining and regulating the use of liberty and property."[6] If this definition is supplemented by a list of the items for which the public welfare may be promoted—health, safety, morals, and general welfare—it becomes quite complete.

The police power, therefore, may be exercised to restrict the use of private property, provided the objects for which restrictions are created conform to due public purpose. Each case involving this power will be measured in these terms and stand or fall on the degree to which the proposed restrictions relate to the court's concept of

[1] The phrase "police power" first appears in the decision of *Brown v. Maryland*, 12 Wheat. 419, written by Chief Justice Marshall in 1827.

[2] Justice McKenna, p. 406 in 233 U.S., 1914.

[3] *Mutual Loan Co. v. Martell*, 222 U.S. 225, 233 (1911).

[4] *License Cases* (*Peirce v. New Hampshire*), 5 Howard 504, 583 (1847), quoted in *Munn v. Illinois*.

[5] *Noble State Bank v. Haskell*, 219 U.S. 104 (1911).

[6] Quoted in Dodd, *Cases on Constitutional Law*, 2d ed., p. 988.

public health, public morals, public safety, and general welfare. As has been said, "The term police power means nothing as a test of the validity of legislation."[1] Laws that the courts approve fall within the police power; laws that they reject fall outside that power.[2]

The objects of the valid exercise of the police power apply in the following ways to public utilities. A few regulations can be said to be designed to safeguard the public health, morals, and safety. Rules requiring insulation of electric wires, guards and fenders on street cars and motorbusses, the odorization of natural gas are safety measures. Chemical tests of water are health measures. Beneficial as these objects are, however, they scarcely begin to touch the heart of the problem of public utility regulation. It is the fourth object, general welfare, that validates the bulk of police regulation of utilities. This objective, of course, is not subject to brief definition or precise meaning. In fact, any standardization of its content might be a handicap in the future in that it would not be flexible enough to meet new conditions. Thus, general welfare covers a multitude of subjects, though it may by no means be stretched indefinitely and without reason. The best statement of the limits of the police power is to say, in the words of Mr. Justice Holmes, that it includes those things sanctioned by long usage or desired by a dominant segment of the public. Courts generally bow to either of these forces when reviewing legislation. As we proceed, we shall observe that those utility regulations permissible under the police power may only be discovered by a process of trial and error, or, to use the statement of a famous jurist, "With regard to the police power, as elsewhere in the law, lines are pricked out by the gradual approach and contact of decisions on the opposing sides."[3]

[1] *Ibid.*, p. 988.

[2] This power of government is one of three primary powers that operate to interfere with the use of property. The other two are the powers of taxation and eminent domain. All three must be exercised for a public use or purpose, and each must imply a public benefit. Eminent domain action requires adequate compensation to the person from whom property is taken, whereas the police power involves no compensation, although it takes property just as truly as it is taken by eminent domain. Usually, only a fraction of property is taken by the police power, yet it has been used to destroy property completely. [*Mugler v. Kansas*, 123 U.S. 623 (1887).] The taxing power, especially in the hands of the states, seems to be boundless and can be used to take the substance of property without compensation. [*A. Magnamo Co. v. Hamilton*, 292 U.S. 40 (1934).] The dividing line between each of these powers cannot be distinctly marked; consequently, actions based on the police power, for instance, may sometimes be balked on the grounds they are in effect eminent domain proceedings.

[3] Holmes in *Noble State Bank v. Haskell*, 219 U.S. 104 (1911).

Nebbia v. New York

Until the decision in *Nebbia v. New York*,[1] it had become the traditional thing to say that public interest industries were regulated under the police power and, because of the special obligations attaching to the status, subject to limitations quite inapplicable to economic activity generally. Thus, public interest was a special area of the police power, restricted to businesses commonly known as "public utilities," although within that sphere the power was broad and comprehensive. The decision of Mr. Justice Roberts writing the majority opinion in the Nebbia case casts doubt upon the validity of the traditional view. It had been argued before the Court in that case that rate regulation was unconstitutional "save as applied to businesses affected with a public interest," and counsel for Nebbia attempted to show that the business of milk retailing was not one of those so affected. Roberts agreed that "the dairy industry is not, in the accepted sense of the phrase, a public utility."[2] It had no monopoly, possessed no franchise. He then proceeded to analyze the public interest cases, concluding:[3]

> Thus understood, "affected with a public interest" is the equivalent of "subject to the exercise of the police power. . . . "

He then summarized the situation with this statement:[4]

> So far as the requirement of due process is concerned, and in the absence of other constitutional restriction, a state is free to adopt whatever economic policy may reasonably be deemed to promote public welfare, and to enforce that policy by legislation adapted to its purpose.

By this decision, the terms "public interest" and "police power" are made interchangeable, and all the instrumentalities of utility regulation, hitherto thought to apply to utilities (public interest industries) alone, may be extended to any business if such extension is "deemed to promote the public welfare" and reasonably adapted to the end in question. It would appear, therefore, that the police power is still the basis of regulation but that the doctrine of public interest has been broadened well beyond the area of its orthodox application.

From the discussion, it should be apparent that the police power resides in the legislative branch of government; and since it is a part

[1] 291 U.S. 502, 2 P.U.R. (N.S.) 337 (1934).
[2] 291 U.S. at 531, and 2 P.U.R. (N.S.) at 349.
[3] 2 P.U.R. (N.S.) at 350.
[4] 2 P.U.R. (N.S.) at 352.

of that thing called "sovereignty," it "exists in the legislature without any explicit grant or reservation of it in the constitution."[1] Its only limitations are those marked out for it in the many cases in which it has been defined and analyzed. Under our dual system of government, the question is often raised whether or not the Congress possesses police powers, and the usual answer is that it has none, except as may appear in the exercise of its specifically delegated powers. Within the areas of these delegated powers, and the implied powers attaching thereto, Congress does have, in fact, as much authority of control and regulation as the states have in their own jurisdictions under the doctrine of the police power. The police power may usually be exercised by one important creation of the legislature, the municipal corporation. Since this is a subordinate agency of the state, it may exercise only those powers specifically delegated to it and only under the conditions prescribed in the grant of authority. Therefore, a legislature, unless restricted by its constitution, may alter, amend, and modify at any time and for any reason this grant of power. Until the movement set in after 1907 for the creation of state utilities commissions, the governing bodies of municipalities were the major agencies through which the police power was made effective.

THE AGENCIES OF REGULATION

Direct Regulation.—The right of regulation having been established, the next problem concerned the proper agency or method to enforce whatever statutes had been enacted. The earliest regulation of the railroads, except for an occasional inactive commission, consisted of [direct legislative prohibitions] of certain practices such as rebating, passes, and other discriminations, particularly charging less for a long haul than for a short haul. Rates were often fixed by statute, as in Nebraska, Minnesota, Iowa, Wisconsin, Illinois, and other states. The 2-cent maximum passenger fare of the pre-World War days was found generally on statute books. New York, for instance, in 1905 and 1906, enacted laws limiting the price for gas of a specified heat value to the municipality of New York City to 75 cents a thousand cubic feet and to 80 cents for private users in the Bronx and Manhattan (boroughs of New York City). This same state has likewise passed statutory prohibition of the use of the service charge form of domestic gas rate.

The weakness of statutory regulation lay in its inflexibility and inadequacy of enforcement. The 80-cent gas law stood the legal test of reasonableness in 1909 but failed when tested in 1921 because of

[1] BLACK, *Constitutional Law*, 4th ed., p. 367, and cases cited.

intervening price increases.[1] The state statutory maximum railroad-freight and passenger-fare laws have been nullified since 1920 by the operation of the Transportation Act of 1920, and this nullification has been sustained by the Supreme Court of the United States.[2] Regulation by statute is too slow and inflexible to meet changing economic conditions. More serious than these is the problem of enforceability. No act of prohibition or direction is self-executory but requires constant vigilance on the part of a responsible public agency. A legislature meets but for short periods and even when in session cannot constitute itself an enforcing body. The history of the 80-cent gas law of New York illustrates the weakness of legislative regulation. Evidence of the failure of the Consolidated Gas Company to observe the statutory candle-power requirements was not allowed as a defense for the continuance of that rate when later the company claimed it to be confiscatory.

Delegation of Regulatory Authority.—Experiences such as these caused legislatures to delegate most of the enforcing powers to various subordinate agencies. The Granger laws of the 1870's, besides prescribing the duties of the railroads and warehousemen, created commissions to enforce the provisions of the laws. For other utilities, commission regulation came much later. Initially, the municipal corporations regulated those utilities operating within their territorial limits, either directly by city council or indirectly by a municipal commission. The power of issuing franchises was likewise given to cities and towns, with certain basic limitations, and this power was often used as a vehicle by which to regulate the recipient corporations.

The creation of agencies to regulate railroads and public utilities was immediately challenged as a delegation of legislative power and therefore unconstitutional. It is a principle of constitutional law that a legislature cannot divest itself of its powers, not even in favor of the executive or judicial branches; consequently, the creation of a commission was challenged as an unconstitutional delegation. To this contention, the Supreme Court of the United States gave the following answer:[3]

[1] *Willcox v. Consolidated Gas Co.*, 212 U.S. 19 (1909); *Newton v. Consolidated Gas Co.*, 258 U.S. 165 (1921).

[2] *Railroad Comm. v. Chicago, B. & Q. R.*, 257 U.S. 563 (1922).

[3] *Reagan v. Farmers' Loan & Trust Co.*, 154 U.S. 362, 393 (1894). See also *Railroad Comm. cases*, 116 U.S. 307. "The true distinction . . . is between the delegation of power to make the law, which necessarily involves a discretion as to what it shall be, and conferring authority or discretion as to its execution, to be exercised under and in pursuance of the law. The first cannot be done; to the latter no valid objection can be made." *Field v. Clark* 143 U.S. 649, 693 (1892).

> . . . there can be no doubt of the general power of a State to regulate the fares and freights which may be charged and received by railroad or other carriers, and that this regulation can be carried on by means of a commission. Such a commission is merely an administrative board created by the State for carrying into effect the will of the State as expressed by its legislation.

Thus was the question set to rest. So long as a legislature lays down general provisions or, in other words, establishes a legally acceptable standard of conduct, it may create an administrative body to fit to the ordained law whatever facts that body may find and from this fitting make the proper order or decision.[1] Of necessity, some of the legislative standards are broad and to the layman vague—such as the requirement that rates be reasonable—and, consequently, the discretion of the commission is often broad. Even here, however, the delegation cannot be challenged, although it may seem that the legislative standards are too general to indicate the precise course of conduct expected of the utilities. Since regulation is a phase of civil law, and criminal penalties are rarely applicable, vagueness of standards inflicts no serious liabilities. An injunction issued before alleged damage can occur gives ample protection to utility management. One of the best explanations of the attitude of the courts in this matter is to be found in the ineffectiveness of legislative regulation. To have declared commission and city council regulation an unconstitutional delegation of legislative authority would have been to free utilities from all regulation whatsoever.

Since commissions are created by statute, they possess those powers which have been specifically given or which can be reasonably implied as necessary to enforce their enumerated powers. The right to control depreciation, for instance, may be implied from the power to regulate rates and systems of accounts; the right to control abandonments and extensions may be implied from the power to require adequate service. But it could never be assumed that a commission had jurisdiction over industries other than those specified by law. If a legislature, regardless of its motives, should omit the electric supply business from a list of utilities, that business would continue unregulated until such time as this law was amended to include it.

[1] *Smith v. Cahoon*, 283 U.S. 553, P.U.R. 1931C 448 (1931), furnished an excellent illustration of the principle that law must create a forseeable standard of conduct. In that case, the Court refused to accept the action of the Florida Commission in the matter of the regulation of contract carriers, because the statute had not been drawn so as to specify the special and separate duties of such carriers. See *Stephenson v. Binford*, 287 U.S. 251, P.U.R. 1933A 440 (1932), in which this type of defect had been cured.

Thus it is that the annual reports of state and federal commissions contain recommendations for extensions of power or clarification of existing powers in order that some abuse or practice may be brought under the aegis of regulation. Until the legislature heeds those requests, the commission is powerless to proceed, or at best its authority may be questionable.

On the whole, therefore, it is within the province of state legislatures to create such agencies of regulation for the control of public utilities as they may choose. They may select one or a combination of the following ways: direct control by statute, control by a state commission, or control by municipalities. By and large, the most successful of these methods has been the state commission with state-wide jurisdiction.[1]

JUDICIAL REVIEW

In the argument of counsel before the Court in the case of *Munn v. Illinois*, it had been urged in defense of the elevator operators that the requirements of the Illinois Warehousing Act were unreasonable and therefore unconstitutional. Of course, in 1877, no one doubted the right of the Court to review a legislative declaration of public interest. Failing in the challenge of the validity of the Illinois declaration, the final defense was to allege the unreasonableness of the act in its operation. On this point, the Court said:[2]

> It is insisted, however, that the owner of property is entitled to a reasonable compensation for its use, even though it be clothed with a public interest, and that what is reasonable is a judicial and not a legislative question. . . .
>
> As has already been shown, the practice has been otherwise. In countries where the common law prevails, it has been customary from time immemorial for the legislature to declare what shall be a reasonable compensation under such circumstances, or, perhaps more properly speaking, to fix a maximum beyond which any charge made would be unreasonable. . . . If there are no statutory regulations upon the subject, the courts must determine what is

[1] Because of the American system of government, which splits sovereignty between forty-eight states and a national government, certain of the public utility problems must be dealt with on a national basis. We have several national agencies such as the Interstate Commerce Commission, the Federal Power Commission, the Federal Communications Commission, and the Securities and Exchange Commission. The source of the authority of each of these differs in none of its essentials from that of the state commissions. Likewise, they are subject to the same checks and limitations. Therefore, in this discussion of principles, no distinction between federal and state commissions has seemed necessary.

[2] 94 U.S. at 133, 134.

reasonable. . . . To limit the rate of charge for services rendered in a public employment, or for the use of property in which the public has an interest, is only changing a regulation which existed before. It establishes no new principle in the law, but only gives a new effect to an old one.

We know that this is a power which may be abused; but that is no argument against its existence. For protection against abuses by legislatures the people must resort to the polls, not the courts.

Thus, the Court declined to accept the authority to pass upon the reasonableness of a legislative regulation, thereby confining its position in such problems to a review of questions of *right* of regulation. At this point, it is proper to recall the sharp dissent of two members of the Court. Those justices were squarely opposed to the decision, preferring to make the possession of a franchise exclusive evidence of public interest. They feared that the principle of the case would open business generally to the mercy of legislative control and interference. Although subsequent decisions of the Court did allay this fear, the position of the minority can be understood, because the majority opinion did seem to leave the public utilities to the vicissitudes of legislative fancy.[1]

Before analyzing subsequent cases, it should once more be emphasized that this case stands near the beginning of a period of almost revolutionary change in fundamental legal theory. Between 1870 and 1890, the Court was on the move from the orthodox common law concepts of property, liberty, and due process of law to its present position. Property becomes less the personal use of things and more intangible values in exchange. Liberty shifts from absence of physical coercion to right of access to markets in which exchange values are determined. In fact, liberty and property become so fused as a legal right that their separation has become unnecessary. It follows, then, that the right to seek a market and secure an advantageous price becomes a valuable right to persons, especially public utilities. When these rights have become property within the meaning of the Fourteenth Amendment, would not the position of the Court in the Munn case concerning judicial review necessarily be changed? To permit the doctrine of legislative finality to stand would be to leave unprotected many property rights.

Behind these changes in legal theory lies a shift in the concept of due process of law. These four elusive words are borrowed from English law, having their parentage in the "law of the land" phrase

[1] In passing, it ought to be said that some of the utilities of that day took to heart the suggestion of resorting to the polls for protection, because they played politics in the state legislatures on a scale now impossible.

written into Magna Carta in 1215. Whatever this original phrase may have meant, English jurists came to identify it with a later phrase, "due process of law," and gave to it a purely procedural meaning. Due process protected Englishmen from arbitrary search and seizure by the crown—it gave them rights of trial by jury, defense by counsel, an impartial trial atmosphere not charged with threats and animosities, and a host of other personal safeguards. It was essentially a protection from arbitrary executive acts.

Thus was the notion transplanted to the United States and, before *Davidson v. New Orleans* in 1878,[1] was considered as a guarantee of "due procedure of law." After the Davidson case, the Court begins to look to the substance of the rights to be protected, thereby opening a tremendous area in which the Court could and did afford protection against "arbitrary" legislative interference with private rights. With this change from procedure to substance, the Court began to review legislation from two standpoints. First, Is the procedure adequate? Second, Does the act violate fundamental rights without good reason or—as Commons has phrased it—is there "due purpose of law"? "The *purpose* must be right, as well as the procedure."[2] "Due purpose is not what is or has been, but what *ought* to be the law of the land. . . . Due process is ideal process. . . . Regard must be had to the *substance* rather than the *form*."[3] Under this expanded concept of due process, nothing can escape minute judicial review, unless the Court sees fit to pass it by.

In the light of these changing concepts of property, liberty, and due process, it is not surprising to find the Court receding in this matter of legislative finality in utility rate regulation. When that principle in *Munn v. Illinois* was reexamined, the Court found it not to have been essential to the decision and therefore dictum. Thus, the Court could say later of the Munn case that it contained "no decision as to the extent of [state] control, but only as to the right of control." After several preliminary thrusts at the principle of legislative finality in matters of utility regulation, the Court finally faced the problem squarely in the case of *Reagan v. Farmers' Loan and Trust Company*.[4] There it said, after careful review of the decisions since the Munn case:[5]

These cases all support the proposition that, while it is not the province of the courts to enter upon the merely administrative duty of framing a tariff

[1] 96 U.S. 97.
[2] *Legal Foundations of Capitalism*, p. 341.
[3] *Ibid.*, p. 353.
[4] 154 U.S. 362 (1894).
[5] *Ibid.* at 399. (Italics ours.)

of rates for carriage, it is within the scope of the judicial power, *and a part of the judicial duty*, to restrain anything which, in the form of a regulation of rates, operates to deny to the owners of property invested in the business of transportation that equal protection which is the constitutional right of all owners of other property. There is nothing new or strange in this. It has always been a part of the judicial function to determine whether the act of one party . . . operates to divest the other party of any rights of person or property. In every constitution is the guaranty against the taking of private property for public purposes without just compensation. The equal protection of the laws, which, by the Fourteenth Amendment, no State can deny to the individual, forbids legislation, in whatever form it may be enacted, by which the property of one individual is, without compensation, wrested from him for the benefit of another, or of the public.

Since the Reagan case, the doctrine of judicial review has never been successfully challenged. The courts have continued to reserve to themselves the right to review all legislative and commission findings relative to public utilities. The Fourteenth Amendment, the contract clause, the commerce clause, and the diversity of citizenship clause furnish the way to the federal courts. Thus, the Supreme Court of the United States has the final word in utility regulation; it has the last word in the formulation of public policy. So, as it now stands, the courts review first a legislative declaration of the *right* to regulate, and, following this, they scrutinize constantly the *extent* of that regulation.

ATTEMPTS TO CURB THE JUDICIARY

Various attempts have been made to restrict the scope of judicial review, especially review by the federal courts. One of the first efforts was attempted by the state of Minnesota, when it gave to its railroad commission the right to alter any rate found to be unreasonable and the power to proceed by mandamus to enforce new schedules of rates. Against a claim before the Supreme Court of Minnesota that such an order was confiscatory, that court refused to admit evidence of reasonableness and issued a mandamus. From that body an appeal was carried to the Supreme Court of the United States, which promptly reversed the Minnesota court, saying that its action[1]

. . . deprives the company of its right to a judicial investigation, by due process of law. . . . A railroad commission . . . cannot be regarded as clothed with judicial functions or possessing the machinery of a court of justice.

[1] *Chicago, M. & St. P. R. v. Minnesota*, 134 U.S. 418, 457 (1890).

Minnesota, still convinced of the equity of its position, in 1908 passed a law assessing heavy fines against railroad companies and their agents for failure to obey specified rates regardless of alleged confiscation. Again the Supreme Court of the United States interfered.[1] "The necessary effect and result of such legislation must be to preclude a resort to courts for the purpose of testing its validity." On the basis of the decision in the previous Minnesota case, the Court held the act to be unconstitutional. Note the sweep of the decision:[2]

> We hold, therefore, that the provisions of the acts relating to the enforcement of the rates . . . by imposing such enormous fines and possible imprisonment as a result of an unsuccessful effort to test the validity of the laws themselves, *are unconstitutional on their face*, without regard to the question of the insufficiency of those rates.

To escape a review of the entire proceedings of a utility case, some of the states have attempted to limit review to one of error in law, thereby leaving the finding of facts by a commission, unless grossly in error, undisturbed. Again these efforts were balked and again in no uncertain language. In the Ben Avon case, Mr. Justice McReynolds said:[3]

> In all such cases, if the owner [of a utility] claims confiscation of his property will result, *the state must* provide a fair opportunity for submitting that issue to a judicial tribunal *for determination upon its own independent judgment as to both law and facts;* otherwise the order is void because in conflict with due process clause, Fourteenth Amendment.

The doctrine of the Ben Avon case has withstood all subsequent assault, although there may be evidence of a weakening of position. By a five to four vote, the Court in 1936 again sustained its principle in the case of *St. Joseph Stock Yards Co. v. United States.*[4] There, one point dividing the Court was the propriety of a review of the findings of the Secretary of Agriculture. Dissenting, Mr. Justice Brandeis said:[5]

> I think no good reason exists for making special exception of issues of fact bearing upon a constitutional right.

[1] *Ex parte Young*, 209 U.S. 123, 146 (1908).

[2] *Supra*, p. 148. (Italics ours.)

[3] *Ohio Valley Water Co. v. Ben Avon Borough*, 253 U.S. 287, 289 (1920). (Italics ours.)

[4] 298 U.S. 38, 14 P.U.R. (N.S.) 397.

[5] 14 P.U.R. (N.S.) at 417, 419.

But there is nothing in the text of the Constitution (including the Amendments) which tells the reader whether to constitute due process it is necessary that there be opportunity for a judicial review of the correctness of the findings of fact. . . .

Mr. Justice Stone expressed as follows his reaction to the principle of the precedent involved in the earlier cases:[1]

The doctrine of *stare decisis*, however appropriate and even necessary at times, has only a limited application in the field of constitutional law.

Prior to the enactment of the Johnson Act in 1934, utilities could proceed from any commission hearing into either a federal or state court, there to have the entire case tried over, even to the taking of testimony. In the federal courts especially was this likely to be the result. Any utility that believed a rate order to be confiscatory could apply to a federal district court for a writ of injunction against the issuing body. Such a writ ordinarily was issued, and proceedings begun on the merits of the case. A master would usually be appointed to take testimony and make recommendations to the court. The master might or might not, as he pleased, admit the record of the commission. In a New York Telephone Company case, although the company and the commission consented to the introduction of the commission record, the master of the federal court refused. The next step was for the court to accept or amend the findings of the master. After the court's decision, either party was privileged to appeal to an appropriate circuit court of appeals and thence to the Supreme Court of the United States. Some cases could go immediately from a district court to the Supreme Court.

The controversy of the state of New York with the New York Telephone Company beginning in 1920 illustrates this in-and-out process in the federal courts.[2] In the valuation portion of the controversy, the New York Commission required 3 years' time and collected a record of 25,000 pages. In the federal court, a master began the work anew. He held 710 hearings, heard 609 witnesses, admitted 3,288 exhibits (one of which filled several volumes), collected 36,000 pages of testimony. The time of this revaluation was 4 years. A better illustration of unnecessary duplication and waste of time and money could not be found. Had the appeal been routed through the New York courts, this revaluation would have been omitted, the original

[1] *Ibid.* at 430.

[2] For a detail listing of the steps of this controversy and the hearings and record accumulated up to April 14, 1936, see the Brandeis dissent, St. Joseph Stockyards case (14 P.U.R. (N.S.) 397, 428, 429).

record before the commission being sufficient for an appellate court of that state.[1]

This extensive litigation contrasts sharply with a prediction of a federal judge, who said, following a prolonged contest over city council regulation, "Appeals to the courts will seldom be taken from the findings of such a tribunal" as a state commission.[2] His expectation has hardly been realised. In recent years, ways and means have been studied to find valid techniques by which to confine appeals from commission orders to the state courts. New York, in 1929, created a commission to study its public service commissions law, and among the many items studied was this question of court review. Said its counsel William J. Donovan, "The present [public service] Commission has not once since its creation in 1921 been enjoined by a bill in equity in a state tribunal." The majority report summarized the situation as follows:

> The procedure in the Federal courts which thus permits all the issues in a case to be tried over again before a master, after they have already been presented before the Commission, robs the State tribunals of the right to make determinations upon important local problems which these tribunals should not be required to surrender. Congress should not permit the Federal courts to deprive the people of this State of a determination of their interests by their own courts.

The special commission in its report to the legislature considered ways of correcting the situation; but, as was pointed out, the possibility of valid state legislation to cure the problem was slight.[3]

The Johnson Act

The Johnson Act, passed by the Congress in 1934, is an attempt to meet this problem through federal legislation.[4] It provides that no

[1] See 1930 *Report*, Commission on Revision of Public Service Commissions Law, New York, pp. 28, 155.

[2] Judge McPherson in *Des Moines Gas Co. v. Des Moines*, 199 Fed. 204, 205 (1915).

[3] *Report, supra.* The majority report is found on pp. 28–31, report of William J. Donovan, Counsel, pp. 150–161. This report of the counsel is an excellent exposition of the process of court appeal and the relative merits of state versus federal appeals. Note the decision of the Supreme Court in *Railroad Comm. v. Duluth Street Ry.*, 273 U.S. 625, P.U.R. 1927B 712 (1927), upholding the right of the utility to attack a commission order in the federal court without first taking an appeal to the state courts as provided by the Minnesota statutes. See Whitten and Wilcox, *Valuation of Public Service Corporations*, Sec. 22

[4] 48 Stat. at L. 775, c. 283, 28 U.S.C.A., §41.

federal district court shall take jurisdiction to restrain the enforcement of a state administrative board or commission

> . . . where jurisdiction is based solely upon the ground of diversity of citizenship, or the repugnance of such order to the Constitution of the United States, where such order
>
> (1) affects rates chargeable by a public utility,
>
> (2) does not interfere with interstate commerce, and
>
> (3) has been made after reasonable notice and hearing, and where a plain, speedy, and efficient remedy may be had at law or in equity in the courts of such state.

The success of this act, assuming its constitutionality, in confining appeals from rate disputes to the state courts turns upon the meaning of "reasonable notice" and "a plain, speedy, and efficient remedy."

The constitutionality of the act has been an issue in only one case, and there a lower federal court upheld it in its entirety.[1] All other cases have involved interpretations of the act. In one, a federal district court held that it had jurisdiction because the state law of the state of controversy did not require its municipalities conducting rate hearings to give notice of hearing, although such notice had been accorded as a matter of courtesy.[2] The remaining cases have turned upon the meaning of plain, speedy, and efficient remedy. The Supreme Court of the United States has ruled that conflict in state cases on the question of whether review of commission decisions was legislative or judicial in character gave the federal district court jurisdiction.[3] In another case, the Supreme Court has ruled that a state statute prohibiting use by state courts of the writ of injunction prior to final determination of the controversy is not a plain, speedy and efficient remedy and that therefore the federal district court had jurisdiction.[4] The conclusion seems to be, after review of the cases, that the Johnson Act can be effective only in so far as state judicial codes and practices conform to the interpretations of the lower federal courts and the Supreme Court of the United States. In those states failing so to conform, the act may soon be a dead letter in its efforts

[1] *Mississippi Power & Light Co. v. Jackson*, 9 F. Supp. 564, 7 P.U.R. (N.S.) 236 (1935).

[2] *Mississippi Power Co. v. Aberdeen*, 11 F. Supp. 951 (1935).

[3] *Corporation Comm. v. Cary*, 296 U.S. 452, 12 P.U.R. (N.S.) 161 (1935). Later, a federal district court in Oklahoma ruled that a state supreme court decision settling this question as a judicial review did not oust it from jurisdiction in a controversy begun prior to that decision. *Cary v. Corporation Comm.*, 17 F. Supp. 772, 18 P.U.R. (N.S.) 512 (1936).

[4] *Mountain States Power Co. v. Public Service Comm.* 299 U.S. 167, 16 P.U.R. (N.S.) 235 (1936).

to confine to the state courts appeals from state commission rate orders.

STANDARDS OF JUDICIAL JUDGMENT

So long as the dictum of the Munn case concerning judicial review remained the rule of law, utilities were obliged to look to the legislatures as sole determinants of what was reasonable in matters of rates and service requirements. Judicial review in such situations had been denied them. With the decision in the Reagan case in 1894, the Court assumed the right of judicial review of all claims of unreasonable regulation, thereby making necessary the formulation of some standard of judicial judgment. The bulk of the challenges concerned rates, the allegation being that a proposed rate deprived the utility of property without due process of law, or, in other words, was confiscatory. This raised the questions, "What is confiscation?" "When is an act or order confiscatory?" Since legislatures almost never set up standards of review, the courts have been obliged to develop their own formulas by which to measure allegations of confiscation. Following the Reagan case, almost every significant charge of legislative unreasonableness has turned around the problem of reasonable rates and the prospective return upon the investment of the protesting utility. Therefore it was inevitable that the doctrine of reasonableness should find expression in such a phrase as a fair return upon a fair valuation. This rule was finally formulated in 1898 in *Smyth v. Ames*, in which the Court laid down the following proposition:[1]

> . . . the basis of all calculations as to the reasonableness of rates . . . must be the fair value of the property used . . . for the convenience of the public. . . . What the company is entitled to ask is a fair return upon the value of that which it employs for the public convenience.

Thus, a rule of valuation was the consequence of the reversal of *Munn v. Illinois*. When the Court assumed the right of judicial review of the reasonableness of statutes and commission orders, it was inevitable that the main test of reasonableness would be found in the earnings on the investment. Therefore, in most situations the determination of value becomes the key to a standard of judicial judgment. If a statute or commission order does not deprive a utility of a fair return upon a fair value, it is by that fact reasonable.

SUMMARY

The legal basis of regulation rests on the police power. That power may be invoked to limit the rights of property in the interest

[1] 169 U.S. 466, 546 (1898).

of what the courts regard as public health, public morals, public safety, and general welfare. The police power as applied to public utilities allows more extensive regulation than could be applied to business generally because of "a peculiarly close relation between the public and those engaged in it. . . . "[1] The usual expression of the Court is to pronounce the business to be "vested with a public interest," although the Nebbia case changes sharply the scope and significance of that phrase.

The exercise of the police power is a prerogative of the legislature and the legislature only. This power may not be delegated to subordinate agencies because of the constitutional principle against the delegation of legislative power. The legislature, however, may create such subordinate agencies as it wishes, to enforce proper regulations upon public utilities. This is not a delegation of legislative power, because the subordinate agency is applying the law, not making it. The most effective agencies thus far created are the state commissions with state-wide jurisdiction to handle state and local problems and federal commissions to deal with national utility problems. The powers of a commission are specifically given to it by its creator, the legislature or the Congress. Because of this source of authority, a commission can do only those things which its legislative grant of power specifically permits or which can be reasonably interpreted as necessarily flowing out of the grant.

The right of the judiciary to pass upon the reasonableness of a legislative declaration of public interest has never been questioned. As was said in the Munn case, the facts of the case, not the law of Illinois, made grain elevation in Chicago a public utility. The Court always reserves the right to check a legislative declaration against the facts as it finds them. This was the extent of the doctrine of judicial review from the Munn case until the early 1890's. By that time the Court had broadened materially its concepts of property and due process of law, and therefore it was a logical step to broaden the doctrine of judicial review to include the reasonableness of regulatory efforts. In short, the courts, not the legislatures, mark the limits of regulation, and today they will review any controversy between a utility and its regulating agency. All attempts to limit the substantive protection of judicial review have been blocked in no uncertain language by the Supreme Court of the United States.

With the extension of judicial review, it was essential that a standard of judicial judgment be established by which to measure the reasonableness of regulation. This standard found its expression in

[1] Chief Justice Taft in 262 U.S. 536 (1923).

the reasonable rate rule of *Smyth v. Ames.*[1] Any act was reasonable that did not reduce earnings below a fair return upon a fair value. Thus, it was inevitable that the doctrine of judicial review should lead to a court pronouncement upon the problem of valuation. Without a value there could be no answer to the challenge of confiscation. The problem of valuation, however, belongs to a subsequent chapter. Thus, it should appear obvious that the place of the courts in utility regulation is important—more important than that of the commissions when matters of public policy are involved.

Bibliography

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[1] *Smyth v. Ames* was not the first but the sixth valuation case before the federal courts. It was the first case, however, in which the Court attempted to formulate a clear-cut rule of reasonableness. Whether or not it succeeded in its efforts is, of course, another question.

CHAPTER VIII

THE FRANCHISE AS AN INSTRUMENT OF REGULATION

The means by which public utilities have been brought under the control of the state, in their order of creation are as follows:

1. Direct statutory control.
2. Local (municipal) control.
3. State commission control.
4. Federal commission control.

At any one period of time, a combination of two or more of these may actually be in use. Although direct statutory control as a major means of regulation was soon abandoned, even for railroads, it still continues as a supplement to the newer forms. New York, for instance, forbids the use by gas companies of the service-charge type of retail rate. In fact, the usual public utility is in some way or another subject to all four of these forms of control.

On the other hand, there is a point to setting out the foregoing sequence, because it shows the shift in major emphasis. After direct control by statute had been tried, the municipalities were next handed the task of regulation. They found two ways by which to exercise their power, namely, by enactment of city ordinance and by franchise provisions. Particularly did they rely in the early years of regulation upon the franchise to prescribe the rates and conditions of service of public utilities. For this reason, we begin our study of the agencies of regulation with an analysis of that instrument. Because it has long since ceased to be simply a means of local regulation, we shall present it as a general instrument basic to any form of control.

THE ORIGIN AND NECESSITY OF A FRANCHISE

The usual public utility because of the very nature of its service must occupy and use streets, highways, alleys, and other public property and therefore must secure special permission. This special permit is known as a "franchise" and is quite distinct from the ordinary charter required of all who would operate under the corporate form of business enterprise. The necessity of securing a franchise lies in the fact that no one has a right, except as he secures permission, to make direct use of public property as a scene or place of his occupation.

Therefore, one can do business in such a place not as a matter of common right but only by the grace of the sovereign. Public utilities, therefore, must possess a charter to be; a charter to do (the usual requirements of corporations); and a special permit, or franchise, to use the streets and other public property. It is this third privilege with which we shall be concerned in this and the next chapter.

The legislature is the *source* of the utility franchise, and it may be issued as a special act or under the provisions of a general franchise law. The usual procedure at present is for legislatures to establish general incorporation and franchise laws, leaving to specified state officials the power to grant articles of incorporation and to cities or state commissions the power to grant utility franchises. Because of past abuses, these general laws contain many restrictions designed to prevent the issuance of charters and franchises containing provisions inimical to the public welfare. In short, the *granting* of the franchise to use the streets is generally left to the discretion of city fathers or state commissions, subject to such restrictions as statutes and state constitutions may impose.

The franchise is peculiarly related to the public utility concept because only a business of the public interest status can validly secure permission to occupy public property. If this were not the case, the numbers of persons and firms securing franchises to occupy public property would soon destroy its primary use and purpose. As pointed out, the issuance of a franchise is a legislative privilege; and since only a restricted group of businesses may ask for it—businesses by their legal status subject to a multitude of restrictions and controls —it is logical that such instruments would be "loaded" with many regulatory provisions. It is an established legal principle that any provision or condition that is in itself proper and valid can be stipulated in a franchise. Thus it is that the franchise became an instrument of regulation.[1]

Mr. Justice Brandeis has summarized the essential characteristics of the franchise better than we can state them; therefore we quote from him:[2]

> It must . . . be borne in mind that a franchise to operate a public utility is not like the general right to engage in a lawful business, part of the liberty of a citizen; that it is a special privilege which does not belong to citizens

[1] In 1931, for instance, a federal court pointed out that a municipality could impose, as a condition for use of its streets, obligations that on any other business than a public utility would be entirely beyond its charter powers to require. *Todd v. Citizens' Gas Co.* (U.S.C.C.A.), 46 F. (2d) 855, P.U.R. 1931C 203 (1931).

[2] Dissenting in *Frost v. Corporation Comm.*, 278 U.S. 515, 534 (1929).

generally; that the State may, in the exercise of its police power, make that a franchise or special privilege which at common law was a business open to all; that a special privilege is conferred by the State upon selected persons; that it is of the essence of a special privilege that the franchise may be granted or withheld at the pleasure of the State; that it may be granted to corporations only, thus excluding all individuals; and that the Federal Constitution imposes no limits upon the state's discretion in this respect.

THE HISTORY OF FRANCHISE GRANTS

In the early days of the utilities, common practice was to issue franchises with little regard for the interests of the public. The abuse was particularly flagrant in those cases in which legislatures voted special franchises to railroad, gas, and telephone companies. The consequence was that the recipient corporation often was handed valuable privileges of occupancy of streets and highways and tax exemption. Frequently, these special legislative franchises were perpetual and exclusive. If rates were prescribed, they were initially generously high; and as the years passed, falling prices or improved production methods or both reduced costs so that initial liberality became legal extortion. And these franchises were often inviolate and not subject to revision because, under the doctrine of the Dartmouth College case, they had the status of a contract.

These abuses which tied the hands of generations yet unborn eventually caused a wave of public protest. As a consequence, state constitutions were amended or overhauled, and severe limitations placed first on legislatures and later on municipalities relative to the terms under which utility franchises could be issued. Louisiana, for example, in 1879, adopted a new constitution which went to the extreme of attempting to repeal the monopoly features of all prior charters, railroad corporations excepted. Broad powers of subsequent amendment or repeal of charters were adopted. In general, the ill-used power of the legislatures was materially curbed. Furthermore, city councils were delegated the task of issuing franchises, under general statutory and constitutional limitations, in the hope that local interest would safeguard the public. The problem, however, was not yet entirely solved. The constitutional limitations upon legislatures, though supposed to extend to municipalities, were in fact held not to so extend unless the latter had been specifically included within the restrictions.[1] Eventually, however, the exact powers of the municipalities were discovered through the process of legal trial and error until the possibility of too liberal grants has been practically eliminated.

[1] HALL, *Cases on Constitutional Law*, p. 1720.

In this period of utility development, public sentiment shifted from one of favoritism to one of antagonism. Too many franchises had been sought by speculators to be peddled to the highest bidder. The feeling grew that a franchise carried with it valuable rights and therefore should be issued only for a monetary consideration. California, at one time, required that a franchise be sold to the highest bidder. New York has issued franchises upon a consideration of 3 to 5 per cent of gross receipts as a yearly payment during the life of the grant. The franchises issued by Chicago to its utilities require annual payments of 3 per cent of gross income. Earlier, that city split with its street car companies in a 55-to-45 ratio excess company earnings over 7 per cent. Other methods of compensation have involved specified initial sums and per annum unit payments such as $50 a year per car in operation. Regardless of the form of city compensation, the purpose was the same, namely, the recovery of some of the profits arising out of franchise grabs.

Many other special burdens were introduced in franchises—especially street railway franchises. Free service to the city or city employees, maximum rates, street paving, and street cleaning are but a few of them. In the last analysis, however, the ratepayer ordinarily paid for these burdens. This was soon discovered, especially in the period of rising prices during the first World War, and the conclusion became obvious that such "swollen profits" as might exist could better be eliminated by continuous rate and service regulation. Assuming that either method of recapture is available, the regulatory method has the advantage of cheaper rates.

THE LEGAL STATUS OF THE FRANCHISE

Early in the development of American constitutional law, the Supreme Court of the United States held that a franchise or corporation charter was a contract between the state and its private holder. Any material alteration by subsequent legislation, therefore, would be a breach of contract. Article I, Section 10, of the Constitution provides that

> No state shall . . . pass any . . . law impairing the obligation of contracts. . . .

This provision was the basis of the first decision holding a charter to be a contract, the Dartmouth College case, decided in 1819, Chief Justice Marshall writing the decision.[1] The case involved an attempt on the part of New Hampshire to overhaul and amend the charter

[1] *Trustees of Dartmouth College v. Woodward*, 4 Wheat. 518 (1819).

of Dartmouth College against the will of its trustees. The Supreme Court of the United States stopped the attempted interference by interpreting the college charter to be a contract between the people of New Hampshire and the college trustees. The Chief Justice, in these words, found the consideration an indispensable element to a good contract:[1]

> 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. . . .
>
> This is plainly a contract to which the donors, the trustees, and the crown (to whose rights and obligations New Hampshire succeeds) were the original parties. It is a contract made on a valuable consideration. . . .
>
> The opinion of the Court, after mature deliberation, is, that this is a contract, the obligation of which cannot be impaired, without violating the constitution of the United States.

This doctrine has never been successfully challenged from that day to this, though subject often to vigorous dissent. Its protection was soon extended from eleemosynary corporations to charters and franchises of all kinds.[2]

Justice Story, in a concurring opinion in the case, suggested that the way around the decision in the future was to issue charters subject to the legislative right of subsequent amendment and alteration. This suggestion was quickly followed by the states and is now commonly used in the issuance of charters and franchises. Reservation of the right of subsequent amendment, however, may not be exercised without restraint. As has been said, "The exercise of this power must be reasonable and must have relation to the original nature and scope of the charter."[3] It is unnecessary for our purposes to pursue this question further, since it has many legal complications beyond the scope of an economics discussion. Moreover, and for most situations to be studied, the power of future amendment will not be involved.

WHEN IS A FRANCHISE A CONTRACT?

The question often arises as to the right of a legislative body to contract away any of its police powers. The key to this problem is found in the statement of Chief Justice Waite, that "The contracts

[1] *Ibid.* at 637, 643, 650.

[2] HALL, *op. cit.*, p. 825*n*.

[3] BLACK, *Constitutional Law*, 4th ed., p. 730. In *Greenwood v. Freight Co.*, 105 U.S. 13 (1882), the Court sustained a repeal, under the reservation of such power, of the charter of a railway company in Boston.

which the Constitution protects are those that relate to property rights, not governmental."[1] In a leading case, the Supreme Court of the United States, sustaining an exclusive franchise under a former constitution of Louisiana, added that there was nothing in the possession of a franchise to prevent the state from prescribing and enforcing proper police regulations. It said:[2]

> The constitutional prohibition upon state laws impairing the obligation of contracts does not restrict the power of the state to protect the public health, and public morals, or the public safety, as the one or the other may be involved in the execution of such contracts.

Thus, the term of the franchise and rate provisions are property rights for which contracts may be made, but all attempts to contract away the right to regulate health, morals, and safety involve fundamental powers of government and therefore cannot be suspended. If this analysis is correct, only legislative prohibitions can prevent the bargaining away of most of the basic items of utility regulation, because they involve rights not governmental in nature.

To those who demand logic in legal precepts, this inconsistency on the part of the Court in the matter of contracts suspending the police powers is quite unacceptable. Either all or none of the objects for which the police power may be exercised should be subject to contract. To draw a distinction between a governmental power and a property right (or "proprietary power," as the Supreme Court of Iowa has phrased it[3]) is to create an artificial distinction. One solution would be to recognize a difference between the general police power and the field of public utilities and to create a separate legal fiction by which to justify the regulation of the latter. One writer in constitutional law has made such a distinction, finding the basis of regulation not in the police power but "in the *quasi*-public character of the industries affected."[4] This distinction, although not accepted by the courts, would cure the present inconsistency in the interpretation of the

[1] *Stone v. Mississippi*, 101 U.S. 814 (1879) (lottery case). Here it was argued that a license, issued by the state for consideration, was a contract and therefore could not be abrogated by a succeeding legislature. This position was rejected by a unanimous Court.

[2] *New Orleans Gas Co. v. Louisiana Light Co.*, 115 U.S. 650 (1885). Note the significant omission of the fourth object for which the police power can be exerted, general welfare. At the time this case was decided, this fourth object was not generally recognized by the Court as a proper aspect of that power. This narrower concept of the police power may, therefore, explain why the Court was willing to allow public utility contracts to stand.

[3] *Mapleton v. Iowa Pub. Service Co.*, 209 Iowa 400, P.U.R. 1929B 359.

[4] WILLOUGHBY, *Constitutional Law of the United States*, 2d students' ed., p. 767.

police power. If this modification were to be adopted, then it could be said that none of the police powers could be bargained away. The public utility power, on the other hand, could be so contracted away, subject to proper limitations.

Fortunately, the courts have developed a rule of interpretation of contracts between private parties and the state by which the public interest has been protected. This is the rule of strict construction, first stated in the Charles River Bridge case in 1837, by which all ambiguities are resolved in favor of the public.[1] As a corollary to this rule, nothing is to be read into a franchise. If it is silent relative to certain matters, the courts assume that the legislature made no bargain on those points.

The most significant problem of franchise contracts concerns rates. It was a common practice at one time to prescribe in the franchise a schedule of rates, usually intended to prevail during the life of that instrument. During the years of the first World War, precipitous rise in prices created severe financial distress to many franchise holders, causing them to attempt to increase their prices in excess of the contract rate. From these efforts came a series of cases, which clearly established the principles under which a utility franchise rate was a contract and thus unalterable.[2] For a franchise provision to be construed as a contract, the following conditions must exist[3]:

1. The state constitution or statute must specifically give to the public contracting body the power to make rate contracts,
2. The length of time during which the police power of rate making is suspended must be reasonable.

If either of these elements is missing, the presumption (the doctrine of strict construction) will be that the police power of rate regulation has not been vacated. Likewise, silence in a franchise relative to rates implies the continuance of that power of regulation. In short, any ambiguity or omission is resolved in favor of the public.

If it is established that a franchise rate is a contract rate, no charge of confiscation or extortion can be raised before the courts. "The contract being valid we are not concerned with the question whether

[1] *Charles River Bridge Co. v. Warren Bridge*, 11 Pet. 420 (1837). For a recent statement of the rule of strict construction, see *Central Power Co. v. Hastings*, 52 F. (2d) 487 (1931).

[2] *Southern Iowa Electric Co. v. Chariton*, 255 U.S. 539 (1921). See also *Home Telephone & Telegraph Co. v. Los Angeles*, 211 U.S. 265 (1908); *Railroad Comm. v. Los Angeles R. Corp.*, 280 U.S. 145 (1929).

[3] A further condition may sometimes be essential, namely, a specific reference in a franchise to the statutory or constitutional authorization of rate contracts.

the stipulated rates are confiscatory."[1] From such a situation in periods of rising costs, there is only one escape—appeal for relief to the generosity of the other contracting party, the public. Usually, when a city council has been the other party, it has refused relief, remembering the time not many years previous when it had been balked in its efforts to lower rates by the plea of the sanctity of a contract.[2] The next point of appeal was either to a state legislature or to a public service commission. There utilities found a more sympathetic reception. Several state commissions have raised rates above the contract level, although in one instance a commission was ruled to be without power in that matter.[3] The theory behind this act of generosity on the part of the state is that it is the master of the public contracting party and as such can therefore waive its rights at its discretion. The commission, as a subordinate legislative creation, can be empowered to act for the state in such situations, and the former contracting agent, say a city council, can offer no legal objection to commission decisions in such matters.[4]

In the light of these principles, let us now analyze recent cases involving claims of a rate contract. Twice since 1929, the Supreme Court has been faced with this problem. In the first of these, there was involved an alleged fare contract of the Los Angeles Railway Corporation.[5] Specifically, the point at issue was the right of that company to raise its fare schedule above the 5-cent franchise provision. In the decision, Mr. Justice Butler said:

> It is possible for a State to authorize a municipal corporation by agreement to establish public service rates and thereby to suspend for a term of years not grossly excessive the exertion of governmental power by legislative action to fix just compensation to be paid for service furnished by public utilities. . . . And, in such case, the courts may not relieve the utility from its obligation to serve at the agreed rates however inadequate they may prove to be.

[1] *Georgia R. & Power Co. v. Decatur*, 262 U.S. 432, 438 (1923), and cases there cited; *St. Cloud Pub. Service Co. v. St. Cloud*, 265 U.S. 352. "It may be . . . it undoubtedly is, a case of a hard bargain. But equity does not relieve from hard bargains simply because they are such." *Columbus R. v. Columbus* 249 U.S. 399, 414 (1919).

[2] *Minneapolis v. Minneapolis Street R.*, 215 U.S. 417 (1910).

[3] *Matter of Quinby v. Public Service Comm.* 223 N.Y. 244 (1918). The New York law later was amended to give commission jurisdiction over contract rates. This was later affirmed by the New York Court of Appeals, 232 N.Y. 377 (1922).

[4] *Arlington v. Bay State Street R.*, 224 Mass. 463 (1916).

[5] *Railroad Comm. v. Los Angeles R. Corp.*, 280 U.S. 145, 151, P.U.R. 1930A 1 (1929).

Applying the doctrine of strict construction, Justice Butler found no delegation of authority to California cities to contract for rates and therefore dismissed that contention.

The significant point in the case, however, was the statement that had this rate been a contract when originally specified in a franchise, it had been abrogated under a provision of the California law giving to its commission powers of review of street railway and other utility rates. Twice had the commission considered the reasonableness of the fares of the Los Angeles Railway. These acts of review had canceled the contracts in question. Therefore, we can conclude that otherwise valid and enforceable rate contracts between municipal corporations and utility companies can be set aside by subsequent legislative delegation of the power of rate regulation to a state commission.

The second case involved an alleged rate contract in Texarkana, Texas.[1] The essential point was the contract nature of a provision in the franchise of the gas company of that city, requiring it to maintain at all times a rate no higher than that charged for the same service in Texarkana, Arkansas. In other words, any rate reduction in the latter place was supposed to reduce rates automatically in the Texas city. Since the charter of Texarkana, Texas, reserved to it the continuing power of rate regulation (and thus presumably forbade rate contracts), the question was properly raised concerning the validity of the alleged contract with the gas company. In truth, it would seem that Texarkana, Texas, could *either* continuously regulate gas rates *or* (assuming a defect in its charter provisions) contract for reasonable periods of time for the rate to be charged. The Supreme Court, after examination of the Texas laws and court decisions, found that the "regulatory and contract power may be exercised concurrently in that state," found that a company can be held to the terms of a rate contract *even though the other contracting party (the city) cannot be so bound!* We, therefore, come to the strange conclusion that a contract fixing rates at whatever level may be in force in an adjoining city is not invalid although it was made under a charter prohibiting suspension of the rate-making authority. If these contradictions can be harmonized, it would seem to be only on the assumption that the so-called "contract" was itself an act of continuing exercise of public authority, a logical impossibility.

In the face of these decisions, a summary would appear to be dangerous. Nevertheless, there do seem to be some unquestioned conclusions. None of the police powers relative to public health, morals, and safety may be suspended by contract. Utility regulation,

[1] *Texarkana v. Arkansas La. Gas Co.*, 27 P.U.R. (N.S.) 193 (1939).

on the other hand, would appear to be subject to contract, under certain specified conditions. In cases of doubt as to the existence of the status of contract, courts resolve the doubt in favor of the public. At present, the possibility of contract in matters of utility rates and service has been generally removed by the public service commission laws of most states. This was especially seen in the Los Angeles Railway case. Even in those states in which there is no commission, statutes often forbid contracts. The Code of Iowa, for instance, after reciting the powers of cities and towns to require reasonable rates and service of public utilities, concludes as follows: " . . . and these powers shall not be abridged by ordinance, resolution, or contract."[1]

PROVISIONS OF A GOOD FRANCHISE

The provisions that should properly be included within a good franchise vary according to type of utility, location, and geographic differences and the degree of state commission regulation. Specifically, a requirement that an electric utility trim such trees as interfere with its lines would be meaningless in a gas franchise. A requirement of a street railway that it keep the streets over which it operates free of snow is one thing in Cleveland and quite another thing in Tampa. Likewise a franchise in states having effective commission regulation needs fewer provisions than one in states having no regulation or inadequate regulation. Therefore, this discussion will omit those features arising from differences in utilities and location.

Term.—Historically, two general classes of terms have been specified in utility franchises. The first is the long, or (more rarely) perpetual, term; and the second is the short term. Of recent origin is the indeterminate (or terminable) franchise, or permit, which is designed to remedy the defects of both the short- and the long-term franchises. Discussion of this special franchise is reserved for the next chapter. Earlier franchises were often drawn in perpetuity, or for 99 or 999 years, which in their immediate effect were perpetual. Occasionally, franchises omitted any reference to term. In such a case, one interpretation of law was that the legislative intent was to make the franchise perpetual.[2]

[1] *Code of Iowa*, c. 312, §6143. Iowa is one of those states which leaves to its cities and towns the regulation of public utilities.

[2] "The grant by ordinance . . . is a grant of a property right in perpetuity, unless limited in duration by the grant itself or as a consequence of some limitation imposed by the general law of the State, or by the corporate powers of the city making the grant." Justice Lurton in *Owensboro v. Cumberland Telephone Co.*, 230 U.S. 58, 65 (1913). Citing *People v. O'Brien*, 111 N.Y. 1, 42, and *Detroit v. Detroit Street R.*, 184 U.S. 368, 395, Dillon, *Municipal Corporations* (5th ed.,

The major objection to the long-term franchise has been that under the conditions of its grant, its holders were more or less exempt from effective regulation. Of course, mere perpetual life in itself does not prevent effective regulation, though it did require some litigation to establish that point.[1] It was in those cases in which perpetual life was combined with some essential privilege such as exemption from taxation or contract rates that effective regulation was avoided. In such situations, about all that was left for a state was an action under eminent domain to acquire the property and franchises of the holder. A taking by eminent domain is valid because that action does not impair the obligation of contract; it simply acquires the contract.[2] If this was out of the question, then all that remained was to await the time when the holder needed some form of relief or aid, which then could be withheld until the objectionable franchise provisions were surrendered. Of course, one other way to nullify, at least in part, unwarranted immunities of a perpetual franchise has been to authorize a competing company or, better yet, to establish a competing municipal utility. Because of the strict interpretation of franchises in the matter of exclusiveness, unless there is a specific grant of exclusive privilege, neither the city nor another private company is barred from entering into competition.[3]

The principal advantage of the perpetual, or long-term, franchise is the ease and cheapness with which its holder can float long-time securities. Bonds maturing at any reasonable time in the future will still be within the lifetime of the company's franchise and are therefore, other things being equal, better buys than those whose maturity dates coincide with or exceed the life of the franchise. In the latter case, the risk is much greater, because assets pledged for

Sec. 1265), says "In the absence of language expressly limiting the estate or right of the company, we think the court correctly held under the legislation and facts that the right created by the grant of the franchise was perpetual, and not for a limited term only." Cited in the Owensboro case, *supra*. Even the expiration of the corporate life of a franchise holder, if the franchise be transferable, does not terminate a perpetual franchise, because it is property and part of the assets of the expiring corporation which may be sold as any other asset.

[1] *New Orleans Gas Co. v. Louisiana Light Co.* 115 U.S. 650 (1885), and Black, *op. cit.*, p. 717, and cases cited in notes.

[2] *West River Bridge Co. v. Dix*, 6 How. 507 (1848); *Long Island Water Co. v. Brooklyn*, 166 U.S. 685 (1897).

[3] *Vicksburg v. Vicksburg Water Co.*, 202 U.S. 453 (1906). For a most sweeping approval of this point, see *Tennessee Electric Power Co. v. T. V. A.*, 306 U.S. 118 (1939); *Alabama Power Co. v. Ickes*, 302 U.S. 464; and *California Water Co. v. Redding*, 304 U.S. 252.

bonds would be reduced to scrap value in the event of a refusal of public authority to renew the franchise.

In the reaction against the practice of granting franchises of perpetual, or what amounted to perpetual, life, many legislatures amended their laws by specifying maximum terms controlling future grants. Iowa, for example, in 1897 provided a maximum of 25 years and specifically forbade the perpetual term.[1] Other states fixed 20-, 25-, and 30-year limits. In some states, constitutions were amended to forbid franchise terms beyond specified lengths. Whether the term is 20 or 30 or even 50 years, it is usually called a "short-term" franchise.

The prime advantage of the short-term franchise has been that, when it eventually expired, unwise provisions hindering subsequent regulation or provisions that became obsolete with changing economic conditions likewise expired. Periodically, there must be a renewal of the franchise, at which time the latest public desires in matters of service standards and obligations could be incorporated. There is a proverbial "new deal" toward which the utility must ever steer its public policy—therefore to the presumed benefit of the public. Furthermore, if in the evolution of public attitudes it seems desirable to switch from private to public ownership, a convenient time to do so is at the expiration date of a franchise—there is no franchise to condemn and no need to purchase the existing private plant. Since the right to occupy the streets expires with the franchise, the company can simply be ordered to vacate the public ways, and the city is thus in a position to set up its own plant and distribution system.[2] At the present time, except in those states having the indeterminate permit, the short-time franchise is the rule.

The main objection to the short-term franchise concerns its effect upon financing. If on the day that a utility receives a 25-year franchise it issues 50-year bonds, it would be obliged to face the risk of a franchise renewal at the halfway point in the life of those securities. That possibility would obviously influence the cost of financing. Also, as the expiration date of a franchise approaches, the uncertainty of renewal may cause curtailed maintenance, poorer service, and inadequate extensions. The history of the street railway has many illustrations of these consequences. We conclude, therefore, that neither long nor short term is without its inherent defects.

[1] *Code of Iowa*, c. 312, §6128.

[2] For a strange decision on this point, see *Geneseo v. Illinois Northern Util. Co.*, 14 P.U.R. (N.S.) 61, and 28 P.U.R. (N.S.) 208.

For this reason, the indeterminate permit seems to be the best choice so long as private ownership continues.

If one must choose, however, between these two terms, we select the short term. A short term, of course, need not be too short; a minimum (except in special situations) should not be less than 25 years, and a maximum life of 50 years is often not too long. The Federal Water Power Act of 1920 allows 50 years as a maximum; and at the end of the period, the license holder is then protected from having his investment reduced to junk by a provision that requires his relicense or the licensing of another private corporation to acquire his property or public acquisition at adequate compensation.

Exclusiveness.—The history of franchise grants shows that many of the early ones were exclusive in nature; that is, they excluded all competition in the area for which each was issued. As a general rule, to be exclusive such grants must have been authorized by law, and the franchise must specify its exclusiveness. Even when a franchise appears to be exclusive, it may sometimes not be so restrictive as might be supposed. For instance, "An exclusive bridge franchise does not forbid a railway bridge,"[1] and a grant of "sole privilege of supplying the city of Mobile with water from Three-mile Creek" was held to be exclusive only as to the source of supply, not the Mobile water supply generally.[2] This narrow interpretation of exclusiveness has permitted public authority later to escape some of the consequences of an exclusive feature, though some of the interpretations obviously are often strained and in direct conflict with the seeming intent of the original grant. From a social viewpoint, however, such construction is quite defensible. Early methods used to procure franchises were notoriously questionable, and it is no wonder, when the full import of such grants was realized, that they were later carefully scrutinized for loopholes.[3]

The exclusive feature fell under the legislative ban at the same time that the issuance of the perpetual, or long-term, franchise was forbidden. The gains from this change, however, are more apparent than real. The advocates of the nonexclusive franchise probably envisioned either public or private competition, previously made

[1] HALL, *op. cit.*, 2d ed., p. 833*n*, citing *Bridge Proprietors v. Hoboken Co.*, 1 Wall. 116 (1864).

[2] *Stein v. Bienville Water Co.*, 141 U.S. 67 (1891).

[3] An excellent illustration of this method of construction, which seems to fly in the face of an obvious intent to the contrary, was the ruling that a city ordinance which provided that a public utility . . . "*shall* charge the following annual water rates" was no contract but subject to subsequent revision. *Rogers Park Co. v. Fergus*, 180 U.S. 624 (1901); cited in Hall, *op. cit.*, p. 834*n*.

impossible by an exclusive grant. It is true that at the turn of the century there were many competing street railway, electric, and telephone companies. Even yet, one finds an occasional competing public and private utility. In general, however, such competition was short lived. It was not the exclusive feature of franchises that explains the monopoly status of public utilities but other factors such as limitation of supply, time, space, and the economic conditions of operation. Therefore, it matters little whether a franchise is exclusive or nonexclusive. The only gains from the latter are the possible effects of threats of public competition.

Rate Schedules.—One of the most frequent provisions found in early franchises was a schedule of rates to be charged during the life of the franchise or for a specified shorter interval. As we have shown above, these provisions often came to have the status of a contract. To illustrate the consequences of rate contracts, let us suppose that in 1910 a 25-year franchise was issued to an electric company specifying the rate to be charged. Suppose further that there can be no questioning the validity of the rate contract. The first 10 years, 1910 to 1920, saw a tremendous upheaval in prices—about 150 per cent, to be exact. The next 10 years saw prices stabilized at approximately 60 per cent above the 1913 level. By 1933, on the other hand, the price level had fallen to an all-time low. What might be the consequences of these price changes? It is quite possible that the company barely broke even in the early years, though in the later years it may, under its 1910 rates, have earned exorbitant profits. Rate contracts for more than a few years (not to exceed 2 to 5) are unfair to utility and public alike. Too much is left to chance; profits or losses turn upon price level and technological changes which obviously are unpredictable.

The general practice, therefore, should be to omit any reference to rate structures, simply specifying that rates be reasonable. Most regulatory agencies now have continuous jurisdiction over rates, thereby making rate provisions unnecessary. If an initial rate is written into a franchise, as most state laws are now drawn, it should be distinctly understood by everyone that it is not binding on either company or public. Immediately after a franchise becomes operative, proceedings could be started to raise or lower that rate, and there could be no pleading that provision was a contract. A good franchise, therefore, need not include a schedule of rates and preferably should not, because the provision is ordinarily not binding and is thus extremely misleading to the public mind. It is quite sufficient to specify that rates shall be reasonable, though even this is unneces-

sary, because that requirement usually has been written into our state utility law.

Service Standards.—In those states having a state commission, there is little need to provide for service standards. If there is no state commission with jurisdiction within municipal limits, some attention to service standards may be necessary. Rather than attempting to anticipate by specific franchise provisions future service standards, a preferable way is to specify that they be adequate, leaving to subsequent ordinances the specification of the type of service desired. Ordinances can more easily be amended than franchises to conform to changing technology.

The experience of the gas and street railway companies with too rigid service standards proves our point. In the early days of the gas industry, its product was used mainly as an illuminant. Gas franchises often specified a product of a certain candle power. With the shift of the industry to the cooking and heating business, old franchise standards were inadequate and often a handicap. At present, some gas franchises specify manufactured gas of a stipulated British thermal unit. With the rapid extension of the natural gas market, a product of twice the richness has been made available to many manufactured gas companies. Where franchises still require the older heat value, they have retarded the introduction of the newer fuel. Similar illustrations exist in the street railway history. Franchises issued in the 1880's sometimes specified horses as the motive power. To prevent a forfeiture of an otherwise valuable franchise on the grounds of failure to observe the motive power requirements, several horse-drawn street cars were operated until well into the 1920's. Such a situation borders on the ridiculous and aptly illustrates the lack of wisdom of minute service prescriptions.

If a franchise is to be flexible and fair to both public and utility, it should simply call for adequate standards. The city council, city commission, or state commission, as the case may be, can then be entrusted with the responsibility of formulating and enforcing proper service standards, amending and adapting them to changing economic conditions and improvements in the arts.

Accounts and Reports.—To make regulation effective, a franchise should have some prescriptions as to accounts and reports, provided these items are not covered in the state public service laws. In those states having commissions, the requirements of accounts and reports are usually left to these bodies. The franchise holder must be required to follow certain accounting procedures. It probably is no exaggeration to say that in the accounting system and its controls

lies the heart of effective regulation. In addition, the utility should be required to file periodic reports showing income and expense and assets and liabilities. These reports should be drawn from the accounts and be an accurate picture of the financial operations of the business. All variants in accounts and reports should be forbidden except as they are properly authorized.[1]

These provisions for accounts and reports are not self-executory and thus must be followed by periodic and adequate audits; otherwise their prescription is worthless. To obtain a reliable audit, a city must be willing to pay the going rate for it. Haphazard or unverified reports made by the utility may or may not be a true picture of the business. Observation convinces us that more often than not such reports do not reflect the true state of affairs and are in themselves of no value to a city council. If the report seems to show no more than a reasonable profit, the usual policy is to "let sleeping dogs lie," thereby permitting a utility that conceals its true state of affairs to go on indefinitely charging extortionate rates. In short, a franchise must be explicit on the matter of accounts and reports. The city, in the absence of a state commission, should then see to it that a proper system of utility accounting is installed, that it is followed without deviation, that reports are made as needed, and finally that comprehensive audits are made annually.

Special Requirements.—As we pointed out above, the profitableness of early franchises soon caused subsequent grants to be loaded in retaliation with many burdens. Street railway franchises granted during the years 1900 to 1910 are notorious for their special obligations. The classic illustration is found in a franchise held some years ago in Pennsylvania.[2] The street railway company there not only paved the entire width of the street on which it laid its tracks (between the tracks and a foot on either side has been the usual requirements) but constructed sidewalks and drains and built and maintained a fence around the public school. Many street railway franchises have

[1] For instance, in an Iowa water company report to its city council for 1938 are to be found at least two items markedly different from the company's books. The report lists depreciation reserve at about $80,000 more than the book total for that account; it lists the surplus at a figure less than the book total of the surplus account by about $80,000. These differences are identical. Although this discrepancy may be explained by saying that it is simply a matter of difference between bookkeeping and reporting, it is far more fundamental. According to the reports to the city, a rate may appear confiscatory; but according to the books of the company, that same rate may be quite reasonable.

[2] *Re Swarthmore*, P.U.R. 1921E 252, 254, cited in Nash, *Economics of Public Utilities*, 2d ed., pp. 298, 299.

required the holder to keep free of snow the pavement between the tracks and a traffic width on either side, furnish free or at reduced fares transportation to city and federal employees in uniform, and sprinkle streets in summer weather. Electrical and gas franchises often called for street lighting and free city hall service; the telephone franchises required free telephones at the police and fire stations and in the mayor's office.

It is now recognized that these special obligations are burdens upon the user and paid by him in his rates. As a substitute for taxation, these special burdens are inadequate because they fall upon the users without regard to their ability to pay. No special objection, however, was raised to special franchise requirements until the period of the first World War. Relief from them often became the difference between bankruptcy and solvency. Although some of these burdens may have been justified, many were not; and the tendency has been to relieve present holders of unreasonable requirements and to omit them entirely from new franchises. If there are "swollen profits" in the utility business, a preferable program is to eliminate them directly through taxation or by rate reductions.

There are certain special obligations, however, that are justifiable. These include requirements such as underground cables in congested areas, use of alleys rather than streets for pole lines, tree trimming, proper street excavations and pavement replacement, meter inspection, and house wiring and pipe installation. If a city has park systems and boulevards, the terms of their use should be minutely specified or prohibited if feasible. These and many other special requirements peculiar to the municipality in question are proper items to be included in a utility franchise.

Municipal Compensation.—In addition to special requirements, taxes were likewise often demanded under the guise of compensation. They took many forms, the more common being: an initial sum; annual sums of specified amounts; annual contributions based on some unit such as cars, poles, miles of line; fixed percentages of gross income; and a percentage of excess net income.[1] Illustrations of these special burdens need not be repeated here, as some were given earlier in the chapter, and the general problem is discussed in detail below in the chapter on taxation.

[1] When these payments have been challenged as violating a statute or constitutional provision concerning taxes, the courts have generally ruled them not to be "taxes" but to be rentals or compensation for the use of the streets. See *Baker v. Montana Petroleum Co.*, 99 Mont. 465 (1935); *Lewis v. Nashville Gas & Heating Co.*, 162 Tenn. 268 (1931).

Whether or not a franchise should carry provisions for municipal compensation depends upon the purpose of the requirement and the philosophy behind it. In so far as utilities occupy the surface and subsurface of streets, they curtail its complete use by the public at large; and in this sense, compensation resembles damages paid for that inconvenience to people. Furthermore, on the basis of "plucking the goose where he squawks the least," such compensation becomes a painless source of revenue and, if it constitutes no more than a moderate utility burden, may be pragmatically defensible.

However special tax contributions may be justified, it must not be forgotten that in the final analysis "the strap hanger pays the bill." Municipal compensation payments are charges against operations and must be covered by rates. Especially in the large city is this an injustice, because there, there is positively no correlation between taxpaying ability and the volume of personal use of utility service.[1] Considered from all angles, our conclusion is that, except to compensate for actual damages to public streets and for real inconvenience to the public, no other compensation provisions should be included within a good franchise.

Municipal Acquisition.—One other feature should be included in all franchises—minute provisions for municipal acquisition. If a reasonable arrangement for purchase can be made, there is seldom any justification for construction of a new plant in the event of a decision to embark upon public ownership. It should cost no more to buy a going plant than to build one, and purchase has certain operating advantages. The main questions to be settled in the provision for purchase are two: first, option periods; second, determination of the purchase price. Both these should be carefully specified in order to guard against "joker" provisions. In the franchise of the water company in Iowa City, Iowa, is an illustration of this kind of joker. The 25-year franchise of the company provides for an option of city purchase. Provisions are made for a board of five appraisers to fix the purchase price, the board to be composed of two representatives of the company, two appointed by the city, and a fifth chosen by the four. The joker lies in an added proviso that four of the five appraisers must agree upon a valuation, a practical impossibility for a board so constituted. All such features should be kept out of a franchise. It is our opinion that every utility franchise should provide for municipal acquisition. The provisions must be carefully drawn; the best type are those which usually are found in the indeterminate permits or

[1] See the senior author's article, "The Actual Taxpayers in 'Taxless' Towns," *Public Utilities Fortnightly*, **11**:458, Apr. 13, 1933.

modeled along the purchase provisions of the Federal Water Power Act of 1920.

THE IMPORTANCE OF THE FRANCHISE

Whatever its provisions may be, and regardless of its source, a franchise is an absolute prerequisite to engaging in the utility business. As we pointed out above, no person or corporation has a right to occupy public streets and alleys for private gain unless he has secured permission from that governmental unit or other agency authorized to extend such permission. Since public utility operation without use of public property is impossible, the franchise becomes the first essential to its existence. So important is it that the courts have devised the legal fiction of day-by-day franchises for those companies still rendering service but whose franchise has expired. Every day that it is not ordered to vacate public property, it is said to have by tacit consent a franchise to continue in business.

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CHAPTER IX

SPECIAL FORMS OF THE FRANCHISE

The preceding chapter has been concerned with the general problem of the franchise, its origin, legal status, and use as an instrument of regulation. During the years, many defects had been found in it; and consequently, several important modifications and variations have been suggested and tried. Of these, we shall discuss the sliding scale, the service-at-cost franchise, and the indeterminate permit. These will be treated as separate items, but any combination of them could be incorporated within a single franchise.

These proposals grew out of several circumstances. In the first place, the ordinary franchise proved an ineffective instrument of regulation. It was entirely too rigid to permit quick adjustment to changing conditions, and it was powerless in itself to command performance. To be effective, some active arm of government must be empowered to enforce its provisions. In the second place, these proposals are based on new concepts of utility service. The sliding-scale and service-at-cost principles were aimed at the elimination, in part, of the speculative nature of the utility enterprise, and the indeterminate permit was designed to bring stability and certainty to utility businesses. Finally, the first two especially were expected to supply an incentive to more efficient operations, thereby meeting one of the greatest weaknesses of regulated enterprise—inefficiency of operation when the competitive spur has been removed.

THE SLIDING SCALE

The sliding scale has been defined as "a form of regulation in which the rate of return which a utility is allowed to earn (or retain from earnings) varies inversely and in some designated ratio with the rates charged the public."[1] This scheme was originated in England in 1855 for gas companies and was simply a limitation of earnings to a maximum level of 10 per cent. The presence of excess earnings was to be the signal for rate reductions.[2] Later, as electricity com-

[1] MORGAN, *Regulation and the Management of Public Utilities*, p. 154.

[2] The early English sliding-scale provisions failed to gain significant rate reductions. See Bussing, *Public Utility Regulation and the So-called Sliding Scale*, Chap. 2.

panies were organized, they were subjected to some type of sliding scale. In 1906 the principle was first tried in the United States by the Boston Consolidated Gas Company. Other cities using plans designated as sliding scale have been Dallas, Texas; Memphis, Tennessee; Rochester, New York; Des Moines, Iowa; Philadelphia; Detroit; and Washington, D.C. At no time has it been extensively used as a means of utility regulation.

The orthodox sliding scale requires agreement between company and public on the following items:

1. A rate base.
2. An initial rate of return.
3. An initial schedule of rates.
4. A schedule of reciprocal changes between 2 and 3.

The Massachusetts legislature provided the following sliding scale in 1906 for the Boston Consolidated Gas Company:[1]

1. A standard rate of 90 cents per 1,000 cubic feet.
2. A standard dividend of 7 per cent on common stock.
3. For every 1-cent reduction in the gas rate, an extra ⅕ per cent return could be paid to common stock.
4. A 10-year life.

A typical arrangement of rates and rate of return for street railways has been as follows:

Rate of Fare, Cents	Rate of Return, Per Cent
Over 7	0
7	3
6	4½
5	6
Under 5	7

"The Washington Plan."—Not all so-called sliding-scale arrangements, however, have followed such a rigid rate and rate-of-return schedule as set out above. A much more flexible program is possible, as the plan used in the District of Columbia demonstrates. Originally agreed to in 1924 after years of conflict and brought to a head by the threat of public competition, its results have been hailed as evidence of the merits of the sliding scale. Under the present agreement, rates are to be reduced in accordance to the following schedule. If earnings exceed 7 but are less than 8¼ per cent of the rate base, half the excess is to be used for reduction; if earnings fall between 8¼ and 9 per cent, 60 per cent is the measure of reduction; if earnings exceed 9 per cent, 75 per cent is the measure of reduction. Thus, in 1935, for

[1] *Ibid.*, pp. 75, 76.

instance, on a valuation of $66,000,000, earnings in excess of $4,620,000 were available for reductions in 1936.

As this agreement has operated, it has resulted in sharp rate reductions. Rates for electricity in the District of Columbia in 1924 were at a 10-cents-a-kilowatt-hour level. By 1926, the average domestic rate level had dropped to 6.78 cents; and in 1934, the average was 3.36 cents. During the 8 years 1926–1934, "domestic prices thus appear to have decreased about 29% in the nation and about 50% in Washington. . . . "[1] The following table shows something of the significant operations of the plan. The savings have amounted to several millions of dollars. In the 10 years ending in 1935, the cumulative annual savings had totaled almost 6 millions, and the effect over these same years was to save customers 37 million dollars.[2]

TABLE 30.—CONSUMPTION OF ELECTRICITY AND AVERAGE REVENUE IN THE DISTRICT OF COLUMBIA, 1926–1933

Year	Average kw.-h. per customer	Average revenue per kw.-h., cents
1926	456	6.7
1927	489	6.1
1928	524	5.8
1929	578	5.2
1930	636	4.7
1931	714	4.2
1932	798	3.8
1933	868	3.7

An Appraisal of the Sliding Scale.—The sliding-scale principle has certain weaknesses. In the first place, its appeal is solely financial. In effect, it measures efficiency of management by one standard—lowness of rates. Such an incentive must be closely watched because it invites skimped maintenance and inadequate service. In the next place, if the orthodox rigid-rate and rate-of-return schedule is used, the initial, or standard, figures must be reasonable, and the ratio of change

[1] *Ibid.*, p. 142.

[2] *Ibid.*, pp. 137, 138. Following the "Washington Plan," there has been placed in operation in Detroit a sliding-scale arrangement for the gas company. Probably its most significant innovation was the discarding of any rate base as of the date of the agreement (1936), substituting an agreed return of $3,500,000. Excess earnings, under the plan, will be returned to customers as cash dividends. For a summary of this arrangement, see the *Public Utilities Fortnightly*, **17**:321, Feb. 27, 1936. For further explanation of the Washington plan, see the article by William A. Roberts, Peoples Counsel, District of Columbia, in *Public Utilities Fortnightly*, **18**:11, July 2, 1936.

must cause neither niggard nor extravagant results. For instance, the Massachusetts arrangement with the Boston company, had its gas rate fallen to 50 cents, would have permitted a 15 per cent rate of return, an excessive figure under any circumstance. The greatest weakness of the orthodox sliding scale lies in its basic assumption of static economic conditions. For instance, if a 10-year agreement is predicated on a 90-cent rate for gas, so long as costs remain relatively unchanged and technological processes are stable, then variations of rates from that base point might be one measure of efficiency. As a matter of fact, neither of these assumptions is borne out in American experience. We conclude, therefore, that the orthodox sliding scale will inevitably be unfair to either company or customer unless it is for very short periods of time. But if frequent revision is contemplated, then the standard service-at-cost franchise is preferable.

When we examine the Washington plan as a sample of the more recent so-called sliding scale, we find that, in reality, it is a service-at-cost plan. Much has been claimed for it as the "open sesame" to the problem of regulation. In truth, it has been very much overrated. Can the rate reductions in the District of Columbia be credited solely to the use of a sliding scale? The answer to this question depends on the degree to which technology has been stabilized in the electrical industry. In other words, if operating conditions remain relatively unchanged during a period of sharp rate reductions, then those reductions might be credited to a sliding-scale agreement. As we quoted above, in the 8 years 1926–1934, residential rates did decline in the District of Columbia about 50 per cent. At the same time, rates in the United States declined about 30 per cent. Although we cannot designate the exact part played by changing technology in the rate reductions in Washington, yet it seems safe to conclude that that factor was more important than the sliding scale. The fact of declining unit cost (the result of changing processes and methods) made possible to a large degree the startling rate reductions in the District. When utilities approach stability in technical processes, spectacular rate decreases will be no longer possible. When that time arrives, will the Washington plan be so widely applauded?[1]

On the other hand, the Washington plan has its merits. It did solve a conflict situation, forestalling the possibility of a competing public electric plant in the District. Any proposal that can restore peace between company and public deserves credit, if only for that fact alone. Even more significant is the demonstration of the elas-

[1] For a critical analysis of the Washington plan, see Ruggles, "Some Aspects of Public Utility Rate Making," *Harvard Business Review*, 13:417, Summer, 1935.

ticity of demand for electric service. Referring to Table 30, it will be noticed that simultaneously with the rate decline from 6.7 to 3.7 cents per kilowatt-hour, annual electric consumption per customer rose from 456 to 868 kilowatt-hours. Even in the worst years of the depression of 1929, the annual consumption figure showed quick response to price decreases. One illustration is an inadequate basis for a complete case, yet these data certainly point to a high degree of elasticity in the demand for electricity. It seems to require a sliding-scale franchise or a Tennessee Valley Authority experiment to force private companies to recognize this simple economic truism. Once this principle is demonstrated, the usual mechanism of regulation ought to be able to apply it without the use of a special franchise.[1]

THE SERVICE-AT-COST FRANCHISE

Almost simultaneously with the migration of the sliding-scale principle to the United States, there appeared in this country the service-at-cost franchise. In 1907, the first of such franchises was issued to the street railways of Chicago. This instrument had as its fundamental purpose the elimination of the speculative element of the utility enterprise, the substitution of assured earnings for possible fortuitous gains and losses. As one writer has said of it, it has been a device to approximate the regulatory ideal of fixing rates to cover no more than the cost of service (including as economic cost a fair return).[2] In addition to being tried in Chicago, the service-at-cost franchise at one time or another has been used in Cleveland, Kansas City (Missouri), Des Moines, Dallas, Boston, Cincinnati, Rochester (New York), Philadelphia, Memphis, and Detroit. The duplication of places in this list and the list for the sliding scale is to be explained by the fact that some franchises included both features.

Judged in its historical setting, the service-at-cost franchise has had its greatest use as a consequence either of conflict between company and public or of the pressure of adverse economic circumstances. In the years prior to the first World War, the street railway had been the constant object of attack because of its apparent profitableness and political participation. When it was caught between the mill-

[1] For all its faults, the sliding-scale principle stands in high favor among students and practitioners. In fact, the public service laws of many states have specifically authorized it. See Public Utilities Act of California, §21; Wisconsin Statutes, §196.11. Such provisions serve one good purpose, namely, they give to commissions and cities a club to be used as a last resort over those stubborn managers who may cling to their "legal" right of refusing to adjust their rates in accordance with public wishes.

[2] MORGAN, *op. cit.*, p. 189.

stones of rising costs and changing rider habits, it found itself denied the usual escape of rate increases. A hostile public insisted upon concessions before it would come to the rescue. One of these became the service-at-cost franchise. Other, and later, illustrations of its use are available. In Washington, D.C., a sliding-scale franchise settled a bitter fight over the electric rates and removed the specter of a public competitor. Since the depression of 1929, electric utilities have considered service at cost as an escape from demands for public ownership. The electric power company in Cincinnati, in 1934, entered into such an agreement. It immediately found it possible to make a sharp rate reduction.[1]

Regardless of how or why the service-at-cost franchise was created, to accomplish its basic purposes it must make provision for equating rates and cost. The exact measures may vary, but in general they will include the following items. Certainly the first six of them must exist if service at cost is to be a reality. These are:[2]

1. Prescription of standards of service and their maintenance.
2. Careful definition of cost.
3. Agreement upon a rate base (valuation).
4. Agreement on a rate of return.
5. Establishment of rate schedules.
6. Provisions for adequate reserves, including:
   a. Reserve for depreciation.
   b. Reserve for contingencies.
   c. Reservoir or stabilization reserve.
7. Provisions for audits and accounts.
8. Provision for municipal purchase.

Service Standards and Cost Supervision.—Service standards and service maintenance must be prescribed in order to guard against skimpy maintenance. This is especially important if the rate is combined with the rate of return, as illustrated above in the discussion of the sliding scale. To gain this objective, franchises should specify or delegate to some agency the power to specify service standards. For street railways, for instance, there must be standards covering frequency of service, types and capacity of cars, rush-hour schedules, car repair, maintenance and replacement, track renewal, and a host of other things. If a franchise does not have this minutiae of standards, they must be defined carefully by a control agency. To be effective, a service-at-cost agreement must leave no substantial margin of dispute over operating costs. Furthermore, standard budgets should be prepared to prevent carelessness of operations. Not only

[1] See *Public Utilities Fortnightly*, **14**:221, Aug. 16, 1934.

[2] MORGAN, *op. cit.*, p. 191.

should management be rewarded for mere lowness of costs, which might have been gained through concealed undermaintenance, but it should be rewarded for operating within budget standards. The latter goal is to be preferred from the standpoint of long-run good service. As conditions change, so can budgets be changed, thereby climinating one major criticism of service at cost, namely, that profits and losses may be the fortuitous result of price changes.

The Rate Base and Rate of Return.—The most controversial point in regulation is Item 3, the establishment of a rate base. Since the amount of the rate base has been the stumbling block to effective regulation, its determination is essential to the use of the service-at-cost principle, and provision is always made for it in that type of franchise. Its solution can be provided for in several ways. The important thing, however, is that some figure on value be agreed upon by city and company alike. A common practice is to establish a value figure as of a certain date—say, January 15, 1941. The cost of all property installed later is added to that sum; all retirements are deducted. No franchise can truly be said to follow the service-at-cost principle unless it has a careful formulation of the process of valuation. Equally important is the fourth item, the determination of a fair rate of return. Either a standard fair rate of return can be prescribed, or else a schedule of fair rates of return, under a sliding-scale method, can be used. Our preference would be a standard rate based upon the actual interest and dividend rates paid by a company on its bonds and stocks. By this fashion, a franchise provision could be geared to move with changes in market rates of return.

Rate Schedules.—The four items described above complete the traditional minimum essentials of service at cost. Yet smooth operations would be expedited by other requirements, especially the second four items set out above. Rate schedules should be established by the franchise. One provision in this regard appears to be especially desirable. Not only should there always be an actual rate schedule in force, but there should be two others—an optional higher rate schedule and an optional lower rate schedule. If such a combination of schedules is always available, then all that need be discussed is the occasion for invoking either the higher or the lower option. Even this need not be a difficult problem, as we shall show below.

Reserves.—In the sixth item, provision for reserves, lies the key to successful operations of the service-at-cost principle. First, there must be made adequate provision for depreciation, and the resulting reserve must be deducted from property values in determining value for rate making. Minute supervision of this problem of depre-

ciation has been necessary because of the scant attention paid to it in the past by utility leaders. Their practices have resulted in understatement of operating expense and overstatement of valuations. Regulation of the reserves for depreciation, therefore, directly affects values and indirectly affects expense.

The Rate Stabilization Reserve.—The second reserve—a barometer, or stabilization, reserve—is the means by which service at cost is made to operate smoothly and through which the cost principle is made effective. One of the problems in the use of service at cost has been to prevent too frequent changes in rates. One year, a schedule might yield a 10 per cent return. Consequently, rates would be reduced. Next year, a lower rate (and changes in economic conditions) might yield only 5 per cent. There might, therefore, be annual changes. In fact, changes might conceivably be made as frequently as monthly. To avoid this, a stabilization reserve should be created. All extra-normal earnings over and above those allowed in a franchise could be credited to it, and against it, all shortages in earnings or losses in operations could be charged. Let us illustrate this. A company has a valuation of a $1,000,000 and an allowed rate of return of 6 per cent. Its normal return would be $60,000 a year. If it earned $75,000, then the excess, $15,000, would be credited to the stabilization reserve. If it earned only $40,000 in some year, then that reserve would be charged for $20,000. Additional provisions should be made for a minimum and a maximum limit to this reserve. For instance, if it were to exceed a stated credit balance of, say, $100,000, a lower rate schedule would be invoked; if it fell below a stated credit balance, say $50,000, a higher rate schedule would be ordered. Thus rate changes would be infrequent; and at the same time, the service-at-cost principle would be applied in an orderly fashion.

The Milwaukee Proposal.—One of the best illustrations of a rate stabilization reserve is contained in the service-at-cost franchise proposed in 1925 for Milwaukee.[1] It would have set up a rate stabilization reserve with an initial credit balance of $700,000. When the balance fell below $350,000, the next higher optional rate was automatically to be placed in use. On the other hand, when the balance exceeded $1,050,000, the lower optional rate became effective, and the accumulations above the original balance of $700,000 were to be transferred to the credit of the city of Milwaukee. For instance, if the figure were $1,200,000, then $500,000 would be transferred to a "city equity" account. This proposal would have been truly an application

[1] For a copy of this proposal, see Glaeser, *Outlines of Public Utility Economics*, Appendix A.

of service at cost; all excess revenues would belong to the city as the representative of the customers. If the program had one specific weakness, it was its failure to provide for restoration by city advance or transfers from the city equity account in the event that the rate stabilization reserve fell below $350,000 and the new rate failed to increase revenues sufficiently to restore the balance in that reserve. Otherwise, the Milwaukee scheme was an excellent expression of the service-at-cost principle. In short, it illustrates clearly the fact that the service-at-cost franchise does not guarantee earnings; it only assures earnings provided economic conditions permit.

Audits and Accounts.—The need for adequate accounts and reports is too apparent to require demonstration. We pass this point by with the comment that a service-at-cost franchise to be effective must have careful prescription of accounts and reports as one part of a machine or mechanism of enforcement.

Public Purchase.—Finally, the provision for municipal or public purchase is not an ingredient peculiar to service at cost. Such a provision should appear in any franchise, and it should be minute and specific. For instance, the exact process should be prescribed—such as stating which accounts shall be closed to a vendee account, the balance resulting therefrom being the sales figure. In event of a dispute over validity of any account, a means of adjudication should be provided in advance. Further discussion of provisions for municipal or public purchase is deferred to the next section.

An Appraisal of Service at Cost.—The first comment that must be made about the service-at-cost principle is that it has never been widely used. Since it removes chances of speculative gain, it is never advocated by utilities, except when in distress or when threatened with the destruction of public competition. Because it proposes to place service on a cost basis, the principle does have merit—it is one device for approaching the goal of regulation. As it has been used, it has the further merit of having been a means of restoring harmony between company and community. Any instrument that has such a record is worthy of careful consideration.

The major weakness of service at cost, a weakness inherent in all quasi monopolies under price regulation, is the possible loss of alert management. Basically, this franchise is a "cost-plus" agreement between public and company; and unless costs are closely supervised and measured against standards, the possibility of their gradual inflation is more real than one might suppose. It was this potentiality that has caused the addition of budget provisions and sliding-scale arrangements to service-at-cost franchises. Assuming that budgets

and sliding scales might succeed in nullifying some of the tendencies to inefficient management, they are not the best of incentives, because they have one appeal only, financial. Success is rewarded in dollars allowed to stockholders—not a very strong stimulant to the "mine run" of employees.

Another weakness of the service-at-cost franchise is the exposure to which it subjects its holders. Designed to remove fortuitous profits from utility enterprises, it has been successful from that standpoint, yet the holders of such franchises have been no less exposed to the risks of economic change. In short, although surrendering certain privileges, utilities have gained no corresponding reduction of their exposure to destructive economic forces. Specifically, the street railway companies operating under service at cost were no more protected from changes in rider habits than other companies having ordinary franchises. It would seem that denial of at least some speculative gain, when such was possible, ought to entitle those businesses to a certain quantum of protection later. Yet no service-at-cost franchise ever promised a public subsidy, and therein lies its greatest inconsistency. We are therefore reduced to the conclusion that service-at-cost franchises have neither widespread use nor theoretic advantages to recommend them as a general means of control of public utilities. Conceived as a means to settle disputes during the early troublesome years of the street railways, and used occasionally for other utilities, the device seems to have lost most of its support. Perhaps the explanation lies in its emphasis upon local control. Whatever of good it has developed can be applied by state and federal commissions, given the proper legislation and utility attitude.

THE INDETERMINATE PERMIT

We now turn to the third of the special forms of the franchise, the indeterminate permit. Previously, it has been mentioned as one of the modifications of the usual form of public utility franchise. At least two other names are given to its principle, namely, the terminable franchise and the revocable franchise, and the word "franchise" is often replaced by the word "permit." Whichever of these possible expressions is used, the same principle is involved. For purposes of this discussion, we chose the phrase "indeterminate permit" because it seems to indicate best the fundamental character of the proposal.

Specifically, the fundamental elements of the indeterminate permit are two. First, it has indefinite, or indeterminate, life. There is no fixed expiration date beyond which its holder has no right to use the streets. Secondly, the permit is terminable by one of two ways,

purchase or forfeiture for nonuse or misuse. The latter method of termination is too rare to consider and may be dismissed without further discussion. Termination by purchase may be acquisition by a municipality (or other public agency) or by a private company designated by public authority. Because the major protection of the public is through provision for purchase, it is important that that feature be very carefully and minutely stated. In this respect, the indeterminate permit differs from most standard franchises.

This type of franchise is found in several of our states. Massachusetts has used it (though not by that name) for many years for street railways. The weakness of the Massachusetts type, however, is that the permit may be revoked at will by the grantor (city council) without compensation. The first thoroughgoing terminable permit law was enacted by Wisconsin in 1907, the same year that a public service commission was created in that state. The Wisconsin law applied generally to all utilities. Oklahoma and Indiana have likewise enacted general indeterminate permit laws. Several other states, Ohio, California, Louisiana, and Minnesota, have passed restricted laws. The principle has been applied by Congress to the District of Columbia and some of the Federal possessions and, in modification, to the water-power licenses under the Water Power Act of 1920.

The restricted use of this franchise is surprising in view of its almost unanimous endorsement. It has been endorsed by officials of the Wisconsin Commission and the National Association of Railroad and Utility Commissioners. A special committee of the Illinois Senate in its report of 1927 give a full summary of endorsements gathered from many states of the union.[1] This committee listened to state commissioners, utility executives, experts, and a host of others, most of whom favored it. The American Gas Association, the American Electric Railway Association, the Investment Banker's Association, the American Bar Association, the National Municipal League, and President Wilson's Electric Railway Committee have all placed their stamp of approval upon it. The uniform Public Utilities Act drafted by the National Conference of Commissioners on Uniform State Laws includes a provision for it.[2]

The provisions of the indeterminate permit are not entirely standardized, though variations are largely in matters of detail. The fundamental provision relates to the term which, as was said above, is indefinite and continues until it is terminated by either forfeiture or

[1] *Report* of the Illinois Terminable Permit Investigation Committee to the 55th General Assembly.

[2] §21–26.

purchase. The franchise is ordinarily exclusive, permitting neither municipal nor private competition. The Oklahoma law forbids exclusive franchises, but the Wisconsin law is exclusive.[1] The latter state, however, permits its state commission to certify a competitive company if the incumbent license holder is not rendering satisfactory service. This is a desirable provision, its effectiveness being shown in Wisconsin where the threat of such competition has been considered sufficient to maintain a high standard of service.

At the introduction of the indeterminate permit, there always exists the problem of converting the existing fixed-term franchise holders to the new basis. Wisconsin made its original law optional on that point, though in 1911 the conversion was made mandatory. This change was approved by the Supreme Court of Wisconsin as falling within the reserved power of the state; but upon appeal, the United States Supreme Court reversed the Wisconsin decision.[2] The general procedure is to permit existing franchise holders to exchange their franchises for indeterminate permits and to require all subsequent franchises to be indeterminate in nature. Considerable controversy may arise as to whether the surrender of the old for the new permit vacates all the provisions of the old or only the term provision. The answer turns on the statute in question. The state may so provide by law that every item of the old franchise is canceled by an exchange for the new.

The authors believe the indeterminate-permit statute should be specifically drawn in the matter of the items to be included and the conditions under which any one of them may be made the basis of a contract. The franchise should be issued by municipalities but only after a state commission has certified the necessity of its issue.[3] In case of an exchange of a term franchise for an indeterminate permit, all provisions and restrictions of the old one in conflict with the new should be automatically void.

The indeterminate permit, if used in a state having a state commission, need be nothing more than a license to occupy the streets,

[1] §196.50 of the Wisconsin law forbids the issuing of a franchise to either a competing privately or a publicly owned utility where the first holder has an indeterminate permit, except as the proposed competitor has been certified by the Public Service Commission. Such a certificate can be issued only upon a showing of public convenience and necessity (discussed in Chap. XII). This provision has been sustained by the Supreme Court of Wisconsin. See *Wisconsin Power & Light Co. v. Beloit*, 254 N.W. 119, 3 P.U.R. (N.S.) 113 (1934).

[2] *Superior Co. v. Superior*, 263 U.S. 125 (1923).

[3] In Indiana, the Public Service Commission is the sole authority to grant public utility franchises. See *City of Huntington v. Northern Ind. Power Co.*, 5 N.E. (2d) 889 (1937). This is not the rule, however, in most states.

alleys, and highways of a given area. But in the absence of such a commission, it should have the many provisions enumerated above for a good franchise. It should especially have general specifications governing extensions of service and maintenance of minimum service standards. Detailed provisions are not necessary, if their enforcement is left to the city or a specially created city enforcement agency.

The second pertinent provision of this franchise is the right of termination by municipal purchase upon notice at specified intervals. There is nothing new in the principle involved, because such an agency of government, if authorized by law to do so, may take by eminent-domain proceedings the property and franchise of any public utility within its jurisdiction. The objections to this older method of acquisition are the time involved in litigation and the uncertainty of jury awards. The indeterminate permit, if properly drawn, avoids these objections. It designates an agency, such as a state commission, to make the valuation, or, better yet, it specifies in detail the method of determining purchase price. No jury need be involved. The Milwaukee service-at-cost franchise (which the voters of that city so unwisely rejected in 1925) prescribed in detail the accounting process for calculating a purchase price. Such detail, of course, requires specification of the rate base, depreciation, disposal of reserves, and other essential items. Any item in dispute, or the final figure itself, may be appealed to the courts for adjudication. The careful prescription of the procedure of municipal acquisition is so desirable that it need not be confined to an indeterminate permit but may well be included in every franchise.

Arguments in Favor of the Indeterminate Permit.—The advocates of the indeterminate permit have advanced many arguments in its favor. We shall merely state them without supporting evidence. The greatest advantage is the elimination of that period of uncertainty which usually arises in the final years of a term franchise. There is no need for the utility to go through periodic supplications for a renewal. Toward the end of a term franchise, extensions will usually be withheld and maintenance skimped because of the possibility that a recalcitrant council or public will reduce the utility property to scrap value. The history of the street railway industry confirms this point. Refunding becomes either impossible or possible only on short-time notes at high interest rates. Bonds may not ordinarily be issued beyond the life of a franchise, so with every renewal comes the expense of refinancing. The advocates of the indeterminate permit maintain that it results in better harmony, improved service, a more complete and extensive service, and lower rates. They insist that

the public interests are fully conserved by this franchise, pointing to the municipal purchase feature as the main public safeguard. What does it matter that the public may not compete with a private company, when it can buy the one in operation as cheaply as it could build one?[1]

Arguments against the Indeterminate Permit.—The few opponents to the indeterminate permit stack their opposition on the point that, in fact, it is a perpetual franchise. Since the vacation of the permit by nonuse or misuse is rare, municipal purchase is the only ordinary available method. Even the authorization of another private company is not an acceptable alternative to the ordinary advocate of public ownership. But the right of the city to acquire a private property, say the opponents, is an empty right, because most cities are bonded up to their debt limits and therefore have no means of acquisition. So the indeterminable permit becomes a perpetual franchise. The weakness of this position is that it assumes that a city bonded to its debt limit would be free to embark in the utility business at the expiration of a term franchise or that significant gains will be had at the periodic renewals of a term franchise. Such is not the case; therefore a franchise, no matter what its term, has no relation to the legal ability of a city to go into the utility business.[2]

A second argument takes the position that it is unfair to require a city to acquire an existing privately owned plant, thereby denying to the city the right to build a new one by which to drive the older one out of business. What is the basis, however, of the assumption that it is cheaper to build than to buy? Facts do not prove this contention, and, furthermore, a going and operating plant often has a higher value to the city than a new one. But more serious than this is the basic assumption of the social desirability of competing plants. This runs counter to the basic premises of utility economics. As we demonstrated in an earlier chapter, competition in the utility business, whether between private or public plants, is socially wasteful and therefore socially undesirable.

[1] One interesting argument for the indeterminate permit was advanced in the Illinois *Report, supra*, as furthering rural electrification. The argument was that Wisconsin had more rural electrification than Illinois because the terminable franchise in the cities and the resulting security of the investment encouraged the urban utilities to extend their lines to a larger extent to the surrounding countryside (pp. 13, 73–79). See the discussion in the chapter on Utility Service in Rural Communities for the fallacy of this argument. There are better reasons why Wisconsin has more electrified farms than Illinois.

[2] In so far as the states have adopted the principle of the revenue bond for publicly owned plants, this limitation set out above does not control. For a further explanation of the revenue bond law, see Chap. XXVIII.

A third argument against the indeterminate permit is that it will hinder the growth of municipal ownership and "home rule" because it centers too much power in the hands of a state commission. The municipal ownership side of this argument was discussed in the first objection. If, in fact, the home-rule movement has been hampered by the indeterminate franchise, such interference may be eliminated. All a municipality surrenders is its right to specify a termination date; nothing more of its power to control franchise provisions need be curtailed. If the home-rule movement is set back by the indeterminate permit, the fault lies not with the permit but rather in the reaction against past unreasonable exercise of the power of franchise grants. An examination of almost any street railway franchise issued before the first World War will show that it was loaded with many burdensome restrictions. Therefore, home rule and the indeterminate permit will harmonize, *if* home rule appears to be a desirable ingredient in the scheme of public utility control.

In the course of the Illinois investigation, a novel objection was voiced by an official of the city of Los Angeles.[1] This witness felt that the indeterminate permit might be a stumbling block to the adjustment of city transportation facilities to economic changes in methods or devices of transport. For instance, suppose that the bus became more economical than the electric street car, and suppose that the car company has an indeterminate permit; how can the streets be cleared of the less efficient agency? He argued that if only a term franchise were involved, the holder could be ordered out of the streets at its expiration date, whereas the indeterminate permit could be eliminated only by purchase. There are two questionable elements in this argument, as was pointed out in the hearings. First, the argument supposes that the less efficient agency could operate indefinitely. If this inefficiency were marked, the chances are that operating losses would soon put the less efficient service off the streets. Secondly, the premise that the appearance of inefficiency and franchise expiration dates approximately coincide is a *non sequitur* assumption. It takes time to demonstrate beyond question the efficiency of a newer service over an older and established agency. Once that fact is established, however, the less satisfactory of two services will soon disappear, franchise or no franchise.

The Superiority of the Indeterminate Permit.—There seems to be no doubt of the economic superiority of the indeterminate permit or of its legal acceptability. On the other hand, it has not been widely used. Two factors probably account for this. In the first place,

[1] *Report*, p. 45.

many state constitutions limit the life of all franchises to a fixed number of years. Strict interpretation of such a provision would destroy a statute authorizing a terminable franchise. Of course, the exact wording is important. As one authority has said of the fixed-term provisions of the Illinois Constitution prohibiting the "irrevocable grant of special privileges," it might not apply to a terminable or a revocable franchise.[1] Likewise, the Michigan Supreme Court has held that a 30-year constitutional limitation did not invalidate an indeterminate permit, although the Court further said: "In the absence of a time limitation in the grant, it must be assumed that it cannot extend beyond the term fixed by the Constitution."[2] This is a liberal and not too conclusive interpretation. If the franchise in question must be renewed every 30 years, then, regardless of its name, it is a fixed-term franchise.[3] A second obstacle to the indeterminate permit has been the traditional fear of monopoly, or "perpetual" monopoly, as it is often called by its foes. In the campaign of June, 1930, against a proposed indeterminate permit for Chicago, its opponents used this line of attack. Screaming billboards labeled the franchise as an Insull perpetual monopoly designed to fetter and shackle the good citizens of Chicago. In many situations, this has been a potent attitude.

THE PLACE OF THE FRANCHISE IN REGULATION

The franchise to use the streets and exercise the power of eminent domain has run the compete gamut of legal interpretation and political juggling. It has passed from the status of an irrepealable contract to that of a right both revocable and modifiable for cause. As an instrument of regulation, even in its most approved form, it will fail unless it is supplemented by a regulatory agency. Coupled with a state commission possessing such powers as will be discussed in the next chapter, the franchise need no longer be a lengthy document filled with minute reservations and restrictions designed to safeguard the public interest. An alert commission can give far more protection than the best of franchises, be they indeterminate or service at cost in nature. Therefore, the notion of a complex contract should be

[1] Exhibit B. *Report*, Illinois Terminable Permit Investigation Committee to 55th General Assembly, p. 6, 1927.

[2] *Peck v. Detroit United R. Co.* 146 N.W. 978 (1914).

[3] In Indiana, the legality of the indeterminate permit law was assailed on the ground that the law authorizing the commission to issue permits violated the constitutional prohibition of special legislative acts creating corporate charters and rights. This challenge was rejected in *William v. Citizens' Gas Co.*, 188 N.E. 212 (1933).

forgotten, and instead we should define a franchise as simply "a permit to use the public streets for the purpose of rendering some public service thereon."[1] Such is, in essence, the fundamental nature of the franchise, and the sooner we recognize this the sooner we shall progress in our American experiment of regulating our monopolistic utility enterprises.

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CHAPTER X

STATE REGULATION

In the history of the regulated enterprises, the first state agency of regulation was a commission, confined more or less to the control of railroads. One of the important results of the Granger movement in the post-Civil War days was the state railroad commission created to enforce the new laws controlling railroad rates, service, and practices. To this new departure in legislation has been given the name "Granger laws." Although centering in the four states of Illinois, Iowa, Minnesota, and Wisconsin, this new development spread to surrounding states, until at the present time only one state in the Union, Delaware, does not have a commission with some jurisdiction over rail facilities. The utilities—gas, water, telecommunications, electricity, and urban transportation—have not had a similar history. Here, state commission regulation came only after a period of local municipal regulation, which, in the main, had failed to accomplish its objectives. With the recognition of the defects of municipal regulation, public opinion turned to state regulation; and once the movement for state commission regulation began, it swept the country like wildfire, subsiding only after more than three-fourths of the states had created commissions controlling some or all of their utilities.

THE WEAKNESS OF MUNICIPAL REGULATION

At their inception, the public utilities were quite unlike the railroads in their operations and areas of service. A gas plant, a waterworks, even a telephone company, when first built, appeared to concern only the municipality that it served. Certainly there were seldom operating connections with adjoining towns and scarcely any financial relations. Both types of ties, financial and operating, came some years later. Therefore, it was very reasonable for state legislatures to delegate to their municipal corporations complete power of control, restriction, and regulation of whatever utilities were to operate within their borders.

Municipal regulation has taken several forms. At first, franchise provisions were relied upon to secure adequate service at reasonable rates. The general power of regulation was delegated to the munici-

palities, and the extent of that authority, in turn, depended upon the contract nature of the franchise. With the growth of the utilities in size and importance, it was soon found necessary to begin the exercise of this power; and in so doing, much litigation was necessary to establish its extent. The usual procedure followed by a municipality was for its governing body—council, city commission, etc.—to exercise directly utility control as one of its several governmental powers. In a few instances, cities have created local public utility commissions of one or more members which were to act in a manner similar to a state commission. City commissions have existed in St. Louis; Kansas City (Missouri); Denver; Los Angeles; and now, with jurisdiction over street transportation, in New York. The general practice, however, was for each municipal legislative agency to retain direct supervision over its utilities.

City council regulation was soon found to be faulty as an effective check to utility action. In the first place, the utility soon outgrew the local area that it initially served. Economic boundaries no longer conformed to political boundaries. Telephone and electric companies bridged the gaps between towns, adding service in the process to the intermediate rural areas. The transportation companies of the larger cities soon found it profitable to extend into the suburban field. City councils often awoke to the fact that, in trying to regulate a utility within their jurisdiction, they were dealing with a unit of a large system, and consequently their actions often involved parts of the system outside their jurisdiction. Thereupon the second weakness appeared. In dealing with a unit of a large system, the council was actually contending with the combined strength of that system. A system usually has a staff of experts to handle its litigation and hearings, thereby often furnishing more than a match for a council. In the third place, the council was a partisan in any issue at stake. Elected by the people to represent their interests, the council approached utility regulation from the view of the people—a sort of public defender, or champion, attitude. At the outset, therefore, it was likely to be prejudiced and biased by whatever local color had developed in the utility problem. Fourth, the job of regulation, to be effective, required constant attention of persons trained in the field of public utilities. How, therefore, could a city council, elected because of general qualifications and meeting but periodically, cope with the problem? Regulation of utilities, furthermore, was but one of many problems confronting a city council; and were a council sitting continuously, it could not give more than a fraction of its time to the subject of regulation. How, therefore, could a local

governing body cope with its local utilities? It could not unless it were willing to pay the cost of experts retained to assist it. This discloses the last weakness of city council regulation. Many councils could not or would not pay the price for retaining such experts. Experts are not needed permanently, only occasionally; therefore the retainer fee becomes no small item. Because of the expense of effective regulation, it is safe to say that no city under 50,000 population can afford its cost. Economy for all sizes of cities practically demanded the creation of a centralized agency which would relieve the cities of the burden of regulation. Other things being equal, the per capita cost of *effective* regulation should be much lower by means of a state commission than by local agencies. If in fact the per capita cost has risen, the cause is not likely to be found in the creation of the state commission but in the utter lack of attempts to regulate in the past. Many councilmen, city commissioners, and city managers have become so convinced of the utter futility of their regulatory efforts that they refuse to spend anything in useless attempts.

Judge Smith McPherson of the United States Federal Court, in 1911 and 1912, during the course of litigation in his court over water and gas rates for the city of Des Moines, made these observations on the efficacy of city council regulation:

> The present expensive chaos should be brought to an end. It is 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.[1]
>
> The ordinance was adopted within a few minutes from its introduction. Quite likely it had been considered by the members in their individual capacities. But in open session it received but little consideration, and without the presence of any one for the gas company. And every member voting to reduce the earnings had a direct personal and moneyed interest in thus reducing the rates. If a judge were to so act, his acts would be absolutely void. . . . This litigation has cost both the gas company and 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 of the expense, would be avoided if Iowa . . . had an impartial and city nonresident commission. . . . Iowa is a laggard in this matter, and will continue as such until these rate makings are taken from the power of city councils. *Appeals to the courts will seldom be taken from the findings of such a tribunal.*[2]

[1] *Des Moines Water Co. v. Des Moines*, 192 Fed. 193, 195 (1911).

[2] *Des Moines Gas Co. v. Des Moines*, 199 Fed. 204, 205 (1912). (Italics ours.) Since this case was written, it has become common practice to pass such costs of litigation back to the consumer. One practice is to charge them as operating expenses in the next few accounting periods following the close of a rate case.

Except for the judge's overoptimism about the ready acceptance of a commission order, he certainly sketched an accurate picture of some of the weaknesses of local council regulation.

THE DEVELOPMENT OF THE STATE COMMISSIONS

In a few states, notably Massachusetts, utility regulation (excluding the railroads) extends back into the past century. In 1885, a Board of Gas Commissioners was created in that state; and two years later, electric light, but not power, companies were added to its jurisdiction. The board was given certain powers over rates and service and also power to prevent competition between like companies, a novel provision at that time.[1] The Massachusetts agency, while not the "weak" type, did not have the authority of a modern commission, and therefore does not mark the beginning of the regulatory movement in an aggressive sense. The real beginning of the strong type of commission came only after the turn of the century and almost simultaneously in several states.

In the year 1907, public agitation and resentment forced the issue of state regulation to the foreground in New York, Wisconsin, and Georgia. In New York, Charles Evans Hughes[2] had been elected governor largely because of his exposé in 1905 of the insurance scandals of New York; and under his vigorous leadership, a state commission was created. The Wisconsin legislature, less dramatic in its enactment but more thorough in form, followed on the heels of the New York law, its action being an item in the liberal program of Robert La Follette. In the same year, Georgia overhauled her Railroad Commission, extending its powers to other public utilities. In New York, a peculiar division was made between the city of New York and upstate New York, the Public Service Commission being organized into a first and second district, one for the city, the other for the rest of the state. In effect, then, a city commission and a state commission were created. Both in Georgia and in Wisconsin, the law simply expanded the powers and duties of existing railroad commissions. It was not until the summer of 1931, for instance, that Wisconsin dropped the old title for the more descriptive one of Public Service Commission.

One may ask, "Why did this legislative program come so many years after the movement to regulate the railroads by state commission?" The Railroad Commission set a pattern; why was it not

[1] See Barnes, *Public Utility Control in Massachusetts*, Chap. 1, for a full account of the growth in Massachusetts.

[2] Chief Justice of the Supreme Court of the United States since 1930.

sooner followed? For one thing, it was necessary that the true monopoly nature of the public utility be recognized. Competition, even after 1907, was still held by some as the best regulator of the gas, telephone, electric, and street railway utilities. Second, the weakness of city council regulation did not become apparent until after the turn of the century. In the third place, this was the era of political unrest, discontent over rising prices—all typified in the (Theodore) Roosevelt policy of "trust busting." Thus the agitation demanded that some trusts be "busted," others be regulated. And lastly, the dynamic influence of Hughes, La Follette, and other leaders cannot be overlooked.

Other states soon followed the leadership of New York and Wisconsin. In 1908 came Vermont; in 1910, Maryland and New Jersey. The next three years saw the adding of seventeen more states. The tide slowed down in the succeeding years, but not until over three-fourths of the states had commissions with jurisdiction over one or more of the utilities. Including railroads and other utilities, every state in the Union, save Delaware, has a state commission, although about ten of them have little or no authority over the utilities included within our study.[1] In those states without complete state supervision of utilities, there is scarcely a legislative session at which one or more commission bills is not introduced and often seriously considered. It is the hope of the advocates of state-wide utility regulation that eventually every state will extend its activities to the usual group of utilities and to any other utility of particular significance to that state.

TYPES OF COMMISSIONS

In the development of the state commission from the earliest railroad commissions created in New Hampshire and Rhode Island in 1844 down to the present, two general types have appeared, usually referred to as the "weak" commission and the "strong" commission. A more descriptive terminology is to call them "advisory" and "mandatory," respectively. The early railroad commissions organized between 1844 and the Granger movement of the 1870's were of the advisory type. The Massachusetts Board of Railroad Com-

[1] State commissions with no or limited jurisdiction over public utilities are found in the states of Florida, Iowa, Michigan, Minnesota, Mississippi, Nebraska, South Dakota, and Texas. A few other states might be included here because of limited jurisdiction within municipal limits. It becomes very difficult, because of particular differences in state laws, to classify precisely some of the state commissions in terms of limited and unlimited jurisdiction.

missioners, established in 1869, is an excellent example.[1] It was given extensive powers of investigation but could only recommend changes, not order them. Of course, it was permitted to give due publicity to its findings, thereby enlisting the aid of public opinion. This commission was remarkably successful during its early years in its efforts to regulate the railroads, though when that pattern was transplanted to other states it was a failure.

With the growth of the Granger agitation, the Midwestern states of Illinois, Iowa, Minnesota, and Wisconsin began in the 1870's to apply positive legislation to their railroads. First, maximum rate and antidiscrimination laws were established, then commissions created either to enforce these laws or to prescribe rates and service. The first of these mandatory bodies was the Illinois Railroad and Warehouse Commission, established in 1872. The essential difference between these new mandatory commissions and the older Massachusetts type was that whereas they both could investigate the railroad actions and activities, the former type was given broad powers to correct whatever abuses it found.

The mandatory type of commission was developed on a wave of agrarian discontent; and in the reaction that soon set in, much of the progress gained was lost when several states reduced their newly created mandatory commissions to the older advisory status. The years 1880 to 1900 mark a period of vacillation between commission control and direct statutory regulation of the railroads. With the turn of the century, the tide swung once more toward the mandatory form; and without exception, the public utility commissions created after 1907 have been of this type. In this wave of public utility commission creation, the railroad commissions were likewise restored to a mandatory status, until now there is no other kind, and the subject is no longer of practical significance. Of course, now and then a sporadic movement appears to emasculate a state commission; but as yet, none has developed alarming strength and is not likely to grow in the future because of the persistent trend to more, rather than less, regulation.

The inherent weakness of the advisory type of commission is almost too patent to warrant discussion. Even in Massachusetts, where the advisory type did succeed, it finally was replaced by a stronger one. "The repeated delinquencies of the New Haven road had convinced both the people and the legislature of the necessity for a more powerful commission."[2] The growth of systems and

[1] BARNES, *op. cit.*, pp. 9–13.

[2] *Ibid.*, p. 17.

holding companies made them too powerful to fear the nebulous force of public opinion. The lessons of this experience in the field of railroad regulation and especially the failure of advisory commissions were not lost when the movement toward public commissions began after 1907, because all of them have been mandatory in form.

THE NATURE OF THE COMMISSION

Early in the history of railroad regulation, the courts of the United States were obliged to rule on the legal right and place of the commission in the American system of government. As has been pointed out, acts creating commissions were assailed as a delegation of legislative power and therefore unconstitutional. The courts quickly upheld the legislative right to create the commission and ruled that so long as there was a reasonable definition of its powers and authority, there was no illegal delegation of legislative power. The commission, therefore, is an administrative body, empowered to enforce the law, similar to any other administrative body. Its function is to find the facts and, having fitted these facts to the law, begin the process of enforcement.

The public service commission, however, is not a court and therefore is not clothed with judicial power. Any attempt to disguise its true character under the name of court, as was attempted in Kansas in the creation of a Court of Industrial Relations, does not in any sense give it judicial power. Having ordered a utility to do this or not to do that, a commission may no more proceed to use its own force to execute the order than may any other administrative agency. It must, if the offending utility resists, go to the constituted judicial agencies and ask their help. Thereupon, the issue becomes a case or controversy within the meaning of the Constitution of the United States and subject to judicial review upon its merits. If the commission has properly found the facts and made the proper fitting of these facts to its authority, then it will be sustained by the courts, and the full force of the judicial machine will be exerted to enforce the action of the commission.

In a real sense, however, the commission finds itself playing a dual role in its function of utility regulation. In its hearings, it does exercise some judicial as well as administrative power. It is therefore both a tribunal and the public defender. In so far as it weighs and evaluates evidence, it acts in a quasi-judicial sense. When it seeks out evidence by means of its own staff, it then functions in its second capacity of public defender. In truth, it is prosecutor, judge, and jury. Originally conceived as a public defender, the

commission has gradually evolved into a semijudicial body. It has adopted with modification the legal rules of presentation of evidence. The frequency of court review necessitated this development. This change in the essential nature of the commission has not been accomplished without severe criticism and has resulted in several proposals to restore the commission to its original function of public defender. The severest critic must never forget that however much the commissions may be responsible for this swing to the judicial function, the greater share of the blame, if it is truly a fault, lies in our system of government which permits almost every kind of controversy to find its way into our courts for final adjudication.

THE PERSONNEL AND ORGANIZATION OF THE COMMISSION

Title.—The state commissions have a variety of official titles. The most common, in seventeen states, is "public service commission." Next is "public utility commission" in seven states.[1] Some five call their agency a "corporation commission," and a few still use the title "railroad commission," although railroad control is the least important duty. Other variations are "commerce commission" in Illinois and Iowa, "department of public utilities" in Arkansas and Massachusetts, "board of public utility commissioners" in New Jersey, and "department of public service" in Washington. In short, in the forty-seven states having railroad and public utility commissions, fifteen distinct types of official designations are to be found. But the name is immaterial; and in our discussion, we shall use the generic phrases "public service commission" or "public utilities commission" to refer to any or all of these forms. In so far as any title is preferable and worthy of uniform adoption, our choice is "public service commission."

Number of Commissioners.—In all the states, there is the usual organization setup, although the numbers of commissioners vary, as do their tenure of office, salaries, and method of selection. The bulk of the states (thirty-six) have a commission of three members. When the number exceeds three, it is usually an odd number such as five. Oregon is unique—it has only one commissioner. The states with more than three commission members are, with two possible excep-

[1] This summary was made as of January 1, 1939. In its 1939 session, the Michigan legislature passed a "ripper" bill abolishing its Public Utilities Commission, substituting in its stead a Public Service Commission. In 1940, the North Dakota Board of Railroad Commissioners was renamed "Public Service Commission."

tions of Georgia and South Carolina,[1] industrial states in which the volume of litigation is the heaviest. They are California, Illinois, Massachusetts, Michigan, Missouri, New York, and Pennsylvania. In every instance, whatever the number, it is odd, thereby preventing equal division on an issue and ensuring a majority vote on every hearing before a full commission.

Tenure of Commissioners.—There is a wide range of tenure of office, ranging from 2 years on one hand to an indefinite tenure on the other. In two states, the tenure is 2 years; in eleven states, it is 4 years; 5 years in Massachusetts; 6 years in twenty-eight states; 7 years in Maine; 10 years in Pennsylvania and New York; and in Washington and Rhode Island, the tenure is at the pleasure of the governor. The fact that practically three-fifths of the states have the 6-year tenure is an encouraging sign—it takes these commissioners out of politics for that period; and, furthermore, it leaves them in office long enough for them not only to acquire the basic training in the job but also to serve after this period of training undisturbed by the immediate possibility of failure of reappointment. A term of 2 years is too short—one is just becoming useful when his term expires. Be the office elective or appointive, best results are gained by at least a 6-year term.

Salaries of Commissioners.—The least stable and least uniform of all the major features of the state commissions are the salaries of their members. Before the depression of 1929, the salary range varied from $15,000 in New York to $2,000 in Vermont. Since 1929, many changes, permanent and temporary, have occurred. In 1935, for instance, $12,000 was the top salary paid, and $1,600 was the lowest for a full-time commissioner. In that year, the average salary for chairman was $5,280; and for other members, $5,080. The median salary for chairman was $5,000; for other members, $4,500.[2] In general, since 1935, the tendency has been again upward toward the predepression salary levels. An inspection of the figures shows a correlation between commissioners' salaries and the quantity of work and degree of industrialization. The highest salaries are paid in the industrial states of the East and Middle West and the states on the Pacific coast. The lowest salaries are paid in the more rural states, the Mountain states, and the states that yet confine their commissions primarily to carrier regulation.

[1] Under a 1935 statute, South Carolina will eventually change to a three-man elective commission.

[2] RUGGLES, *Aspects of the Organization, Functions, and Financing of State Public Utility Commissions*, Exhibit vii.

No minimum pay can be set up for all commissioners in the United States. Obviously, if $3,000 is adequate in Idaho, $15,000 may not be enough in New York. The one state has a minute fraction of the American population to protect; the other, over 10 per cent. On the other hand, ability must be fairly compensated if it is to be available for commission appointment, and it seems as if $5,000 should be a minimum in any state, with a higher minimum in the more populous and industrial states east of the Mississippi River. A few states pay the chairman of the commission more than the rest of the commissioners. This is an unnecessary practice where the salary scale is adequate and where a secretarial force is at the disposal of the chairman to assist in carrying out the routine duties of that office.

Method of Selection.—There are two general ways of selecting a commission—one by appointment by the state chief executive, the other by a vote of the electorate. A third way is used in South Carolina and Virginia, where the general assembly elects its commissioners. Of the remaining forty-five state railroad and utility commissions, twenty-eight are appointed; sixteen are elected; and in one, North Carolina, the chairman is elected, while the governor appoints two associate commissioners. A study of major geographical divisions shows that all the commissioners in New England, New York, New Jersey, Pennsylvania, West Virginia, and Maryland are appointed. In the southern states, eleven elect their commissions; in only two are the commissioners appointed.[1] In the corn and wheat states of the upper Mississippi River and Missouri River valleys, five states elect their commissions, and in seven they are appointed. The eastern side of this area uses the appointment method; the western side (which has not extended its regulation beyond railroads and the telephone) still clings to the older method of election.[2] In the Mountain states, including New Mexico and Arizona, the majority use the appointive method of commission selection.[3] On the Pacific coast, all commissions are appointed.

[1] Appointed commission—Kentucky and Arkansas
Elective commission —Virginia, North Carolina (Chairman), South Carolina, Georgia, Florida, Tennessee, Alabama, Mississippi, Louisiana, Oklahoma, and Texas

[2] Appointed commission—Ohio, Michigan, Indiana, Illinois, Wisconsin, Missouri, and Kansas
Elective commission —Iowa, Nebraska, Minnesota, North Dakota, and South Dakota

[3] Appointed commission—Nevada, Idaho, Wyoming, Colorado, and Utah
Elective commission —Montana, New Mexico, and Arizona

The preferred method of selection is by executive appointment. In this way, the odds are in favor of the appointment of commissioners who have some qualifications for the office. Of course, it is possible by the appointive method to make the commission a political plum of the party in power, although to safeguard against this possibility the long term for commissioners has been used.[1] If this method is fraught with dangers, consider the defects of the elective process. In states in which commissioners are elected, the candidates are chosen, usually, in a national or state election, thereby sweeping into office the candidates of the successful ticket regardless of their qualifications. The Democratic landslide of 1932 produced exactly this situation. In one of the states of the Southwest, one of the most energetic commissioners in the United States was swept into the discard. In Iowa and other states, similar situations occurred. The illustrations do not prove that the ones elected would not be successful commissioners, but certainly their elections were not based on their qualifications as experts in the field of public utilities.

Qualifications of Commissioners.—An examination of the laws of the several states reveals, with scattered exceptions, an almost complete absence of qualifications for appointment to the public service commission other than the requirement that the appointee be a duly qualified voter and resident of the state, that upon appointment he divest himself of any office in a public utility and dispose of all utility investments. An examination of the Uniform Public Utilities Act shows the following to be the only proposed restriction: Each new commissioner shall "swear that he is not pecuniarily interested in any public utility . . . as employee, stockholder, security holder, bondholder. . . . " Presumably, one so interested could divest himself of such connections or holdings and thereupon be eligible to appointment. It is a bit difficult to frame a proposed standard by which to choose utility commissioners; but if one seems necessary, it could include, in addition to the foregoing restriction, some requirement such as business, legal, or professional experience bearing upon the problem of public utility regulation.[2]

[1] In states with gubernatorial elections every 2 years, a 6-year term for appointed commissioners, expiring at regular 2-year intervals, allows only one appointment to the state commission during each term of a governor, provided no interim vacancies occur.

[2] Former Chairman Prendergast of the Public Service Commission of New York has said, "I think it essential . . . that it is necessary and advisable that at least several of the members of the Commission should be lawyers." *Hearings*, New York Commission on Revision of Public Service Commissions Law, p. 234, 1930. On the other hand, one writer after study of the Nebraska State Railway Commission concludes, " . . . the formal training of a commissioner is not as

Expert Personnel.—Most commissions are empowered to build up a staff of experts and clerks—some of the positions being specified by law. Among these employees are a secretary, a counsel, examiners, engineers, accountants, and such clerks as are necessary. Of course, the amount of appropriation will determine the extent of the staff. It is usual to find a rate division headed by a rate engineer, an engineering department in charge of a chief engineer, an accounting and auditing department under the supervision of a chief accountant, and an office force under the direction of the secretary of the commission or a chief clerk. Some of the larger commissions subdivide these departments and add others, such as motor vehicle division and valuation division. In a few instances, hearing deputies are created to relieve the commission of minor hearings, and sometimes the commissioners are divided into sections (as, for instance, in the Federal Communications Commission), each with certain types of cases assigned to it. Thus, only important cases are heard before the full membership of the commission. Whatever form the organization of the commission, it is largely determined by the size of its appropriations, the number of utilities under its jurisdiction, and the special problems and traditions of the state.[1]

FINANCING THE COMMISSIONS

As has been suggested, the extent of the commission organization, in fact its very effectiveness, is dependent on its financing. Accurate figures in this matter are scarce. One study, for instance, showed in 1929 that forty-seven states and the District of Columbia spent $7,201,972 regulating their railroads, public utilities, and other public interest industries.[2] If to this be added the 10 million dollar budget of the Interstate Commerce Commission for 1929, we have a total of 17 millions spent in that year for the control of about 60 billions of dollars worth of business. That study showed New York to have spent $983,000, with Illinois second, spending $747,000. From these figures, the state expenditures fall rapidly to Nevada in

important as that he shall be intelligent, fairminded, and anxious to perform the duties of his office to the best of his ability. With these qualifications a commissioner is able to rely on the staff for advice in technical matters." Durisch, "The Nebraska Railway Commission," *Journal of Land and Public Utility Economics*, **9**:44, February, 1933.

[1] See Chap. XII, for a more detailed discussion of commission organization.

[2] From BETTERS, *Public Utilities Fortnightly*, Apr. 17, 1930. Reported as Appendix V (*a*) of *Report* of National Water Power Policies Committee of the Chamber of Commerce of the United States, entitled, "National Aspects of Water Power Development."

last place with a budget of $14,500. In fact, thirty-one of these states spent less than a hundred thousand dollars each.

After 1929, many of the commissions were victims of the "economy" drives of their legislatures, and, consequently, their budgets were for a time seriously reduced. Of course, not all states were affected, and some of them only for a short time. Ruggles found, in comparing budgets of 1928 and 1934, that of the thirty-three state commissions for which he had figures, fourteen were operating under smaller budgets in the latter year.[1] Taken as a whole, these thirty-three states spent on their commissions in 1928, $5,995,355; and in 1934, $7,735,046, a 29 per cent increase. Considering, however, the tremendous development in motor carrier regulation over these years, the increase was more apparent than real. In short, one cannot but conclude that, with the exception of a few commissions, they have been woefully financed even in the best of times.

TABLE 31.—SOURCE OF FUNDS OF THE NEW YORK PUBLIC SERVICE COMMISSION*

Year	Appropriations	Assessments
1933	$1,153,136	none
1934	1,035,153	$170,100
1935	1,091,565	486,574
1936	1,163,260	727,042
1937	1,182,430	891,720
1938	1,209,690	872,243

* 1938 *Annual Report*, pp. 148, 155. The appropriations are for fiscal years ending June 30 of years shown, and the assessments are for calendar years, except 1938, which is for 10 months ending October 31, 1938. Assessments are divided between a revolving fund for special investigations and a general fund. Since 80 to 90 per cent goes to the former account, the effect of these assessments has been to increase by those percentages the appropriations of the commission. Specifically, a revolving fund of $300,000 has been made available for special work. The cost of such work is advanced from that fund, and assessments on companies being investigated are later used to restore it.

The source of commission funds has undergone major changes since the depression of 1929. Before that time, the main source was direct legislative appropriation of tax funds. Although that has continued to be the leading source, other means have been added. Several states now require payment by their utilities of special fees and assessments, either as a general annual contribution or as payment for specific attention. For instance, the Wisconsin law permits the assessment of the cost of special investigations in an amount not to exceed four-fifths of 1 per cent of the operating revenues of the

[1] RUGGLES, *op. cit.*, p. 68.

utilities involved.[1] In Oregon, a comprehensive scheme of fees for commission maintenance has been set up. There utilities pay a fee for filing of rates, a fee based on annual gross revenues, and other special levies.[2] West Virginia provides for the collection of stipulated sums from utilities of that state, the amounts being established on the basis of their respective property valuations and gross intrastate revenues.[3] These are but random samples of the laws enacted in over half the states since 1930, tapping new sources of commission funds. In the face of the two forces of reduced legislative appropriations and increased work occasioned by depression demands for rate reductions and rapid growth of motor carriers, the sudden popularity of special assessments and fees is easily understood.

For all these changes, however, we conclude again that our state commissions have been underfinanced. It may be argued that their costs should be a charge against all the people, but we cannot object strenuously to the use of these new nontax sources of income—at least so long as most of the state laws limit specific payments of utilities to their present painless fractions.

JURISDICTION OF THE STATE COMMISSIONS

The reader may have observed that so far in this chapter we have made no attempt to separate the primarily state railroad commissions from those other bodies having jurisdiction over both carriers and public utilities. As we have shown above, the state railroad commissions generally appeared after the Granger movement of the 1870's. As such, they were a mixture of mandatory and advisory bodies, with their "jurisdiction being largely of a supervisory nature."[4] After 1907, their authority began to expand in two directions; namely, they became definitely mandatory in type, and their jurisdiction was broadly extended to include not only the five public utilities of our study but other public interest industries of local significance. For instance, warehousing has generally been regulated in the northern agricultural states, but in the southern states the commissions have had the additional duties of controlling the cotton gin and supervising oil production. In a few states, notably Virginia, the commission has supervised all financial and banking institutions. As the years have passed, changing events have reduced the authority of the states

[1] Wisconsin Laws: 1933, cs. 4, 298, 438.
[2] Oregon Laws: 1933, cs. 190, 441.
[3] West Virginia Acts: 1935, c. 83.
[4] RUGGLES, *op. cit.*, p. 45.

over carriers especially by rail, until now that regulatory function is quite insignificant.

It is difficult to present a quantitative picture of the extent of the control of the states over particular utilities. The individual state variations almost defy classification. The state commissions of Iowa and Nebraska, for instance, have jurisdiction over electricity supply in rural areas only. Measured in terms of control over rates both within and without corporate limits, we find that forty states regulate privately owned gas companies, thirty-nine regulate privately owned water companies, forty regulate street railways, and forty-four regulate telecommunications companies. In addition to privately owned companies, a few of the state commissions also regulate some of the phases of municipally owned utilities. For instance, eighteen of them control accounting; fifteen control rates or rate schedules of municipal electric plants.

Not only does jurisdiction differ from state to state, but the extent of this jurisdiction over specific utilities varies. The usual classification of the extent of state control is ordinarily based on the power of rate regulation. As we shall show below more in detail, in addition to rate control, commissions also have certain powers over security issues, accounts, and service standards, although in these matters their jurisdiction is not nearly so widespread. This over-emphasis on rates to the detriment of other controls is unfortunate, because complete regulation cannot be attained until commissions have been given powers over all phases of the utility business. In fact, we go to the extreme of suggesting that commission regulation will not have been given a fair trial until all states have created state commissions with jurisdiction over all phases of all utilities whether privately or publicly owned.

POWERS OF AN EFFECTIVE COMMISSION

We are now ready to turn to the problem of the powers of an effective state commission. For this presentation, we shall not attempt to state the detail of powers enacted in the usual state public utility law but rather to discuss those essential powers which must exist if regulation is to be effective. In this discussion, no particular state commission law will be used as a guide, but rather will the best practice in the more progressive states be our model.

The primary duties of a state commission are the regulation of rates, service, and security issues of the utilities within its jurisdiction. Practically every power delegated to it can be classified under one or more of these primary heads. For instance, in order to establish

reasonable rates, a commission usually is given power to make valuations, prescribe accounts, fix depreciation allowances, require periodic and special reports, make any audit or appraisal that it desires, etc. Relative to rate schedules, it is desirable to give a commission the power not only to approve particular rate schedules but also to order the adoption of specific rates. The New York Commission, for instance, has ordered the various electric companies serving New York City to put in use a uniform type of residence rate, thereby displacing a variety of forms in use.[1]

Service requirements are covered in detail in many state public utilities laws. Discrimination is forbidden, safeguards required, and a host of items included, too numerous to be discussed here.[2] Under the authority of reasonable and adequate service, commissions have formulated rules covering minimum standards, meter checks and inspections, extensions of service, abandonment of service, rural extensions, free pole limits, and so on. In short, the enforcement of these service standards becomes one of the most important tasks of a commission and one that occupies a large portion of its time. Unfortunately for a sane appraisal of the effectiveness of regulation, rate supervision has been brought to public attention more often than service regulation, thereby leading to the assumption that commissions spend most of their time making valuations for the purpose of rate making. This error in popular belief is founded upon the unsettled state of valuation theory and practice and has led to the assumption that state commission regulation has failed. Such an assumption ignores the fact that rate regulation is only one of several primary tasks. From the public viewpoint, service regulation is every bit as important as rate regulation.

The third primary function of the commission is to regulate utility security issues. Unfortunately, this function has not been recognized by half the states, and therefore half the state commissions have no authority over the issuance of public utility securities. Since this subject is dealt with more in detail later, but brief mention need be made here. Adequate regulation demands proper supervision of security issues. It is not enough to prescribe rates and service if utilities can issue securities in any volume subject only to the questionable restraint of blue-sky laws. If a utility is overcapitalized and thereby suffers a loss of credit rating, its rates may rise and its service may suffer. Skimped maintenance, for instance, is one of the likely

[1] *Re Rates & Rate Structures of Corporations Supplying Electricity*, P.U.R. 1931C 337.

[2] See Chap. XXI, in which are discussed standards of service.

consequences unless there is a vigilant commission, because of the efforts of the company to pay a return upon an inflated capitalization. Therefore, before commission regulation is pronounced a failure, it is imperative that this power over security issues be given to the commissions, coupled with appropriations enough to make that grant of power as a practical matter enforceable.[1]

CRITICISM OF THE STATE COMMISSION

Although the state commission appears to have commanded almost universal acceptance, it has not been free of sharp criticism. There are those who question the efficacy of regulation in any form. Others feel that the commissions have collapsed on the rock of rate regulation. This attitude was expressed by Frank P. Walsh of the New York Commission on Revision of the Public Service Commissions Law, when he said:[2]

> On the basis of this intensive investigation [of the Commission] . . . we find that effective public utility regulation in the State of New York has broken down and that the consumers of the State have been abandoned to the exploitation of the public service companies without any effective restraint by the Public Service Commission.

Others object to the passivity of the commissions. Finally, there are those critics who believe that the utility business has outgrown the states and can be controlled only by an integrated federal and state system of regulation. Thus, the state commission has been under attack from many directions.

There is no point in discussing weaknesses with those who do not believe in any form of regulation. Therefore we defer that viewpoint to our later chapters on public ownership. Furthermore, such weaknesses of the state commission as may have arisen out of its inability to control interstate activities have been remedied by the creation of the several federal commissions regulating those activities of communications, gas, and electric companies. With these eliminations, we have remaining for analysis the following criticisms: First, state commissions are too judicial in nature; second, they are not responsive to local conditions; and, third, they have broken down because of the valuation impasse. Let us consider these points in order.

[1] The reader may wonder why we say nothing here about our fourth primary problem of regulation, the holding company. This omission is to be explained by the fact that the holding company must be dealt with on a national basis; thus its discussion is not pertinent to an analysis of the state commission.

[2] 1930 *Report*, p. 258.

The Judicial Nature of the Commission.—Initially, public service commissions were thought of as active defenders of the people. They were supposed to be in constant search of company dereliction, and their approach in a controversy was to assume guilt until the accused proved himself innocent. Although this is an obvious overstatement, it illustrates an attitude from which the commissions have definitely departed. Today, they are accused of mimicking the passivity of courts—they sit quietly by awaiting private citizens and city officials to bring offenders to trial. As a result, it is argued that the commission procedure has become as slow and expensive as a court trial. On the other hand, this change has not been without defense. As was said of the Maryland Commission, it "necessarily and quite properly got to be largely judicial in character."[1] A former chairman of the New York Commission has similarly approved of this judicial attitude.[2]

The judicial nature of the public service commissions can be both explained and defended. It is explained by the relation of the commission to the judicial system. Every order may be appealed, which means that a commission must conform in some degree to court practice and procedure. Thus, a commission, although having more latitude than a court, still is bound to some extent by judicial precedent. The fear of reversal on technical errors, therefore, certainly has contributed to the assumption by commissions of at least a quasi-judicial role. Furthermore, this new position can be defended. Operating on slim budgets, it has been impossible for many of them to be very militant. But even if commissions were well financed, the judicial role can still be justified. A partisan, combative body will soon defeat itself. In other words, it is quite possible to combine the judicial procedure with the prime function of public defense.

"Home Rule."—A second criticism charges state commissions with unresponsiveness to local needs and conditions. To cure this alleged defect, some would return to the now discarded principle of local regulation or, as it is called, return to a situation of "home rule." These criticisms are largely unfounded and often are a cover for ulterior motives. In so far as some of our largest cities do have special local conditions, these can be met in one of two ways. For instance, a state commission can meet frequently in its large cities. The Illinois Commission maintains a regular schedule of hearings at its Chicago offices. During the fiscal year 1938, out of 634 formal hearings held by the California Commission, 251 were heard in San

[1] *Hearings*, New York Commission on the Revision of the Public Service Commissions Law, p. 704, 1930.

[2] *Ibid.*, pp. 321, 323.

Francisco, 202 in Los Angeles, and 181 in other cities. For the city of New York, a special commission has been created to handle its metropolitan transit problem. Thus, by one means or another, can local needs of our larger cities be accommodated. If it should ever appear to be necessary to revive home rule on a large scale, certainly the state commission should be retained with appellate jurisdiction.

The Rate-making Impasse.—A third group of critics believe that the controversy over reasonable rates has defeated the effectiveness of the commissions. In general, as we shall discuss in detail in Part III, the commissions have favored valuations on some theory of cost, whereas the companies have argued for cost of reproduction. The courts have declined to settle this controversy, though they certainly have leaned toward the company viewpoint. As a result of the conflict between the companies and commissions, prolonged litigation over rates often occurs, lasting on rare occasions for many, many years. Such a situation has caused one critic to say, speaking of a prolonged rate litigation over New York telephone rates:[1]

> We consider this case the limit of absurdity in the valuation method of adjusting public utility rates. The ultimate result of this method is to render regulation inoperative, to coerce public service commissioners into a supine fear of over-stepping court-drawn lines, and to produce absurd elements in the rate base which add materially to the general confusion which has defeated any effective state control of its utilities.

There can be no doubt that the impasse over valuation for rate making has contributed much to reduce the effectiveness of commission regulation. Commissions have been inclined to concede to cost of reproduction only to the extent deemed sufficient to avoid court reversal. Consequently, the degree of recognition of cost of reproduction usually occasions much dispute.

We cannot accept, however, the charge that commission regulation has broken down because of the valuation controversy. Although it may have weakened the effectiveness of those bodies, nevertheless they yet have certain areas of authority in which there can be but little dispute, such as powers over accounting, service standards, and securities issues. Therefore, he who argues that the aggravated problem of rate making has destroyed the effectiveness of regulation must assume that all other duties are incidental to and insignificant beside the duty over rates. This position we cannot accept.

On the other hand, we want it clearly understood that we do not approve of the present controversy over valuation for rate making.

[1] 1930 *Report*, New York Commission on Revision of the Public Service Commissions Law, p. 263.

We believe that the courts should end this dispute, as they so easily could. Choice of a wrong theory would be preferable to the present lack of any choice.[1] Therefore, we believe that such criticism as has been leveled at commissions because of the impasse in rate making is misdirected—it should be aimed in the direction of the courts, especially the Supreme Court of the United States.

STRENGTHENING THE COMMISSIONS

There are many ways in which the state commissions may be strengthened. As we have pointed out above, the courts could help by being more specific in defining their bases by which they review commission orders. In the next place, legislatures could help by being more generous either in appropriations of tax moneys or in seeking other sources of funds. Third, the creation of the federal commissions since 1935 has cured another serious defect. Finally, two proposals merit our consideration.

The Public Utility Court.—The first of these would split the present functions of the commission, giving the judicial function to a specially constituted tribunal and thereby making the commission essentially a fact-finding body. Apparently, Arkansas had something of this in mind when at one time it called its commission a "Fact-finding Tribunal." At one time, it was proposed to reorganize the Pennsylvania Commission and change its name to "Fair Rate Board." In the report of the special counsel of the New York Commission on the Revision of the Public Service Commissions Law (1930), this proposal was urged. There it was proposed to make the route of appeal from the commission to the public utilities court and thence to the highest court in the state.[2] Much can be said in favor of these proposals. In the first place, utility commissions would be free to act as a more energetic representative of utility consumers. In the second place, such a court would provide an unquestioned group of judges qualified to handle appeals on quite complex issues. It is a bit too much to expect every state and federal judge to be an expert in all branches of the law.

On the other hand, the proposal has met with scant approval. Commissioners have regarded it as simply creating a needless and

[1] As a simple illustration, let us cite a specific instance. At one time, we were asked to advise a city council in the matter of the reasonableness of water rates. Our answer was of necessity guarded because of the confused state of value theory. Under a cost theory, our answer would be one way; under cost of reproduction, another.

[2] *Ibid.*, p. 73.

additional step between the source of an order and its final court review. We further suspect that the unfortunate experience with the Commerce Court during 1910 to 1912 as the appellate body for the Interstate Commerce Commission accounts in no small part for this attitude. But as we have said, we feel that the complexities of administrative findings justify a special court of review, and it now appears that the Court of Appeals for the District of Columbia may gradually be in the process of assuming that role for appeals from the federal commissions.

People's Counsel.—A second proposal, one designed to offset the judicial nature of the commission, is the appointment of a special people's counsel to represent the public side in any proceeding before the commission. This has been done in Georgia, Indiana, Maryland, and the District of Columbia. Under this plan, there need be no splitting of the commission into the two parts as suggested above. This counsel may be attached either to the office of the attorney general or else to the legal department of the commission. The creation of a deputy-attorney general as the people's counsel was urged by the majority in the New York *Report*.[1] In Maryland, the first state to have a People's Counsel, that officer is attached to the legal department of the commission. He represents the public side of cases before the commission, and in so doing he may make use of its expert staff. If, in his opinion, the commission order is adverse to the public interest, he may appeal it to some properly constituted court. One of the duties of the People's Counsel of Maryland is to be on the alert for excess earnings and, if he finds evidence of such, to file a complaint before the commission.

It has been feared that friction might develop where the counsel is attached to the commission. There is no question that friction could develop, but a former People's Counsel in Maryland has testified to the high degree of harmony between him and the commission. He pronounced the institution to be very successful. "The Commission does not always agree with People's Counsel, and the People's Counsel does not always agree with the Commission, but for the nineteen years past the relations have been very cordial, which is remarkable, I think, considering the divergence in duties."[2] To avoid this possibility of conflict, the New York plan was to attach the counsel to the office of the Attorney General. If a people's counsel is to be created, this may be the preferable attachment.

[1] *Ibid.*, p. 31.

[2] Testimony of Thomas J. Tingley, former People's Counsel, Hearings of Commission on Revision of Public Service Commissions Law, p. 711.

The argument for people's counsel frankly recognizes the judicial nature of the commission. It recognizes that the legal department of the commission is purely advisory and does not prosecute the public side. The use of this institution does relieve the commission from acting both as judge and prosecutor. Since it seems to be necessary for commissions to function in a judicial capacity, the office of People's Counsel may solve the problem of providing a proper public defender to conduct the public's case.

Reviewing the history of the state commission, we are forced to conclude that, for all its defects and shortcomings, it occupies a permanent place in the economy of the United States. So long as private ownership of public utilities is the predominant type of ownership, the commission will be indispensable. Even under public ownership, it may have a significant place. Therefore we believe that every effort should be made to correct weaknesses as they appear.

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CHAPTER XI

NATIONAL REGULATION

Prior to the inauguration of the Roosevelt Administration in 1933, the regulation of public utilities had been almost the exclusive function of the states. Telecommunications in their interstate aspects during the years 1910 to 1934 were nominally under the jurisdiction of the Interstate Commerce Commission; certain phases of the electrical utility were under the jurisdiction of the Federal Power Commission; and after 1927, the Federal Radio Commission supervised radio broadcasting. Otherwise, before 1933, the control of utilities had been left to the states, and such regulation of interstate activities as was legally possible was administered by their commissions.

The public utilities have passed through stages of development similar to those of the railroads. Initially local in their areas of operation, some of them have expanded their boundaries to include parts or all of states and since 1920 have grown to national and in a few cases international size. During these years, water, manufactured gas, and urban transportation have continued to be essentially local. An interconnected water system from Chicago to New York, for instance, is both prohibitive in cost and quite useless. Urban transportation, by its very nature, is a local business. Such, however, has not been the case for electricity, natural gas, and telecommunications. The years since the first World War have seen each of these expand by means of physical interconnection and holding company integration until state lines have become of no significance or, if of any significance, only annoying hurdles in their path.

THE MOVEMENT TO NATIONAL REGULATION

Telecommunications.—National regulation of telecommunications, by the very nature of their service, came first. The telegraph from its very inception was destined to be a long-distance communication agency. Early in the telephone development, long-distance connections were attempted. By 1892, Chicago and New York were interconnected; shortly thereafter, New York was connected to Denver. As a result of technical improvements by Pupin and De Forest, the first transcontinental line from New York to San Francisco,

3,390 miles, was placed in operation in January, 1915, the year of the San Francisco Exposition. More recent exploits in transoceanic communication are too familiar to be repeated. The prosaic side of these interconnections was accomplished only by means of agencies of national scope and strength. These organizations were the American Telephone and Telegraph Company in the telephone field and the Western Union Telegraph Company and the Postal Telegraph Cable Company in the telegraph field.

The need for a regulatory agency comparable to the size of these companies was partially met by the Mann-Elkins Act of 1910, placing telephone, telegraph, and cable companies under the jurisdiction of the Interstate Commerce Commission. The commission, however, being essentially concerned with transportation problems, seldom exercised its powers over communications companies. It was content to limit its active control to such items as depreciation orders, accounting systems, and one order involving a $75,000 gift of the New York Telephone Company in 1931 to an emergency unemployment relief fund.[1] Consequently, regulation of telecommunications by the Interstate Commerce Commission was not acceptable to many persons, and suggestions were advanced from time to time for improvement. One proposal was to expand the commission to include a specific communications division. Another was made by Senator Couzens, in 1929, in the form of a bill to place all wire and wireless communications companies under a separate federal commission.[2] Opposition of the companies and the state commissions caused it to be killed by the Senate committee to which it had been committed. Finally, however, this type of proposal was enacted by Congress when it created in 1934 the Federal Communications Commission.

Natural Gas.—The second public utility having interstate aspects is natural gas. It is similar to other gifts of nature in that its source of supply is usually miles from its best market. As a result, the intervening space must be bridged by pipe lines, thereby ofttimes necessitating the crossing of one or more state lines. With the development of high-pressure long-distance pipe lines after 1928, the interstate movement of gas has grown rapidly. For instance, gas from the Panhandle of Texas travels well over a thousand miles to such points as Denver, Minneapolis, Des Moines, Chicago, Indianapolis, and Detroit.

[1] *Accounting of the New York Telephone Co.*, 188 I.C.C. 83. The commission found the contribution to have been improperly charged to operating expense and ordered it to be charged directly to profit and loss.

[2] S. 6, 71st Cong., 1st Sess.

It was estimated in 1930 that more than 16 per cent of the natural gas production entered into interstate movement.[1] The figure since then has risen to about 25 per cent. This, it should be remembered, applies to total production and therefore does not give a fair picture of the extent of interstate transportation of gas. For years, approximately half the total has been locally consumed in the gas fields, in oil and gas refining, and in the making of carbon black. Considering such use as nonutility in nature and thus excluded from our figures, almost half the definitely utility consumption occurs after interstate transmission. In fact, the continued rapid development of pipe lines will undoubtedly cause the percentage to rise significantly.

From time to time, bills were introduced in Congress to regulate this movement of natural gas. Senator Capper introduced a bill in 1930,[2] which called for the creation of a federal Gas Pipe Line Commission with "full power, authority, and jurisdiction to supervise and control the purchase, production, distribution, sale, and/or transportation of natural or artificial [manufactured] gas by pipe-line agencies." Every company so engaged would have been required to secure a certificate of convenience and necessity. This bill was designed to safeguard the state commissions from federal encroachments, all intrastate jurisdiction being denied the federal commission except in those states in which there was no state commission. A second attempt to regulate interstate commerce in natural gas occurred in 1935. The first draft of what later was the Public Utilities Act of 1935, in addition to providing for the regulation of the holding company and interstate commerce in electricity, had similar provisions for the control of interstate commerce in natural gas. In the original draft, the Federal Trade Commission was to have been the regulating agency. When the bill was passed in August, 1935, the provisions relating to natural gas had been eliminated. Finally, in the spring of 1938, a third effort to extend federal regulation was successful. At that time was passed the Natural Gas Act vesting in the Federal Power Commission authority to regulate the interstate activities of natural gas operating companies. In retrospect, we can pronounce the 1938 efforts to be far better than those of 1935 because of the integration of interstate regulation of gas and electricity within one commission. It would have been unfortunate to have two federal bodies dealing with such closely interrelated businesses.

[1] *Gas Age-Record*, **65**:641, May 3, 1930. According to another estimate, approximately 22 per cent of the marketed production of 1930 entered into interstate commerce. *Public Utilities Fortnightly*, **22**:218, Aug. 18, 1938.

[2] S. 5030, 71st Cong., 3d Sess.

Electricity.—The third utility service in interstate commerce is electricity, a development that has come mainly since 1925. So long as each town was served by its own plant or by a near-by plant, there were only incidental occasions for power to cross state lines. With the development of superpower systems and large hydro and steam units located at strategically situated points, the proportion of interstate movements began to increase. A study for the year 1926 revealed that approximately 9 per cent of the electric power consumed in the United States crossed state lines.[1] The figures in the census of 1927 indicated that about 14 per cent of the power generated in that year entered into interstate commerce.[2] The National Electric Light Association estimated for 1929 that 11.8 per cent of the total energy generated and sold in this country crossed state lines.[3] According to the calculations of the Federal Trade Commission for the same year, the percentage was somewhat higher.[4] The commission estimates showed the ratio of outward movement across state lines to total generated electricity to be 15.18 per cent; the ratio of inward movement to total consumed to be 19.65 per cent. Corrected for duplications, these figures were 13.42 and 17.57, respectively.

In 1935, the Federal Power Commission made the following estimates of interstate transfers of electricity for 1933.[5] For the country as a whole, it found that imports into states amounted to 18.5 per cent of the total energy available and that exports from states were 18.2 per cent of the total electricity generated. Excluding states having but minor quantities of electricity interchange, these figures become 23.6 and 22.8, respectively.[6] Individual states, of course, differed markedly from these average figures.

In the years since 1933, the percentage of electricity crossing state lines has certainly continued to increase. The technical and economic superiority of ever larger steam and hydro units and improvements in transmission methods all conspire to cause electricity to be shipped farther and farther from points of generation. Thus, it is inevitable

[1] Bureau of Business Research, Harvard University, and cited in *Bulletin* referred to in footnote [3], *infra*.

[2] Census of Electrical Industries: 1927, Central Electric Light and Power Stations, Table 27.

[3] "Interstate Transfer of Electric Power in 1929," *Statistical Bulletin* 5, National Electric Light Association.

[4] "Interstate Movement of Electric Energy," *Sen. Doc.* 238, 71st Cong., 3d Sess.

[5] National Power Survey, *Power Series* No. 1, pp. 46–48.

[6] These states are Maine, Michigan, Florida, Montana, Colorado, Wyoming, Texas, New Mexico, California, Nevada, Arizona.

that electricity movements will more and more be interstate unless natural tendencies are thwarted by artificial, man-made restrictions.

The interstate character of this significant fraction of electricity transmission naturally caused many persons to demand its regulation on a national scale. Senator Couzens expressed the opinion of that group in his bill to expand the jurisdiction of the Federal Power Commission to include the regulation of the electric holding company and interstate transmission.[1] The commission was to have jurisdiction over the rates, service, and securities of the electrical utilities doing an interstate business. It would have subjected to regulation all electric holding companies and those groups rendering expert advice and service for a fee. The bill specifically would have prohibited the commission from interfering with the rates and service "of power which does not enter into or become a part of interstate commerce, whether for the purpose of removing discrimination against interstate commerce or for any other purpose." Only upon a petition of a "substantial number of consumers" could the Federal commission have assumed jurisdiction in a state receiving power in interstate commerce. In addition to these safeguards, the bill proposed to create joint boards to assist in the preservation of the local character of utility regulation. A board composed of one representative of each state concerned in any controversy and created *de novo* for each complaint would be organized. This board was to have original jurisdiction and be vested with the same powers of investigation and decision as the Federal commission. As in the case of the Couzens communications bill of 1929 and the Capper gas bill of 1930, this one likewise died in committee. Finally, with the passage of the Public Utility Act of 1935, the powers of the Federal Power Commission were expanded to include control of interstate movements of electricity, and the Securities and Exchange Commission was given jurisdiction over the electric and gas holding companies.

THE FEDERAL POWER COMMISSION

The history of the Federal Power Commission can be divided into three parts. The first part covers the years 1920–1930, during which the commission had limited jurisdiction and even within that area was quite ineffective. The second part covers the years 1930–1935, during which it attempted to make itself more effective. The third and present period covers the years since the enlargement of the commission's jurisdiction after 1935. The first significant expansion of authority, in 1935, gave it authority over interstate movements of

[1] S. 3869, 71st Cong., 2d Sess., 1930.

electricity; the second expansion, in 1938, added authority over interstate movements of natural gas. We shall now consider more in detail each of these periods.

The Ineffective Years (1920–1930).—The Federal Power Commission was created in June, 1920, as a compromise between those who desired private development of water-power sites on the public domain and those who desired their public development. There had been for several years many proposals before Congress, and the Federal Water Power Act of 1920, which created the Federal Power Commission, was the culmination of the conflict. The power sites in the United States had been under the supervision of three secretaries in the Cabinet. The Secretary of War controlled the power sites on navigable streams; the Secretary of Interior, those on public lands and Indian reservations; and the Secretary of Agriculture, those in the national forests. Prior to 1920, the administration and licensing of power sites had not been successful, because of a lack of coordination in policies among the secretaries and because of the uncertain tenure of licensees. The act of 1920 proposed to coordinate the activities of the secretaries by organizing them into a commission of three whose duty it was to license the use and development of these power sites in accordance with the provisions of the act.

The major provisions of the act of 1920 were as follows: Power sites were to be leased to private or public interests for a period not to exceed 50 years. At the expiration of a lease to a private company, the commission was empowered to recapture the site and equipment or transfer them to state or municipal operation or lease to another (or the same) private company. The major duties of the commission in this connection were four: investigation of applicants; valuation of projects; supervision of the construction and accounting of licensees; and regulation under certain conditions of their rates, services, and securities.

Valuation was divided into valuation of projects before licensing and valuation subsequently. For prelicense property, the "fair-value" rule of *Smyth v. Ames* was to be used. For licensed developments after 1920, the rule of valuation was to be the actual legitimate investment. This latter provision excluded a valuation of the license, going value, water rights, lands, right-of-ways, or arbitrary promotion fees. Only actual cost was to be allowed. About the only valid elements of dispute that could arise under this rule of valuation for licensed construction were the prelicense expenses involved in preparation and presentation of project proposals to the commission. This principle of valuation was a unique departure in valuation theory and practice.

No other law, state or federal, has ever been so drawn. It has been challenged as unconstitutional on the grounds that it violated the fair-value rule of *Smyth v. Ames*. The points that its assailants have overlooked were, first, that the rule—net investment—applies to project works built after the enactment date and, second, that, since it is a privilege of sovereignty to license or not as it sees fit, the government may therefore attach such reasonable requirements as it desires as a condition precedent to the issuance of a license. This valuation rule is surely a reasonable condition precedent. In addition, the Federal Power Commission was given powers to prescribe accounts, make audits, establish certain reserves, fix rates (restricted to states having no state commission), and amortize the investment of the private licensees out of excess earnings.

The commission was organized in 1920 and was staffed mainly by assignments of personnel from the departments of the secretary-commissioners. The commission set up minute rules and regulations and adopted for its licensees the accounting system of the Interstate Commerce Commission. The years 1920 to the reorganization of 1930 were ones of experimentation by the commission with very little in the way of actual accomplishment. Its defects were many.

In the first place, the commissioners were too busy with their respective departments to devote any major time to this side job. They met a few times a year for a few minutes at a time. Furthermore, in the decade 1920–1930, the fifteen persons served as secretaries of these three departments, an average tenure of 2 years each. Because of this lack of continuity and interest, the actual direction of the work was left to an executive secretary. A subsequent investigation showed an almost unheard-of amount of internal dissension in the commission personnel because of this situation.

Second, the lack of a permanent personnel responsible to the commission was not satisfactory. The assigned employees from the Departments of War, Interior, and Agriculture were neither qualified for their tasks nor interested. When the commission attempted to create a permanent staff of its own, it was blocked by the Director of the Budget.

As a result of these factors and a small budget, the original commission did not rule upon a single case involving an important and disputed item of valuation. Consequently, its valuation work fell more and more in arrears; and until reorganized, millions of dollars of disputed items were no nearer adjudication than they were when first protested.

The First Reorganization (1930–1935).—The many complaints about the ineffectiveness of the Federal Power Commission finally led Senator Couzens to introduce in 1930 a reorganization bill.[1] In consideration of the bill, extensive hearings were held by the Senate Committee on Interstate Commerce, during which the defects of the original organization were brought squarely into the open.[2] The Couzens bill was adopted by Congress, approved in June, 1930, and finally put into force in the following December. The new law created a five-man commission to be appointed by the President and gave to the commission the right to select its own staff. Other than these changes, the provisions of the original act of 1920 still applied.

The new commission, following some unfortunate litigation over the legality of the appointment of its new chairman, soon began in earnest and quickly had accomplished more than the first commission had done in its 10 years of life. In 2 years, it had audited and settled claims of 70 millions and had other claims in process of settlement amounting to many millions. It actively prosecuted cases before the courts, being sustained in every major instance.

The record of the work of the Federal Power Commission at the close of the fiscal year June 30, 1935, furnishes a summary of the first two periods of that agency. During these 15 years, 112 major licenses, 140 minor licenses, 31 licenses for minor parts of major projects, and 279 licenses for transmission lines had been issued and were in force on June 30, 1935.[3] These licenses, including a few pending applications, represented an estimated primary capacity of 4,488,815 horsepower and an estimated ultimate installation of 13,858,457 horsepower and were scattered throughout thirty-five states. During the 5 years ending June 30, 1935, the commission devoted much attention to settlement of claims of investment in projects. Its report for that date showed 135 million dollars of accounts audited and claims settled or partially settled. In addition, the commission had awaiting hearings and field audits approximately 500 million dollars of claimed investment.[4]

Prior to the expansion of the authority of the commission in 1935, however, its place and importance in the field of electricity generation was minor at best. Its licenses covered only one-fourth of the total

[1] S. 3619, 71 Cong., 2d Sess.

[2] "Investigation of Federal Regulation of Power," *Hearings* before Senate Committee on Interstate Commerce, 71st Cong., 2d Sess., 2 parts, 1930.

[3] 15 *Annual Report* Federal Power Commission, pp. 11, 12.

[4] *Ibid.*, p. 14.

hydropower capacity in operation in the United States and, measured in terms of the total generating capacity—steam, hydro, and internal combustion—about 10 per cent.[1]

Since 1935.—With the passage of the Public Utility Act of 1935 and the Natural Gas Act of 1938, the Federal Power Commission entered into its third period of development. By the act of 1935, its authority over water power was amended at several points and generally extended to include interstate transmission of electricity.[2] Its authority was also expanded to permit the gathering of essential cost data on request of state commissions; the establishment of uniform systems of accounts; the drafting of plans for voluntary coordination of power facilities and resources; the control of security issues, consolidations, interlocking directorates; and the disposal of property of companies under its jurisdiction. The act of 1935 authorizes the use of the joint board, composed of one representative of each state interested in any interstate controversy. The act provides: "The action of such board shall have such force and effect and its proceedings shall be conducted in such manner as the Commission shall by regulations prescribe."[3]

By the Natural Gas Act of 1938, federal regulation is extended to interstate movements of natural gas. By its provisions, the Federal Power Commission is authorized to regulate interstate transportation or sale of natural gas destined "for ultimate public consumption." This act, however, does not include authority to regulate rates of such movements "for resale for industrial use only." In general, the same provisions applying to interstate commerce in electricity, including joint boards, apply to interstate commerce in natural gas. A major exception was omission of provisions concerning security issues, mergers, and sale of gas properties. One writer has concluded, therefore, that "the new Natural Gas Act seems less stringent on the whole than the Federal Water Power Act [as amended in 1935]."[4] Both the 1935 and the 1938 acts are designed to preserve the authority of the

[1] These figures may be slightly inaccurate, because the primary capacity under all types of commission licenses is compared to total American generating capacity. If the installed capacity of major licenses only, in 1935, be compared to total generating capacity, the results are less favorable to the commission.

[2] Public Utility Act of 1935, Title II. Title I is concerned with the regulation of the holding company and is discussed in Chap. XXIII.

[3] Title II, pt. II, § 209(*a*).

[4] WELCH, "Uncle Sam Moves in on the Gas Industry," *Public Utilities Fortnightly*, **22**:217, 222, Aug. 18, 1938. For further discussion, see the Oct. 13, 1938, issue of the *Fortnightly*, which contains three articles on the Natural Gas Act of 1938.

state commissions within their respective jurisdictions by limiting that of the Power Commission to sales in interstate commerce and by prohibiting control of local rates and local distribution facilities. It can be concluded that, in the field of operating natural gas and electric companies, the Federal Power Commission occupies now the entire field of national regulation.[1]

In addition to the exercise of the positive duties created under the additions of 1935 and 1938, the Federal Power commission has conducted several investigations at the request of the Congress. These include an electric rate survey of cities and towns in the United States and related subjects[2] and a power survey covering the problems of adequacy of power supply, holding company systems, cost of distribution of electricity, and the use of electricity in transportation.[3] More recently, the commission has been empowered to assist in cost allocation of the investment in the Bonneville hydroproject, in Oregon, and in the determination of the rates to be charged by that project. These are illustrations of the special uses made of the Power Commission.

FEDERAL COMMUNICATIONS COMMISSION

Another gap in the area of national regulation was filled by the creation in 1934 of the Federal Communications Commission. To this agency were transferred the powers of the Federal Radio Commission (created in 1927) over radio broadcasting and the powers of the Interstate Commerce Commission (since 1910) over telephone, telegraph, and cable communications. Of course, in the process of integration, certain new duties relating to wartime supervision of communications were added. This integration was a most logical step. The act provides the usual powers of supervision of the interstate and foreign activities of communications companies. They include control of rates, facilities, interconnections, new construction, accounts, and service generally. The act further directs cooperation with state commissions and provides for the use of the joint board. Since many messages are delivered by means of joint arrangements among communication companies, the commission is empowered to supervise the division of tolls among the participants in such service. To

[1] For an excellent and concise review of the commission, see the article by Plum, "The Federal Power Commission Grows up," *Public Utilities Fortnightly*, 22:67, July 21, 1938.

[2] *Electric Rate Survey*, eight reports, 1935. Other rate series, as of January 1, 1938, and January 1, 1940, have also been issued.

[3] *National Power Survey*, four reports, 1935.

facilitate the sectioning of the work of the commission, the act creates a seven-man body, to be divided into three divisions: telephony, telegraph and cable, and radio broadcasting. The chairman of the commission sits with each division. Plenary jurisdiction resides with the entire commission sitting *en banc* on important cases and cases involving matters of policy.[1]

Probably most publicized of its work has been its 2-year investigation (1936–1938) of the Bell System.[2] From this investigation came a report containing several suggestions for reform and reorganization within the system. Among the items were ones concerning depreciation, rate reductions, disposal of profits of Western Electric Company, and control of the cost of equipment. Of all these items, two at least are worthy of immediate action. The Bell System appears to have been charging excessive depreciation and to have overworked its special charge for the hand-set type of telephone. It is fast eliminating this special charge, leaving the depreciation problem to be tackled by the commission. Otherwise, the report found no sensational abuses. None of these items in the recommendations could be said to reflect upon the integrity of the company but rather involve matters of managerial policy or ineffectiveness of previous regulation.

NECESSITY OF NATIONAL REGULATION

Reserving for later discussion the place of the Securities and Exchange Commission in the regulation of public utilities, we turn next to the question of the necessity of national regulation. Suffice it to say that much of the heat of this question has disappeared since the legislation here described has been passed; yet certainly there ought to have been valid reasons for the enactments. Examination of the problem shows that two aspects of the electrical, telephone, and natural gas utilities were more or less beyond the effective control of the most vigilant of state commissions. The expression "more or

[1] For an excellent article on the work of the commission, written by the vice chairman of the telephone division, see Brown, "Federal Telephone Regulation," *Public Utilities Fortnightly*, **20**:3, July 8, 1937.

[2] Pursuant to Public Resolution No. 8, 74th Cong. The findings of the investigation are entitled "Proposed Report on Telephone Investigations." For discussion of this report, see articles by Bickley, *Public Utilities Fortnightly*, **21**:771, June 23, 1938; and Welch, same magazine, **22**:494, Oct. 13, 1938. See also *Brief of Bell System Companies*, Special Investigation Docket No. 1, before the Federal Communications Commission. The final report, adopted unanimously by the commission and released in June, 1939, is entitled "Investigation of the Telephone Industry in the United States" and is printed as *House Doc.* 340, 76th Cong., 1st Sess. For a dramatized version of this controversy, see *Life*, pp. 58–63, July 17, 1939.

less" is intentionally used because the extent or lack of extent of state jurisdiction over the holding company and interstate sales has been in dispute.

The problem is best approached by remembering that ours is a federal system of government, with forty-eight states on the one hand and the national government on the other. To the Congress of the United States are given certain enumerated powers, among which is the commerce power, which reads: "[Congress has the power] To regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes." Thus, to the Congress is given the power to regulate interstate commerce. Since powers not delegated to Congress and not prohibited to the states "are reserved to the States respectively, or to the people," the states retain complete jurisdiction over all intrastate or internal commerce.[1] Hence, there are two spheres of interest—the state and the national—and each may, if it so desires, exercise those powers appropriate to its jurisdiction.

The commerce clause of the Constitution has been interpreted to include more than the mere movement of goods and extends to the agencies of movement and the security of the receiver from undue regulation and taxation. Likewise, what constitutes interstate commerce has been very broadly interpreted.[2] The movement of goods and all agencies involved in that movement, such as railroads, boats, motor vehicles, and airplanes, are, of course, within this clause. Likewise, the sending of intelligence, gas, and electricity has been so interpreted, and therefore its agencies can be in interstate commerce.[3] There is, therefore, no question that the services of the telephone, electrical, and gas utilities are commerce and can be interstate in movement. Thus, they can be subjected to such regulation as Congress may deem to be appropriate.

Can the States Regulate Interstate Commerce?—In the event that Congress fails to assert its authority, what powers may the states exercise over interstate commerce? To put it concretely, what power had Illinois before the legislation of 1938, for instance, over that part of the movement of gas from the Texas panhandle coming within its borders? To answer this requires a complete statement of the scope

[1] The effect of the doctrines of the *Minnesota Rate Cases* and the *Shreveport Rate Case* upon the powers of the states over intrastate commerce is reserved for later consideration.

[2] *Gibbon v. Ogden*, 9 Wheat 1 (1824), began this process of liberal interpretation. A most significant case defining commerce in a functional sense is found in the *N. L. R. B. v. Jones & Laughlin Corp.*, 301 U.S. 1 (1937).

[3] The extent of the doctrine of the commerce clause has not been exhausted by this explanation. It has been developed only in so far as it applies to our problem.

of the commerce clause. In the early litigation over this provision of the Constitution, it was insisted that like other powers, such as the coinage power and war power, this one was by its very nature exclusive of all state action in the field and that therefore failure of Congress to assert its authority over interstate commerce was a declaration that that commerce was to be undisturbed by state action. The Supreme Court finally took a position on this problem in 1851.[1] The Court held that, in its very nature, the commerce power might be either exclusive or not, depending upon the subject matter to be regulated. Certain types of interstate commerce are national in scope and demand a uniform type of regulation. In this situation, Congress, and Congress alone, may regulate, and the absence of national regulation is to be interpreted as a conscious desire by Congress to leave that commerce unregulated. The states, therefore, have no right in the absence of national regulation to place any burden on that portion of interstate commerce which is national in scope and necessitating uniform control. There are, however, many situations in which interstate commerce is essentially local in nature and therefore unaffected by a diversity of local regulations. In the absence of congressional action, the states in which this interstate commerce terminates or originates may assert jurisdiction over it, so long as no direct burdens are imposed.[2]

These two aspects of the commerce clause are well illustrated in the railroad cases. In one of the Granger cases, the Supreme Court of the United States approved the attempts of Wisconsin to control the terminating and originating segment of interstate commerce in that state.[3] Ten years later, in the Wabash case, the Court held that railroad shipments in interstate commerce were beyond any control of the states.[4] This overthrow of the older case can be explained by the shift of the Court in its interpretation of the type of commerce interstate commerce involved. Therefore, if Congress had done nothing to regulate the interstate activities of the railroad, Congress obviously had intended that such commerce be left unregulated. The states must consequently keep hands off. Whatever the intention of Congress, the hiatus created by the Wabash decision was closed in 1887 by the passage of the Interstate Commerce Act.

[1] *Cooley v. Board of Wardens*, 12 How. 299.

[2] No objective statement of what is direct and what is indirect or incidental can be made. In general, if the Court approves of a state law affecting interstate commerce, it is found only incidentally to burden interstate commerce.

[3] *Peik v. Chicago & N. W. R.*, 94 U.S. 164 (1877).

[4] *Wabash, St. L. & P. R. v. Illinois*, 118 U.S. 557 (1886).

The Answer Seems to Be "No."—So far as the public utilities are concerned, the cases are conflicting. The Supreme Court has approved regulation by New York of the rates for natural gas brought from Pennsylvania.[1] In this case, the distinguishing fact was ownership of the supply and distribution facilities by a single company. The Supreme Court was careful, however, to add that the jurisdiction of New York over this interstate commerce was dependent solely upon the inaction of Congress. In other natural gas cases, the court has held that gas moving in interstate commerce was not subject to regulations of the receiving or producing states.[2]

> A state law, whether of the State where the gas is produced or that where it is to be sold, which by its necessary operation prevents, obstructs or burdens such transmission is a regulation of interstate commerce—a prohibited interference.

In the cases following this latter rule, there has been a corporate separation of the wholesale supply from local distribution.[3] Since this latter principle is far more common than that existing in the New York situation described above, the general conclusion to be drawn is that interstate movements of gas are beyond any regulation of the states so long as the supply (wholesale) function is separate from the distribution (retail) function. Whatever the local gas company contracts to pay to the pipe-line company for gas delivered at the city limits is of no concern to a state commission or city council so long as there is nothing fraudulent in the transaction.

The case of *Public Utility Commission v. The Attleboro Company*, decided in 1927,[4] practically settled conclusively this question of the extent of state jurisdiction over interstate commerce in public utility service. The rate for electricity sold by the Narragansett Power Company, a Rhode Island company, to an independent company in near-by Attleboro, Massachusetts, was held to be beyond the jurisdiction of the Rhode Island Commission. Mr. Justice Sanford writing the majority decision made the following comments:[5]

> It is conceded, rightly, that the sale of electric current by the Narragansett Company to the Attleboro Company is a transaction in interstate commerce.
> . . .

[1] *Pennsylvania Gas Co. v. Public Service Comm.*, 252 U.S. 23 (1920). This case has in part been overruled in *East Ohio Gas Co. v. Tax Comm.*, 283 U.S. 465 (1931).

[2] *Pennsylvania v. West Virginia*, 262 U.S. 553, 596 (1923).

[3] The important cases are: *Oklahoma v. Kansas Natural Gas Co.* 221 U.S. 229 (1911); *Public Util. Comm. v. Landon*, 249 U.S. 236; *Missouri v. Kansas Natural Gas Co.* 265 U.S. 298 (1924).

[4] 273 U.S. 83.

[5] *Ibid.* at 86, 89, 90.

It is clear that the present case is controlled by the *Kansas Gas Co.* case [265 U.S. 298]. . . . Being the imposition of a direct burden upon interstate commerce, from which the State [Rhode Island] is restrained by the force of the Commerce Clause, it must necessarily fall, regardless of its purpose. . . . The forwarding State obviously has no more authority than the receiving State [Massachusetts] to place a direct burden upon interstate commerce.

In this case, the essential localness of the New York situation described above was urged. Only a few miles separated the two companies; the Massachusetts company was the only wholesale customer of the Rhode Island company and bought only 3 per cent of the latter's output. On this basis, Mr. Justice Brandeis dissented. The Court, however, met this argument squarely, ruling that though the specific situation was local, the problem was "national in character" and therefore subject to the exclusive control of Congress. If regulation of this type of transaction is required, "it can only be attained by the exercise of the power vested in Congress."[1] In view of this decision, it can be concluded that the Pennsylvania Gas case has been robbed of most of its importance. We conclude, therefore, that state commissions have no jurisdiction over business transactions between independent wholesale and retail utility companies involving interstate transmission of energy, gas, or intelligence.

The Holding Company Situation.—What of the situation in which interstate commerce involves a parent company-subsidiary company relationship such as is best typified by the American Telephone and Telegraph Company and its associated operating and manufacturing companies? How extensive could be the control of the state commissions over contracts for service between the subsidiary and the parent company involving interstate commerce? Prior to 1930, the ruling principle at law was that contracts between a parent and subsidiary could not be questioned by a state commission on the grounds of excessive cost.[2] In other words, the terms of the contract measured the value of that service to the subsidiary company. The only recourse of a commission desiring to set aside a contract was to show fraud or evidence that an outside agency would have performed the service more cheaply or evidence that the operating company could perform that service at a cheaper figure than the contract price. These defenses as a matter of practice were worthless.

In 1930, however, the Supreme Court in the Illinois Bell Telephone case accepted the view that in such contracts as these there was in no sense arms'-length bargaining and therefore directed that "there

[1] *Ibid.* at 90.

[2] *Southwestern Bell Telephone Co. v. Public Service Comm.*, 262 U.S. 276 (1923).

should be specific fundings by the statutory court with regard to the *cost of these services* to the American Company. . . . "[1] This new principle was further sustained and amplified by the Supreme Court in *Western Distributing Company v. Public Service Commission.*[2] Mr. Justice Roberts, commenting on the close relationship of the holding company and the local distributing company, said, "There is an absence of arms' length bargaining between the two corporate entities involved, and of all the elements which ordinarily go to fix market value."[3] Further he said because of the close connection between the supply and distribution companies, ". . . the elements of double profit and of the reasonableness of inter-company charges must necessarily be the subject of inquiry and scrutiny before the question as to the lawfulness of the retail rate based thereon can be satisfactorily answered."[4]

It may appear as a consequence of these decisions that the state commissions finally acquired some measure of control over the interstate activities of the holding companies. And because of the fact that three-fourths of the private electric plants are controlled by holding companies interstate in size, it would seem as a matter of practice that the states had sufficient control over interstate commerce to protect the consuming public. For example, the Kansas Commission prior to 1931 was practically the only commission advocating federal control of interstate gas movements. At the 1931 convention of the National Association of Railroad and Utilities Commissioners, Kansas, because of these new cases, withdrew her support of her previous position, saying, "If the reasonableness of the contract can be tested by the rule laid down in the Smith case [Illinois Bell Telephone case]—cost to the holding or affiliated company in rendering the service—then there is nothing further to be desired by the States."[5]

Although the Supreme Court has given the right to the states to inquire into the costs of these holding company relationships, it has not yet ruled on the extent of this power.[6] In the Western Distribut-

[1] P.U.R. 1931A 1, 12; 282 U.S. 133 (1930). Official name of this case is *Smith v. Illinois Bell Telephone Co.* (Italics ours.)

[2] 285 U.S. 119; P.U.R. 1932B 236.

[3] P.U.R. 1932B at 239.

[4] *Ibid.* at 240.

[5] 1931 *Report*, Committee on Legislation, Convention of National Association Railroad and Utilities Commissioners, p. 327.

[6] Since Congress by its legislation of 1935 and 1938 did occupy the field of federal regulation, this question is not likely to be litigated because by that legislation the states lost whatever authority they had over interstate transfers of gas and electricity.

ing case, the company raised the objection that the demands of the Kansas Commission for proof of the wholesale cost of gas brought into Kansas would involve a valuation of the property of the wholesale company. This property, of course, lay largely outside the state; and according to the company, "this burden should not be thrown upon" it. The Court declined to meet this issue, saying, "Whether this is so we need not now decide." To change the problem, but not the principle, consider the potential consequences of this new doctrine to the telephone industry. Almost all the states regulate the telephone. The Bell System companies are in each of these states and buy equipment from the system-owned Western Electric Company. Suppose that each of the commissions in these states should decide to inquire into the cost of equipment sold by the Western Electric Company to a particular operating unit. Would each of them have a right to go to Western Electric's home office or the system's headquarters in New York City and there make an audit of the books? If the Court should stop short of this permission, the new doctrine of the Chicago Telephone and Western Distributing cases would be of little value, because it would be impossible to verify adequately the evidence presented by the utilities in a state case. How the Court will react on this is a moot question; but if it follows the territorial theory of the law, it can scarcely permit such extraterritorial jurisdiction. If this is the outcome, then in holding company relations the state commissions in the absence of federal regulation would be actually as powerless as they are in independent company relations involving interstate commerce.[1]

PROTECTION OF "STATES RIGHTS"

Prior to the enactment of the Federal Communications Act of 1934 and the Public Utility Act of 1935, the opponents to national regulation had succeeded in defeating every proposal considered by Congress. Between 1928 and 1935, this opposition was especially strong and was led by members of state public utility commissions and officers of the utility companies. In every hearing on a proposed extension of the authority of a federal agency to interstate commerce in public utility service or a proposed creation of a new authority for this purpose, these leaders made vigorous and effective protest. In many ways, their arguments were identical. They argued that federal regulation was unnecessary, that it would raise costs of regulation, that it was essentially bureaucratic. The Massachusetts commission, for instance, feared that federal regulation would jeopardize its rule of prudent

[1] See Chap. XXIII for further consideration of the legal aspects of this problem.

investment in valuation cases and felt that a revival of municipal ownership would immediately follow an overthrow of its valuation process.[1] Federal regulation was even likened to Communism and Socialism. Typical statements by leaders of the electrical industry were:[2]

> The interests of the public are already fully safeguarded. . . . Federal regulation would only lead to confusion and besides it would greatly increase the cost of the service.
>
> [Federal regulation will] raise from the several states the last vestige of utility control and deprive them of rights which distinctly belong to the states. . . . It would substitute for a regulation sensitive to local public opinion the absentee treatment of a Federal Bureau in Washington.

The state commissions and their national organization, the National Association of Railroad and Utilities Commissioners, were at one time especially opposed to national regulation, although their opposition declined sharply when they finally became convinced that for the present, at least, no threat was intended against their respective jurisdictions.[3] The state commissioners were probably motivated most by their fears of the consequences of the growth of federal regulation. As they expressed it, they wanted no repetition of the "Shreveport principle" in the field of public utility regulation. Or, as one commissioner said, "There can be no such thing as concurrent jurisdiction or even co-operation between the states and the Federal government on the subject of rate-making."[4] If both occupy the field of utility regulation, the inevitable result would be the ousting

[1] *Public Utilities Fortnightly*, Mar. 20, 1930.

[2] Excerpts from addresses by high officials in the electrical industry, Halford Erickson and Harold T. Sands, respectively, delivered at a conference, August 29, 1928, and published by the National Electric Light Association.

[3] In 1930, the National Association passed the following resolution: "Resolved, that this Association is unalterably opposed to any form of Federal legislation which proposes the enlargement of Federal authority by the creation of new agencies, or the extension of the authority of present agencies, whereby the regulative authority of the State Commissions would be interfered with in fields in which they are now adequately functioning." 1930 *Annual Proceedings*, p. 250. In 1931, a committee of the association said: "Your Committee in passing desires to draw attention to the fact that the States now exercise complete regulatory jurisdiction over all imported electrical energy, as well as that energy which is intrastate in character." Committee on Intercorporate Relations, 1931 *Annual Proceedings*, p. 202. By 1938, the association had undergone sufficient change in opinion so that it appeared to support the proposed regulation of natural gas, which was finally written into the Natural Gas Act of 1938.

[4] 1931 *Annual Proceedings*, National Association of Railroad and Utilities Commissioners, p. 150.

of the state agencies, leaving the entire field of regulation in the exclusive possession of the federal agency or agencies.

A brief study of the history of railroad regulation since the decision in the Shreveport case[1] will illustrate the basis of these fears. That case involved the right of the Interstate Commerce Commission to control intrastate railroad rates claimed to be discriminatory against interstate rail rates, even though the Interstate Commerce Act denied to the commission all jurisdiction over intrastate rates generally. The Supreme Court of the United States sustained the right of the commission in this case, thereby definitely broadening its scope of authority to areas previously thought to be the exclusive province of the states. The Court based its decision upon the superiority of federal power when it conflicts with state power and the obvious inextricable intermingling of interstate and intrastate rail traffic to the extent that their separation for purposes of regulation had become impossible. Even more significant in widening the authority of the Interstate Commerce Commission at the expense of the states was the Transportation Act of 1920, which declared transportation by rail to be a national problem and placed upon the commission the obligation to establish rates at such levels that carriers as a whole could earn a fair return upon a fair value. As a consequence of this act, sustained by the Court, the state commissions were ousted from all practical jurisdiction over rail transportation.[2]

In the light of this sequence, it is no wonder that state public service commissions were fearful of all federal public utility regulation. They envisioned a similar sequence of events and Court decisions the final effect of which would transfer to Washington all utility regulation. These fears, however, are probably groundless, for the following reasons. Rail shipments are essentially interstate in volume; utility movements are essentially intrastate in volume. Next, interstate utility shipments can be more easily separated from intrastate movements. The utility business divides into three functional steps—production, transmission, and retail distribution. This division leaves clearly defined areas for state and federal action. It is difficult, for instance, to see any valid allegation of discrimination leveled against intrastate retail electricity rates, unless the most indirect and probative evidence is accepted.[3]

[1] 234 U.S. 342, 1914, also known as *Houston, East & West Tex. R. v. United States.*

[2] Sustained in *Railroad Comm. v. Chicago, B. & Q. R.*, 257 U.S. 563 (1922). This case is often called the "Wisconsin Passenger Fare case."

[3] On the other hand, see the decision of the Federal Power Commission in

Finally, the most significant flaw in the logic of the state commissioners was their failure to realize that it was the Wisconsin Passenger Fare case sustaining the Transportation Act of 1920 and not the Shreveport case that dealt the lethal blow to state railroad regulation. The Shreveport case applied to discrimination situations only, as the Court later pointed out in no uncertain terms.[1] To have a complete analogy of this rail regulation sequence, Congress must pass an act similar to the Transportation Act of 1920 by which public utility service would be declared to be a national problem, and a federal commission ordered to fix rates at levels that would yield utility systems as a whole a fair rate of return upon a fair valuation. This type of law has not been urged and would probably be declared unconstitutional. Until it is passed by Congress and validated by the Supreme Court, the state commissions are in no danger whatsoever of being ousted from their proper area of control of intrastate activities of public utilities.

The fears of the states, however, did produce some results, because the various utility acts of 1934, 1935, and 1938 do contain restrictive provisions designed to protect the authority of the state commissions. The cooperation and joint board provisions have the same basic purpose. For instance, the Public Utility Act of 1935, in extending the authority of the Federal Power Commission, lays down the following statement of its jurisdiction:[2]

> The provisions of this Part shall apply to the transmission of electric energy in interstate commerce and to the sale of electric energy at wholesale in interstate commerce, but shall not apply to any other sale of electric energy or deprive a State or State commission of its lawful authority now exercised over the exportation of hydroelectric energy which is transmitted across a State line. The Commission shall have jurisdiction over all facilities for such transmission or sale of electric energy, but shall not have jurisdiction, except as specifically provided in this Part . . . over facilities used for the generation of electric energy or over facilities used in local distribution or only for the transmission of electric energy in intrastate commerce, or over facilities for the transmission of electric energy consumed wholly by the transmitter.

Re New Jersey Power & Light Co., 30 P.U.R. (N.S.) 33, holding that because a public utility stood in the path of interstate commerce, it was subject to commission control in the matter of acquisition of common stocks of another utility. See also *Rochester Telephone Corp. v. United States* (U.S. Sup. Ct.,), 28 P.U.R. (N.S.) 78 (1939).

[1] *Illinois Cent. R. v. Public Util. Comm.*, 245 U.S. 493 (1918), commonly called the "Illinois Passenger Fare case."

[2] Public Utility Act of 1935, Title II, pt. II, §201 (b).

The Natural Gas Act of 1938 likewise has a restricting clause which reads as follows:[1]

> The provisions of this act shall apply to the transportation of natural gas in interstate commerce, to the sale in interstate commerce of natural gas for resale for ultimate public consumption for domestic, commercial, industrial, or any other use, and to natural gas companies engaged in such transportation or sale, but shall not apply to any other transportation or sale of natural gas or to the local distribution of natural gas or to the facilities used for such distribution or to the production or gathering of natural gas.

One critic concludes, in reviewing this act of 1938, that it[2]

> . . . allows no room for any so-called Shreveport Case construction whereby the state regulatory field could be overrun by the Federal Power Commission. . . .

He fears, however, that amendments and court decisions may yet make that possible. As we said above, we do not fear for the future usefulness of the state commissions within their respective state borders.

THE COMPACT CLAUSE

One proposal often advanced as an intermediate solution of the problem of interstate commerce in utility service is to make use of the constitutional device of state compacts. The compact clause of the Constitution reads: "No State shall, without the Consent of Congress . . . enter into any Agreement or Compact with another State, or with a foreign Power. . . . " Examples of the state compact antedate the Constitution. New York and New Jersey have compacts relative to the harbor between them and the tunnel under the Hudson River. Probably the best known compact to utility students is the Colorado River compact, which has as its major purpose the construction and operation of Boulder Dam between Nevada and Arizona. More recent is the proposed Connecticut River Flood Control Compact. This proposal would, in addition to setting up flood control devices, reserve to the compacting states control and disposal of all electric power to be generated on the Connecticut River.[3]

It has been claimed that the compact could be used to regulate interstate movements, especially of electricity, thereby making

[1] Natural Gas Act of 1938, §1 (b).

[2] WELCH, "Uncle Sam Moves In on the Gas Industry," *Public Utilities Fortnightly*, **22**:222, Aug. 18, 1938.

[3] 1937 *Annual Report* of the Federal Power Commission, pp. 13–16. It was this latter feature that caused the Federal Power Commission to object to it.

national regulation unnecessary. The development at Keokuk, Iowa, is a good illustration of how a compact among states could be effected for utility regulation. A compact among the three states of Illinois, Iowa, and Missouri would permit them to set the wholesale rate for the electricity generated in Iowa. Control would be by means of a commission composed of one representative from each state.

The compact may be made effective in so far as only two or three states are involved, although even there the necessity of unanimous decision will often be a handicap. The economics of electric power generation, however, does not confine it to the artificial boundaries of states. A compact today to meet a given situation may be antiquated tomorrow because of changes in the radius of electricity transmission. Furthermore, interstate transmission is not an occasional, but the usual, thing and is growing in volume. As was well expressed in 1925 by the Federal Power Commission, "the number of cases [of interstate transmission of electricity] is constantly increasing, and eventually the transfers will affect groups of States."[1] This prediction has come to pass. Therefore, we conclude that the compact is too inflexible to satisfy the need for the regulation of interstate commerce in electricity. If "localness" in the regulation of interstate commerce in utility service is desired, the joint boards provided in the acts of 1934, 1935, and 1938 will be far more effective. A joint board can have all the advantages of a state commission and none of the disadvantages of a compact.

So far as gas and the telephone are concerned, the compact is out of the question. Texas Panhandle natural gas is marketed in a dozen states, and therefore a compact of these states loses that localness claimed for it. The telephone is national in scope; and if it needs regulation of its interstate activities, that must obviously come from the national government. We conclude, therefore, that the compact has little, if any, place in an adequate scheme of utility regulation.

COORDINATED REGULATION

We believe that the complete regulation of public utilities requires forty-eight state public service commissions, an occasional state compact for exceptional projects, and federal commissions controlling interstate public utility activities, whatever they may be. We subscribe to the statement of the Federal Power Commission that the power industry (and we add natural gas and telephone service) is both local and national and that "if complete and effective supervision is to be had it must be had through cooperation of both local and

[1] 1925 *Annual Report*, p. 10.

national control."[1] We believe, for instance, that a recognition of the three divisions in the production process—generation, transmission, and distribution (to select the electrical industry for illustration)—furnishes proper areas in which states and federal authorities can function without conflict of jurisdiction. Certainly, the third one of these can always be a local problem left to state control. In those generation and transmission situations entering interstate commerce, a federal commission can control. It need never go further. Take, for instance, the problem of gas rates for Detroit. The Federal Power Commission can fix a gateway (wholesale) rate at Detroit. On the basis of this, the Michigan commission can then fix retail rates and require such service standards as are reasonable. In the area of finance and financial policies, there may be conflict; yet in spite of all state efforts, these problems have been largely outside effective control. In this area, the holding company has predominated and can be controlled only on a national basis.

We approve thoroughly of the principle of the joint board. We hope that it will continue to be widely used; and we believe that if the states cooperate properly, it can be made an effective intermediate agency of control.[2] We likewise hope that the state and federal commissions can find satisfactory bases on which to cooperate. We note, for instance, that the Federal Power Commission and the National Association of Railroad and Utilities Commissioners have seen eye to eye on the matter of uniform accounting. The bulk of the state commissions and the Power Commission now require the same system, a significant step in integrated regulation.

We believe that an ideal federal commission setup would have included the present Communications Commission, the Power Commission, and the holding company section of the Securities and Exchange Commission. A seven- or nine-man commission supervising all federal utility problems, properly sectioned and staffed, would eliminate such unnecessary duplication as the present three commissions may unavoidably cause. Since the likelihood of this integration is remote, it is to be hoped that the three independent federal agencies concerned with utility problems will find some informal and extralegal basis on which to cooperate to the advantage of all. Finally, we recognize that many changes may be required in both state and federal commission laws. We must fearlessly experiment if commission regulation is to be given a chance to be genuinely successful.

[1] 1931 *Annual Report*, p. 14.

[2] See 1936 *Annual Report* of the Federal Power Commission, pp. 12–14, for a plan of cooperation with state commissions.

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CHAPTER XII

TECHNIQUES OF REGULATION

Thus far in our study of the agencies of regulation, we have limited our investigation to the history, growth, structure, present status, and deficiencies of these agencies. Our task at this point, therefore, is to analyze the techniques of control commonly used to put into effect their many powers. It is quite easy to say that a commission shall control rates, service, security issues, accounting practices, depreciation, and other matters, but it may be another thing to devise techniques by which to accomplish these objectives quickly, efficiently, and cheaply. Therefore, it will be no surprise to the student of public utilities to discover that commissions have been organized and equipped in certain ways because those forms seemed to gain best the desired ends. We shall study, then, the commission form of organization, commission practice and procedure, and especially the certificate of convenience and necessity.

COMMISSION ORGANIZATION

As has been pointed out previously, in addition to the designation of the number and method of selecting commissioners, state and federal public utility laws provide for the creation of groups of experts and other personnel through which those laws may be enforced. There is usually included a secretary, legal counsel, engineering and accounting experts, and administrative and clerical help. Within the specifications of the law, commissions have proceeded to organize their working force along such lines as has seemed best. Let us illustrate by citing several actual organizations.[1] The Illinois Commerce Commission is divided into eight sections, each in charge of a chief, such as the "executive officer" in charge of the executive section and the "chief engineer" in charge of the engineering section. Of course, each section has assistants, clerks, and stenographers, the number depending upon the volume and importance of its work. The following table

[1] For an excellent monograph dealing with this topic, see Ruggles, *Aspects of the Organization, Function, and Financing of State Public Utility Commissions*, No. 18, Business Research Studies, Graduate School of Business Administration, Harvard University. We have relied heavily upon this study for the following section.

shows section names, personnel, and salaries of the Illinois Commission as of April 17, 1939:[1]

Section	Number	Salaries
Commission (5) and secretary	6	$ 35,100
Executive section	24	81,000
Administrative section	46	112,100
Engineering section	55	161,270
Accounting section	26	73,500
Rates and research section	17	46,200
Railroad transportation section	11	29,870
Motor vehicle section	11	26,100
Warehouse section	7	16,220
	203	$581,360

Of course, not all commissions follow this type or organization, nor do they allot their personnel and budget in the same proportions. The New York Public Service Commission organization, personnel, and salary cost as of January, 1936, is as follows:[2]

Section	Number	Salaries
Executive department (includes commissioners)	14	$ 101,300
Administrative department	106	165,700
Power bureau:		
Electric group / Gas group	90	195,420
Telephone bureau	14	36,820
Water bureau	6	19,500
Transportation bureau:		
Transportation group / Grade-crossing group / Motor vehicle group	60	172,100
Tariff bureau	6	17,400
Accounting division	50	142,370
Research and valuation division	31	102,250
	389	$1,018,360

Each commission will have some peculiar variation in organization, to be accounted for by historic or legal accident. For instance, note the remnants of the early efforts of Illinois to regulate warehouses still

[1] Information supplied by the commission.

[2] RUGGLES, *op. cit.*, p. 36.

present in its commission organization. The attached sample chart for the Wisconsin Public Service Commission shows a typical organization of a progressive commission. Had this chart been prepared prior to 1938, it would have shown an additional division of the commission covering all securities regulation. On January 10, 1938, that function was transferred to the state banking commission, where it properly belongs. It would appear from these samples that no single principle of organization has been followed. New York leans toward an organization by types of utilities to be regulated; Illinois by functions to be performed. Neither, however, is consistent; each actually combines something of both these organization principles in its respective commission.

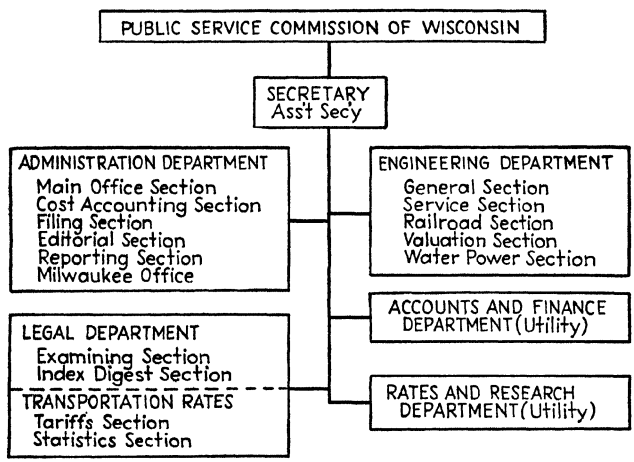

CHART 17.—Organization chart of the Public Service Commission of Wisconsin. This material was supplied by the commission. Notice that the organization is along functional lines.

The Federal commissions, although following a pattern similar to those set out above for the state commissions, have their own variations. The Federal Power Commission, for instance, has organized its staff as follows:

Adjudication:
(Includes commissioners, trial examiners, research assistants, and confidential secretaries).
Bureau of Administration:
Office of the secretary.
Personnel division.
Division of information.
Administrative division.

Bureau of Law:
  General counsel.
  Assistant general counsel.
Bureau of Engineering:
  Office of chief engineer.
  Division of gas and electric resources.
  Division of licensed projects.
  Division of power-flood control surveys.
  Maps and drafting section.
Bureau of Accounts, Finance, and Rates:
  Office of chief of bureau.
  Division of rates and statistics.
  Division of finance.
  Division of accounts.
  Division of original cost.

In addition to its Washington office, the commission maintains five regional offices each under the charge of a director. These are located in New York, Atlanta, Chicago, Denver, and San Francisco.

The Federal Communications Commission is similarly organized under the direction of seven commissioners, a general counsel, a chief engineer, a chief accountant, and a secretary. Under Administrative Order No. 2, as amended February 7, 1940, the work of the commission is sectioned as follows: The secretary, in addition to his usual duty of entering appropriate orders, is given authority over licenses of amateur radio operators, ship stations, and aircraft stations. The chief engineer is directed to supervise many phases of radio broadcasting, especially experimental approvals. The chief accountant has the usual duties of prescribing accounts, requiring of reports, and posting of tariffs. A significant innovation is the "Administrative Board," composed of the foregoing officers plus the chief counsel. This board is given extensive powers over radio and wire service. All orders of this board "shall be reported in writing each week to the Commission at its regular meeting." Finally, one of the commissioners is specifically designated to act on formal hearings except as motions may be in effect an "appeal to the Commission." This right of appeal is specifically secured by a provision permitting a petition for rehearing which "shall be passed upon by the Commission."[1]

COMMISSION PROCEDURE

Variations in practice and organization make it difficult to give an accurate and adequate description of a proceeding before a public

[1] Because of its restriction to holding company regulation only, we have omitted description of the holding company section of the Securities and Exchange Commission.

service commission. The usual ways by which a proceeding may be initiated are: by a petition of the proper officials of a city or company, by petition of a minimum designated number of interested taxpayers (twenty-five is the minimum number in New York), or by the commission on its own motion. The Illinois law permits complaint to be made[1]

> . . . by any person or corporation, chamber of commerce, board of trade, or any industrial, commercial, mercantile, agricultural or manufacturing society, or any body politic or municipal corporation by petition or complaint in writing. . . .

Complaints are classified as formal and informal. The latter are those which can be settled without the need of a formal hearing. For instance, a customer may complain of some practice or policy of his local company. It may be a question of meter inspection. Such complaints are referred for adjustment to the alleged offending utility, which subsequently makes to the commission a follow-up report on the matter. If the complaint is settled to the satisfaction of the first party and the commission, the matter is closed. If not, it becomes a formal complaint and is placed on the docket of cases to be heard later.

Informal proceedings are usually carried on by mail in the same manner as similar nonlegal negotiations would be conducted. Formal proceedings, on the other hand, are conducted at specified places at a designated time. They are presided over by some or all of the commissioners or by a hearing deputy or by an examiner. In a state such as New York, only a very important case would be heard by the full commission. The same is true of the Interstate Commerce Commission and the Federal Communications Commission. These bodies divide their membership into several sections. The former body employs assistant commissioners, called "examiners," who conduct hearings but whose findings are subject to review by the commission. When a complaint is filed, it is placed on the docket, a hearing date set, and all parties involved are properly notified. If it is an important case—a rate case, for instance—the engineering and accounting staffs will be assigned to the task of collecting evidence. When the hearing is held, the company may introduce evidence and witnesses. If it is anything other than a hearing on the motion of the commission, there is a second party who may also present evidence and witnesses. The hearing follows court practice, except that it is usually less formal and

[1] Illinois Commerce Law, §64, art. 5.

the rules of evidence are not quite so restrictive. Of course, being quasi-judicial in nature, the right of cross-examination is allowed to each side. Attorneys usually represent each side, make objections, file motions, present briefs, and sum up the evidence at the close. Commissioners ordinarily take a more active part than judges; they question witnesses and introduce such evidence as may have been developed by their own experts.

At the conclusion of the hearings, the commission votes on the issues at stake, with one of them writing the decision and whatever order is necessary. If there is a dissent, one of the minority members may write the argument of the minority, or else simply the names of the dissenters are appended to the decision. Occasionally, one or more of the members concurs with the results of the order but for reasons different from those given by the majority decision. Such a special concurrence is noted, with or without a statement of reasons by that member or members. It is the usual practice, often required by law, that the reasons behind the majority decision be stated in writing. Practice indicates that a written special concurrence or dissent is optional with the persons concurring or dissenting.

The order of the commission specifies the thing to be done or to be discontinued by the utility and its effective date. A rehearing may be asked, which may be granted by the commission at its discretion. If the commission denies a rehearing, then the utility either accepts the verdict or appeals to the courts for a temporary injunction against the order pending a hearing on the merits of the dispute. We need not detail the succeeding steps of a court hearing. Once a court has settled the controversy, its decision either sustains or reverses the commission, in part or *in toto*. Sometimes a court decision closes the case; more often, the court simply remands the case for further hearings and for decision consistent with its opinion.

For the bulk of the cases, however, the commission decision is usually final. The Supreme Court of the United States since *Smyth v. Ames*, in 1898, has not handled over three dozen rate cases, which is but an infinitesimal fraction of the total. The record of cases in New York is illustrative.[1] In the 11-year period ending in 1931, the commission initiated on its own motion 838 cases, with 594 of them in 1930 and 1931. During these 11 years, over 800 formal cases a year have been instituted before the commission. In the year 1938, 895 formal cases were considered, 118 of them on motion of the commission. During that year, 906 hearings were held, divided as follows:

[1] 1931 *Annual Report* of the Public Service Commission, New York, pp. 19, 25–28.

TABLE 32.—HEARINGS OF NEW YORK PUBLIC SERVICE COMMISSION, 1938*

Subject	Number	Subject	Number
Rates	198	Construction of gas and electric plants	57
Capitalization and security issues	88	Accounts and reports	73
Certificates of convenience and necessity	186	Service	46
Railroads	83	Miscellaneous	49
Grade-crossing elimination	126	Total	906

* 1938 *Annual Report*, pp. 123–125.

In addition to formal cases, the commission annually handles thousands of informal complaints. In the years since 1922, these have never totaled less than 5,800 a year. In 1938, for instance, 7,172 of them were filed, involving such things as high bills, meter tests, and service disconnections and extensions. In the course of their settlement, the commission caused over $9,200 to be refunded.

TABLE 33.—CLASSIFICATION OF INFORMAL COMPLAINTS HANDLED BY NEW YORK PUBLIC SERVICE COMMISSION, 1938*

Utility	Number
Electric	4,315
Gas	1,924
Steam	8
Telephone and telegraph	717
Transportation	368
Water	167
Total	7,499

* 1938 *Annual Report*, pp. 67–69.

The largest single item of informal complaint involved claims of defective meters. In the New York City and Albany offices in 1938, there were filed 1,060 complaints requiring tests of electric meters. During that year, the commission was a party to thirty-three new court proceedings; at the same time, forty-eight proceedings were closed. In all but three of these closed cases, the commission was the victor.

In so far as data are available, the facts for Wisconsin are similar to those of New York.[1] During the biennium July 1, 1936, to June 30, 1938, there were 6,142 formal cases opened, 6,410 cases closed, 4,980 cases heard, and 212 pending on the docket at the close of the period. Of these cases, 1,096 involved utility matters, of which 32 were for security issues. During this period, thirty-two appraisals were made

[1] 1936–1938 *Biennial Report* of the Public Service Commission of Wisconsin, p. 4.

by the commission. The following table, prepared by the commission, shows the details of its work:

TABLE 34.—FORMAL CASES BEFORE THE WISCONSIN PUBLIC SERVICE COMMISSION

	1936–1937		1937–1938	
	Opened	Closed	Opened	Closed
Railroad	105	105	145	151
Water power	63	60	51	50
Utility:				
General	109	117	179	138
Securities	18	19	14	13
New plant and additions	418	417	358	351
Motor:				
General	33	33	31	32
Common carrier certificates	54	64	56	54
Contract carrier licenses	1,585	1,758	1,272	1,342
Amendment of operating rights	840	889	808	817
Total	3,225	3,462	2,914	2,948

In addition to these formal cases, the commission in this 2-year period handled informal matters totaling 22,393.

Our last sample is for the state of California.[1] The commission of that state reports its work by major divisions. In the gas and electric division, in the year ending June 30, 1938, eight rate cases had been conducted, six special rate matters, and seven cases involving gas and electric service and safety. The division handled 513 informal complaints, settled ninety-six formal matters, received sixty new applications, inaugurated six cases, and at the end of the year had five cases and ten applications pending. The valuation division reported continuous work on annual and semiannual rate base studies of major California utilities, in addition to its regular valuation and accounting work. Estimated savings in rate reductions were $5,311,900. The department of finance and accounts reported the summary of decisions on applications for security issues as shown in Table 35.[2]

Summarizing the work of all departments and divisions of the commission for the fiscal year 1937–1938, there were received 3,084 informal complaints, and 634 formal hearings were held (251 in San Francisco and 202 in Los Angeles). The commission rendered 1,173 decisions,

[1] *Letter of Transmittal of Annual Report*, Railroad Commission of California, July 1, 1937, to June 30, 1938.

[2] *Ibid.*, p. 14.

received 760 formal applications, and defended 23 cases before the courts.

TABLE 35.—DECISIONS OF THE CALIFORNIA RAILROAD COMMISSION ON APPLICATIONS FOR SECURITY ISSUES

Action taken	Twelve months ending June 30	
	1938	1937
Securities authorization:		
Additions and betterments	$21,967,700	$ 1,822,000
Refunding	7,761,500	85,124,300
Reorganization	4,512,800	40,707,200
Miscellaneous	51,900	2,400
Securities dismissed	123,100	7,464,000
Securities denied	1,539,300	
Total	$35,956,600	$135,120,100

The figures for these states indicate several things. First, the commissions do not lack work to do. Second, a large part of their effort is devoted to the handling of informal complaints. Third, only a minor part of their task involves directly rate making and valuation. Fourth, only an insignificant fraction of their orders are appealed to the courts, and in these few appeals the commission is ordinarily sustained.

PROCEEDINGS ON COMMISSION INITIATIVE

One significant power is that of initiation of proceedings by a commission on its own motion. Typical is the provision of the California law: "Complaint may be made by the commission of its own motion. . . . "[1] It is no exaggeration to say that without this power, no commission can be an entirely effective one. As a general thing, most cases arise out of a complaint of an aggrieved party. Therefore, for the bulk of a commission's work, it may be sufficient that it sit passively as does a court, trying cases as they are presented. There are times, however, when a commission should take the initiative. Certain popular grievances can often be sensed long before formal complaints are filed. Criticism of the commission can often be allayed by its prompt action in such situations. This power of initiation of cases on its own motion is also effective in situations where statutory requirements of a minimum number of persons necessary to institute an action operate as a bar to a case. For instance, between

[1] Public Utilities Act, §60.

the original filing of a complaint and the time of hearing, for reasons unknown to the commission, a number of objectors may have withdrawn, thereby automatically closing the case because less than the statutory minimum of complainants are involved. If the commission suspects coercion or intimidation of the complainants, it can and should on its own motion continue the case.

One of the complaints of the 1920's against the state commissions was their lack of activity in prosecuting utility cases. In some instances, the fault lay with a lack of the power to institute *ex parte* proceedings. In other cases, however, the fault was with the commission; it possessed this power but had allowed it to lie dormant. The power can, as the experience of the New York Commission after the reorganization of 1930 demonstrates, be an effective instrument for the protection of customer interests. In recent years, *ex parte* proceedings have increased in number. They should continue to represent a significant portion of total commission work.

TABLE 36.—CASES INITIATED ON MOTION BY THE NEW YORK PUBLIC SERVICE COMMISSION, 1921–1938*

Year	Number	Year	Number
1921	85	1930	50
1922	41	1931	74
1923	79	1932	78
1924	19	1933	86
1925	6	1934	108
1926	13	1935	60
1927	2	1936	76
1928	11	1937	103
1929	15	1938	118

* 1938 *Annual Report*, p. 129.

THE CERTIFICATE OF CONVENIENCE AND NECESSITY

In the development of the techniques of regulation in the United States, there has been devised an important instrument of control, the certificate of convenience and necessity. Unknown to the common law, it is a modern development which was created only with the recognition of the true monopoly nature of the public service corporation; and being a modern invention, it was obliged to run the gamut of judicial review before it was accepted as a proper instrument of regulation. This certificate may be defined as a permit issued by a commission to a public utility to perform some act or service on terms from which no deviation is allowed. In one form or another, it is widely

used, forty-three states and the federal government requiring it for one or more utilities.[1]

Mr. Justice Brandeis has accurately stated the purpose behind the certificate of convenience and necessity as follows:[2]

> The introduction in the United States of the certificate of public convenience and necessity marked the growing conviction that under certain circumstances free competition might be harmful to the community and that, when it was so, absolute freedom to enter the business of one's choice should be denied.

In short, the certificate is grounded on the proposition that competition is wasteful socially as well as productive of poorer service and higher rates to the customer and that therefore a monopoly or semi-monopoly, regulated to secure reasonable rates and adequate service, is superior to competition. This conclusion has been well summarized as follows by the Public Service Commission of Pennsylvania:[3]

> One of the principal purposes of regulation under [the laws of Pennsylvania] . . . is the prevention of ruinous rate competition between public service companies. Experience has demonstrated that where two or more such companies engage in rate war, the public, while possibly temporarily benefited, will ultimately be the loser.

In common with all other forward steps in utility regulation, the certificate of convenience and necessity was obliged to overcome several legal hurdles. It was first assailed on the ground that it denied the constitutional right of a person to enter into any business not outlawed as predatory or immoral. This challenge, however, was not admitted by the courts. They have taken the position that those industries clothed with a public interest (public utilities) are subject to the force of the police power in many ways. One of the powers of regulation is the right to limit the numbers of persons and companies engaging in a public service. The courts have generally been cognizant of the economic basis of the certificate and therefore have placed a legal approval upon it.[4] The certificate was next challenged as

[1] *New State Ice Co. v. Liebmann*, P.U.R. 1932B 433, 441.

[2] *Ibid.* at 441.

[3] *Re Service Gas Co.*, 15 P.U.R. (N.S.) 202, 206. We cite this quotation because we think that it expresses a valid attitude on this problem. The Pennsylvania Commission appeared later to have shifted its opinion from regulated monopoly to one of "regulated competition." This change, however, was not approved by the Superior Court of Pennsylvania. See *Metropolitan Edison Co. v. Public Service Comm.*, 127 Pa. Super. Ct. 11, 19 P.U.R. (N.S.) 55 (1937).

[4] See *Idaho Power & Light Co. v. Blomquist*, 26 Idaho 222, and cases there

contrary to provisions in state constitutions forbidding monopolies and trusts. In the state of Washington, for instance, this point was squarely raised. The Supreme Court of that state sustained the certificate in question on the grounds that the constitution was designed to prevent oppressive monopoly.[1] A further challenge in this case was that the state constitution prohibited the issuance of an irrevocable grant of privilege. This point was likewise denied. In a still later case, a United States district court ruled that a certificate of convenience and necessity may not be challenged as tending to create a monopoly. The case involved a taxicab license, the court ruling that the city of Chicago had not surrendered its right to license other cabs, when the need should arise. The limitation in question was simply in conformity with the declared policy of Illinois requiring a showing of public convenience and necessity as a condition precedent to licensing the operation of a cab company.[2]

We can do no better in summarizing the legal status of a certificate of convenience and necessity than to quote from the Supreme Court of Wisconsin. Mr. Justice Owens of that Court has said:[3]

A franchise to operate a public utility is a legislative privilege. It may be granted or withheld at the pleasure of the legislature, and, where the legislature acts directly upon the subject, no justiciable question results. The legislature cannot be coerced to grant the privilege no matter what its reasons for withholding the same, and no matter whether the public convenience would be promoted by granting the privilege. The power of granting a certificate of convenience and necessity which the legislature has delegated to the Public Service Commission is legislative in character. The power delegated or conferred is broad. So far as the language of the section is concerned, it is absolute. The grant of the power is accompanied by no conditions whatever. If we consider only the language of the grant of this specific power, it would seem that the power granted was as broad and comprehensive as the power of the legislature itself, and, if so, their decision upon that question presents no issue upon the merits which a court may review. However, if we look to the entire act, we discover some indication of a legislative intent that all orders of the Commission shall be subject to the test of reasonableness.

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cited. This case is reproduced in part in Robinson, *Cases on Public Utilities*, p. 104. See his notes, pp. 110–112.

[1] *State v. Inland Forwarding Corp.*, 164 Wash. 412, P.U.R. 1931E 394, 397 (1931). Another state case sustaining the monopoly consequence of the certificate is *Clifton Forge-W. Telephone Co. v. Commonwealth* (Va.), 165 Va. 38, 13 P.U.R. (N.S.) 501 (1935).

[2] *Capitol Cab Co. v. Cermak*, 60 F. (2d) 608, P.U.R. 1932E 141 (1932).

[3] *Union Co-op. Telephone Co. v. Public Service Comm.*, 206 Wis. 160, P.U.R. 10932B 269, 270.

What Are Convenience and Necessity?—There has been no standard definition of what circumstances constitute public convenience and necessity. In general, the courts have been inclined to accept the commissions' conclusions on the matter. The Kentucky Court of Appeals has said that it is not only necessary to find that a proposed certificate satisfies the requirement of public convenience but that the public necessity must also be served. Mere showing of convenience was insufficient.[1] Although most courts and commissions do not bother to give precise meaning to the phrase "convenience and necessity," occasionally one of them does make an attempt. The Maine Commission has defined public convenience in terms of the "effect upon the people of the neighborhood in contrast to the private rights or benefits of the individual . . . " and necessity as "needful, essential, requisite, or conducive to public convenience."[2] On another occasion, this same commission has held that convenience and necessity was a composite expression and was to be judged in terms of the consumers affected, not the public generally or the particular advantage of any applicant.[3] But for all these scattered efforts to define these terms, we are forced to the conclusion that there is no clear definition of necessity or of convenience or of their composite meaning. Each case usually stands upon its own merits and turns on the intuitive reaction of the judges or commissioners to the need or lack of need in the issue in question.

Conditions of Issue.—It often happens that two or more persons or corporations are applying for certificates and that only one is to be issued. How do commissions choose among them? In every case, the past performance, if any, of the applicants, their financial standing, and the nature of their equipment are considered. If there is one applicant outstanding on the basis of this test—and often there is—the choice is easy. It may be, however, that these tests disclose no difference. Then the commission must look further. It asks, if an extension into a new area is involved, "Which utility is nearer?" and "Would it have been a natural move for that utility to expand into the area in question?" Or in the case of applicants for a bus certificate,

[1] *Shorty's Bus Line v. Gibbs Bus Line*, 237 Ky. 494, P.U.R. 1931C 507, 509 (1931).

[2] *Public Util. Comm. v. New England Telephone & Telegraph Co.*, 18 P.U.R. (N.S.) 440.

[3] *Re Northern Maine Transportation Co.*, 2 P.U.R. (N.S.) 95. Similar positions have been taken by two state courts. See *Tri-City Motor Transportation Co. v. Great Northern R.*, 67 N.D. 119, 17 P.U.R. (N.S.) 504 (1936); and *Incorporation of Serv. Gas Co. v. Public Service Comm.*, 126 Pa. Super. 381, 18 P.U.R. (N.S.) 256 (1937).

it may choose the one who is a taxpayer in the district to be served.[1] Sometimes, the existing agency is favored, particularly if it is a railroad; sometimes not, depending on the commission policy of protecting the railroads from excessive competition.[2] In one case, for instance, in which two rival gas companies were petitioning for a certificate, the approval given one company by the local authorities of the area to be served determined the choice between them.[3] One thing that can very definitely be said is that a holder of a certificate to do interstate business who for that type of business is thus put beyond the jurisdiction of the state commission is not, by the fact of his presence, entitled to preference over other applicants in the matter of issuing an intrastate certificate of convenience and necessity. This problem has arisen with the recent growth of the motor vehicle, and the commissions have been none too friendly to the requests of the interstate carriers to do an intrastate business.

A certificate to do business within a municipality does not usually become valid until its possessor secures a municipal franchise or consent to do business. The Supreme Court of Missouri has said that municipal consent is always a condition precedent to granting a certificate of convenience and necessity.[4] Whether it is so or not depends upon the laws of the state and the area for which the certificate is requested. If the area, for instance, is entirely rural, then of course no question of municipal consent is involved. The New York law requires that, before an electric or gas company may begin any construction under a franchise, it must first secure a certificate of convenience and necessity from the commission. This likewise applies to any municipal utility project.[5] The Illinois law applies to all utilities and any extensions thereof.[6] The Uniform Public Utilities Act, §20, would require every applicant to have a municipal franchise prior to the issuance of a certificate. In addition, that act would allow the issuance of a preliminary certificate prior to the actual securing of a municipal franchise or permit, though such franchise must be secured before the regular certificate could be obtained.

Property Status of a Certificate.—A significant question often raised in connection with a certificate is its property status. Does

[1] *Re Polson Damsite Motor Transportation* (Mont.), P.U.R. 1931A 263.

[2] *Pennsylvania R. v. Public Util. Comm.* (Ohio Sup. Ct.), 123 Ohio St. 655, 176 N.E. 573 (1931).

[3] *Re Alleghany Gas Co.* (Pa.), P.U.R. 1931D 415.

[4] *Public Service Comm. v. Kansas City Power & Light Co.*, P.U.R. 1931A 32.

[5] Consolidated Laws, New York, §68, c. 48.

[6] Illinois Commerce Law, §55, approved June 29, 1921.

it resemble a franchise, or is it a right of a lesser order? The Supreme Court of Ohio has said that a certificate of convenience and necessity constitutes neither a contract nor a franchise, confers no property right, is a mere license which may be revoked according to provisions of law.[1] On the other hand, several courts have been quite definite in holding that the certificate is property, subject to all the protection of law. The Supreme Court of the United States has said of a certificate to operate a cotton gin:[2]

> It follows that the right to operate a gin and to collect tolls therefor, as provided by the Oklahoma statute, is not a mere license, but a franchise, granted by the state in consideration of the performance of a public service; and as such it constitutes a property right within the protection of the Fourteenth Amendment.

Thus, under this decision, a certificate comes under the aegis of the Fourteenth Amendment and is consequently protected from all subsequent substantial changes, unless there is just cause for that change. Some of the states—Illinois, for instance—reserve the right to alter on their own motion any certificate issued.[3] It is essential that each certificate be issued with proper reservations; especially should it set out the conditions of forfeiture for nonuse. Furthermore, where possible, it should be made nontransferable. The Supreme Court of Ohio, for instance, has taken the position that a "certificate is personal, non-transferable and does not pass by succession."[4] A United States district court in Ohio, interpreting the laws of that state, has subsequently held that a certificate of convenience and necessity in interstate commerce issued by Ohio is revocable, thereby following the Ohio interpretation of certificates for interstate commerce.[5] In line with these decisions is that of the Supreme Court of New Hampshire that the purchaser of a utility at a foreclosure sale does not thereby acquire a right to operate in the territory formerly served by a mortgagor.[6] A complete legal interpretation of the status

[1] *Matz v. Curtis Cartage Co.*, 132 Ohio St. 271 (1937).

[2] *Frost v. Corporation Comm. of Okla.*, 278 U.S. 515, 519, 520 (1929).

[3] Illinois Commerce Commission Law, §55.

[4] ROBINSON, *Cases on Public Utilities*, p. 111n., citing *Westhoven v. Public Util. Comm.*, 147 N.E. 759; *Estabrook v. Public Util. Comm.*, 147 N.E. 761. See also *Re Shull* (Colo.) 20 P.U.R. (N.S.) 144; *Re Calhoun* (Wyoming), 68 P. (2d) 591, 20 P.U.R. (N.S.) 505 (1937); and *Re Derry Electric Co.* (N.H.), 184 Atl. 356, 16 P.U.R. (N.S.) 331 (1936).

[5] *Cannonball Transportation Co. v. American Stages*, 53 F. (2d) 1051, P.U.R. 1932C 64, 67.

[6] *Re Derry Electric Co., supra.*

of the certificate of convenience and necessity has not yet been made, and therefore it is wise to proceed cautiously in drafting it, leaving no foreseeable loophole by which the courts can give to it a status not originally contemplated by either a legislature or a commission.

Monopoly v. Competition.—As we said above, the essential purpose of the certificate is to restrict or eliminate competition between like utilities in those instances in which competition is wasteful. The problem then arises, especially in those situations where a certificate holder has a monopoly of his service, as to the attitude of a commission in certifying a second utility in order to correct certain alleged abuses by the first certificate holder. Shall the first holder be continued on the basis of his promise to correct the alleged defect, or shall it be assumed that he had his chance and all such promises of better service be disregarded in favor of an applicant for a second certificate? Commission practice has split on this question. A few of the western states, notably California, have served notice that, at the time of application of a second utility for a competing certificate, they will review the service record of the first holder and, if it is deficient, certify the competing applicant, protestation of reform notwithstanding.[1] This position has been defended on the ground that the western states still need more utilities and that therefore nothing should be done to discourage their entrance.

The bulk of the commissions, however, in so far as they have taken any position, have been hesitant to certify a second competing utility, even though the service record of the first holder is poor, if he promises better performance in the future. In fact, the problem has not been pressing in states such as Wisconsin, because, as a former chairman has said, "The threat of doing . . . is the most potent agency in securing that [desired quality of] service."[2] The Wisconsin Commission has, on occasion, made its stand plain on the question of certifying a competing utility. In one case, it said that, although it would not tolerate inadequate service, it would make every effort to force the existing certificate holder to render adequate service before it would certificate a second one. Before it does so, the commission must be convinced that the first company is incapable of rendering adequate service.[3]

[1] SPURR, *Guiding Principles of Public Service Regulation*, Vol. I, p. 34.

[2] 1927 *Report* of Illinois Terminable Permit Committee to 55th General Assembly, p. 11.

[3] *Re Central Union Telephone Co.*, P.U.R. 1932A 465, 468. This position has been sustained by the Supreme Court of Wisconsin in *Union Co-op. Telephone Co. v. Public Service Comm.*, 206 Wis. 160, P.U.R. 1932B 269. Similar holdings will be found in *Re Buerge Telephone Exchange* (Mo.), 7 P.U.R. (N.S.) 381; *Re Joplin Water Co.*, 10 P.U.R. (N.S.) 190; *State v. Valley Milk Transportation* (Wash.), 183

So far, we have been mainly concerned with the question of certification of a second company to correct inadequate, faulty, and defective service. It often happens, however, that an applicant for a competing certificate will offer a lower rate than that charged by the existing company. What shall be the position of a commission in such situations? Presumably, the answer lies in the choice of basic premises. Shall commissions strive to secure regulated monopolies or regulated competition? Some of the commissions have passed through a cycle of advocating in turn each of these. The Nevada Commission, for instance, has said:[1]

> . . . it is the opinion of this Commission that, for the interests of the public, we can accomplish more by healthful competition than by building up that service which might lead, or tend to lead, to monopolistic control. Healthful competition should render to the public a service of the highest standard, with an alert utility ever ready to serve the needs of the public at large.

Although this opinion by the Nevada Commission involved a motor carrier problem, it is no less applicable to other public utilities. The Pennsylvania Commission, for instance, used this same principle (calling it "regulated competition") to justify its certificating a competing municipal electric plant.[2]

On the other hand, many commissions have followed the practice of requiring not only proof that a second applicant could serve for less but proof that the existing company was serving at excessive rates. Even if the latter point were proved, the existing company should be required to reduce its rates rather than have them governed by an authorized competitor. As the Arkansas Commission has so well said, the remedy for inadequate service or excessive rates lies in their correction rather than in the certifying of a competing company.[3]

In light of the fundamental conditions of public utility service, this latter position is the better. It strikes us, in fact, that the use of a second (and competing) certification to correct rate and service deficiencies is an admission of the failure of regulation to secure its objectives. In this connection, let us quote from the dissent of Commissioner Vaughn, who said:[4]

Wash. 329, 48 P. (2d) 208 (1935); *Re Maynard* (Md.), 1 P.U.R. (N.S.) 234; *Re Yuma* (Ariz.), 2 P.U.R. (N.S.) 8; and *Corporation Comm. v. Hopkins* (Ariz. Sup. Ct.), 79 P. (2d) 946, 25 P.U.R. (N.S.) 516 (1938).

[1] *Re Nevada-Calif. Transportation Co., Inc.*, 23 P.U.R. (N.S.) 358, 360.

[2] Cited and reversed in *Metropolitan Edison Co. v. Public Service Comm.*, 127 Pa. Super. Ct. 11, 19 P.U.R. (N.S.) 55 (1937).

[3] *Re Municipal Light & Power Plant*, 12 P.U.R. (N.S.) 103.

[4] *Re Grady Harrison's Freight Service*, P.U.R. 1931D 24, 29.

A regulatory body cannot dodge its duty of keeping rates at a reasonable point by permitting competition—competition does not solve the problem. And if rates are not kept at a just and reasonable point by the regulatory body and "competition" alone does the regulating by rate wars, then regulatory bodies will soon have no excuse for existing.

The truth of this quotation cannot be questioned. Unless our theory and facts are all wrong, the certificating of a second and competing utility can only lower rates or secure better service by impairing the investment in these utilities.[1] But such a situation is quite temporary, resulting in either permanently poorer service or else the elimination of competition and possibly higher rates to cover the doubled fixed investment of the two utilities. Therefore, it is commendable that the practice of most commissions is to hesitate before placing an identical competitor into the field.[2]

We conclude this discussion of the certification of a competing utility by citing the questions that the Superior Court of Pennsylvania has proposed as a guide to that problem.

1. Are there any fundamental defects in the service of the existing supply?
2. Has the existing public utility been negligent of its public obligations?
3. Has the existing public utility failed either to render adequate service or to charge reasonable rates?

If these can be answered in the affirmative, and if there appear to be no adequate remedies, then, as that court pointed out, the second certificate could be properly issued.[3]

Bibliography

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BRANDEIS, LOUIS D.: Dissents in *Frost v. Corporation Comm. of Okla.*, 278 U.S. 515, 531–553 (1929); and *New State Ice Company v. Liebmann*, 285 U.S. 262,

[1] The assumption, of course, behind this statement is that both utilities are rendering identical services. Should the second certificate holder have superior equipment and thus be able to render services not available from the original utility, the problem shifts, and the principle set out above does not then apply.

[2] We feel that one final word of explanation needs to be added. We have been generally concerned with the authorization of competing privately owned companies. Since 1933, the problem of the certification of a competing publicly owned plant has become significant. Although the same rule should apply in such situations, we realize that the problem has its own peculiarities, and consequently we postpone final judgment on it until we have occasion to delve further into the question of public ownership and operation.

[3] *Metropolitan Edison Co. v. Public Service Comm.*, 19 P.U.R. (N.S.) 55, 63 (1937).

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PART III
PRIMARY PROBLEMS OF REGULATION

CHAPTER XIII

THE PROBLEM OF REASONABLE RATES

THE PRIMARY PROBLEMS OF REGULATION

With this chapter, we begin the study of the primary problems of regulation. A review of the common law duties of public service, set out in Chap. IV, discloses that historically the significant problems were two—rates and service, with the major emphasis on service. The years of regulatory effort in the United States have reversed this emphasis, at least from a publicity viewpoint. Today, a phase of the rate problem—valuation—stands out in the public eye as the number one problem of regulation. This reversal is to be accounted for by the unsettled state of the valuation question. The public hears much about the "breakdown of commission regulation" because of the impasse on that problem. One hears but little, however, about that other original primary problem—adequate service—because there is nothing spectacular, nothing controversial, about it. The utilities, on the whole, have had quite far-sighted leadership, insisting on service standards at least as high as those imposed by the commissions. Controversial or prosaic, service requirements are as important as rates; in fact, the reasonableness of rates should never be considered apart from the adequacy of the service in question.

In the years of experimentation with public utility control, other regulatory problems have emerged to assume primary importance. Their number depends upon the viewpoint of the student and the emphasis that seems most desirable. Whatever the choice, it can always be challenged. Reviewing the work of the commissions, we have chosen to elevate to primary problems those of security regulation and holding company control. All other problems we have relegated to Part IV, "Special Problems of Regulation." We make our selection on the assumption that effective regulation of security issues and holding company activities is absolutely essential to the attainment of the lowest possible reasonable rate for adequate service. Watered stock, overcapitalization, unconscionably high intercompany profits—all possible in the absence of security and holding company control—definitely will inflate rates, all efforts of the most vigilant commission to the contrary. Other problems, although they might be said to have

a similar rate-service relationship, at least are not quite so close and, as we said above, are reserved for Part IV. We therefore are ready to turn to the first of these primary problems, that of reasonable rates.

WHAT IS A REASONABLE RATE?

The first question to be solved in answering the query, "What is a reasonable rate?" is to discover an acceptable standard of reasonableness. The very word "reasonable" is not one to be found in orthodox economics but rather is borrowed from other fields. Prices generally are determined according to the interaction of demand and supply within a given market situation. No one asks whether the resulting price is reasonable or unreasonable, so long as there is no interference with the respective forces there operating. A reasonable price, or rate, on the other hand, implies that institutional or social approval attaches to it, that it was determined according to a theory of prices bearing legal sanction or popular acceptance.

What choices may be available as standards of reasonableness? We select two possible alternatives, one of which has at least the unexpressed approval of courts and commissions. In the first place, a reasonable price could be said to be one that would place the utility service within the economic grasp of the mass of potential users. Statistics can be marshaled to show the minimum essential consumption of these services necessary to maintain an accepted standard of living. For instance, the annual domestic consumption of electricity in 1939 averaged around 900 kilowatt-hours. Many persons, however, consumed far less than this amount. If it were premised that the bulk of the householders in the United States should use this amount in order to maintain a minimum standard of living, a policy of lowered prices could be adopted to gain that end. Whatever that price, or set of prices, might be, by definition it would be reasonable. The closest illustration of this theory of reasonableness is found in the 5-cent street railway and subway fares of New York City. Regardless of changes in rider habits or changes in costs, this price has remained constant because of consideration for the mass of users of transport services. Of course, this theory, as the experience in New York well illustrates, creates the problem of financing such deficits as may result; and since the bulk of the utility companies are privately owned, this theory of reasonableness has not been seriously urged upon either courts or commissions.

The other approach to the question of reasonableness is to ask what the service costs. This second measure has both a historical

explanation and a logical defense. During the Middle Ages, there was developed a theory of the just price (*jus pretium*), a price that covered all reasonable previous costs plus enough more to maintain the social status of the seller. Fundamentally, therefore, this medieval concept was a theory of cost, and any price yielding a return much in excess was regarded as an extortionate price, subject to the penalties of church and state. Out of this background developed the concept of reasonable rates, as we now know it.

Extracts from leading cases attempting to define this modern concept read as follows:

> Like so many other questions in the law that involve reasonableness of conduct, it is a question of [sound business judgment rather than one of legal formula]. . . . The real test of the justice and reasonableness of any rate seems to be that it should be as low as possible, and yet sufficient to induce the investment of capital in the business and its continuance therein.[1]
>
> The carrier is entitled to adequate recompense for the service it performs.[2]

Mr. Justice Hughes, discussing the question of specific rates for coal, said of them:[3]

> The outlays that exclusively pertain to a given class of traffic must be assigned to that class, and the other expenses must be fairly apportioned. . . . When conclusions are based on cost, the entire cost must be taken into account.

We therefore conclude that the courts and the commissions, too, approve of some cost concept of reasonableness. The emphasis upon a fair return on a fair value presupposes that all other costs of service are also covered. An inspection of rate cases confirms this conclusion. In such proceedings, a careful check of all costs is made; then finally the residue of income is measured against a valuation. If the final comparison produces a rate of return that appears to be judicially acceptable, then the tenets of reasonableness have been observed, and the rate in question will have judicial approval. Mr. Justice Brandeis has stated this process in the following manner. Note that he states his proposition in terms of confiscation, the judicial opposite of reasonableness.[4]

> To decide whether a proposed rate is confiscatory, the tribunal must determine both what sum would be earned under it, and whether that sum

[1] *Public Util. Comm. v. Springfield Gas & Electric Co.*, 291 Ill. 209 (1920).

[2] *Puget Sound Electric R. v. Railroad Comm.*, 65 Wash. 75 (1911).

[3] *Northern Pac. R. v. North Dakota*, 236 U.S. 585 (1915).

[4] Concurring opinion in *Southwestern Bell Telephone Co. v. Public Service Comm.* 262 U.S. 276, 291 (1923).

would be a fair return. The decision involves ordinarily the making of four subsidiary ones:

(1) What the gross earnings from operating the utility under the rate in controversy would be. (A prediction.)

(2) What the operating expenses and charges, while so operating, would be. (A prediction.)

(3) The rate base—that is, what the amount is on which a return should be earned. (Under *Smyth v. Ames*, an opinion, largely.)

(4) What rate of return should be deemed fair. (An opinion, largely.)

This and the subsequent four chapters are concerned with the procedure as outlined by Mr. Justice Brandeis.

COST OF SERVICE VS. VALUE OF SERVICE

Several leading cases of the Supreme Court of the United States have suggested not only a cost standard of reasonableness but also a value standard. In the Covington Turnpike case, in 1896, the Court, following a lengthy discussion of the rights of utility and public in the matter of rates, concluded:[1]

> So that the right of the public to use the . . . turnpike, upon the payment of such tolls as in view of the nature and *value of the service rendered by the company*, are reasonable, is an element in the general inquiry whether the rates established by law are unjust and unreasonable.

In the leading case upon valuation, *Smyth v. Ames*, in 1898, the Court spoke as follows:[2]

> We hold . . . that the basis of all calculations as to the reasonableness of rates . . . must be the fair value of the property being used by it [in this case, a railroad] for the convenience of the public.

Yet not half a page farther on, the Court adds:

> On the other hand, what the public is entitled to demand is that no more be exacted from it . . . than the services rendered . . . are reasonably worth.

In reality, has not the Court stated two rules of reasonableness? In the first quotation from the Smyth case, we see the cost principle of reasonableness. In both quotations, however, there is a further suggestion of an alternate rule of reasonableness, the value of the service. This latter suggestion was soon forgotten, not to be resurrected until the depression of 1929. In 1932, for instance, Wisconsin

[1] *Covington & Lexington Turnpike Road Co. v. Sandford*, 164 U.S. 578, 597 (1896). (Italics ours.)

[2] 169 U.S. 466, 546, 547 (1898).

made this suggested alternate rule of reasonableness the basis of an attempt to reduce telephone rates, though those efforts were later nullified by the courts.[1]

What can be the meaning of value of service? In at least one case, a commission equated it to cost of service.[2] Such a definition, however, simply makes value of service meaningless. The Wisconsin Commission has explained value of service in terms of the changes in general purchasing power.[3] If, in a depression, purchasing power declines by, say, 50 per cent, has not the value of utility service likewise declined, and should not rates be likewise reduced? Others refer to value of service as its desirability to actual and potential customers, thereby attempting to distinguish it from what they call ability to pay, that is, desire coupled with actual purchasing power. Such a distinction is likewise quite unnecessary.

All that the notion of value of service can mean is found by examining the meaning of demand for utility service. Demand, as used by the economist, simply refers to the schedule of the quantities of a particular good or service that a buyer or buyers would take at a given time at all possible prices. Thus, when plotted on the usual price quadrant, it appears as a descending curve from left to right and simply shows the correlation of quantities desired and their respective prices that would be paid. Suppose that we actually measure the demand of any group of consumers, say, for electricity service. All we find is that at a given set of rates a certain quantity will be sold. If these rates are lowered, we find another and larger quantity that will be taken. Suppose that at 10 cents per kilowatt-hour annual sales amount to 500 kilowatt-hours per customer and that at 5 cents the total is 800. Obviously, if 10 cents is charged, demand remaining unchanged, all that can be sold will be 500 kilowatt-hours per customer. If 800 is the goal, the rate must be lowered to 5 cents.

Value of service—the demand for utility service—could therefore be used as a basis of rate making. Customers could be classified according to their respective group demands and charged accordingly. Residential customers ordinarily have intense demands; they could be charged high rates. Other customers, for a variety of reasons, have less intense demands and would be charged something less. Of

[1] *Re Wisconsin Telephone Co.*, P.U.R. 1932D 173. For a history of this case, see pp. 233–235 in 13 P.U.R. (N.S.), and *Wisconsin Telephone Co. v. Public Service Comm.*, 287 N.W. 122, 30 P.U.R. (N.S.) 65 (1939).

[2] *Re Ansonia Water Co.* (Conn.), Docket No. 5973, July 10, 1934, cited by Eberle in his article in *Public Utilities Fortnightly*, **17**:364, Mar. 12, 1936.

[3] P.U.R. 1932D at 262–266.

course this basis of rate making would not only create a variety of rates but would yield a total revenue that would bear no necessary relation to total costs. For this reason, value of service is *no help at all as a primary standard of reasonableness for pricing* of utility services. As will be developed later in our discussion of rate making, value of service plays an important part in the setting of specific rates. Inability to construct public utility rates on a basis of covering total costs incurred in rendering any specific unit of service makes it necessary that a supplementary principle be invoked. Even here, however, value of service, although the basis of individual rate differences, is restricted to a point where all rates to all users yield only enough total revenue to cover total costs. Thus, value of service is distinctly subordinate and supplementary to cost of service as a theory of particular rates and is never acceptable as a general theory of reasonableness of rates (or prices).

One exceptional situation remains to be considered. In rare instances, no rate or combination of rates will cover all costs of production. This was the case of many street car companies after the first World War and of other utilities built in decadent areas. The demand in those situations had changed so sharply that under the most economical management and any conceivable combination of rates, revenues were less than total costs of plant operation. The demand had declined either because of substitute services, such as the motor vehicle as a substitute for the street railway, or because of the disappearance of a former demand, such as the closing of a factory or the exhaustion of a natural resource. In these situations, all talk of adjusting public utility rates to cover costs of such plants becomes futile. All that remains for management and commissions is the fixing of rates in accordance with the shrunken demand so that losses will be held to a minimum. Here, truly, value of service, although it may not yield a legally acceptable rate, certainly sets the economic boundaries to actual rate levels and to specific rates.

PAST OR PRESENT COST?

Having selected a cost theory of reasonableness, the next question is "Shall past or present costs control?" Each of these choices has advantages. Past costs are easily ascertained; they are certain and permit of a minimum of dispute. The determination of costs actually incurred becomes a matter of accounting check and audit. Present costs, however, have the advantage of reflecting the latest state of the arts. They best approximate the principle of the competitive

norm. In a competitive situation, a new process or new plant with the latest equipment sets the pace for the industry and, unless it is too insignificant a unit, may set the price for all producers.

On the other side, each of these choices has its disadvantages. Actual past costs may be too high because they may have been incurred through the use of semiobsolete equipment and antiquated processes. An unprogressive management may cling to outmoded machines and methods. In that case, although a rate may be charged that no more than covers the cost in question, it may be far above a rate based on present costs of a thoroughly modern substitute plant and processes. This then becomes an argument for the use of present costs. Determination of present costs of a hypothetical plant itself is not without difficulty; the very process involves conjecture and dispute. Logically, then, the use of present costs requires the complete disregard of the plant under consideration. In its place, what is sought is the answer to the question "What will it cost, with the best known present equipment and methods, to produce and deliver a certain amount of service?" Of course, the difficulties of this choice are recommendations for the use of past costs.

In essence, this dispute of present versus past costs is the same dispute that has been at the bottom of the valuation problem. Those who desire certainty will prefer the actual records of past performance. They would therefore choose past costs and actual investment—and such a combination has its merits Those, however, who believe that the goal of regulation is the approximation of the competitive norm, that utility rate levels should be integrated with price levels and move in the same general direction, will choose present costs and cost of reproduction. In the area of costs, apart from that cost called a fair return upon a fair value, there has been but little dispute. Usually but slight difference exists between present and past costs or between actual costs and costs of a substitute service, because of a rather close similarity in the results of the respective theories. Past costs of most of the items involved in utility service (other than the reward to capital) tend to be but slightly past and merge quite imperceptibly into the present. Changes in coal costs and wage rates will quickly reflect themselves into present costs. For instance, if one of these costs should be doubled, it will be immediately reflected into costs. New processes are constantly being adopted in place of older ones. Thus, we come to the conclusion that, except in periods of rapidly changing prices, although present costs are a logical choice, past costs are an acceptable practical measure of them.

COMMISSION PRACTICE

Choice of past actual costs, however, is not sufficient in itself, because without further qualification and limitation the doors would be thrown wide open to inefficiencies and extravagances. A vouchered expenditure, unless the voucher had been fraudulently issued or involved illegal actions, would be *ipso facto* a valid cost and includable in total costs. Courts and commissions have been quite insistent that cost as a standard of reasonableness refers to the usual costs incurred under the reasonably efficient management of a going concern. This proposition was well stated in a case before one of the lower federal courts as follows:[1]

> To be allowable in a rate case, operating expenses must be reasonable. The utility should be permitted to earn the cost of operation and a fair return; but, in addition to a fair return, it is not entitled to earn whatever it may choose to spend. Its expense account is limited to the reasonable cost of efficient ordinary operation, to the exclusion of expenditures too large, or otherwise improper, injust, or unfair to its patrons, who must pay them, if provided for by higher rates.

The insistence of the commissions upon reasonable costs finds its legal support in the statutes under which they operate. In every state public utility law will be found a provision outlawing all unjust and unreasonable rates and further provision giving its commission power to "determine the just, reasonable or sufficient rates. . . ."[2] From these provisions it is probably a valid inference that the commission authority extends to supervision of specific items of expense or at least to their disallowance in rate determination. Otherwise, the mandate of reasonableness would be unforceable. Several of the state utility laws, however, go further in this matter of expense supervision. Some, for instance, have provisions by which their commissions can control such specific items as the charge for depreciation. Wisconsin, in 1931, rewrote that part of its law relating to depreciation, thereby giving to its commission a most complete supervision over it.[3] With the public emphasis given the holding company after 1928, many amendments to state laws gave minute supervision to intercorporate transactions, whereby all payments for services or anything else between operating affiliates and their holding companies could be

[1] Judge Farrington, in *Reno Power, Light & Water Co. v. Public Service Comm.*, 298 Fed. 790 (1923).

[2] 1935 Colorado Stat. Ann., c. 127, §23a.

[3] C. 196, §196.09.

disallowed for good cause in calculations of reasonable rates. In Wisconsin, the commission has been given jurisdiction over dividend payments. The provision reads:[1]

> Whenever the commission shall find that the capital of any public service corporation is impaired it may, after investigation and hearing, issue an order directing such public utility to cease paying dividends on its common stock until such impairment has been made good.

The Wisconsin Public Service Commission has had occasion to exercise the authority of this provision.[2] Other states exercise similar authority. When this provision was challenged in the state of Ohio, the Supreme Court of that state upheld it.[3] Although it might be argued that such authority was unnecessary in light of the legal hazards incurred by any board of directors who were to permit such capital impairment, it is just as well to eliminate the possibility, rather than rely upon civil and criminal remedies to be applied after the event had occurred.

Several states have enacted specific provisions giving their respective commissions control over all items of expense, thereby eliminating any challenge of valid jurisdiction. The New York law reads:[4]

> In determining the price to be charged for gas or electricity the commission *may consider all facts* which in its judgment have any bearing upon a proper determination of the question . . . with due regard among other things to a reasonable average return upon capital actually expended and to the necessity of making reservations out of income for surplus and contingencies.

The Indiana law is quite specific in this matter. It reads:[5]

> The commission shall inquire into the management of the business of all public utilities, and shall keep itself informed as to the manner and method in which the same is conducted and shall have the right to obtain from any public utility all necessary information to enable the commission to perform its duties. If, in its inquiry into the management of any public utility, the commission finds that the amount paid for the services of its officers, employees, or any of them, is excessive or that the number of officers or persons employed by such utility is not justified by the actual needs of the utility, *or that any other item of expense is being incurred by the utility which is either unnecessary or excessive*, the commission shall designate such item or items . . . [and they] shall not be taken into consideration in determining and

[1] C. 184, §184.11, Amendment of 1931.

[2] P.U.R. 1933A 253, 319.

[3] *Ohio Central Telephone Corp. v. Public Util. Comm.*, 127 Ohio St. 556, 2 P.U.R. (N.S.) 465 (1934).

[4] Consolidated Laws, c. 48, art. 4, §72. (Italics ours.)

[5] Stat. Ann., §54–402 (12722). (Italics ours.)

fixing the rates which such utility is permitted to charge for the service which it renders.

As a third illustration, we cite the Oregon law which, under the caption of Budgets, gives its public utilities commissioner the following authority:[1]

> The commissioner shall have the right and power of regulation, restriction and control over the budgets of expenditures of public utilities, as to all items covering proposed payment of salaries of executive officers, donations, political contributions and political advertising, and all other expenditures and major contracts for the sale or purchase of equipment, and as to all items covering or contemplating any payment or payments to any person or corporation having an affiliated interest, for service, advice, auditing, associating, sponsoring, engineering, managing, operating, financing, legal or other services.

It would appear, therefore, that our state commissions are at least equipped with the legal powers to review utility expenses of all kinds in order to fix just and reasonable rates. It goes without saying, of course, that these powers do have limits, as many court decisions show. Always must the legal doctrine of the sanctity of managerial discretion be observed. Yet, as the Supreme Court of the United States has itself pointed out, the contention that utility expenditures are a question of managerial judgment cannot be used to evade the requirement that rates should not include extravagant or unnecessary items.[2] We conclude, therefore, that such ineffectiveness as may exist in the actual supervision of public utility expenses is not the result of legal incapacity but the result of other things such as underfinancing or indolence.

Suppose we cite a few examples of the type and extent of expense control. Commissions generally examine with extreme care expenses not of an obvious public utility nature. The Interstate Commerce Commission, when it had jurisdiction over the telephone industry, disallowed as an expense a contribution of $75,000 by the New York Telephone Company to an emergency relief fund.[3] Texas has disallowed all expenditures to credit bureaus and contributions of a civic nature.[4] In general, all donations, organization dues, political contributions, merchandising losses, and similar expenditures are usually disallowed. On the other hand, Oregon, usually a stickler

[1] §61–279.
[2] *Acker v. United States*, 298 U.S. 426 (1936).
[3] *Accounting of the New York Telephone Co.*, 188 I.C.C. 83.
[4] *Lone Star Gas Co. v. Fort Worth*, 20 P.U.R. (N.S.) 89 (1937).

in such matters, allowed contributions toward establishing a first-aid car, because it might be of benefit to utility employees.[1]

In the matter of scrutiny of items of utility expense, the commissions are more lenient. It is amazing to discover in searching through the reported rate cases that practically no question is raised about the bulk of the claimed items of utility expense. Of course, payments to holding companies, managerial salaries, depreciation, and the amount of the return usually occasion much controversy, especially the amount of the return. Such items as wages, materials and supplies, fuel, and repairs are passed by with but scant notice. Such scanty treatment is justifiable, in the main, we suppose, on the grounds that such items are purchased in competitive markets; therefore the likelihood of padding is slight. This may or may not be so.

In summary, each commission should check every major and minor item of utility expense. All items involving nonutility expenditures and all intercorporate transactions should be especially scrutinized. In fact, specific investigations should be made periodically as to the reasonableness of that portion of utility expense not incurred in competitive markets. For those items such as wages generally and fuel, for which utilities compete with a thousand and one other business concerns, so long as the going rates are paid, there is no particular need for minute checking. In all other areas, careful inspections will be necessary. The obvious fact is that in many ways unnecessary expenditures can creep into utility expense accounts and that at best many of them will escape detection. If a cost standard of reasonableness is to mean anything, if it is to afford an approximation of the competitive norm, expense accounts must be ever guarded from that virus which attacks all noncompetitive industries—inefficiency and waste in operations.

THE ZONE OF REASONABLENESS

So far in our discussion, we have assumed the existence of a single rate, or level of rates, as reasonable, all others by inference being either unreasonably high or unreasonably low. Let us now examine the possibility of there being a zone of reasonableness, within which there could be not one but several rates, each of which would be reasonable. We can best approach this problem by using the familiar demand and unit cost chart (p. 97). It will be observed that the average unit cost curve intersects the demand curve in two places, let us say 10 cents and 5 cents. Between these limits, each average price times the quantity that could be sold will yield a total revenue

[1] *Re Portland Gen. Electric Co.*, 19 P.U.R. (N.S.) 314 (1937).

in excess of total cost. So far as a public utility is concerned, it could have no legal objection to any rate level less than 10 cents and more than 5 cents. From that utility viewpoint, therefore, the entire area between these limits could be called the utility zone of reasonableness. Even from that viewpoint, however, we find that we have certainly set out too broad a zone. Examining the problem further, we find at point P', or 7 cents, the monopoly price that alert management would charge if left undisturbed. Obviously, therefore, this would mark from the utility standpoint the upper limit of reasonableness.

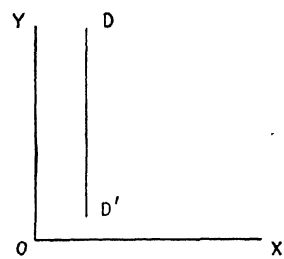
On the other hand, from the consumer viewpoint, the 7-cent monopoly price is the point from which he was attempting to escape when he joined in the movement to create public service commissions. His objective was the lowest price that could be obtained, and the judiciary set this low point as that price which would just cover all costs of production—5 cents in our illustration. Between these limits, rate levels will ordinarily be established, and the nearer the lower limit is approached the more nearly will the goal of regulation be attained.

We come to the conclusion, therefore, that the zone of reasonableness from the utility standpoint is that broad area between monopoly price and the price that just covers total cost (including in cost a reasonable return). To consumer and commission, on the other hand, strictly speaking, there is no such zone—there being theoretically at least, in terms of a given demand, only one level of rates that exactly covers cost (as defined). Any lower price would cause a loss (which will not be permitted by the courts); any higher price would yield an excess (an undesirable result from the public viewpoint). In reality, however, there is a consumer zone of reasonableness, a product of ever shifting demands and the inability of man-made mechanisms to approach an exact point. Custom, likewise, enters to influence customer concepts of reasonableness. Therefore, it might easily happen because of these factors that the customer zone of reasonableness, in terms of our illustration, could be any rate level between, say, 4.8 cents and 5.5 cents.[1]

Of course, as we have tried to make clear, it is important from the standpoint of the total social use of utility service that price be as near the competitive norm as possible, because the lower it is the greater

[1] Although not agreeing precisely with the above point of view, the Public Utilities Commission of Connecticut has recognized the principle of a zone of reasonableness. It has said: "There is a discretionary zone of approximately 2 per cent between a minimum fair return, below which confiscation would apply, and a maximum fair return, above which the company is not legally entitled to earn." *Rabbett v. Northern Connecticut Power Company*, P.U.R. 1933D 119, 136.

the quantity consumers will take. An alert management under the pressure of price reductions will expand sales to that point permitted by demand; but in order thereby to cover total cost, regulation must stand ready to force such sales expansion if management is inclined to hold back. In the face of an attempt to reduce price from the monopoly point, management might not attempt to expand its sales, thereby incurring some loss. Such a loss could be used as grounds for a claim of confiscation, a claim valid only because of sluggish sales policies. In such cases, the aim of regulation ought to be quite plain. To repeat, commissions must ever be on the alert to force prices down to the competitive norm and, if need be, to force an expansion of sales to that norm also.



At this point, we wish to point out an unexpressed fallacy in judicial thinking in matters of economic analysis. In many of the appealed rate cases, one gets the impression that judges believe the demand for utility service to be very inelastic. To express this attitude in an exaggerated form, the judicial demand curve is a vertical line, a condition of complete inelasticity. If this were the case (and it is not, as the experience of the Commonwealth and Southern subsidiary companies and the Tennessee Valley Authority eloquently demonstrates), then a reduction in rates would leave sales unchanged, and total revenues would decline. We have overstated this point; but a reading of the cases will convince one that our interpretation is essentially correct, because it is common practice to take a given year's sales of a company and multiply that sum by a proposed lower rate in order to estimate probable future revenues. Such a procedure obviously assumes a vertical demand curve, illustrated above. This judicial fallacy enables utility companies to resist proposed rate reductions, when, in reality, those rate reductions might actually yield an increased net return. We conclude, therefore, that for utilities generally and the electrical industry in particular, courts should be more hesitant about enjoining proposed rate reductions but rather should allow a trial operating period in order to determine more accurately how a proposed rate would affect revenues and costs. It may be surprising to see how often a proposed rate reduction will become a boon to company earnings.

THE JUDICIAL CONCEPT OF REASONABLENESS

The courts of the United States, although coining the concept of reasonableness, have not defined it too carefully or too consistently. In general, they speak of reasonableness as a zone of undefined bound-

aries lying between extreme areas of confiscation and extortion. Only the lower of these two boundaries has been involved in the cases, and there, the courts have avoided the problem of clear-cut delineation by introducing a sort of twilight zone called "nonconfiscation." Mr. Justice Butler, for instance, has said that a reasonable rate may be one that is considerably higher than one that is confiscatory.[1]

> The mere fact that a rate is nonconfiscatory does not indicate that it must be deemed to be just and reasonable.

This point has been phrased as follows by a judge of a federal district court:[2]

> A rate from a legislative standpoint, may be unreasonably low, and yet be a reasonable rate from a judicial viewpoint. The authorities seem to recognize a marked distinction between a rate which is not confiscatory in its character and a rate which is fair from an economic and commercial sense. Under the authorities a rate of return may be all-sufficient to meet the demands of the Fourteenth Amendment of the Constitution of the United States and at the same time fail to encourage and justify the operation of a utility business with that degree of service to which the public is entitled.

Although this extract speaks of a rate of return, such restricted reference does not change its essential idea, namely, that a rate can be judicially acceptable yet hardly reasonable from an economic viewpoint. Such reasoning is faulty, to say the least. A rate, or rate level, is either reasonable or unreasonable (confiscatory). To assume that there can be a twilight zone of nonconfiscation (or nonreasonableness) is simply to confuse the issue. By the very statement of the federal judge, that which he designates to be neither reasonable nor confiscatory is actually unreasonable or confiscatory.

Presumably, the point that the courts are suggesting is that commissions may be generous in some rate-making situations to the extent of rewarding management for its efficiency and willingness to keep well abreast of technological advance. But to dub the denial of such generosity in the process of rate making as legislative confiscation not subject to judicial correction is to infer bad conduct. We take the position that a proposed rate or rate level is either confiscatory or not confiscatory. If that rate appears to cover all allowable expenses but no more, it is poor judicial policy to attempt to condemn it by indirection by speaking of it as "legislative confiscation" although judicially

[1] *Banton v. Belt Line R. Corp.*, 268 U.S. 413, 423 (1925).

[2] *Arkansas-Louisiana Gas Co. v. Texarkana*, 17 F. Supp. 447, 17 P.U.R. (N.S.) 241, 249 (1937).

reasonable. Whatever generosity may be permissible under commission regulation is of no concern to the judiciary.[1]

MARGINAL COST AS A BASIS FOR RATE MAKING

It should be apparent by now that courts and commissions are striving to set rates at as near the point of average cost as possible, because at that point total income will just equal total cost. Of course, as we show below, no utility will attempt to fix a single rate applicable for all customers and all units of output. Yet customer classification and a graduated rate schedule for each class does not violate the foregoing proposition. The anticipation behind all rate complexities is that total revenues will equal total cost. In effect, then, average cost is the goal of rate control. Even the federal projects and municipal plants premise this objective.

Another cost could be argued as the basis for reasonable rates, namely, marginal cost. Strangely enough, the literature on public utilities is quite silent on this point, but that silence is not surprising. Let us consider this point further. As any principles of economics text will show, for every industry and for every establishment there can be determined curves of both average cost and marginal cost. For the ordinary business or industry of increasing cost, within the usual ranges of productive capacities, the marginal cost of the final unit of output is higher than its average cost. Therefore, marginal cost in those situations, if there is competition, tends to be the long-run determinant of price. Utilities, on the other hand, are businesses of decreasing cost, and therefore marginal cost (the variable operating cost discussed in Chap. V) tends within the usual limits of plant utilization to be lower than average. As a consequence, marginal cost as a basis of pricing would not cover total expense and has thus, for industries of decreasing cost, been replaced by average cost as a pricing norm.

There is, nevertheless, sound social basis for the advocacy of marginal cost as a rule of reasonableness, because at that price there would be a maximum of satisfaction of wants and at no increase in fixed costs. This appears in Chart 18, which shows, for a hypothetical utility, three alternate prices—monopoly price, price based on average costs (the competitive norm), and price based on marginal cost. No one doubts the wisdom of regulation's forcing prices from P' to P,

[1] For an expanded and similar view on this problem, see Smith, *The Fair Rate of Return in Public Utility Regulation*, pp. 131 *et seq.* Although Smith is essentially concerned with the rate of return, his comments on this point bear precisely upon this general problem of reasonableness.

hence increasing output and eliminating monopoly profits. Why not push it to P^2, the marginal cost, thereby gaining a maximum of want satisfaction at no increase in fixed costs? Such a proposal is entirely valid as a rule of reasonableness.

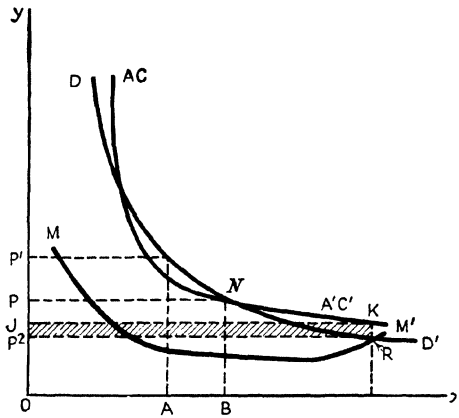


CHART 18.

Immediately it will be argued that such a rule of pricing fails to cover all costs and therefore cannot be applied by private owners of public utilities. Of course, such a price policy would result in a loss. Referring to our diagram, the area of cost would exceed that of income by the area $JKRP^2$. Obviously, such loss must be borne either by direct subsidy or by government ownership and operation. In either case, therefore, the loss would be paid from taxation. In effect, then, if this price policy were to be applied, consumers would pay a rate covering marginal costs; and, in addition, taxpayers generally would pay through taxes an amount equal to the fixed costs. Such a procedure, as we said, has the advantage of giving the maximum use of utility service and at not the slightest increase in social burden. Where consumers under a price established at average costs pay all costs, under a marginal price policy, the fixed portion is shifted to taxpayers, and a significant increase in consumption would occur.

Of course, this rule of reasonableness has its opponents. Some will argue that such sharp rate reductions as it would create would overtax existing facilities. This is a trivial argument. Demand analyses and capacity figures together could furnish the basis for a sane policy of gradual conversion of rates to marginal cost. One objection certainly would be raised, namely, the effect upon the distribution of income. To shift a part of utility costs from users to taxpayers will be to create

a different incidence of burden. Finally, it will be argued that such a price policy would make public ownership and operation inevitable. On that point, there can be little dispute. Thus, it seems to simmer down to the following choice: Are the hazards of government ownership greater than the loss in social satisfactions that inevitably flow from the use of average cost as a rule of reasonableness for utility rates? So long as private ownership continues in the United States, we shall not have utility prices set by marginal costs.

CONTROL OF ACCOUNTING SYSTEMS

Basic to adequate control of rates is accounting supervision. It could even be argued that accounting control is basic to all regulation. Certainly, as an instrumentality to rate regulation, valuation, depreciation, security control, and holding company supervision, it is quite indispensable. It is surprising and disappointing, therefore, to find that only half the state commissions have powers to prescribe accounts and accounting practices. Fortunately, all the federal utility commissions have full authority in this area. The more vigilant commissions, under the authority of their respective state laws, early began to prescribe systems of accounts. Wisconsin, New York, and Massachusetts, to mention a few, were pioneers in accounting control, and of course the Interstate Commerce Commission early developed the field of railroad accounting. The National Association of Railroad and Utilities Commissioners took under advisement the question of developing uniform systems of accounts for all utilities in the states. In 1922, the association adopted a Uniform Classification of Accounts for Electrical Utilities and recommended it to the member state commissions for adoption. The association subsequently adopted uniform classifications for gas and water utilities. With modifications, some minor, a few major, these systems have been generally required by the state commissions of their utilities.[1] The federal utility commissions have likewise developed systems, patterned largely on those developed by the Interstate Commerce Commission. Since the creation of the federal utility commissions, they and the state commissioners have cooperated closely in the matter of utility accounting systems, so that utilities are subjected, in general, to the same system by both state and federal agencies.

Using the uniform classification for electrical utilities as an illustration, we find it divided into seven major sections, covering accounting procedure for

[1] One major modification has been in accounting for depreciation. The conflicting views on this question are discussed in detail in the chapter on depreciation.

Balance sheet accounts.
Electric plant accounts.
Earned surplus account.
Clearing accounts.
Income accounts.
Operating revenue accounts.
Operating expense accounts.

Within each section, the specific account titles are set out, and general instructions attached directing the specific debits and credits to each account. In addition, there are set out standard forms for a balance sheet, income, and operating revenues and expense statements.

Utilities, when subject to accounting regulation, are permitted no other system of accounts. Deviations from the system and duplicate but different systems are forbidden. Their books must be kept available for commission inspection and periodic audit. Of course, commission audit does not take the place of a thoroughgoing audit by independent public accountants. In rate hearings, especially, will these books be checked and rechecked. Accounting systems, once established, will be altered from time to time upon commission order. Occasionally, major changes will be ordered, for which considerable time is usually allowed for compliance. The Interstate Commerce Commission, for instance, in 1926, ordered all railroads to change materially their methods of depreciation accounting. Since this was a sharp departure from the usual practice, the order was suspended pending further hearing and then finally made effective on January 1, 1933.[1] One of the first acts of the Federal Power Commission after the enlargement of its authority in 1935 was to overhaul completely the accounting procedure for fixed capital of the companies reporting to it.[2] Here, too, a certain amount of time was allowed between the date of the order and the date on which it would become effective.

Accounting supervision has many arguments in its favor. It makes checking of expenditures easier, and it facilitates studies in valuation. Comparison of net income and certain of the balance sheet accounts furnishes clues of excessive earnings and needed rate adjustments. Adequate accounts assist cost distribution studies, a necessary prerequisite to rate making. Accounts, obviously, must be in good order to enable adequate budgeting. Uniform systems of accounts make for more accurate comparisons among privately owned units and between privately owned and publicly owned plants. Accounts furnish the basis for security authorizations, mergers, and rearrangement of property holdings. By all means, therefore, must every accounting

[1] 118 I.C.C. 295, 177 I.C.C. 351.
[2] See "Uniform System of Accounts," effective January 1, 1937.

step be prescribed by commission action, and each commission should ever be on the alert to improve its systems and procedures.

SPECIAL PROBLEMS IN THE DETERMINATION OF REASONABLE RATES

In this chapter, we have attempted to review the general problem of reasonable rates. By and large, commissions and companies have found themselves in general agreement on all economic costs save two —the amount of the depreciation charge and the amount of the return. The determination of the amount of the return itself raises three questions, namely, the "valuation" of utility property, the depreciation deduction from that valuation, and the rate of return. Since each of these questions has become a major problem in itself, to each will be devoted a separate chapter. That emphasis, however, does not remove them from their general setting, the problem of reasonable rates.

The final problem of reasonable rates is rate making. Having determined what level of rates is needed to cover all costs of operation, the necessary sequel is so to arrange a schedule of rates for various types of users that total receipts approximate the desired goal. That problem is treated in the chapters on rate-making theory and practice.

We are now ready to turn to the first of the special problems, valuation, the *bête noire* of American utility regulation.

Bibliography

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CHAPTER XIV

VALUATION THEORY

The most disputed item of cost in the establishment of rates is the amount of the return; and to the determination of this item, courts and commissions have devoted much time and attention. With the reversal of the doctrine of legislative finality in matters of rates, one of the items in *Munn v. Illinois*, it was inevitable that the courts would be projected into this area. Railroads, protesting rate reductions in the 1880's and the 1890's, were arguing that the new rates failed to cover operating costs, bond interest, and dividends. They naturally urged upon the courts the principle that a reasonable rate should cover all these items of expense. In reply, commissions quickly conceded that operating expenses (narrowly defined) should be covered by rates, but they resisted demands that returns on existing capital structures should be included. In the leading case of *Smyth v. Ames*, counsel for the state of Nebraska, William Jennings Bryan, urged upon the courts a compromise rule of reasonableness. He argued that the amount of the return was a matter of legislative policy and that therefore, if all costs other than this return were covered by rates in question, they were judicially reasonable. How much more was to be added for return on investment should be a legislative question only. Suffice it to say that the Court refused to accept this proposed rule. Had it done so, however, the subsequent development of this problem might have been indeed different. As we pointed out in previous chapters, reasonableness and, consequently, the amount of the return became judicial questions, and therefore we must turn to the litigation on this subject to find at least an introduction.

The determination of a fair return on the property of a utility is, simply stated, a problem of pricing. To solve this problem, several other pricing problems must be considered. "What is the property to be valued, and how shall it be valued?" This is the first and most controversial of these problems. Next, "Shall that value be reduced by depreciation?" Finally, "What is a fair rate of return?" Each step, and the process as a whole, is a pricing problem.[1] The solution

[1] At this point, all items of intangible valuation are omitted. Of course, in a complete valuation, they must be considered. We reserve these items for discussion in the following chapter.

of this sequence can be expressed as follows:

$$(V - D)r = R$$

In this equation, V is value, D is depreciation, r is the rate of return, and R is the quantum sought, a fair return.[1] Applying this to real situations, if a proposed set of rates seems to yield an excess over and above all other costs at least equal to the solution of our formula, it will meet our definition of reasonableness. In this and the next chapter, we shall confine our attention to the valuation question.

IMPORTANCE OF A RETURN TO PUBLIC UTILITIES

Before turning to the minutiae of our problem, let us ask why a fair return on utility investment is important. The briefest consideration will show that capital once committed to utility service is definitely "sunk"; it cannot be moved except at great expense, and its alternative uses, if any, are quite limited. Therefore, were it possible to deny any return to present investments in utilities, that investment would be no less useful, would probably continue to serve as formerly. It is a truism that any enterprise that can cover all its operating and any part of its fixed costs will continue for a time at least to operate; and if it covers all its fixed costs except a return on the investment, it can continue to operate indefinitely under court receivership. Thus, except as there may be a sense of obligation for past services, a return on the investment could be omitted.

The real justification for allowing a return is found by looking to the future. Utilities ordinarily need upward of a billion dollars of new capital each year to meet their growing demands for service. The acquisition of this capital must be, in the main, through the investment market. Here utility demands must compete with all others; and to be successful, utilities must offer prospects of return similar to those offered by a thousand and one other competing businesses. The best "lure," therefore, is the record of past earnings (returns). Thus, the real reason for consideration of this problem of return upon the investment, apart from ethical reasons, lies in the economy of rewarding, in the present, past capital commitments so that future capital requirements can be secured on most advantageous terms.

[1] Strictly speaking, it is incorrect to separate depreciation (D) from "value" (V) because values imply deductions for depreciation. We have separated these, however, because of the extraordinary controversy over the relation of depreciation to valuations.

VALUATION OR RATE BASE?

Common consent refers to the process of placing a monetary estimation upon the property of a public utility as a valuation. Fundamentally, however, is this a valuation, as properly understood in economics, or is that phrase a misnomer? As Bonbright has pointed out, a valuation in an economic sense refers to two things—market value and value to the owner. The first of these values is determined by actual sales in the market place, and a significant aspect to market valuations is capitalization of the expected future income from property. Because actual market valuations may occur under abnormal conditions, variants of the market value concept are intrinsic value and normal value, both developed by appraisers and economists. Value to the owner, a subjective concept, "is generally measured in terms of money, and is then set by the amount of money that would just compensate the owner for the loss of property."[1] Either of these fundamental concepts implies a sale of property, a transfer of legal title for consideration. Neither of these bears any necessary relation to the cost of property.

When we approach the question of the valuation of public utility property, we find neither of these definitions of value to be acceptable. Utility properties as going concerns are never sold in competitive markets. Even if they were, their market valuations (always related in part to their anticipated earnings) would be unacceptable as a basis upon which to compute a fair return, because price is the end sought to be established by the rate-making process. Likewise, value to the owner is inapplicable; it has no objective measure; it would always be used as a means of resisting price change. We come to the conclusion, therefore, that the process of placing a monetary estimation upon utility property is not a valuation—that to speak of utility valuations is a misnomer, arising out of a confusion of procedures for measuring value with the definition of value and the thing to be valued. What has happened is that the evidences of value—cost or replacement, to mention but two—have been incorrectly elevated to the rank of the thing to be found—value. Therefore, the "valuation" process is really a rate-base determination, and the contending methods of calculation must stand on their own merits rather than on their merits as adequate rules of value determination. The confusion in this problem arises out of the ease with which the courts have borrowed from such fields as taxable valuations, insurance valuations, and eminent domain valuations for their working tools by which to establish a rate

[1] BONBRIGHT, *Valuation of Property*, Vol. I, p. 93.

base for rate making. Evidences of values in those areas were transferred to the rate-making area; and in the process, the distinction between evidence and the thing to be found was lost. Persistence of language, however, cannot be erased, and therefore we shall speak of utility valuations; but we know that such reference is inaccurate, and we always are referring to the process of rate-base determination.

PURPOSES OF VALUATION

Within the field of public utilities, valuations of property may be made for several purposes. They may be made for taxation, security issues, mergers and consolidations, sale, public purchase, reorganization, and rate making. Each of these valuations has its own purpose, and the results of any two of them need not necessarily be the same. Let us compare, for instance, a valuation for rate making and one for taxation. Each has a specific and different purpose—one to establish reasonable rates, the other to determine the tax burden. There may, therefore, be startling differences between their amounts. Tax values may apply to tangible values only; they may include nonutility property. We conclude that a valuation for one purpose does not necessarily serve for other purposes.[1] We admit, on the other hand, that some of the discrepancies between taxable values and rate values are not defensible. Yet an extremely low tax value is the fault of the taxing administration and does not necessarily justify its use as a rate base.

THEORIES OF VALUATION: SMYTH V. AMES

When commissions came to the question of fixing a value for the investment in railroads and utilities, they were confronted by many problems and theories. To understand these difficulties, one must examine the problem of valuation in its historical setting. No particularly effective attempts had been made to regulate rates prior to the Granger movement in the 1870's; and except in a few eastern states, no valuation problems of consequence arose until the late 1880's or early 1890's. By this time, a sizable proportion of the railroads had been built and not only built in a period of falling prices but built without an iota of effective public control over security issues or accounts. Suppose that you had been suddenly catapulted into the situation of fixing railroad rates; what values would you have allowed? The original records were often lost or destroyed. Even if they were available, how reliable would they be? Much of the stock issued had

[1] BONBRIGHT, "May the Same Property Have Different Values for Different Purposes?" 1927 *Proceedings*, National Tax Association, p. 280.

no real assets behind it; hence, could the sum of outstanding securities be relied upon? Furthermore, in the face of falling prices and the agrarian revolt against "high rates," was the actual investment (assuming it to be known) the proper basis of valuation? Unless one keeps this historical setting in mind, much of the controversy over valuation both in the past and at present is meaningless.

Smyth v. Ames.—Out of this welter of conflict came the leading decision on valuation. Nebraska had fixed a schedule of railroad rates, which was challenged on several grounds by the railroads operating in the state. These roads urged the sum of their securities as the rate base, whereas Nebraska, represented by William Jennings Bryan, urged cost of reproduction. The Court, speaking through Mr. Justice Harlan in the case of *Smyth v. Ames*, accepted neither position but ruled as follows:[1]

> If a railroad corporation has bonded its property for an amount that exceeds its fair value, or if its capitalization is largely fictitious, it may not impose upon the public the burden of such increased rates as may be required for the purpose of realizing profits upon such excessive valuation or fictitious capitalization; and the apparent value of the property and franchises used by the corporation, as represented by its stocks, bonds and obligations, is not alone to be considered when determining the rates that may be reasonably charged. . . .
>
> 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 an inquiry, will always be an embarrassing question. . . .
>
> We hold, however, that the basis of all calculations as to the reasonableness of rates to be charged by a corporation maintaining a 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,
>
> 1. the original cost of construction,
> 2. the amount expended in permanent improvements,
> 3. the amount
> 4. and market value of its bonds and stock,
> 5. the present as compared with the original cost of construction,
> 6. the probable earning capacity of the property under particular rates prescribed by statute,
> 7. 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

[1] *Smyth v. Ames*, 169 U.S. 466, 544–547 (1898). (Italics ours.) The arrangement and numbering of the items in the extract are ours, but the exact wording, punctuation, and order of the decision are followed.

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 was a noteworthy decision; and this case and *Munn v. Illinois* constitute the two best known utility cases. Note that the decision came in 1898, near the low point in the price movement between the Civil War and the depression of 1929. Second, it appears that it was intended as a first and tentative approach to valuation. Third, there are two extraneous items which are wholly unrelated to valuation, items (6) and (7). Fourth, the words "cost of reproduction" are not used in this decision and may be implied only in the phrase "the present . . . cost of construction. . . . " Lastly, nothing is said about depreciation. Probably as important as the actual items mentioned in this extract are the last two sentences which state, in general language, the rights of both utilities and public in the matter of reasonable rates.

Eliminating the extraneous items in the case of *Smyth v. Ames,* we find three theories of valuation are suggested. They are:

Sum of capital liabilities.
Investment.
Cost of reproduction.

Of these, the last two have been the moot theories, and our attention will be devoted mainly to them.

SUM OF CAPITAL LIABILITIES

In the case of *Smyth v. Ames,* attorneys representing the railroads urged with much insistence that the least valuation to which the roads were entitled was the sum of their outstanding bonds and stocks. They were legally liable for bond interest and of course felt under some obligation to pay dividends upon their stocks. The first part of the foregoing extract from the case gave the answer of the Court to this position. There could be no assurance that these securities were issued for equivalent values or assurance that these values had, in turn, been converted into railroad assets. The possibility of fraud, mismanagement, and stock watering was too great, and too many real illustrations of such were known, such as the famous "Credit Mobilier incident," to permit of the use in 1898 of this theory of utility valuation.

To consider the sum of capital liabilities as a basis for valuation is to approach actual investment. The investment in a properly managed company ought to bear a close, if not perfect, similarity to the

sum of the capital liabilities, including actual surplus. Let us suppose a situation of utility construction in a state (such as Massachusetts) that has had security regulation for many years. If the commission authorizes the issuance of $200,000 in securities for a new plant, one can be sure that there are properly $200,000 in both asset and capital liability accounts. Or if the commission requires a new issue of $100 par stock to be sold at a premium of $50 a share, one can be sure that assets will show an increase of $150 for every share sold, whereas the stock account will show an increase of $100 and a true surplus account increase of $50. In such a situation, it is a simple matter to find the "value" (strictly speaking, the cost) of the utility. Simply add the sum of the bond, stock, and real surplus accounts. About the only problem here is to exclude those accounts called "reserves," such as reserve for depreciation, which are in no sense surpluses but valuation reserves.

This method has several strong advantages, but if it is used, commissions must be given powers of strict regulation of the issuance of securities plus a follow-up check on the application of the proceeds of the issues and a final approval or disapproval of the entries on the books. Almost all discussions of allowances for working capital, early operating losses, preoperation expenses, and depreciation are eliminated. The commission will approve capital issues to raise working capital; it will set up early losses and preoperation expenses as suspense debits, to be either charged against earnings or else carried as assets. The depreciation allowance will be authorized by the commissions, and no argument need develop concerning the deduction of the reserve for depreciation in the determination of final value. The rate base of the utility is found on the right hand of the balance sheet, which *ought* in every instance of a properly managed and supervised utility to be equal to the sum of the assets minus valuation reserves, principally the reserve for depreciation.

The weakness, of course, is that this method of valuation is basically prudent investment and thus subject to the same objections. It is weak in so far as utilities have grown up without the aegis of strong commission control—an objection of declining merit. Final judgment should be reserved on this method or theory of valuation, however, until the analysis presented in the concluding chapter of this group (Chap. XVIII).

PRUDENT INVESTMENT

The next rule of valuation suggested by *Smyth v. Ames* is found in the phrases "the original cost of construction, the amount spent in permanent improvements." This seems to suggest the actual invest-

ment, although it might be argued to be the sum of the fixed capital accounts as shown by the books of the company being valued. Whatever the Court may have meant in 1898 by this phrase, no longer is the investment record of the utility ordinarily accepted as an adequate basis for valuation. To guard against imprudent investment or fraud, the investment theory is generally fortified by the addition of legitimacy or prudency. We shall, therefore, use this modification and discuss the merits and weaknesses of prudent investment. Of course, as regulation of securities becomes more effective, actual investment tends to become the prudent investment. In our definition of prudent investment, we shall follow the statement of Mr. Justice Brandeis. In a leading case, he said:[1]

> The term prudent investment is not used in a critical sense. There should not be excluded from the finding of the base [valuation], investments which, under ordinary circumstances, would be deemed reasonable. The term is applied for the purpose of excluding what might be found to be dishonest or obviously wasteful or imprudent expenditures. *Every investment may be assumed to have been made in the exercise of reasonable judgment, unless the contrary is shown.*

Before analyzing this theory of rate-base determination, we are faced with another term often used in the literature of valuation—"historical cost." It is sometimes used to express the price paid by a buyer of a plant already built and in operation. On the other extreme, it is sometimes used to denote the original cost of construction. Brandeis uses the term to denote "the proper cost of the existing plant and business, estimated on the basis of the price levels at the respective dates when the plant and the additions were constructed."[2] So used, it becomes prudent investment computed not in terms of actual records of cost but as a cost of reproduction based on prices prevailing at the time of construction. We shall follow Bonbright in using the phrases "actual cost," "original cost," and "historical cost" more or less interchangeably[3] and use "prudent investment" to refer to cost corrected for imprudency or fraud, a "proper cost."

The Case for Prudent Investment.—Many arguments can be advanced in favor of prudent investment as a rule of rate-base determination. In the first place, it is easy to discover because it is founded on recorded facts, the accounting records of public utilities. Thus—its second advantage—it ought to be neither time consuming as a

[1] *Southwestern Bell Telephone Co. v. Public Service Comm.*, 262 U.S. 276, 289 (1923). (Italics ours.)

[2] *Ibid.* at 295n.

[3] BONBRIGHT, *op. cit.*, p. 141.

process nor costly. In the third place, it is a continuous valuation, one that can be determined with relative ease at any time by simply preparing a balance sheet of utility assets and liabilities. To each of these, its opponents have an answer. Records may be lost or misplaced, and records are not always accurate. The injection of prudency into value theory creates as uncertain an element as cost of reproduction would itself create. In general, these objections are trivial. Records are ordinarily available, and periodic audits can verify their accuracy. Prudency creates no particularly difficult problem if the Brandeis concept is followed, because there prudency is assumed until proved otherwise. This puts the burden of proof on those who would challenge prudency. Furthermore, all capital commitments made subject to security regulation would, in the absence of fraud, by their very prior approval be prudent.

Stability of the Utility Enterprise.—Strong as these arguments are, however, they fail to suggest the fundamental advantage of prudent investment. Mr. Justice Brandeis, in his concurring opinion in the Southwestern Bell case, pointed out that the strongest argument for prudent investment was its resulting credit stability for utilities. In other words, valuations by this rule yield adequate income to pay interest and dividends in both good and bad times, a prime requisite to credit stability. Cost of reproduction, on the other hand, logically applied in periods of depression and low prices conceivably would endanger greatly the credit position of many public utilities. As Mr. Justice Brandeis stated it in 1923:[1]

> If replacement cost should become the measure of the rate base, [in the event of a price decline] the return on enterprises entered upon after 1914 would, obviously, be imperilled. And a serious decline of the price level would subject the return on many utilities established earlier to like dangers. A collapse of public utility values might result. And the impairment of public utility credit might be followed by the cessation of extensions and new undertakings.

In short, then, the rule of prudent investment valuation would become a species of extralegal guarantee of earnings, under ordinary conditions, during the life of public utilities, so long as they do not encounter serious threat to their public interest status.

This sentence above, however, contains the weakness of the rule. Let us consider in reverse order to their statement the qualifications there set out. As we know, public utilities can lose their public interest status, as the history of transportation shows. Is it fair,

[1] 262 U.S. at 304.

therefore, to deny them whatever extra gains the rule of cost of reproduction might allow, since such risks do exist? More significant, however, is the other qualification; namely, "under ordinary conditions," prudent investment will operate. We have seen that in the worst years of the depression of 1929 some utilities were unable to earn returns anywhere near their legal allowances. During those years, demands for rate reductions became vehement. An embittered public was in no mood to see utilities standing in a "preferred" earning situation. Therefore, extraordinary conditions do occur; and during those times, the rule of prudent investment cannot be made to operate. Is it a fair rule that works only in periods of good times?

In this connection, a by-product of the use of prudent investment is a relative inflexibility in utility rates. This is not a desirable consequence, as we have seen. Since to discuss this point further involves the strong point of cost of reproduction, we reserve further discussion for the next section.

COST OF REPRODUCTION

The third valuation theory suggested in *Smyth v. Ames* is found in the phrase "the present as compared with the original cost of construction. . . . " By common consent, these words are taken to suggest a cost-of-reproduction theory, though they could certainly be argued to mean something else.

The trend of prices during the 30 years following the decision in the Smyth case was favorable to the advocates of this theory. First advocated by the public, it was soon adopted by the utilities themselves; and in the years after 1917, it was urged in court and out with much vehemence. As might be expected, commissions, on the other hand, turned to prudent investment as the superior valuation theory. In short, the array of forces behind each theory may be explained in part by the particular interests of the contenders. Should a permanent fall in prices ever occur in the United States, a complete reversal of position might follow. In our discussion, we shall ignore such opportunistic defenses.

The Necessary Postulates.—Cost of reproduction as a theory of valuation has been variously modified by its advocates. Most of them concede the propriety of deducting something for depreciation. This theory requires an appraisal of physical property, which raises the problem of the unit price to be applied.[1] Some advocate the application of an average of prices of a period next to the date of the valuation. Five- and ten-year intervals are commonly used. Others

[1] These problems are discussed more in detail in the next chapter.

advocate prices of a given date, say, 1914 or 1926, to be applied to all items of property antedating that year, plus actual cost of property added subsequently. This method has been used by the Interstate Commerce Commission and is, in reality, a combination of reproduction and investment. A third group advocates the application of unit prices of the time of the valuation, usually referred to as "spot" prices. If we undertook to value an electric plant as of January 1, 1940, we should use the prices of equipment, materials, and labor as of January 1, 1940. The use of spot prices is a most questionable practice, because it makes valuation subject to the extreme oscillations of prices. Between the summer of 1933 and the first of the following year, wholesale prices rose sharply. A matter of 6 months in a valuation date might, then, be important. As from one year to the next, prices of utility construction will vary widely; and if frequent valuations are made on the basis of spot prices, frequent and disturbing rate changes will follow.

Assuming an agreement upon the unit price, shall the plant as it is or a hypothetical new one built according to the latest design be used as a basis of valuation? In other words, is it the value of the present plant or that of a similar or substitute plant? The argument for a substitute plant is based upon the fact that were the plant to be rebuilt, the most modern design would be used; were it to be bought, it would have been valued on that basis. Although the courts have favored the use of the identical plant, the best defense of cost of reproduction demands the use of a substitute plant, hypothetically equipped with the best facilities, located in terms of present needs and city growth.[1]

Lastly, are prices of materials, equipment, and labor of the time the plant was built or of the time of the valuation to be used? For instance, if cast iron has given way to steel in plant construction, and therefore there are no available estimates on the cast-iron costs

[1] Mr. Justice Brandeis, though arguing for the merits of prudent investment, saw the logic of this choice of the substitute plant. On this point, he has said: "If the aim were to ascertain the value (in its ordinary sense) of the utility property, the enquiry would be, not what it would cost to reproduce the identical property, but what it would cost to establish a plant which could render the service, or in other words, at what cost could an equally efficient substitute be then produced. Surely the cost of an equally efficient substitute must be the maximum of the rate base, if prudent investment be rejected as the measure. The utilities seem to claim that the constitutional protection against confiscation guarantees them a return both upon unearned increment and upon the cost of property rendered valueless by obsolescence." *Southwestern Bell Telephone Co. v. Public Service Comm.*, 262 U.S. 276, 312 (1923).

in question, will steel prices suffice, or must imaginary calculations be made as to the cost of producing an obsolete product? In some of our smaller communities, the standpipe of the waterworks, built forty or fifty years ago, still stands. The material and original paint are no longer to be had; part of it even came from England. In valuing these waterworks, how shall this antiquated standpipe be treated? Shall we insist upon the creation of a hypothetical construction company and a paint company, in order to estimate the costs of the materials of that equipment? Although it may sound fantastic, similar arguments have been seriously advanced, as will be discussed later, in the case of hypothetical pavement costs of relaying mains in streets paved since the existing main was laid.

The Case for Cost of Reproduction.—What are the strong and weak points of cost of reproduction? Of course, the strong points of one theory are usually the weak points of its competitor theory. Thus, cost of reproduction (at least as it has been practiced) is time consuming, costly, not continuous. On the other hand, it is strong in that it should make for greater flexibility in utility rates, but cost of reproduction would have nothing special to commend it, if nothing else can be said for it. Its advocates, therefore, have devised several arguments in its favor.

In the first place, it is urged that cost of reproduction is the basic rule of market valuations and therefore should apply to the utilities. When a person buys a factory, his purchase price bears no relation to the original cost of the building or machinery but, if any relation does exist, to the replacement cost of such property in light of present building methods and state of the arts. Thus, if machines are obsolete or inadequate, or if prices have fallen, he will pay a price much below cost. Present value, therefore, is replacement cost. Such an argument is true in respect to competitive economics. The value of capital goods (machines, buildings, pipes, lines, equipment) is their capitalized net earnings, which in the long run will tend to be related to their replacement cost. Notice, however, that the thing being regulated in a utility is net earnings—a reverse procedure in monopoly economics compared to competitive economics. Therefore, may it not be dangerous to transfer to the monopolistic field a valuation technique acceptable in the competitive field?

A second argument is based on the "depreciated dollar" and was most vigorously advanced in the hectic days following the first World War when prices were skyrocketing. It runs like this: When prices rose from an index of 100 in 1913 to 225 in 1920, a dollar bought less than half as much. If the rate base, however, is increased propor-

tionately (the *rate* of return remaining more or less unchanged), the return in *dollars* would likewise increase, thereby giving the same purchasing power in 1920 as in 1913. Concretely, if one had invested $1,000 in 1913 and received 6 per cent, or $60, interest a year, in 1920 that investment should be valued at $2,250 and earn $135. The $135 in 1920 would then have the same purchasing power as $60 in 1913. This is a valid argument, provided, first, that investments generally are so rewarded during periods of declining purchasing power and, secondly, that the increased dollars of return go equally to the security holders. On both provisos, the argument is contrary to fact. Utility bonds, notes, and preferred stocks and industrial bonds, notes, and preferred stocks have specified yields, which are fixed obligations regardless of the oscillations of the purchasing power of the dollar. A 6 per cent bond issued in 1910 still paid 6 per cent in 1920. If in 1920 it were to earn $12 per original $100 of par because of a new valuation, only $6 would go to the bondholder, the balance becoming the legal property of the utility. Who then would profit? The holders of common stock. But what is the ratio of common stock to the total utility capital structure? In 1938, one-third the investment in the electrical utility was represented by common stocks. Thus, the other two-thirds of the capital issues of utilities have fixed yields. To make the argument even weaker, it must be remembered that a sizable fraction of the common stocks of operating utilities is held by holding companies, thereby making the holding company the most significant beneficiary of this argument for cost of reproduction.

Of course, the "depreciated dollar" argument turns on the unstated assumption that the rate of return is inflexible. Since many of the commissions in the past had been rather parsimonious in their rate of return allowances, during a period of rising prices cost of reproduction became an excellent device to gain a higher rate of return on the actual investment. If this were the motive behind the strong advocacy of cost of reproduction, the same result could have been attained by a combination of prudent investment and a flexible rate of return. As prices rise, the rate could be increased, and vice versa. Of course, this "way out" does not remove the fact that the bulk of utility securities have fixed yields and therefore, under our present system of contract, will be unaffected. To correct that situation is a far more difficult problem. Some such remedies as a return varied in accordance with an index number or stabilization of prices are needed if these holders of fixed yield securities are to be freed from the vicissitudes of the business cycle.[1]

[1] We must not be understood as saying that such security holders should be

The Need for Universal Price Flexibility.—There is one outstanding argument for cost of reproduction and one to which the depression of 1929 has given meaning. In so far as the demand for utility service is a derived demand, that is, in so far as electricity, gas, and railroad services, for instance, enter into the production and marketing of goods, they are direct costs of production. Inflexible rates in periods of falling prices accentuate depressions and act as a brake to recovery. But a rate base fixed on any of the variants of the investment principle results in an inflexible item of utility costs—return on the investment—an item that bulks large in the total utility expense. Cost of reproduction, on the other hand, means a high valuation in high-price periods and a low valuation in low-price periods.[1] The volume of the return, consequently, would vary directly with the movement of prices. Therefore, rates for service would be higher in periods of high prices and lower in periods of low prices. This adjustment of rates of service to general prices (if such adjustment could be made automatic) would be a great aid to business, especially during depressions as severe as that of 1929. Instead of a freight rate on a bushel of corn from central Iowa to Chicago being 12 cents in 1925 when corn sold for a dollar and still 12 cents in 1933 when it sold for 20 cents, the rate might have been considerably more than 12 cents in 1925 and considerably less in 1933. No competitive industry could continue in business long if it attempted to base its depression prices upon prosperity costs. Therefore, why should the utilities be so favored? Since they had obtained at least partial recognition of cost of reproduction during good times, why not apply that principle in depression periods, thereby lowering rates for service to the benefit of all industrial users of utility and railroad service?

Professor Frank A. Fetter, in his testimony before the Wisconsin Public Service Commission, made the same points set out above. Discussing the effect of inflexible utility rates, he said:[2]

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freed from the exposure of price change. Our own choice of rate-base theory would leave such investors quite exposed.

[1] This assumes, of course, that there is a fair correlation between general price changes and prices of the particular materials and equipment used in the construction of public utilities. In fact, such correlation is not found for some materials used for certain years.

[2] *Testimony in the matter of the . . . Rates . . . of the Wisconsin Telephone Co.*, 2-U-35, 1932, p. 1169. In this case, expert economists of nation-wide prominence were called as witnesses. At the close of the testimony of each of them, counsel for the company would say "We take the position that the facts as to economic conditions are not material or relevant to the issues in this case for the reason that the economic conditions are not the recognized or admissible rule in

When general prices are rising and business is prospering the railroad rate that was just about right a few years before becomes a decreasing ratio of the value of the goods that are shipped. Consequently, it is possible to

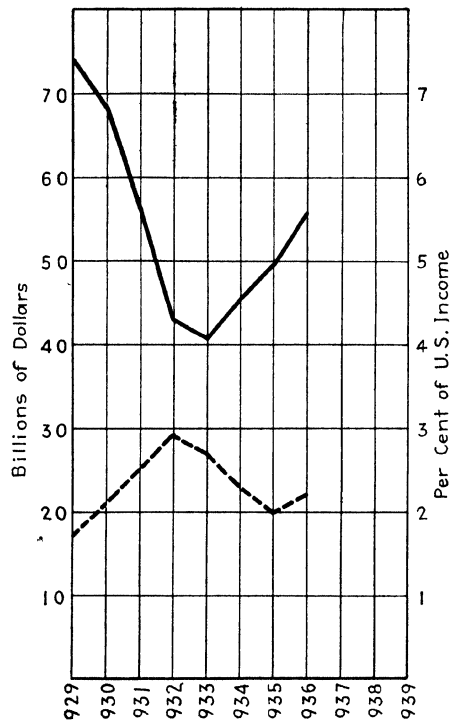

CHART 19.—Production income received in the United States, and percentage received by electric light, power, and gas companies. Notice, in all years except 1936, the inverse relationship of these curves, a situation that was possible only because of the more rigid prices of public utility services. (*Publications of the National Industrial Conference Board.*)

ship goods further. Therefore, in a period of business prosperity there is an artificial, unnatural, stimulation of the shipment of goods to longer distances; and then, when conditions become adverse, when prosperity declines, the reverse occurs.

Noting the general tendency of all utility rates to be rigid, he concludes:[1]

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determining rates under the laws which relate to utility rate-making. For these reasons we move the striking of the testimony on the ground of immateriality and irrelevant (*sic*) to the issues in the case." P. 1181.

[1] *Ibid.*, p. 1170.

Such a rigid rate serves to accentuate and stimulate expansion and speculation at a time of business prosperity, and in turn in the period of depression it adds to the disturbances and accentuates the depression.

Although Prof. Fetter's testimony did not involve his discussion of value theories and their relation to price rigidity, it would appear that unquestionably he would approve, at least in theory, of a cost of reproduction method.

As we have said, the depression of 1929 demonstrated the soundness of this argument. Of course, the same result could be obtained by other means. Prudent investment in combination with a flexible rate of return may be an adequate substitute. In short, precisely the same end can be accomplished either by cost of reproduction coupled with a more or less inflexible rate of return or by the investment standard combined with a flexible rate of return.

Weakness of Cost of Reproduction.—Cost of reproduction as a method of valuation has several weaknesses. Originally devised in a period when records of investment were hopelessly confused, missing, and fraudulently altered, it was regarded as a far more accurate and exact method of calculating a rate base. Instead of relying upon the uncertainties of past records, expert engineers were summoned to make a thorough appraisal of property. This seemed to be accurate and precise. "But gradually it came to be realized that the definiteness of the engineer's calculations was delusive; that they rested upon shifting theories; and that their estimates varied so widely as to intensify, rather than to allay doubts."[1] Sharp differences in value estimates abound in the rate cases. For instance, in a valuation of a water company in eastern Iowa, five engineers using the same inventory arrived at valuations ranging from $600,000 to $900,000. The city representatives found the smallest figure; the company experts reported the highest figure; the fifth expert, an umpire appointed by each group, compromised at $750,000. Neither these engineers nor anyone else could convince the citizens of that community that such a divergence could be explained except in terms of the particular interests of the clients.

As was pointed out above in our discussion of the merits of prudent investment, most serious of all is the possible damage of cost of reproduction to utility credit during periods of falling prices. From *Smyth v. Ames* in 1898 to the depression of 1929, such criticism was entirely academic. During all those years, prices were either rising or else stabilized at relatively high levels. In fact, the stability of the years 1921–1929 caused many to propound a theory of a "new plateau of

[1] Brandeis, in 262, U.S. at 299.

prices."[1] Between 1929 and 1937, we experienced the worst depression in our history, and prices declined perilously near the all-time low of 1896. Since then, however, the trend has been distinctly upward, toward the level of the 1920's. Had the lows of 1932–1933 become permanent, and valuations been made in terms of those prices, of course many utilities would have been pinched because of declines in earnings to meet commitments based upon higher price planes. As Mr. Justice Brandeis had said, in such situations, credit standings could have been impaired. This would be of serious consequence to investors and customers alike and, if it should occur, might be hard to defend, unless the resulting flexibility in utility prices under cost of reproduction produces a social gain that more than offsets these losses.

Cost of reproduction, as it is actually applied, has two weaknesses. In the first place, conceding the goal of regulation to be the competitive norm, and conceding cost of reproduction to be a satisfactory procedure for finding value in the competitive area, do utility valuations by cost of reproduction approximate the results gained in that competitive area? In so far as we insist upon the identical plant, present equipment, and existing locations, the answer is "No." A true cost of reproduction would be in terms of a substitute plant, equipped with the best facilities, located where present knowledge and conditions would dictate. In the second place, cost of reproduction, as it is practiced, is a slow, costly, inexact process, a breeder of extensive litigation. It has too often been a means of checkmating regulation, a device to delay indefinitely reductions of excessive rates. If cost of reproduction as a theory of utility valuation is to be defensible, its methods of application must be improved. A well-known member of the Interstate Commerce Commission has said: "The prime requisites for the rate base . . . are stability, reliability, and relative ease of adjustment to property changes."[2] Although no valuation technique can perfectly attain these goals, cost of reproduction, as it has been used, does not even begin to approach them.

POSITION OF THE SUPREME COURT

In any discussion of valuation, the attitude of the Supreme Court of the United States must not be overlooked. In practical situations, it is the opinion of that body that counts rather than economic merits, although it must not be supposed that courts will stand indefinitely in

[1] Mr. Justice Butler, in 1926, said: " . . . it does not appear probable that there will be a substantial change of prices. . . . " P.U.R. 1927A at 24.

[2] Commissioner Meyer in *Excess Income of the St. L. & O'Fallon R.*, 124 I.C.C. 3, 39 (1927).

the face of economic considerations. We have previously set out the valuation theory of the Court in the leading case of *Smyth v. Ames*, decided in 1898. Several valuation cases followed this decision, but they did nothing more than reaffirm it. Thus, the next significant case is the *Minnesota Rate Cases* of 1913.[1] The Court, speaking through Mr. Justice Hughes, said of valuation:[2]

> The basis of calculation is the "fair value of the property" used for the convenience of the public. *Smyth v. Ames.* . . . The ascertainment of that value is not controlled by artificial rules. It is not a matter of formulas, but there must be a reasonable judgment having its basis in a proper consideration of all relevant facts.

Although this decision did not add to the matter of value theory, the section quoted above has come to be the legal injunction against the exclusive use of any one valuation theory. In the matter of land values, for instance, the Minnesota case was important, as will be shown in the next chapter.

Between this case and the next important one came the first World War, with its disturbing effect upon the price level. Utility adherence to cost of reproduction became complete. Likewise was the Court impressed with the weaknesses of investment, as we see in the Southwestern Bell Telephone case, decided in 1923. There the Court said:[3]

> It is 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, etc., at the time the investigation is made. An honest and intelligent forecast of probable future values made upon a view of all the relevant circumstances, is essential. If the highly important element of present costs is wholly disregarded such a forecast becomes impossible.

The majority opinion here swung quite close to cost of reproduction at "spot prices," despite claims to the contrary. The company had claimed a valuation of cost of reproduction less depreciation plus working capital of $25,760,859, and the Court allowed a figure of $25,000,000. In addition, the Court introduced the suggestion that valuations must be adjusted in light of probable future price changes.

This emphasis of cost of reproduction was not accepted by the Court without vigorous objection by Justices Brandeis and Holmes. The former wrote a special dissenting opinion[4]

[1] 230 U.S. 352. Also known as *Simpson v. Shepard.*

[2] *Ibid.* at 434.

[3] *Southwestern Bell Telephone Co. v. Public Service Comm.*, 262 U.S. 276, 287, 288 (1923).

[4] *Ibid.* at 289. Every student of public utilities should read carefully the majority and minority opinions of this case.

. . . on the ground that the order of the state commission prevents the utility from earning a fair return on the amount prudently invested in it. Thus, I differ fundamentally from my brethren concerning the rule to be applied in determining whether a prescribed rate is confiscatory.

Three significant points are found in the Southwestern Bell case. First, there is a recognition of cost of reproduction as an element to be given weight in a rate case. Second, "spot prices" seem to be approved by the Court. And, third, not only is valuation to be determined for the present, but it is to be adjusted with an eye to probable future price changes—an inconsistent combination.

These points were affirmed and clarified three years later in *McCardle. v. Indianapolis Water Company.*[1] In that case, the Indiana Commission established the cost of reproduction value of the company as of January 1, 1924, on the basis of a 10-year average of prices ending with 1921. Mr. Justice Butler, speaking for the majority, after commenting upon the relative "permanent levels and trends of such prices," said:[2]

The validity of the rates in question depends on property value January 1, 1924, and for a reasonable time following. . . . 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 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.

From this case, it seems clear that the Court had again placed its approval upon cost of reproduction at spot prices. The Court allowed the full claim of the company, intimating that it could have asked for more. In this case, the concept of futurity was defined as being 1, 2, or 3 years. Two other pertinent statements from the decision are:[3]

It is well established that values of utility properties fluctuate, and that owners must bear the decline and are entitled to the increase. . . .

There is to be ascertained the value of the plant used to give the service and not the estimated cost of a different plant.

Taking these extracts in their entirety, one can hardly escape the conclusion that the Supreme Court had practically, if not by admission

[1] 272 U.S. 400, P.U.R. 1927A 15 (1926).
[2] P.U.R. 1927A at 24, 25.
[3] *Ibid.* at 23, 30.

then certainly in action, placed its approval on cost of reproduction of the existing plant at spot prices. As might be expected, Mr. Justice Brandeis vigorously dissented, stating that[1]

> There is, so far as I can recall, no statement by this Court that value is tantamount to reproduction cost. Nor do I find in the decisions of this Court any support for the view that a peculiar sanction attaches to "spot" reproduction cost. . . . "Spot" reproduction would be impossible of accomplishment without the aid of Aladdin's lamp.

Between 1927 and 1933, only two major valuation cases were before the Supreme Court. In the O'Fallon case, in 1929, the Court again showed its leanings toward cost of reproduction, when it reproved the Interstate Commerce Commission for its failure to give at least some weight to that theory.[2] As Mr. Justice Stone, dissenting, said, had the commission not been so insistent upon the fallacies of cost of reproduction, probably no one would have thought to question its decision.[3] The other case involved the rates of a Baltimore street railway, and again the Court sustained the principle of cost of reproduction, although the case is more significant in matters of rate of return and depreciation.[4]

By 1933, the depression of 1929 had reached its climax, and therefore the time was ripe for a renewal of controversy over valuation theory. In that year was decided the Los Angeles Gas case, in which a new principle was developed—the rule of offset.[5] The California Commission had used investment as a basis of valuation, making no deductions for depreciation and an obsolete plant and adding nothing for going-concern value.[6] A divided Court, speaking through Mr. Chief Justice Hughes, approved of the results of this valuation, because it arrived at a similar sum by means of cost of reproduction new, less depreciation, plus going-concern value. Since one result more or less offsets the other, the commission order was approved, not as a rule of

[1] *Ibid.* at 35.

[2] *St. Louis & O'Fallon R. v. United States*, 279 U.S. 461, P.U.R. 1929C 161, 170 (1929). For the decision of the commission, see 124 I.C.C. 3 (1927).

[3] P.U.R. 1929C at 172. "Had the Commission not turned aside to point out in its report the economic fallacies of the use of reproduction cost as a standard of value for rate making purposes, which it nevertheless considered and to some extent applied, I suppose it would not have occurred to anyone to question the validity of its order."

[4] *United R. & Electric Co. v. West*, 280 U.S. 234, P.U.R. 1930A 225 (1930).

[5] *Los Angeles Gas & Electric Corp. v. Railroad Comm.*, 289 U.S. 287, P.U.R. 1933C 229 (1933).

[6] The problems of depreciation and its relation to valuation and going-concern value are discussed below in succeeding chapters.

valuation but because of its results. On the basis of this decision, many advocates of prudent investment thought that they had at last evidence of a first step by the Court toward their position.

This joy proved to be short-lived, because two years later, in the Chesapeake and Potomac Telephone case, the Court once more swung sharply toward cost of reproduction, refusing to accept even a statistical short cut based on that theory.[1] Since then, several cases have been decided, but none of them contributes anything significant to rate-base theory. They were mainly concerned with procedures and therefore need not occupy our attention at this point.

CRITICISM OF THE SUPREME COURT

In spite of the clear demonstration that the sequence of valuation cases furnish as to the acceptance by the Supreme Court of cost of reproduction as the ruling theory of valuation, one must not hastily assume that at some future date the Court may not reverse its own position. The cases in the serious depression years seemed to indicate a wavering of opinion. Another period of falling prices might bring a permanent change.

It must not be forgotten that the Court has never *said* that it approved of cost of reproduction as a sole rule of valuation. It has continually referred to the statement in the Smyth case that the elements in valuation are to be given such weight as is just and right in each case. Furthermore, the dictum in the *Minnesota Rate Cases*, that valuation is not governed by artificial formula but is a matter of judgment, permits an easy escape from the position of having approved of reproduction cost. In the United Railways case, the Court said, "It is the settled rule of this Court that the rate base is present value, . . . "[2] which may or may not be cost of reproduction. The facts of these cases point to the conclusion that "present value" is a sort of compromise between the two theories, the degrees of compromise being known only to the Court.

Of course, one can conclude one of two things concerning this indecision of the Court. The first explanation is to assume that that body simply has been uninformed on a complex problem and has blundered hopelessly in its decisions. The second explanation lies in an examination of the background out of which valuation for rate making has arisen. Courts have been obliged to find value for many purposes—taxation, reorganization, public purchase, insurance com-

[1] *West v. Chesapeake & Potomac Telephone Co.*, 295 U.S. 662, 8 P.U.R. (N.S.) 433 (1935). This case is discussed more in detail in Chap. XVIII.

[2] P.U.R. 1930A at 231.

pensation, etc. In these processes, they have of necessity developed many rules. In fact, out of this experience has come the premise that value is a thing to be found, and certain acceptable evidences of this value have been recognized. When valuation for rate making became a problem, courts assumed that value was the thing to be found, and they proceeded (incorrectly, of course) to transfer from those other areas where valuations had been required, such rules of evidence of value as had been developed. Therefore, the mixture of irreconcilables of *Smyth v. Ames* can be understood. They were simply the evidences to be used in finding value. The Court, there and in all subsequent utility cases, simply made the mistake of assuming that value, as an economic concept, could be found. If it could be disillusioned in this matter and shown that the two rules of valuation—prudent investment and cost of reproduction—are not evidences of value of public utilities but contending methods of rate-base determination it might adopt one or the other of them to replace its present fair-value rule with its present potpourri of unknown ingredients compounded by an unknown formula.

It is not impossible that the Court might accept the suggestion that the rate-base theory be *either* cost of reproduction *or* actual investment, whichever yields the higher figure. This suggestion, although found occasionally throughout the literature on valuation, was particularly discussed after the fall in prices in the early years of the depression of 1929 when valuations under cost of reproduction threatened to be less than actual investment. If this proposal seems surprising, remember that as the bulwark to encroachment upon rights of private property, the possibility of its acceptance by the Supreme Court of the United States is more than a mere academic speculation.

The prime criticism of the Court's attitude on valuation arises from its failure to prescribe any rule or combination of rules to be followed in a valuation case. Since the accepted "rule" is the fair-value principle of *Smyth v. Ames*, which requires every theory of valuation to be given "such weight as is just and right in each case," there is a tremendous latitude for personal judgment. In the final analysis, the opinion of the Court is always the one that will prevail, and that body has yet to give an objective clue by which to be guided. As Commissioner Eastman of the Interstate Commerce Commission has pointed out, the judgment of the commission ought to prevail. The compromise position of the Court caused him to observe, "There is, in our judgment, no intermediate process possible which is capable of being applied by any rule independent of the *caprice* of those who

apply it."[1] The Court, however, has never seen fit to accept the Eastman position. As was discussed in detail in Chap. VII, it takes upon itself the authority to review all determinations of fact as well as law. Therefore, the validity of a valuation order is always in doubt until it runs the gamut of court review, a costly and time-consuming process. A definite mandate by the Supreme Court that hereafter so and so is to be the rule of valuation, though a rule of questionable economic merit and hence purely opportunistic in its approach, would be preferable to the present tenuous fair-value rule of *Smyth v. Ames*.

We conclude these remarks on the Court by reviewing the dissenting opinion of Mr. Justice Black in *McCart v. Indianapolis Water Company*.[2] The case involved rates established by the Indiana Commission on January, 1, 1933, and that had been the basis of hearings by a special master and two decisions, one by a district court, the other by the Circuit Court of Appeals. In the Supreme Court decision, the controversy was again remanded to the district court for further consideration. As Mr. Justice Black pointed out, it was not until 1937 that the 1933 rates were found to be confiscatory, a master and a district court having previously reviewed and approved them. Since the Supreme Court remanded the case in 1938 for trial anew, the Justice concluded that "If the second trial follows the course of the first, the case should return to this court [Supreme Court] by 1943." If the district court in 1938 does not guess correctly the trend of prices for the period before 1943, the case will then be remanded "for still another trial." One of the things that impressed Mr. Justice Black was the many endless delays that characterize rate regulation. In a footnote, he listed six rate cases, showing an average delay of 3 years 7 months. Had he included the several leading telephone rate controversies, his average period of delay would have been at least doubled.

No rule of valuation with its many items of dispute justifies the constant litigation that we have witnessed since the first World War. Because many of the items within a rate base are controversial, the Supreme Court should either give arbitrary (and objective) answers to them, thereby speeding up the rate-making process, or else be more hesitant to interfere with commission findings. We recommend either of these approaches, but we prefer the latter. Rather than enjoining rate proposals, why not allow trial operating periods? If experience shows rates to be confiscatory, then they can be enjoined, and no great harm will have been done. This is infinitely preferable

[1] 124 I.C.C. 3, 39 (1927). (Italics ours.)
[2] 302 U.S. 419, 21 P.U.R. (N.S.) 465, 468–479 (1938).

to the present "inchoate rule of *Smyth v. Ames*,"[1] for which the Supreme Court must alone be held responsible.

NEW DEAL PRESSURES ON VALUATION THEORY

When the Roosevelt Administration came into office in March, 1933, a new attitude toward public utilities was born. It has been seen in many areas, namely, in the creation of new regulatory agencies; in the Tennessee Valley Authority; in the encouragement of municipal ownership of electric plants; in the extensive rural electrification programs; and, finally, in the area of utility valuations. The purchase of several private plants in the area of the Tennessee Valley naturally raised the question of their valuation. In these negotiations, the representatives of the government wanted to pay the least price, and investment was a logical choice. Finally, the President, in a press release in January, 1937, went on record as favoring prudent investment. According to one press report, he attacked cost of reproduction as not being consonant with the common law from which regulation developed and as being actually "unconstitutional" under the Constitution of the United States. If he was reported correctly, these were odd arguments, because the problem of reasonable rates was the least bothersome of all regulation problems in the early days of the common law. If he called cost of reproduction "unconstitutional," he failed to give his authority. Constitutionality is a product of court interpretation, and even a cursory review of the cases will convince the most ardent prudent investment advocate that the other theory stands in high court favor.

In addition to these pressures on the question of valuation, the Federal Power Commission intervened in 1937 in a valuation controversy between a California public utility company and the California Railroad Commission. The federal commission filed an elaborate brief with the Supreme Court in an effort to induce that body to discard the rule of *Smyth v. Ames* and its leaning toward cost of reproduction. It attacked the older position as unreasonable, arbitrary, and capricious, as having no "real or substantial relation to the object sought to be attained," as stifling the regulatory process. In its decision on the case, the Court, however, avoided the direct question of value rule, so that it cannot be said that the Power Commission either succeeded or failed.[2] It is, however, symptomatic of the pressures that are being applied on the Court in the matter of valuation.

[1] GLAESER, *Outlines of Public Utility Economics*, p. 383.

[2] *Railroad Comm. v. Pacific Gas & Electric Co.*, 302 U.S. 388, 21 P.U.R. (N.S.) 480 (1938).

The valuation problem is not necessarily solved by the choice of a theory, although such a choice would clarify some of the other items related to valuation. We have said nothing about the appraisal process, the determination of going-concern values, allowances for overhead and engineering costs, and a host of other items. These are reserved for the next chapter, entitled "Valuation Practice."

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CHAPTER XV

VALUATION PRACTICE

In actual situations, the problem of valuation of public utility property arises in the following manner. Suppose that a certain community protests that its water rates are too high. Upon investigation, the following pertinent facts are found. The company has a total operating revenue of $130,000. Its operating expenses, including taxes but not bond interest, amount to $95,000. Assuming here that there is no challenge of the validity of the sum of operating expense, is the return of $35,000 reasonable? Immediately, the question must be raised of the valuation of the water company's property used in serving its customers. Pertinent facts to a valuation are these: The stocks and bonds of the company total $790,000; its fixed assets less depreciation amount to $738,000. Further investigation reveals that an actual check of records of total costs of fixed assets would show a depreciated cost of $550,000. On the other hand, five appraisals of a few years ago estimated that a fair purchase price of property of the company would range between $650,000 and $900,000. What is the valuation of this company?

This illustration suggests the three theories discussed in the preceding chapter. As a matter of fact, only two practices are usually available when value is in dispute in a reasonable rate controversy, namely, an audit of accounts to determine book costs and an engineering appraisal of the property actually used and useful for serving the public. One would lead to a prudent investment valuation; the other, to a cost of reproduction valuation. Whichever is chosen, of course, the other could be used as supplementary evidence.

By the decision of *Smyth v. Ames* and subsequent cases, little reliability is to be given to records of cost of property. Both their unreliability and their divergence from "present value" have reduced them to evidence of only secondary importance. In the history of valuation proceedings, the accepted technique has come to be an engineering appraisal of physical property as the starting point of a valuation. To this is then added land valuations, certain intangible values, an amount for working capital, and finally (though not always) an allowance for going value. The final figure, sometimes further

adjusted for future price trends, then becomes the valuation for rate making. As was said above, such a method is fundamentally a valuation by cost of reproduction.

BASIC ASSUMPTIONS

Certain basic assumptions must be agreed upon in making a physical appraisal of property. In the first place, the thing to be valued is the actual tangible property now in use. Although the theory of cost of reproduction logically assumes not the present plant but a substitute one, yet practice supported by court decisions does not follow good theory. In the next place, the actual conditions of installation, not the present conditions, are usually assumed, and in this there is court precedent. This assumption is significant when one contrasts actual situations of past installations with hypothetical present conditions. The bulk of our water and gas companies laid their original mains in streets unpaved and but slightly impeded by present subsurface interferences. Obviously, to trench a street for gas mains now would involve breaking of pavement and interference from water and sewer pipes and telephone and electricity conduits. Although conditions of present installation might be more logical, the practice is to assume those past conditions as they actually existed.

Another assumption involves the process of installation. Specifically, in figuring trenching, pipelaying, and backfill costs, should the actual conditions under which the operation was performed or a present condition be assumed? Probably, the actual method involved main reliance on hand labor; present methods would use trenching machines and tractors for the backfill. On the other hand, although machine methods may be cheaper if assumed to be used at the time of actual installations, yet with present-day complications in street occupancy that advantage probably disappears. A hypothetical plan to lay water mains in a modern paved street would be subject to too many interferences to make machine ditching economical. Obviously, since actual conditions of installation are usually assumed, then actual methods of installation should likewise be assumed.

Of course, these assumptions of the present useful plant as it was actually installed by the methods known and accepted then is not without its difficulty, because when we later discuss the problem of pricing, we shall discover at times that no present prices for some of these things exist. Cast-iron pipe of a particular construction may have long since been out of date. In that case, a real problem exists. One has two choices: substitute materials and processes now available for purposes of value estimation, or set up an imaginary plant to

produce imaginary pipe. The former is preferable, though at least one Justice of the Supreme Court has accused his associates of condoning the latter.

INVENTORY

Having chosen our basic assumptions, the first step in a physical appraisal requires the taking of an inventory of the fixed and tangible property "used and useful" in public service. The "used" property is not usually difficult to discover. The real problem turns around the inclusion of property not in active service and property serving in a stand-by capacity. Let us illustrate this problem. An electric company anticipating future expansion acquires a location for a substation to be built some years hence. A telephone company, on the basis of past experience, builds a foundation strong enough to support a six-story exchange, although at present only two stories are constructed. Water and gas companies own reserve resources. To prevent serious interruption in service, many gas companies now distributing natural gas keep the older equipment for making manufactured gas, now unused, in good repair as stand-by equipment to be used in the event of a failure in supply of the natural product.

The primary question is, of course, what portion of such unused or stand-by property should be included in the inventory. No definite answer can be given, but general practice seems to be to err in favor of the company. Such inclusion can be easily defended. Using our first illustration, that of a site for future expansion, foresight by management in acquiring it at an advantageous figure for a plant to be built 10 years later places no great burden on present users and definitely favors future customers. The practice of generous allowances for stand-by and other property not in actual service should always be a subject of scrutiny for its reasonableness.

These problems of inclusion and exclusion having been settled, the process is to prepare, by actual count, a list of all physical property (at this point, excluding land). This list is prepared in detail, because against each item must be set a price.

UNIT PRICE

The second step in the process of appraisal is to determine a unit price for each piece of property, installed and ready for use. This means that a price must be fixed for each machine, pole, mile of wire or pipe, building, etc. It means finding, if available, current prices for these items plus their estimated installation cost. For some of these, such as turbines, pipe, and wire, there is a constant market, and there-

fore the price at any time is readily available. For other items, however, price is not so available. Suppose that we are attempting to find prices for construction of a powerhouse. Of course, organizations such as the American Appraisal Company have constructed indices, by geographic sections, for standard types of construction. These will help. The problem, however, requires estimates of cost in terms of local materials and labor costs. Final evidence must be supplied by contractors equipped to undertake such work.

One significant problem is the selection of the time interval for price determination. Two choices are available: present prices, or, as they are commonly called, "spot prices"; and average prices. A price average may be for a period of years ending with the date of appraisal, or it may be for an earlier period. The period itself may be 5 to 10 years. The advantage of the spot price is that it is a present price. On the other hand, it may be abnormally high or abnormally low—although we cannot define normal. The average of prices for 5 or more years has the advantage of eliminating abnormal prices, giving a more nearly "normal" price.[1] The fact that no public utility is created fully built and ready to operate by any Aladdin's lamp method but is actually built piecemeal over a period of time lends support to the use of prices based on a 3- to 5-year period next to the date of the appraisal. According to its defenders, this is a more realistic approach to the present value of utility property. For this reason, averages of prices for a period of years have generally been preferred; although as we have pointed out above, the courts lean heavily in the direction of spot prices.

The Indianapolis Water Company case furnishes illustrations of the results of the use of both average prices and spot prices. One group of engineers submitted estimates of the cost of reproduction less depreciation of physical property only, as follows:[2]

Average prices 10 years ending with 1920	$16,020,456
Average prices 5 years ending with 1921	20,535,543
Prices prevailing Oct. 1, 1922	19,447,193

In this case, the Court concluded that[3]

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

[1] Emphasis on "normalcy" of prices for cost of reproduction may be found in the report of Charles Evans Hughes, then special Master, in *Brooklyn Borough Gas Co. v. Public Service Comm.*, 17 N.Y. Off. Dept. 81, P.U.R. 1918F 335 (1918).

[2] 272 U.S. 400, P.U.R. 1927A 15, 19.

[3] P.U.R. 1927A at 25.

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.

CONSTRUCTION EXPENDITURES

If the appraisal process followed the logic of its premises, it would assume the instantaneous creation of property. As we have explained, however, such is not the usual assumption. Since we look to the original conditions of construction, piecemeal construction is assumed; and in that case, a certain period of time elapses between the launching of plans for a public utility and its first day of operation. This is a period of construction; and during that time, certain expenditures were actually incurred. The appraiser, therefore, must estimate the amount and kinds of these expenditures. The usual items of expense during this period are:

Organization expense.
Legal expense.
Engineering and supervision expense.
Interest during construction.
Taxes during construction.

These items can be determined by several ways. One is to inspect the records for the actual amount of such expense. Another way is to assume a hypothetical construction period of, say, 3 years and estimate the present cost of such expenditures. A third method is to compute a "normal" percentage relationship between these items and the undepreciated value of physical assets. At least, this third way is a rather usual form in which to express the relation between these overheads and physical property.

A final item usually included at this point is an amount for "omissions and contingencies." No process of inventory can hope to be completely accurate. A pole, a mile of wire, a few transformers, even a powerhouse may be overlooked! Therefore, to guard fully against omissions of items in the inventory and to guard against the imaginary contingencies of floods, drought, tornadoes, strikes, quicksand, and other acts of God, a final sum for omissions and contigencies is allowed. Of course, such a procedure is open to sharp challenge. Significant items will not ordinarily be omitted from an inventory, and therefore for the insignificant items it could properly be assumed that for a system of any size, omissions would be offset by long counts. Overcounts and undercounts can be assumed to be about the same. So far as contingencies are concerned, only the imagination and sensitiveness of the appraiser can establish their limits. Therefore,

how much saner it would be to allow as a maximum actual construction expenditures.

Expressing these as percentages of physical property values, Bauer and Gold have set down these items as follows, "as probably reasonable under most conditions of construction":[1]

Item	Percentage of Physical Value
Organization expenses	1.5
Legal expenses	0.5
Engineering and supervision	5.0
Interest during construction	6.0
Taxes during construction	2.0
Omissions and contingencies	1.0
	16.0

DEPRECIATION

At this point, we have our inventory of physical property (except land) times unit prices plus undistributed overheads occasioned during a period of construction. This figure is cost of reproduction new and so far has taken no consideration of such depreciation as does exist. Originally, appraisers were inclined to argue that little if any depreciation of physical plant existed because it was as efficient as it was the day it was built. Of course, even the courts saw the fallacy of this, and therefore the practice soon developed to make some allowance for depreciation. Thus, the rule has become: Cost of reproduction new, less depreciation. At this point, we shall simply say that depreciation is deducted, deferring to the next chapter discussion of that rather intricate and confused problem.

LAND

One final item of physical property, land, remains to be valued. Since it is thought not to depreciate with use, it is set apart for separate consideration. Of course, in so far as land is used for building sites and rights-of-way, it does not depreciate in the usual sense of the word. In other ways, however, it does. Functional forces of obsolescence and inadequacy may be just as effectively "eating away" a building site as they are destroying the building itself. For the present, however, we accept the position that land does not depreciate.

How shall land owned by public utilities (other than wasting assets such as natural gas supplies) be valued under cost of reproduction? In a real sense, land cannot be reproduced—all that could be considered is the hypothetical cost of an imaginary acquisition of a building

[1] *Public Utility Valuation*, p. 183.

site or a right of way. In this connection, we turn to the *Minnesota Rate Cases*, because there the Court made clear its position on this problem.[1] A point at issue was the value of the lands in Minnesota of several railroad companies. For holdings outside three cities, appraisers had multiplied by three the estimated value of lands adjacent to rights-of-way. This multiplier was defended on the grounds that present cost of acquisition by court proceedings would be at least three times present market values. In fact, the court quotes the testimony of one expert to the effect that "When you are going through a highly cultivated country, I think the multiplier of 3 is not enough."[2] As a result, the market value of these lands of approximately 2 millions was estimated for "railway purposes" to be worth about 5 millions. In the terminal cities of Minneapolis, St, Paul, and Duluth, original cost of $4,527,000 by a similar computation became worth $17,315,000. Here was an unquestioned attempt to apply a kind of cost of reproduction to land holdings.

The Supreme Court, speaking through Mr. Justice Hughes, sharply condemned this technique. It could see no basis to assume that railroads could be forced to pay exorbitant prices for a right-of-way. Quoting directly:[3]

> The cost-of-reproduction method is of service in ascertaining the present value of the plant. . . . But it does not justify the acceptance of results which depend upon mere conjecture. . . .
>
> The question is whether, in determining the fair present value of the property of a railroad company as a basis of its charges to the public, it is entitled to a valuation of its right-of-way not only in excess of the amount invested in it, but also in excess of the market value of contiguous and similarly situated property. . . . It is clear that in ascertaining the present value we are not limited to the consideration of the amount of the actual investment. . . . [On the other hand] it is not admissible to attribute to the property owned by the carriers a speculative increment of value, over the amount invested in it and beyond the value of similar property owned by others. . . .

The Court concludes by saying:

> Assuming that the company is entitled to a reasonable share in the general prosperity of the communities which it serves, and thus to attribute to its property an increase in value, still the increase so allowed, apart from any improvements it may make, cannot properly extend beyond the fair average of the normal market value of land in the vicinity having a similar character. Otherwise we enter the realm of mere conjecture.

[1] *Simpson v. Shepard*, 230 U.S. 352, 444–455 (1913).
[2] *Ibid.* at 447.
[3] *Ibid.* at 452–455.

It seems correct to conclude, first, that this case definitely eliminates speculative valuations based on a kind of alleged cost of reproduction, and it definitely permits utilities to share in such increased land values as its presence or any other factor may have created. These are significant items to have so clearly settled. On the other hand, the case leaves open other problems, not yet settled by subsequent cases. How shall the value of adjacent lands be measured, and what such lands have a similar character? Shall these adjacent lands be valued in terms of the existence of a railroad right-of-way or under imaginary conditions of its nonexistence? In short, land valuations for rate making are quite complex. It is enough for our purposes to say that lands are valued according to the fair market value of adjacent lands.

With this done, the appraisal in its strict sense is completed. There has been established by appraisal a value for all physical property.

VALUATION OF INTANGIBLES

So far, our discussion has concerned appraisals of tangible, physical assets. Although it might be supposed that their valuation would complete the job of a rate-base determination, such is not the case. An examination of public utility balance sheets will disclose many other assets, mainly intangibles, for which valuations will be claimed in a rate proceeding. Since, in truth, these intangibles are property under its generally accepted meaning, their inclusion under certain conditions and limitations can scarcely be protested.

The first problem that one faces in the valuation of intangibles is the selection of the price period. Most of them had an original cost; but if that is rejected, what shall be the basis? Shall it be present value? But present value is an elusive thing, because no present market exists for them. A study of the decisions and cases will disclose no accepted and universally applied rule of valuation of intangibles. We shall discuss the valuation of the following intangibles: franchises, patents, water rights and other rights, leaseholds, and easements. That most elusive of all elements of intangible valuation, going value, we reserve for special treatment.

Franchises.—In the history of franchise grants, franchises originally were regarded as property of high value. They were often sold to the highest bidder and later bought and sold among private parties. Even yet, whatever may be their values, franchises are property subject to the full protective force of the Fifth and Fourteenth Amendments and the Contract Clause of the Federal Constitution.

Early in the efforts of legislatures and commissions to regulate rates, the problem of franchise values arose for determination. The previous holdings of courts as to the property status of franchises and awards of value in taxation and condemnation cases made this question of value for rate making inevitable. A review of early rate cases gives no conclusive answer. In *Smyth v. Ames*, one finds the expression "value of the property and franchises used by the [railroad] corporation," which is suggestive of a separate franchise value. The problem finally found its way into the federal courts in the efforts of the state of New York to reduce the gas rates of the Consolidated Gas Company. In the valuation that followed, an amount ranging from 7 to 20 millions of dollars was claimed for franchise value on the grounds that a New York Act of 1884 authorizing the consolidation of gas companies in New York City had recognized such a valuation. In the United States District Court, this question was thoroughly reviewed, and the judge there said:[1]

> I conclude therefore that I am compelled to consider franchises not only as property, but as productive and inherently valuable property, and to add their value if ascertainable to complaintants' capital account. . . .

The Court then raised the 1884 franchise valuation of $7,781,000 to $12,000,000 by computing it as a fixed percentage of total tangible assets.

Upon appeal to the Supreme Court of the United States, that body refused to allow more than $7,781,000, the original sum of 1884, as the value of the franchise. In conclusion, the Court said:[2]

> What has been said herein regarding the value of the franchises in this case has been necessarily founded upon its own peculiar facts, and the decision thereon can form no precedent in regard to the valuation of franchises generally, where the facts are not similar to those in the case before us.

Although this decision did not put to rest the question of franchise valuation, it did seem to suggest that only in special cases could it be supported. It appears that the Supreme Court did not have the same confusion of the lower court between franchise values in condemnation proceedings and franchise values for rate making. In condemnation cases, such values were a standard award, and the District Judge improperly carried the analogy over to the field of rate making. In conclusion, although the Supreme Court regarded the New York Legislative Act of 1884 as validating the franchise value in question,

[1] *Consolidated Gas Co. v. City of New York*, 157 Fed. 849, 878 (1907).
[2] *Willcox v. Consolidated Gas Co.*, 212 U.S. 19, 48 (1909).

later evidence throws considerable doubt upon the propriety of the Court's conclusion.[1]

After this case, the practice swung toward no allowance of special franchise values. Finally, in 1923, in a case before the Supreme Court, Mr. Justice Brandeis, speaking of the claim that neither franchise values nor early operating losses had been allowed in a rate case, said:[2]

> These items were properly excluded. The franchise in question is not a monopoly. It is merely a perpetual permit, granted by the [Georgia] legislature in 1856, to maintain gas mains in the streets, alleys, and public places of Atlanta without the necessity of securing the consent of the municipality. . . . The allowance for the franchise made in *Willcox v. Consolidated Gas Co.* [described above] was rested on special grounds which do not exist in this case.

We conclude, therefore, that, as a general rule, all special values for franchises are now outlawed.[3] Of course, all actual payments made, other than periodic payments such as franchise taxes, are validly included as a franchise value. These represent actual expenditures. So far as annual payments required by franchises are concerned, these are to be charged as expenses of operation as they are accrued or paid.[4]

Easements.—In at least one state, Maryland, the right of a public utility to use public streets and alleys (usually called a "franchise") is referred to as an "easement." In Maryland, such easements have been defined as real estate and for tax purposes are so valued. As one might expect, efforts would be made to include a value for easements in Maryland rate controversies. In 1913, for instance, the commission of that state allowed an easement value of 5 million dollars for a Baltimore company.[5] In 1926, the problem again arose, and again upon advice of the Attorney General, the commission allowed 7 million dollar easement values for a Baltimore street railway company.[6] The case, after a remand by the Supreme Court of Maryland, finally went to the Supreme Court of the United States.[7] At that point, the

[1] See the careful analysis of Whitten and Wilcox, *Valuation of Public Service Corporations*, 2 ed., Sec. 641.

[2] *Georgia R. & Power Co. v. Railroad Comm.*, 262 U.S. 625, 632 (1923).

[3] Whitten and Wilcox, *op. cit.*, Sec. 648. For an illustration of the application of this rule, see the decision of the Montana Commission in *Public Service Comm. v. Billings Gas Co.*, P.U.R. 1933D 337, 359.

[4] *Ibid.*, Sec. 652.

[5] *Bachrach v. Consolidated Gas, Electric Light & Power Co.*, 4 Md. P.S.C. 39 (1913).

[6] *Re United R. & Electric Co.*, P.U.R. 1926C 441.

[7] *United R. & Electric Co. v. West*, 280 U.S. 234, P.U.R. 1930A 225, 227 (1930).

easement had been valued at 5 million dollars. In its decision, the Federal Court refused to review the challenge of that value, feeling bound by the interpretation of the Maryland court. As it said, the challenge "came too late." Mr. Justice Brandeis dissented vigorously, claiming that an easement was but another word for franchise and that, had it been so labeled, it would have carried no value.[1]

It appears that easements, where recognized for what they are—franchises—should be valued exactly as the franchise is valued. In other words, they should have no special value. The United Railways case, cited above, seems to stand on a special situation—the lateness of the challenge—and, therefore, can be said not to be binding as a general rule.

Water Rights.—Water, irrigation, and electric companies often have intangible assets known as "water rights," that is, certain rights to the use and disposal of flowing water. Although in many cases these rights may be valued as part of the land from which and on which water flows, they are often valuable privileges not related to any real property right. The problem is especially significant in the semiarid sections of the west, and there a complete body of law has been developed by which to value such rights. In an early case, it was established, in California at least, that allowance must be made for water rights in determining fair value.[2]

In general, there are no accepted techniques of valuing water rights. One method has been to compute the cost of supplying the service in question from the next best spurce or facility, capitalizing the estimated savings in operating expense. This can be illustrated by an Alabama case.[3] There, the water rights of a hydroplant were computed by comparing the total expense of that plant with estimates of operating costs of supplying the same electric service by steam generation. For 1920, the estimated saving was $550,000. This the commission capitalized at 10 per cent and then split between the customers and the company. The value of the water rights then became about $2,250,000. This method of computation in electric rate cases, however, has not had the sanction of most commissions, because the claimants generally insist upon not half but all the value as computed. A vital defect of such a method lies in its instability. In 1920, there was a definite superiority of hydrogenerating costs; but by 1930, that differential was declining. By 1940, in fact, few if any of the hydro-

[1] P.U.R. 1930A at 233.

[2] *San Joaquin & Kings River Canal & Irrigation Co. v. Stanislaus*, 233 U.S. 454 (1914).

[3] *Re Alabama Power Co.*, P.U.R. 1923B 28, 38–40.

projects were equal in efficiency to the best steam plants.[1] Therefore, under this method, all value of water rights has disappeared.

In the Indianapolis Water case, allowance for water rights was a point at issue. In preceding decisions involving that company, the Indiana Commission had allowed 9½ per cent for going value and water rights. When the case reached the Supreme Court, it was held by Mr. Justice Butler that[2]

> The evidence sustains an amount in excess of ten per cent to cover water rights and going value. . . .

Thus, it seems that water rights must be valued, but by what rule no one knows. Such a decision, we think, is questionable. To allow a company to value such intangibles in excess of actual payments made for them is to indulge in the worst kind of speculation. We think the New Hampshire Commission was right when it said of a claim of water rights:[3]

> . . . when a water power is an integral part of a utility property it is unnecessary and not ordinarily desirable to endeavor to fix an exact value for the same considered apart from the other portions of the property to be valued.

One legislative approach to this problem of water rights is found in the Federal Water Power Act of 1920. In that act, careful definitions of terms are set out. In the definition of net investment occurs this proviso:

> . . . the value allowed for water rights, rights of way, lands, or interest in lands shall not be in excess of the actual reasonable cost thereof at the time of acquisition by the licensee. . . .

Patent Rights.—Value of patents occasions no little difficulty. Courts have been reluctant to allow their valuation at cost, because so often they cost little, if anything, yet utility customers benefit definitely by their use. In a leading case on this question, the Supreme Court of the United States held that some benefit for their use must be allowed in a rate case, although it did not suggest the method of allowance.[4] Specifically, the company had acquired certain patents relating to gas service. Their use immediately made obsolete a portion of its equipment. There was no question of the public advantage

[1] This may seem to be a dogmatic statement upon a controversial issue. For further discussion, see the concluding section of Chap. XXIX.

[2] 272 U.S. 400, P.U.R. 1927A 15, 33 (1926).

[3] *Berlin Electric Light Co.*, 3 N.H.P.S.C. 174, cited in Whitten and Wilcox, *op. cit.*, Sec. 683.

[4] *Pacific Gas & Electric Co. v. San Francisco*, 265 U.S. 403 (1924).

through the use of these newer processes. The Court was impressed by the fact that allowing no value to these patents resulted in a valuation of the company's property at a lower figure for the production of a superior product, whereas without these patents it could claim a higher valuation. "The results indicate error somewhere, either in theory or application of principle." The principle of the case, therefore, appears to require an allowance of an equitable part of the gain to companies using patents of obvious public advantage. As the Court said, this could be done by allowing a value for patent rights or setting up a value for the obsolescence created by the use of patents.

Leaseholds.—Although we could continue this "parade of the intangibles" to cover many more items, we shall discuss just one more —leaseholds. The problem of leaseholds arises in connection with the practice of natural gas companies of acquiring under lease present and potential gas supplies. Since the actual cost of a lease and its "present value" after an area is proved to be a gas-producing area are very different, an acceptable rule of valuation was bound to be a matter of dispute. In extreme cases, for instance, experts have claimed present values for leases as high as sixty times their cost.[1] In general, the state courts have split on the question of proper rule of valuation. The Supreme Court of West Virginia leans toward actual investment; those of Pennsylvania and New York have adopted a market value theory.[2] The Supreme Court of the United States has had this problem before it several times.[3] A review of its decisions indicates that the Court prefers cost as a basis of a valuation of a lease, largely because of the high degree of speculative results when other criteria are considered. In addition, that body shows a decided opposition to the inclusion of any value for leases covering fields not immediately needed as a source of supply.

To conclude this section on valuation of intangibles, the problem facing commissions is simply this: Cost is a defensible basis of valuing intangibles (if they must be separated from the physical assets that they represent), but it results in all the savings from managerial foresight being passed to the public. Therefore, courts and commissions are inclined to retain at least a part of these benefits for the companies. In so doing, they have attempted to adopt the rule of land valuation—

[1] TROXEL, *Public Utility Aspects of the Natural Gas Industry*, p. 223, thesis, University of Iowa Library.

[2] WHITTEN and WILCOX, *op. cit.*, Sec. 526, and cases there cited.

[3] *United Fuel Gas Co. v. Railroad Comm.*, 278 U.S. 300, P.U.R. 1929A 433 (1928); *Dayton Power & Light Co. v. Public Util. Comm.*, 292 U.S. 290, 3 P.U.R. (N.S.) 279 (1934); and *Columbus Gas & Electric Co. v. Public Util. Comm.*, 292 U.S. 398, 4 P.U.R. (N.S.) 152 (1934).

present market value. That, however, has not been successful, for the reason that there is an inadequate market for patents, leases, water rights, and franchises. The net result has been, inadvertently, to veer toward capitalized net income as a basis of valuation, a process that defeats the very essence of regulation. Since rates (prices) are the thing to be fixed, values should not be related to income.

WORKING CAPITAL

Our study thus far has centered around the valuation of fixed assets, tangible and intangible. At least one other item of unquestioned validity must be included—working capital. Specifically, this phrase covers those items of current assets such as cash, accounts receivable, and materials and supplies used in utility operations. As it has been phrased, "For rate purposes working capital may be defined as the amount of capital [necessary] . . . to cover the gap between cash expenditures in the production and delivery of service and the collection of the revenues from the sale of service."[1]

In general, the valuation of working capital involves an inspection of such utility accounts as accounts receivable, materials and supplies, cash, and prepayments. Although the average balances of these accounts, especially cash, do not necessarily prove the proper allowance, they at least point to it. Especially must the cash account be scrutinized to determine its minimum normal amount. On the other side of the balance sheet, accounts payable, interest accrued, and taxes accrued should be considered and deducted from the asset items. However working capital is measured, it should be enough to carry on normal month-by-month operations, enough to finance the lag between production of service and payment for service.

Of course, working capital requirements differ for different types of utilities. Gas, electric, and water companies, which sell their services on a monthly or quarterly basis, have the greatest need of working capital. One might almost say that they need an amount equal to their operating (and out-of-pocket) costs for that period of time. This would be an especially significant sum if quarterly billing were used. An examination of cases shows the usual ratio of working capital value to property value for gas companies to be 5, 6, and 7 per cent, with an occasional high in excess of 10; for electric companies, 3 to 5 per cent; and for water companies, varying from 1 to 14 per cent. On the other hand, utilities that use prepayments (telephone) or the pay-as-served basis (transportation) have smaller working capital needs. Again, this is borne out by the cases. Ratios of 2, 3, and 4

[1] WHITTEN and WILCOX, *op. cit.*, Sec. 781.

per cent between working capital allowances and property values are common for telephone companies. Similar percentages exist in the street railway cases.

This problem seldom reaches the Supreme Court of the United States. In the Ohio Utilities case, for instance, the court labeled a commission reduction of working capital allowance as "capricious."[1] In the Indianapolis Water case, the Court raised the working capital allowance to the figure claimed by the company.[2] These are the only two cases in which the problem is even touched by that body. These scant notices are of little significance, however, because the Court neither directly nor indirectly gives a hint of a method or rule of working capital valuation.

GOING VALUE

With the estimation of an allowance for working capital, the practical process of utility valuation is next to complete. Only one other significant "value" is open for discussion, though it has occasioned bitter controversy. We refer to going, or going-concern, value. Our first problem is to define this phrase; and for our purposes, "going value" and "going-concern value" are synonymous. Its most accepted description appears in the Des Moines Gas case and is as follows:[3]

> That there is an element of value in an assembled and established plant, doing business and earning money, over one not thus advanced, is self-evident. This element is a property right, and should be considered in determining the value of [public utility] property. . . . Each case must be controlled by its own circumstances.

In the briefest possible language, then, going value is the difference in the value of a going concern and its value as a summation of physical, lifeless, assets.

Good Will.—No thorough understanding, however, of the problem of going value can be had without first reviewing briefly the judicial history of the place of franchise value and good-will value. As we have indicated above, franchise values over and above actual legitimate payments are not includable in rate valuations, probably for the reason that such valuation smacks of a monopoly influence, and courts have not been inclined to recognize a value of such a preferred position. At the same time that the Court was meeting and deciding the question of value of a franchise, it was likewise being asked to recognize as

[1] *Ohio Utilities Co. v. Public Util. Comm.*, 267 U.S. 359, 363 (1925).
[2] *McCardle v. Indianapolis Water Co.*, 272 U.S. 400, P.U.R. 1927A 15, 25 (1926).
[3] *Des Moines Gas Co. v. Des Moines*, 238 U.S. 153, 165 (1915).

an element of value that thing called "good will"—that element of value arising from favorable public relations, an established clientele, etc. At first, courts and commissions were inclined to recognize this as an element of value; but since the decision of the Supreme Court in the first Consolidated Gas case, 1909, they have almost universally discarded it. In that case, it said:[1]

> The complainant had a monopoly in fact, and a consumer must take gas from it or go without. He will resort to the "old stand," because he cannot get it anywhere else. The Court below excluded that item [of good will], and we concur in that action.

This same attitude is found in the cases that follow. Its exclusion, of course, is logical, because good will is a by-product of the competitive struggle, an indication of successful attraction of customers in the face of opposition from one or more other competitors. Furthermore, its valuation depends upon earnings, and therefore to allow good will in utility rate cases would be to assume the very factor attempting to be regulated.

Going Value.—Failure to establish franchise value and good will as valid items for a rate base did not deter the utility advocates. A reading of the cases between 1910 and 1920 shows that while these concepts were being barred, their very notions were creeping in under the heading of "going value." Although courts and commissions were careful to distinguish between the two outlawed items and going value, in fact they were borrowing the same arguments for going value as had been offered for good will. The Indiana Commission, for instance, spoke of the earning power, credit, and fine public relations of the Indianapolis Water Company as evidence of its going value—items obviously evidence, strictly speaking, of good will.[2] Following the confirmation of this position by the Supreme Court of the United States,[3] Whitten and Wilcox could justly conclude, "Apparently, good will and going value, once estranged in the halls of justice, have become reconciled again."[4]

What is going value, or going-concern value? One reads the cases in vain for a formula. All that is suggested is that it is the difference between value of a going business and the sum of the values of its component parts. Of course, this is simply another way of stating an economic truism that the value of anything bears no necessary relation

[1] *Willcox v. Consolidated Gas Co.*, 212 U.S. 19, 52 (1909).
[2] *Re Indianapolis Water Co.*, P.U.R. 1923D, 449, 494.
[3] 272 U.S. 400 (1926).
[4] WHITTEN and WILCOX, *op. cit.*, Sec. 725.

to *either* the cost *or* value of the items of which it is composed. But in rate cases, we have obviously departed from economic value as the thing to be found, and therefore such a definition is meaningless. In short, the whole process of valuation for rate making looks at the utility as a going concern; and as it has often been said by courts and commissions, going value adheres to the thing valued and the valuation made.

On the other hand, appraisers and jurists have insisted on a separate item for going value. In such situations, going value has been defined as

1. Overhead costs.
2. Sum of early operating losses.
3. As neither 1 nor 2, but "something else."

If it is the overhead costs, the ordinary appraisal should handle it in the estimates of value of physical plant—therefore, it requires no separate accounting. Wisconsin first defined the concept of going value as the sum of early operating losses, those costs not charged to operating expenses incurred in getting the plant up to its normal operating level.[1] This rule of going value was clearly disallowed by the Supreme Court in the Galveston case.[2] The disapproval of developmental costs, or early operating losses, of course, can be understood, because such a rule operates to penalize the immediately successful plant. Thus, going value becomes "something else"; it has come to mean all things to all men. In general, although actual early losses of a prudent management have been discarded as a measure, they have indirectly become at least a part of the measure of going value. Courts and commissions are inclined to speak of going value as the costs incurred in securing subscribers, connecting them to the plant, training employees, and placing the plant in efficient operation.

As we said earlier, the Supreme Court, since the Indianapolis Water case, has insisted on allowances for going value, in spite of its earlier decisions which seem to have discarded it. In that case, Mr. Justice Butler said, "The evidence is more than sufficient to sustain 9.5 per cent for going value."[3] Thus, any commission allowing 10 per cent or more of the physical value as going value will probably be sustained. The Court, however, does not always require a specific finding of going value. As Mr. Justice Cardozo has said, it is not to

[1] *Ibid.*, Sec. 755.
[2] 258 U.S. 388 (1922).
[3] P.U.R. 1927A at 28.

be "read into every balance sheet as a perfunctory addition."[1] In fact, the Court now not only seems to demand substantial evidence of its presence before it will be allowed but can be convinced that going value need not be included as a specific item.

In this connection, two cases are suggestive of a liberalized attitude. In the Columbus Gas case, Mr. Justice Cardozo said, "The record justifies a holding that [going value] was reflected in the other items and particularly in the appraisal of the physical assets as a part of an assembled whole."[2] The Los Angeles Gas and Electric case is even more suggestive of this new attitude.[3] There, the California Commission had allowed a valuation of $65,500,000, using an undepreciated investment as a basis for rate making. One of the allegations against the commission was its failure to make allowance for going value. Mr. Chief Justice Hughes, speaking for the Court, after making a careful analysis of fair value, found the California valuation to be about $5,500,000 in excess of his computation. Thus he found, in fact, adequate recognition of going value, saying, "The fact that this margin in the rate base was not described as going value is unimportant, if the rate base was in fact large enough to embrace that element."[4] As one would expect, Mr. Justice Butler, the author of the celebrated decision in the Indianapolis Water case, objected, saying, "There has been no appraisal of going value. That element was arbitrarily excluded below. There is no *rational foundation* for the amount attributed to it here."[5]

The best that can be said, in conclusion, is that the Court believes in going value but that it has quite hazy notions as to its determination. Possibly it is too much to hope that it may be on the road back to the Brandeis position of 1922, that "Going concern value . . . [is] not to be included in the rate base for the purpose of determining whether a rate is confiscatory."[6]

So far as we are concerned, going value or going-concern value has no place whatever as a separate item in utility valuation. In the first place, it is simply a disguise for good will and franchise values and in effect is an indirect method of capitalizing earnings, the thing to be

[1] *Dayton Power & Light Co. v. Public Util. Comm.*, 292 U.S. 290, 3 P.U.R. (N.S.) 279, 292 (1934).

[2] 4 P.U.R. (N.S.) at 161.

[3] *Los Angeles Gas & Electric Corp. v. Railroad Comm.*, 289 U.S. 287, P.U.R. 1933C 229 (1933).

[4] P.U.R. 1933C at 248.

[5] *Ibid.* at 259. (Italics ours. Has Justice Butler ever stated a rational basis for computing going value?)

[6] *Galveston Electric Co. v. Galveston*, 258 U.S. 388, 397 (1922).

fixed by regulation. Next, if going value means early losses, such are improperly made a part of a rate base, because they should be written off against subsequent earnings. Third, the intent of all valuations is to value property as going concerns—thus, a separate sum is simply double counting. Finally, allowances for going-concern value have

TABLE 37.—GOING VALUE ALLOWED BY COURTS AND COMMISSIONS*
(204 cases, 1915–1930)

Utility	Physical property valuation	Total valuation	Amount of going value	Percentage of physical property value		
				Average	Minimum	Maximum
Electric....	$ 316,244,472	$ 345,176,552	$ 28,932,080	9.1	2.3	26.8
Gas.....	322,721,418	349,087,099	26,365,681	8.2	0.7	27.9
Telephone..	1,406,193,247	1,453,978,535	47,785,288	3.4	2.2	25.0
Railway....	294,865,661	329,239,050	34,373,389	11.7	1.9	28.3
Water.....	139,824,356	151,978,037	12,153,681	8.7	2.4	25.0
Sewage.....	2,425,787	2,653,207	227,420	9.4	6.9	10.2
Steam heat.	367,352	384,067	16,715	4.6	2.5	5.8
Toll bridge.	41,302	41,302				
Total....	$2,482,683,595	$2,632,537,849	$149,854,254	6.0		

* COOKE, "Relations of 'Intangible' Assets," *N.E.L.A. Bulletin*, **18**:725, November, 1931.

been a convenient way of inflating rate bases in order to resist rate changes.[1]

FAIR VALUE

But one more step remains in the practical process of valuation for rate making. We can now add together the depreciated value of physical property and the values assigned to intangibles, working capital, and going value (if any). This, it might be assumed, will give our value for rate making. Such is not the case. This figure may be adjusted either upward or downward. For instance, in the Indianapolis Water case, after collecting all its evidence of investment and cost of reproduction values (figures ranging from 13 to 23 millions), the commission established a fair value of $15,260,400. The actual

[1] The significance of going value to total valuations has been estimated by one writer as follows: In the years before 1933, he finds approximately 200 cases involving total physical property values of $1,500,000,000 for which going value was estimated at $142,000,000. Of course, he develops an elaborate defense of such practice. See Riggs, "Going Concern Values Running into Millions," *Public Utilities Fortnightly*, **12**:763, Dec. 21, 1933.

process seemed to be to split in some unknown ratio the difference between high and low figures. In the Los Angeles case, after a careful estimate of value, ranging around $60,000,000, the commission established fair value at $65,500,000.

As we pointed out in the previous chapter, the Court requires all present-value estimates to be adjusted for probable future price trends of the next 1 to 3 years. In the Chesapeake and Potomac Telephone case, such was attempted. There, in view of possible price increases, instead of ordering a rate reduction estimated to save customers about $1,400,000, a figure apparently merited by the findings, the Maryland Commission decided that a saving of a $1,000,000 would be fair. Suffice it to say, one of the main transgressions of the commission in this case was its failure to guess the degree of price change! This process of correction for probable future price trends has drawn scathing comments. Whitten and Wilcox have said: "Thus the process of appraisal by the reproduction cost methods receives the final touch of unreality and becomes dependent upon the opinions of expert witnesses as to future prices, with respect to which, necessarily, they have had no experience."[1]

It appears, therefore, that, by some unknown process, commissions toss all evidence of value into a machine of unknown parts, a machine that then labors and finally brings forth a fair value. In fact, Mr. Justice Stone almost recommends this process in the O'Fallon case, in which he says that he supposes no one would have thought to question the findings of the Interstate Commerce Commission had it not been so painstaking in disavowing use of cost of reproduction, "which it nevertheless considered and to some extent applied. . . ."[2] In fact, something of the ritual that impresses the judicial mind is seen in the following summary sentences of a rate case.[3] We quote this because it is typical of so many commission decisions:

> After considering all the evidence and arguments of counsel in this case, bearing upon the valuation of the properties herein involved, the investment therein, their original costs, cost to reproduce, and present values, including all overheads; preliminary costs; costs of engineering; supervision, interest, insurance, organization and legal expenses during construction; working capital; materials and supplies; and all other elements of value, tangible and intangible, and considering the plants are now going concerns in successful operation, the Commission finds . . . for the purposes of this proceeding, and for those purposes only, the fair rate-making values . . . as follows.

[1] WHITTEN and WILCOX, *op. cit.*, Sec. 340.

[2] P.U.R. 1929C at 172.

[3] *Re Illinois Northern Util. Co.*, P.U.R. 1920D 979, 999, cited by Brandeis in concurring opinion in Southwestern Bell case, 262 U.S. 276, 297 (1923).

CRITICISM OF VALUATION PRACTICE

Valuation practice, with emphasis upon physical appraisals, has scarcely anything to be said in its defense. As a practical method of applying a bona fide theory of cost of reproduction, it has absolutely no support. Its emphasis upon the identical plant, its inconsistent compounding of spot and future prices, its use of prices of utility materials rather than general prices, its inclusion of certain intangibles and going value all are evidence of this. In truth, valuation practice has simply been an expensive method of delaying, sometimes for years, the regulatory machinery. Anyone who plows through the labyrinth of commission and court cases can scarcely escape the conclusion that, in the area of rate making, the critics are correct in pronouncing commission regulation to be a failure. If, in truth, regulation of rates has not broken down, at least it has not been a pronounced success!

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CHAPTER XVI

DEPRECIATION

We have reserved for this chapter two related problems in the matter of reasonable rates, namely, the problem of the amount of depreciation expense and the problem of the reserve for depreciation. The first of these concerns the amount directly charged as an operating expense; the second relates to reasonable rates in so far as depreciation is involved in a rate-base determination. We approach the general problem of depreciation by asking, and attempting to answer, several questions:

1. What is depreciation?
2. What are the causes of depreciation?
3. What are the fundamentals of depreciation, and how have they been confused?
4. What properties are to be depreciated?
5. How have courts treated depreciation?
6. What control should comissions have over depreciation?

WHAT IS DEPRECIATION?

Probably no other term is used with so many meanings and in such confused fashion, and therefore we propose at the outset to define it as carefully and closely as possible. Hatfield has defined depreciation as "the decline in value of an asset due to wear and tear and similar causes."[1] In that connection, he has said, "All machinery is on an irresistible march to the junk heap, and its progress, while it may be delayed, cannot be prevented by repairs."[2] The Interstate Commerce Commission, after several hearings in this matter, devised the following definition:[3]

We therefore find that depreciation is the loss in service value not restored by current maintenance and incurred in connection with the consumption or

[1] HATFIELD, *Accounting*, p. 137.

[2] *Ibid.*, p. 130.

[3] 177 I.C.C. 351, 422. At p. 431, "service value" is defined "to mean the difference between the ledger value of the unit [of property] and its salvage value. . . . " Other terms used are defined on p. 431 and subsequent pages. If this definition of service value is read into the definition above, much of the controversy over the use of the word "value" in a definition of depreciation will vanish.

prospective retirement of property in the course of service from causes against which the carrier is not protected by insurance, which are known to be in current operation, and whose effect can be forecast with a reasonable approach to accuracy.

This definition may be defective in so far as it places emphasis upon "value," and therefore we offer the following definition by the staff of the Wisconsin Commission as the best official pronouncement that we have found:[1]

> Depreciation may be defined as the consumption of investment in property, or the loss in the service capacity of property. . . . Briefly, it results from the usual forces and conditions which limit the service life of property and cause its retirement.

In short, then, depreciation is nothing more than the net cost of assets used to produce goods and services, a cost that should be converted to operating expense during asset life. Thus viewed, much of the controversy about depreciation as a "loss in economic value" and therefore not susceptible to accounting measure can be discarded as meaningless.

CAUSES OF DEPRECIATION

So far as they go, these definitions of depreciation set out above may be acceptable, but they do not suggest the factors that finally force retirement of assets. Broadly considered, the service life of assets is limited by two major groups of causes:

1. Physical:
   - *a.* Wear and tear.
   - *b.* Physical deterioration.
   - *c.* Action of the elements.
2. Functional:
   - *a.* Obsolescence.
   - *b.* Inadequacy.
   - *c.* Requirements of public authority.

The destructive actions of the physical causes of retirement require but little elaboration, because they are self-evident. The various functional causes, however, need further explanation.

Obsolescence refers to the process of antiquation of existing plant and equipment because of technological improvements. The efficiency of the new makes obsolete the older and less efficient equipment. Thus, what may be quite adequate from a physical viewpoint must be

[1] *Depreciation*, p. 14. This monograph was prepared by the staff of the commission and presented by the commission to the National Association of Railroad and Utilities Commissioners at its 1933 convention.

replaced. The telephone, gas, and electrical utilities have continually faced this problem. The steam turbine replaced the reciprocal steam engine; natural gas transported by long-distance pipe lines has been displacing manufactured gas; the automatic telephone forced the retirement of the older manual type. Each of these discarded devices may have been quite adequate from a physical standpoint but quite obsolete from a technical standpoint. Therefore, in these utilities, obsolescence has been a more important cause of retirements than all the physical forces.

Inadequacy as a factor limiting service life of assets has been explained as resulting "from the changes in financial policy, engineering progress, and unexpected developments. . . . Inadequacy results from causes which are largely or wholly internal, such as increase of demand."[1] In other words, any factor such as population growth or industrial change that makes existing facilities unable to serve effectively new load requirements is an illustration of inadequacy. Machines and equipment retired because of inadequacy may be the most efficient known and possess many years of usefulness. The factor of inadequacy can be more easily estimated than the factor of obsolescence and, therefore, more effectively reckoned with. For instance, the period of design of plants and equipment can allow for such forseeable changes as population growth and migration and industrial development. Furthermore, equipment retired from service because of inadequacy often has a high resale value, thereby minimizing the problem of provision for such unrecovered cost as may exist at the time of retirement.

Requirements of Public Authority.—The third, and in many ways the most important, of the functional limits to service life is action of public authority. As urban centers grew, city ordinances or commission orders have outlawed equipment otherwise quite adequate and up-to-date. The requirement of the U-rail in place of the T-rail for street railway systems, the outlawing of the hard-rubber tire for buses, the ban on the one-man street car, the requirement of underground electric cables in place of exposed overhead wires are illustrations of the effect of public authority. In none of these cases, ordinarily, was the outlawed equipment obsolete or inadequate, yet for the sake of health, safety, or esthetics it was ordered retired from service. Fortunately for the depreciation problem, action of public authority usually allows a significant interval of time before it becomes effective, or else it may become effective only upon the retirement from other causes of the equipment in question.

[1] SALIERS, *Depreciation*, pp. 19–22.

As we have defined depreciation—loss of service life—we have chosen to include as its causes both the physical and the functional forces described earlier. In this choice, there is good precedent. For instance, one writer has said, " . . . depreciation in its broadest sense, comprehends all losses arising from physical and functional deterioration."[1] The staff of the Wisconsin Commission has defined depreciation as "the loss in the service capacity of property due to use, wear and tear, physical deterioration, the current action of the elements, obsolescence, inadequacy, or the demands of public authority."[2] Accountants for the American Telephone and Telegraph Company have defined ordinary depreciation as "losses . . . through wear and tear, storms and other casualties, inadequacy, obsolescence, etc."[3] On the other hand, many others insist on confining depreciation to physical causes only, preferring to handle functional causes of retirements in a separate manner. For instance, one would add the unrecovered cost of assets retired because of functional depreciation to the cost of the new assets.[4]

For the following reasons, we choose to follow the broader definition of the causes of depreciation: Depreciation is simply a name for the cost of the contribution of assets to the production of goods and services. Since such costs should be amortized within the life of the assets in question, that factor which sets the limit of that life is the significant one. Therefore, when investigations show that a particular asset will probably wear out in 25 years but more likely may be discarded in 10 years because of obsolescence, it is the 10-year limit that counts. As one writer has phrased it, "the important thing is the *life*, the number of years a unit of perishable property can be used."[5]

The argument against including functional causes of retirement within the classification of the causes of depreciation in the final analysis turns upon their predictability. We believe that many of them are predictable with reasonable accuracy, as the experience of the Bell System demonstrates. The utility industries being mainly monopolies without adequate substitutes can, by and large, control the rate of obsolescence. Even where it cannot be controlled, there is usually plenty of advance warning of the appearance of new machines

[1] *Ibid.*, p. 13. Saliers, however, would not allow functional depreciation to affect the accounting for depreciation.

[2] *Depreciation*, p. 14.

[3] CRUNDEN and BELCHER, *The Straight-line Depreciation Practice of Telephone Companies*, p. 24. Reprinted from 1929 *Proceedings* of the International Congress of Accounting.

[4] SALIERS, *op. cit.*, pp. 27, 28.

[5] HAYES, *Public Utilities, Their Fair Present Value and Return*, p. 160.

and processes. In such situations, we believe that "reasonable prudence demands proper and adequate provision [be made] for the full amount of such losses."[1] Where unpredicted inadequacy appears, the transfer of the property in question to other places within the system or its sale to another company often solves the problem. We take the position, therefore, that functional forces behind retirement are reasonably predictable and thus are truly causes of depreciation. In so far as extraordinary and unpredictable factors, be they obsolescence, inadequacy, war, pestilence, revolutions, or unusual storms, are concerned, of course, their losses must be either written out of past surpluses or else added to the value of their replacements for the purpose of amortization out of future income.

FUNDAMENTALS OF DEPRECIATION

We now turn to the fundamentals of depreciation. In the first place, we insist that the *fact* of depreciation—the loss of service life of assets—cannot be questioned. Even the "one-hoss shay" finally collapsed on the morning of its hundredth anniversary. No matter how well any machine is serviced and repaired, it is on an "irresistible march to the junk heap" and eventually must land there. To deny the fact of depreciation is to deny the obvious—yet we often see situations where experts testify, in effect, that the obvious is not so.

In the next place, depreciation is a cost of operation.[2] In 1908, a member of the Interstate Commerce Commission stated, "A current charge for depreciation is a proper charge to operating expenses."[3] This fact is obscured by accounting procedures which require a periodic casting up of accounts in order to reckon profits and losses. If, however, like the old English trading companies, organized for overseas trade, we were to cast up accounts at the end of each venture, we should set down opposite gross income all expenses of fuel, labor, maintenance, interest, and the cost of the productive equipment. Assets of corporations are really expenses of operation; but because their use stretches across many accounting periods, we have at the end of each period unrecovered portions which we set up as assets on our balance sheets. We should clear some difficulties, however, if these accounts were called "prepaid expenses," because all assets are costs of doing business, and that portion of the capital expense incurred during each accounting period we have come to call "depre-

[1] CRUNDEN and BELCHER, *op. cit.*, p. 24.

[2] Although not copied, this exact phrase occurs in the Summary of the *Report* of the Special Committee on Depreciation of the National Association of Railroad and Utilities Commissioners, 1938 *Proceedings*, p. 439.

[3] Copied from 177 I.C.C. at 361.

ciation." As will be seen below, the periodic debits and credits to depreciation expense and reserve are used to record this essential fact, and thereby we may lose sight of the cost character of depreciation.

Our third fundamental is that depreciation should be based upon cost, not present value or replacement value. This position we take in face of the obvious position of the Supreme Court to the contrary.[1] Since fuel, labor, and other expenses of production are reckoned in terms of actual outlays made for them, there is no reason to choose otherwise for the expenses created by loss of service life. Depreciation is loss of service life; its calculations should relate to original cost; and all recoveries of that amount should occur during the asset life span.

MISCONCEPTIONS OF DEPRECIATION

Depreciation Is Not a Reservation of Profits.—These principles and their corollaries can be illustrated through an analysis of certain common fallacies concerning depreciation.[2] In the first place, the provision for depreciation is often thought of as a reservation of profits, not as a cost of production. This was fundamentally the basis of the opposition of the railroads and electric and gas utilities to commission requirements of scientific depreciation methods. These opponents argued that whatever provision they might make should be in terms of its effect upon net profits. Common accounting procedure for them had been to conclude profit and loss statements: "Amount available for Reserve for Depreciation, Contingencies, and Dividends." Such a position is as fallacious as reckoning profits before taxes, wages, and other costs. One evidence of progress in this regard is illustrated by the statement of the Commonwealth Edison Company, which read "Operating Expenses (including Retirement [Depreciation] Expense of $8,206,201.41). . . . "

Depreciation Does Not Accumulate a Fund.—A second misconception of depreciation is seen in the reference, particularly of courts, to a "depreciation fund." The inference is that the periodic charges for depreciation are invested in a special fund. Although there is nothing to prevent the creation of funds, it is simply not done. Utility companies find it far more profitable to meet part of their needs for new equipment by investing such extra moneys as depreciation provisions create. Thus, funds created by depreciation accounting find their way into some type of new assets. A search of balance sheets of public

[1] See *infra*, pp. 343 *et seq.*

[2] For an excellent short summary of the confusions in depreciation, see Newlove, "Depreciation," *Journal of Accountancy*, **44**:432, December, 1927.

utilities will disclose the fallacy of the "depreciation fund" notion—such earmarked funds simply do not exist.

Depreciation Is Not Loss of Efficiency.—A third misconception is the confusion of efficiency with depreciation. In one case, for instance, a water company claimed to be in a 99 per cent operating condition and thus subject to only 1 per cent depreciation.[1] In another case, a telephone company attempted to defend the position of being in a 96 per cent condition yet asking a 4½10 per cent annual depreciation expense.[2] Of course, advocates of this theory of depreciation always use it when confronted with the relation of depreciation to valuation. When they approach the other side of the problem, they find good arguments for high annual depreciation charges. This confusion has arisen out of the process of engineering appraisals discussed in the previous chapter, and of course its advocacy by private utilities is easy to understand. The Supreme Court, however, at one time at least, seemed to have rejected this theory in its statement that assets "begin to depreciate with more or less rapidity from the moment of their first use."[3]

Chart 20 illustrates the fallacy of the efficiency notion of depreciation. The line (*A*) shows the percentage condition of a particular asset throughout its life. The line (*B*) shows the percentage of

[1] *Vincennes v. Vincennes Water Co.*, (Ind.) P.U.R. 1932A 16, 25. The Michigan Public Utilities Commission shows its confusion in the matter of depreciation in the following extracts from its decision in *Re Detroit Edison*, 16 P.U.R. (N.S.) 9, 19: "It is a matter of common knowledge throughout all of the territory served by the Detroit Edison Company that it keeps its property in good condition. . . . Very little testimony has been given in this case relative to the amount of depreciation existing in the electric and steam properties of this utility. The engineers of the Commission have not made any such examination. Mr. Alex Dow, president of the Detroit Edison Company, testified that in his judgment the property of the company was in not less than 90 per cent condition taken as a whole. We have no doubt of the accuracy of his judgment and we think that in the consideration of this utility we are abundantly justified in assuming that there is not more than 10 per cent of existing depreciation in the depreciable property of the utility." On the basis of this type of reasoning, the commission had no difficulty in justifying the use by the company of the retirement method, the amounts of periodic charges being left to the "competent management" of the company. Such careless logic may be safe in the case of the Detroit Edison Company, but we regard it as essentially unsound.

[2] WHEAT, "Structure and Regulation of Interstate Telephone Rates," 1937 *Proceedings* of the American Bar Association, reprinted in *Public Utilities Fortnightly*, **20**:593–596, Oct. 28, 1937. Mr. Wheat advocates, logically, that if public utilities insist upon the percentage condition (efficiency) theory of depreciation, annual depreciation charges should be reduced accordingly.

[3] *Knoxville v. Knoxville Water Co.* 212 U.S. 1, 9 (1909).

remaining service life. It will be noticed that, defined as efficiency, no appreciable amount of depreciation will occur until retirement, whereas an equal amount of service life, according to the other curve, is lost each year of use. If depreciation charges are made according to the efficiency principle, all will be recovered in the final period of operation —an obvious unfairness to customers. In summary, we cite one authority, who says, " . . . depreciation as a matter of capital accounting, as a matter affecting total value in the rate base, has no necessary relation to momentary operating efficiency [per cent condition.]"[1]

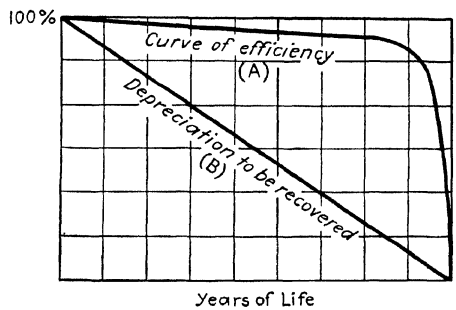

CHART 20.—Depreciation measured (*A*) as loss of efficiency and (*B*) as amortized cost straight-line basis. It illustrates graphically conflicting concepts of depreciation.

Depreciation Is Not Undermaintenance.—A fourth misconception, a corollary of the foregoing point, equates depreciation to undermaintenance of property. This position has been stated as follows:[2]

In valuation work, "depreciation" should be defined as a subnormal or run-down condition of a physical plant—one which is below the proper maximum condition in which the plant can be and should be permanently maintained in order to render adequate service.

Since this position is the logical sequel to the previous point, no particular rebuttal need be added except to say that depreciation, as we define it, is loss of service life over and above all maintenance. If a plant is undermaintained (as well as depreciated), then that factor

[1] WHITTEN and WILCOX, *Valuation of Public Service Corporations*, Sec. 822. Notice the following statement by an engineer: " . . . there must be a certain growing reduction in the value of the parts of a plant with the passing of the years of service, even though that service might continue to be given at 100 per cent of original quantity and quality." Barker, *Public Utility Rates*, p. 108.

[2] RIGGS, "Utility 'Depreciation,'" *Public Utilities Fortnightly*, **9**:560, May 12, 1932.

needs additional consideration in valuation situations. Of course, under this theory, there need be no charges for depreciation expense, since depreciation as we know it is denied.

Depreciation Is Not Offset by Appreciation.—A fifth misconception relates depreciation to price level changes. But falling prices during the life of an asset cannot be the basis of depreciation. Cost of replacement may have declined, but that is not depreciation. On the other hand, it is often argued that price increases—appreciation—offset depreciation (however defined). Appreciation often is referred to in discussing increases in land values. It should be obvious, therefore, that, used in these ways, appreciation and depreciation are not complementary terms—one does not offset the other. Depreciation—loss in service life—bears no relation to declining price levels or rising price levels, no relation to declining replacement costs or rising replacement costs.

Depreciation Is Not Designed to Replace Assets.—Lastly, there is much confusion of the purpose of depreciation. It has often been argued that its purpose is to provide for the replacement of assets, and this position seems to have judicial sanction.[1] Looking to our definition, such a purpose is obviously erroneous. Reckoning depreciation as a cost, the purpose is to recover during the life of assets that cost, thereby keeping intact the investment in depreciable property.[2] Therefore, depreciation policies are not concerned with the replacement of machines as they are retired. If such were a goal, in periods of falling prices allowances would be curtailed—to the advantage of customers and loss to stockholders. The contrary policy and consequence would follow in periods of rising prices. If no replacement were contemplated, no allowance for depreciation would be made. Replacement is an engineering and management problem, not a depreciation problem, and a sharp differentiation needs thus be made.

DEPRECIATION METHODS

Depreciation methods can be divided into two major groups. We call the first group "scientific," because they attempt to compute service life and spread its cost over the life of assets. The other group includes all other devices, and to them we give the heading "substitute methods," because they are arbitrary, follow no formula, have no real relation to those fundamentals of depreciation as outlined above.

[1] *United R. & Electric Co. v. West*, 280 U.S. 234, P.U.R. 1930A 225 (1930).

[2] See Justice Brandeis' position on this point in his excellent dissenting opinions in *Pacific Gas & Electric Co. v. San Francisco*, 265 U.S. 403, 416 (1923); and *United R. & Electric Co., v. West, supra*, p. 231 in P.U.R. 1930A.

Scientific Methods of Depreciation.—To study scientific methods, it is necessary to set up a process by which depreciation can be computed. Briefly, the steps in this process are four:

1. Ascertainment of cost.
2. Estimation of scrap value.
3. Estimation of years of service life.
4. Selection of a method of apportionment.

Let us examine these one at a time. We select original cost rather than present value or future estimated replacement cost because we believe that the purpose of depreciation is to recover original cost. To this is added estimated cost of removal, and from it is deducted estimated scrap value, thereby giving the net depreciable value to be recovered.[1] The third step calls for estimates of service life, a task sometimes difficult and sometimes easy. The Bell System, for instance, has constructed from its past experience tables of expected life and finds easy, therefore, the process of life estimation. The fourth step involves the selection of a method, and generally two scientific ones have been used: straight line and sinking fund.[2]

1. *Straight Line.*—The straight-line method of accounting for depreciation is easy to apply and easy to understand. Suppose that an asset costing $12,000 with an estimated $2,000 net salvage value (gross salvage minus cost of removal) has an estimated life of 10 years. The annual depreciation would be computed as follows:

$$\frac{\$12,000 - \$2,000}{10} = \$1,000$$

Each year, for 10 years, the annual depreciation charge and credit would be $1,000. The annual accounting entry would be

Depreciation Expense	$1,000	
Reserve for Depreciation		$1,000

2. *Sinking Fund.*—The sinking-fund method of depreciation is essentially a device to account for depreciation by a series of increasing debits and credits (the amounts being determined from a sinking-fund table), so that, at the retirement of assets so depreciated, the sum of the reserve entries will equal the value to be recovered. This method is a heritage from a time when sinking funds were actually accumulated

[1] The word "value" is probably improperly chosen. "Cost" or "sum" or "amount" would be more accurate. We bow to common usage, however, and use the word "value," although we recognize its inaccuracy.

[2] For a third method, see Brennan, "Depreciation by the Insurance Method," *Journal of Land and Public Utility Economics*, 9:16, February, 1933.

during the life of assets, and consequently the logical course was to adapt depreciation policies to the sinking-fund principle. Let us illustrate this by an example. Suppose that we have an asset costing $10,000 with an estimated life of 10 years (no salvage value). If a sinking fund were to be accumulated during these 10 years on the basis of interest at 6 per cent, an annual cash sum of $758.68 would be deposited with a trustee. (For the details of this illustration, see Table 38.) Each year after the first, its interest earnings would be added to the fund so that in 10 years the total in that fund (annual deposits plus interest earnings) would be the desired sum ($10,000). For instance, at the end of the second year, the fund would have earned $45.52, and the accounting entries would be

Sinking Fund	$804.20	
Cash		$758.68
Interest Income		45.52

and the depreciation entries would be:

Depreciation Expense	$804.20	
Reserve for Depreciation		$804.20

In the final year of our illustration, the interest income credit would be $523.09, thereby making the sinking fund and depreciation debits and the depreciation reserve credit amount to $1,281.77 each.

As a *means of computing depreciation*, the sinking fund has long since been divorced from sinking-fund accumulations. Therefore, in effect, it is simply a procedure based on a sinking-fund table, by which during the life of an asset a series of orderly rising debits and credits accomplishes a desired result, namely, the amortization of the cost price of an asset. We repeat, the sinking-fund method of depreciation accounting bears no necessary relation to a sinking-fund accumulation. As a matter of fact, a sinking fund could be used in conjunction with any method of depreciation.

A Variant of the Sinking-fund Method.—A few of the state public utility commissions, notably those of Wisconsin and California, have been partial to a modified form of the sinking-fund method. Briefly, they have separated the usual depreciation charge (as computed from a sinking-fund table) into two parts, debiting the annuity portion ($758.68 of our hypothetical problem) to depreciation expense and debiting the remainder, the annual interest accumulation (illustrated in Table 38), against the allowed return upon the undepreciated value of assets. Using our illustrative problem as shown in Table 38, the entries for the first, second, and final years would be as follows:

First year:		
Cost of Service*	$600.00	
Allowed Return		$600.00
Depreciation Expense	$758.68	
Reserve for Depreciation		$758.68
Second year:		
Cost of Service	$600.00	
Allowed Return		$600.00
Depreciation Expense	$758.68	
Allowed Return	45.52	
Reserve for Depreciation		$804.20
Tenth (final) year:		
Cost of Service	$600.00	
Allowed Return		$600.00
Depreciation Expense	$758.68	
Allowed Return	523.09	
Reserve for Depreciation		$1,281.77

* This entry is shown to explain the mechanics of the method. In effect, it sets up the return on our asset (6 per cent on $10,000) as an expense. This is quite defensible, because the return to a public utility is truly a cost of operation.

Thus, the sum of the credits to the reserve for depreciation at the end of the life of our asset (assuming no error in the original life estimate) will equal its depreciable value ($10,000 in our problem), although the sum of the expense debits will be materially less, the exact difference being a function of the interest rate used.

The theory behind this variant of the orthodox sinking-fund method is as follows: First, it premises an *undepreciated* value of assets so treated. Thus, during the service life of any asset its return is not diminished by depreciation. As a consequence, that return is progressively overstated in terms of depreciated value. Next, during these years, annual amounts are recovered by means of the depreciation charges, the totals of which can be measured by the growing balance in depreciation reserve. Other things being equal, there will thus be available dollars, customer contributions for the services rendered by capital assets,[1] that normally will be, in turn, invested in additional plant and equipment. At least in a growing concern it can be assumed that plant expansion will be the most profitable use of such funds. Such investment ought to be on a par with original plant in the matter of earnings, because had the depreciation policy not made that possible, additional funds would, of course, have been borrowed. But to allow a return upon the new investment made possible by this depreciation policy in addition to a return upon the undepreciated value of the original assets results in double earnings. Therefore, the problem is met by the use of the sinking-fund principle, as shown above and in Table 38. The deprecia-

[1] There is no legal validity for this type of statement.

tion expense is understated by the amount of interest accumulation which theoretically can be earned by the rising reserve for depreciation. In effect, an understated operating expense is exactly compensated by an overstated income (measuring proper income by means of a depreciated asset).

TABLE 38.—AN ILLUSTRATION OF THE SINKING-FUND METHOD OF DEPRECIATION*

End of year	Sinking-fund deposit: depreciation expense	Annual interest accumulation	Annual credit to reserve for depreciation	Balance in reserve for depreciation	Value of asset, end of year	Rate base
1	$ 758.68	.....	$ 758.68	$ 758.68	$9,241.32	$10,000
2	758.68	45.52	804.20	1,562.88	8,437.12	10,000
3	758 68	93.77	852.45	2,415.33	7,584.67	10,000
4	758.68	144.92	903.60	3,318.93	6,681.07	10,000
5	758.68	199.14	957.82	4,276.75	5,723.25	10,000
6	758.68	256.61	1,015.29	5,292.04	4,707.96	10,000
7	758.68	317.52	1,076.20	6,368.24	3,631.76	10,000
8	758.68	382.09	1,140.77	7,509.01	2,490.99	10,000
9	758.68	450 54	1,209.22	8,718.23	1,281.77	10,000
10	758.68	523.09	1,281.77	10,000.00	.....	10,000
	$7,586.80	$2,413.20	$10,000.00			

* Assumptions:
Asset depreciable value..... $10,000
Service life..... 10 years
Annual interest rate..... 6 per cent

This proposition is best explained by an example. Referring to Table 38, it will be observed that on the assumption of 6 per cent interest, an annual deposit of $758.68 for 10 years will grow to a total of $10,000. Transferring this information to a depreciation policy, each year for a period of 10 years depreciation expense will be charged for $758.68, or, in 10 years, for $7,586.80. The deficit in expense entries, $2,413.20, finds its way into the reserve by the process of annual offsets against the return allowed on an undepreciated rate base. In effect, then, during these 10 years, earnings (measured against depreciated value) were overstated by $2,431.20 the amount of the expense understatement.[1]

[1] The 1938 *Report* of the Special Committee on Depreciation of the National Association of Railroad and Utilities Comissioners states this point no less emphatically. "This result is accomplished . . . by understating the cost of operation by the amount of that portion of the depreciation charge represented by so-called interest on the depreciation reserve and overstating the return by an equal amount by using an undepreciated rate base." See 1938 *Proceedings*, p. 453. It should be

Little can be said in favor of this modified form of the sinking-fund method of depreciation. Sometimes defended as a solution of the problem of the deduction of depreciation from a rate base, it actually results in a complete recognition of the principle of full deduction.[1] If one assumes otherwise, he is simply fooled by the complexities of the method. Thus, it accomplishes no more than the orthodox method in the matter of total depreciation expense and allowed return.[2] For this reason, this variant has lost favor. The Wisconsin Public Service Commission, for instance, abandoned it after January 1, 1938. Its general disfavor is indicated by the statement of the Special Committee on Depreciation of the National Association of Railroad and Utilities Commissioners that "Where the sinking-fund method is used . . . both the annuity [the annual sum charged as depreciation expense] and the so-called interest element [the interest accumulation illustrated in Table 38] should be charged to depreciation expense."[3] Only where a commission insists upon an undepreciated rate base can this variant of the sinking-fund method be defended.

Straight-line vs. the Field.—It must not be supposed that our discussion of straight-line and sinking-fund methods exhausts the list of scientific methods of depreciation. On the contrary, there are many others,[4] but seldom are they even mentioned in the literature on public utility accounting. Our choice is straight line. Confining our reasons here to a comparison with the orthodox sinking-fund method, straight-line depreciation has the following advantages: First, it is simple, easy

noted that this criticism is solely in terms of accounting theory and practice. From the economic viewpoint, the income of a public utility is as much an economic cost of operation as are the so-called expenses of the accountant. Therefore, the real criticism of this method is that it offsets an understatement of one expense (depreciation expense) by an overstatement of another (return on an undepreciated rate base).

[1] One historical explanation may lie behind this variant of the sinking-fund method. Before 1910, utility leaders argued against the recognition of any depreciation in valuation cases. In fact, it was not until 1909 that depreciation as both an operating cost and a deduction in valuation was recognized by the Supreme Court of the United States. Thus, this variant of the sinking fund may have been advanced as a subtle way of recognizing depreciation without appearing to do so. Can it be, however, that any utility operator was fooled for long?

[2] This, obviously, is true only if the rate of interest in sinking-fund calculations is the same as the rate of return. In practice, the former has usually been materially less than the latter, thereby favoring the utility in its net fair return.

[3] *Ibid.*, p. 451.

[4] The monograph of the Wisconsin commission, entitled *Depreciation*, discusses straight-line and sinking-fund as the only scientific methods. The special *Report* of the Committee on Depreciation, *supra*, adds a discussion of remainder-life method. Neither mentions, for instance, the annuity method.

to understand and compute. Second, since no *method* of depreciation probably accumulates a reserve exactly in proportion to actual depreciation, a complex technique is unnecessary. The only purpose of depreciation accounting is the orderly amortization of a cost of production—a cost unfortunately disguised in the language of assets—and therefore straight-line is as valid as any other method. In the next place, the reserve under a sinking-fund method accumulates more slowly, as Chart 21 shows. For instance, at the halfway mark in the estimated life of an asset, much less than half its depreciable cost will

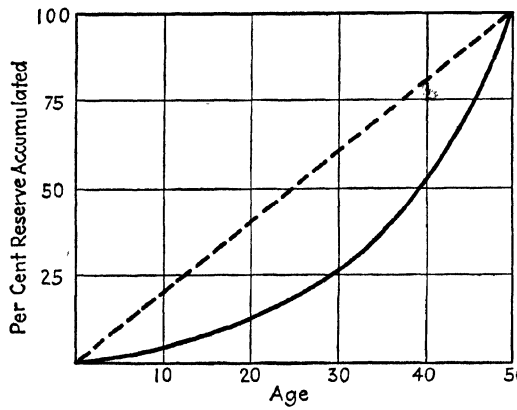

CHART 21.—Comparison of growth of a depreciation reserve computed by straight-line and sinking-fund methods. Assumptions: 50-year service life; no net salvage; 6 per cent sinking-fund reserve. (*Adapted from Report of Special Committee on Depreciation, National Association of Railroad and Utilities Commissioners*, 1939 *Proceedings*, *p.* 356.)

have been recovered, leaving the remainder to be recovered in the less predictable portion of its life span. Fourth, the sinking-fund method is objectionable, since it results in rising charges to depreciation in years when maintenance costs are ordinarily also rising. From management and customer viewpoints, this is undesirable. Finally, as we said above, all depreciation methods are based on estimates of service life, estimates that must from time to time be revised. Since depreciation calculations are at best only approximations, why complicate an already complex problem by use of involved methods? We subscribe to the opinion of the experts, that "The straight-line method is recommended for use generally for accounting *and regulatory purposes*."[1]

Substitute Methods of Depreciation.—The controversy occasioned by the very term "depreciation" has caused many to favor the aban-

[1] *Report* of Special Committee on Depreciation, *op. cit.*, p. 439. (Italics ours.)

donment of the word and the discarding of the aforementioned methods in favor of substitute ones—the "renewal method" and the "retirement reserve method."

Renewal.—"The renewal method consists, briefly, of charging all replacements, or renewals, of property to operating expense at the time renewals are effected."[1] The charge, therefore, is made only provided some replacement or renewal is made. Thus, the original entries setting up company assets remain on the books indefinitely, though the property represented may have been retired years earlier. The accounting for a renewal would be

Renewal Expense	xxx	
Cash		xxx

Retirement Reserve.—This method of handling depreciation has been the one favored by gas and electric utilities and at one time was accepted by many commissions. It was set out in detail in the 1920 uniform classification of accounts promulgated by the National Association of Railroad and Utilities Commissioners. An account, called Retirement Reserve, is created, and to it are credited certain charges to operating expense or appropriations of surplus. It is designed to "cover the retirement loss represented by the excess of the original cost, plus cost of dismantling, over the salvage value of fixed capital retired from service."[2] It is intended especially to facilitate the handling of the retirements of large units, and presumably, therefore, retirement reserve accounting would be used in combination with the renewal method, the latter being used in accounting for small property items. The amount of the periodic charges and credits under the retirement method is a matter of managerial discretion and is not necessarily bound by any formula involving estimates of service life and scrap value. Accounting entries under this method of depreciation would be

Retirement Expense	xxx	
Retirement Reserve		xxx
or		
Surplus	xxx	
Retirement Reserve		xxx

Upon a retirement, the net value loss would be handled as follows:

Retirement Reserve	xxx	
Asset (by account title)		xxx

[1] *Depreciation*, p. 34.

[2] *Uniform Classification of Accounts for Electrical Utilities*, p. 24, 1922.

THE DEPRECIATION CONTROVERSY

The scientific and substitute methods of accounting for depreciation each have their staunch advocates. The supporters of the former accept the fundamentals set out above; the supporters of the later deny them, at least in part. In general, the leading state commissions (California, New York, Wisconsin, for instance), all the federal commissions, and the American Telephone and Telegraph Company and associated companies have supported the scientific methods; the railroads and gas and electric utilities have argued for and used the substitute methods. Let us set out the arguments of each.

The advocates of retirement or renewal accounting for depreciation defend their choice by attempting to discredit the theory and practice of their opponents.[1] In the first place, the extremists deny the existence of depreciation within a well-maintained public utility. These advocates assume a plant immortality and therefore define depreciation as undermaintenance. The only use of the retirement reserve is to equalize, as between accounting periods, the effect of retirement of large and unusual units. The obvious fallacy of this position is seen in the decline and disappearance of the street railway. Although any business kept in the pink of operating efficiency might go on forever, changes in demands and available substitutes may make that business socially obsolete. Therefore, why not protect better by scientific depreciation the equities of the investors? All failure to reckon with depreciation in a scientific manner inevitably results in capital impairment, although such may never be apparent until liquidation becomes necessary.

A second argument of the substitute advocates is to challenge the necessity of the burden that scientific depreciation throws upon customers. It is generally true that depreciation accounting will cause larger annual charges and credits than retirement accounting. In fact, in the early years of a plant, neither retirement charges nor renewal charges ought to be made at all. Thus, rates for companies using these substitute methods ought to be lower than for like companies using

[1] For statements of these arguments see Eastman's summary, 118 I.C.C. 306–318; Coleman, "Retirement *vs.* Depreciation Accounting," *Electrical World*, **103**:715, May 19, 1934; White, *Fundamentals of Accrued Depreciation*, a monograph published by the American Appraisal Company; Riggs, *Depreciation of Public Utility Property;* Nash, *Economics of Public Utilities*, 2d ed., Chap. 8; Riggs, "Utility Depreciation," *Public Utilities Fortnightly*, **9**:559, 748, May 12 and June 23, 1932; and Nash, "The Forgotten Man in the Depreciation Controversy," *Public Utilities Fortnightly*, **14**:506, 569, Oct. 25 and Nov. 8, 1934. These are but a few sample references on the side of the use of substitute methods.

scientific methods (although we doubt that such has been the case). But this rate advantage would be possible only because retirement and renewal methods ignore an obvious cost of operation. If under a straight-line theory a charge per year is $1,000, then to charge anything less is to understate true costs. This, although it may give lower rates for a while to customers, does so only at the expense of capital and therefore can be no long-run gain to its advocate companies or their customers.

A third argument is that the use of either of the scientific methods will, in periods of depression, impair credit standings. The rhythm of retirement, it is argued, can be more or less controlled by management; or, at least, the provision for retirement is a matter of management discretion. If this year is a good year, credit more to retirement reserve; if it is a bad year, credit less. It would follow, therefore, in good years that earnings could be understated by excessive charges and in bad years overstated by sharply reduced charges. Again, this violates our fundamental cost concept of depreciation. To handle this cost in an adequate manner in the end builds up the credit standing of utilities and prevents capital impairment.

Another argument is based on the fact that retirements in the past have not been a result of wear and tear but rather the result of functional forces, especially obsolescence. Since that is the case, the argument is that all unamortized portions of retired property should be carried as a charge against future earnings because it is the future that benefits from newer and more efficient equipment. Although there may be merit in this point so long as obsolescence is a primary cause of retirement, yet its fundamental defect, again, is its failure to recognize that while the original equipment was in use, it was a cost of production and should, in so far as possible, be charged as a cost during its years of use. Unforeseeable and sudden changes may be carried against future earnings, but that is an inadequate rule for depreciation generally.

A fifth argument against scientific depreciation asserts that there is a regular rhythm in retirement and renewal of utility assets, so that, after a plant becomes fully matured, the renewal expense would approximate the depreciation charge. For small and numerous items within a system, such may be true, and that property may for simplicity be so handled. The Interstate Commerce Commission made such an exception for telephone station installations and interior block and drop wires.[1] If the original property had been depreciated 50 per cent at the time of installation by a proper charge against surplus, then the use of the renewal method accomplished the same result as a scientific

[1] 177 I.C.C. 351, 432, 433.

method and by a simpler accounting process. Such an exemption in no way challenges the validity of scientific depreciation. For all other units of equipment, there is no such rhythm, and therefore this argument breaks down.

The final line of attack lies along the accuracy of service-life estimates necessary for the use of a scientific method. The claim is that this life can only be guessed and that therefore its guesses are in no way superior to the management discretion behind the retirement method. We are unimpressed by this argument, however, when we read the answers of the commissions on this point and the reports of the Bell System. Apparently, the life expectancy principles used in the computation of mortality tables for insurance can be used to construct expectancy tables for groups of utility assets. The conformity of the Bell experience to its expectancies shows how accurate life tables for utility property can be. The critics on this point delight in exhibiting isolated examples of assets being retired years before or after the time indicated by an estimate. If a person with a life expectancy of 40 years actually lives 60 years instead, has that proved anything about the accuracy of the tables of American life experience?

It would seem, therefore, that retirement and renewal methods of handling depreciation violate every fundamental of depreciation. Scientific accounting for depreciation cannot be attacked in terms of basic theory and is tacitly recognized by the advocates of retirement in their accounting practices in matters of accrued interest and accrued taxes. Its only challenge, therefore, lies in its accuracy of application, and here actual experience seems to indicate that that challenge can be adequately met. Behind all the arguments of the retirement and renewal advocates, there seems to be an effort to defend inadequate past accounting practice. If utilities possessing retirement reserves amounting to 10 and 15 per cent of the ledger values of depreciable assets were obliged to set up adequate depreciation reserves, that would mean doubling present reserve balances by means of transfers from genuine surplus accounts. This would, to say the least, be painful. Finally, a 10 or 15 per cent reserve makes for better support of the plant immortality theory and claims of undepreciated rate bases in valuations based on cost.[1]

[1] For defenses of scientific depreciation, see chapters on that subject in Bonbright, *Valuation of Property;* Bauer and Gold, *Public Utility Valuation.* See also two reports of the Interstate Commerce Commission 118 I.C.C. 295 and 177 I.C.C. 351; *Depreciation* by the Wisconsin Public Service Commission; Crunden and Belcher, *Straight-line Depreciation Accounting Practice of Telephone Companies in the United States;* and an article by C. Woody Thompson, "Depreciation Accounting Favored," *Electrical World,* **104**:39, July 14, 1934.

DEPRECIATION AND VALUATION

The handling of the expense side of depreciation accounting (no matter what method is used) is quite obvious. In the accounting technique, that expense entry is closed to profit and loss along with all other expense accounts. On the other side is the reserve account, which, except for retirement of assets, continues to grow over the years. For companies using retirement reserves, it will amount to something between 10 and 20 per cent of ledger asset values. For companies using scientific depreciation reserves, it will amount to something between 20 and 40 per cent, depending on the rate of plant growth. In valuation cases, how should this accrued depreciation be treated?

In cost of reproduction valuations, the usual treatment is to deduct accrued depreciation, though much controversy exists as to the amount of the deduction. The usual argument of utilities is that the observable depreciation, that is, physical deterioration, should be the measure of deduction. In such cases, deductions are likely to be slight, because functional forces, not physical, have so far been more significant in the retirement of assets, and such forces are not observable. It is our opinion that the percentage relationship between reserve and asset ledger values should be the minimum depreciation deduction in a valuation case under cost of reproduction. We have the support of the Wisconsin Commission in this position.[1] For example, we have a utility with assets having a ledger value of $1,000,000 and reserves of $300,000. If the cost of reproduction new less depreciation formula is applied, and the value placed at $1,500,000, then that figure should be reduced by $450,000 depreciation.

If any utility is found to be obviously undermaintained, then the amount of depreciation should be something more than this minimum figure.

In investment valuations, the same theory holds, except in those cases in which the variant of the sinking-fund method of depreciation is in use. In those cases, the rate base should be undepreciated, because the effect of the mechanics of this method is to reduce the amount of the return by the amount of the interest on the accumulated reserve. In all other cases, the accumulated reserve should mark the minimum deduction. Suppose that a utility has assets valued at $1,000,000 and a reserve of $300,000. This simply means that $300,000 of asset values has been amortized out of previous rate charges and therefore should be deducted from the rate base, since users have fully compensated the company for its contribution of that value of equipment in the produc-

[1] *Depreciation*, p. 148.

tion of utility service. As we said before, the deduction may be more because of undermaintenance and inadequate past accounting procedures. In situations where income has not been enough to allow adequate depreciation reserves, commissions are justified in deducting only such depreciation as the accounts actually show. In reality, what is allowed is the temporary capitalization of past losses as a part of the rate base.

As a matter of fact, in a well-maintained and prosperous system, assets minus depreciation reserves will always equal at least the capital liabilities. Let us illustrate: We organize a company with assets of $100,000 and (for simplicity) capital stock of $100,000. At the end of the first year, on a 10-year service-life basis (no scrap value), we shall have a reserve of $10,000. Now our balance sheet shows

Assets			Liabilities	
Original Plant.....	$100,000		Capital Stock.....	$100,000
Other Assets.....	10,000			
	$110,000			
Less Reserve for Depreciation.....	10,000	$100,000		
		$100,000		$100,000

Eight years after the start of the venture, our balance sheet will read

Assets			Liabilities	
Original Plant.....	$100,000		Capital Stock.....	$100,000
Other Assets.....	114,958			
	$214,958			
Less Reserve for Depreciation.....	114,958	$100,000		
		$100,000		$100,000

Again, the net "value" of the assets totals $100,000.[1] If the accumulations from the depreciation charges are reinvested in further

[1] We have assumed that the annual sums accumulated by the depreciation entries are immediately invested in company equipment in order to meet increased demands for service. We have further assumed that this added equipment has the same depreciation rate as the original. Furthermore, we have shown the reserve for depreciation as it properly is—"a record of the cost of existing property which has been charged to operation" and therefore a deduction on the asset side of the balance sheet. See 1939 *Proceedings* National Association of Railroad and Utilities Commissioners, p. 343.

plant and equipment, as we have assumed, and as the annual growth curve for utility service would require, then our rate base—total ledger cost of assets minus depreciation reserves—always at least equals our capital structure. In a well-maintained utility subject to adequate state regulation, therefore, valuations on the basis of investment automatically take care of the depreciation deduction problem if the investment is reckoned as the sum of the capital structure and *real surplus.*[1]

WHAT PROPERTY SHOULD BE DEPRECIATED?

In general, there is not much dispute as to the items of property to be depreciated. "All tangible property whose service life is limited is subject to depreciation."[2] The one exception is land. Although it may have a limited life as a particular site, it is not considered subject to "depreciation," as that term is ordinarily used. Its resale value usually equals or exceeds its original cost. If construction overhead costs have been distributed to their respective assets, they will of course be depreciated. If set up separately, they likewise should be depreciated. Organization costs, franchise costs, and patents are not depreciable, although conservative accounting justifies their amortization. Going value should never be regarded as depreciable.

COURT ATTITUDES ON DEPRECIATION

In the original valuation case of *Smyth v. Ames*, no mention was made of depreciation; in fact, not a single reference to it can be found in the entire case. In earlier cases, courts seemed to have denied its validity as an operating expense. Therefore the pronouncement of the first case directly dealing with that subject must have been a surprise to those who had assumed the legal invalidity of depreciation charges and credits. In the Knoxville Water case, the Court spoke as follows:[3]

> The items composing the plant depreciate in value from year to year in a varying degree. . . . [Utility assets] begin to depreciate with more or less rapidity from the moment of their first use. . . . But it is clear that some substantial allowance for depreciation ought to have been made in this case.

[1] This discussion by no means exhausts the subject of depreciation. We have intentionally omitted discussion of such problems as the methods of estimating service life, choice of unit or groups of units for calculations, the preparation of life mortality tables, and other technical problems. These, though significant, do not modify the fundamentals that we have set out here. For a more detailed discussion of the relation of depreciation and valuation, see Krebs, "Public Utility Depreciation in Its Relation to the Rate Base," *The Accounting Review*, **41**:93, June, 1939.

[2] *Depreciation*, p. 46.

[3] *Knoxville v. Knoxville Water Co.*, 212 U.S. 1, 10, 13–14 (1909).

A water plant, with all its additions, begins to depreciate in value from the moment of its use. Before coming to the question of profit at all the company is entitled to earn a sufficient sum annually to provide not only for current repairs but for making good the depreciation and replacing the parts of the property when they come to the end of their life.

This case, therefore, can be cited for two propositions. Depreciation is a valid deduction in valuation determinations (at least in cost-of-reproduction valuations), and depreciation is a valid item of operating expense.

Beyond this point, it is difficult to go, since most of the finer points in the depreciation problem remain moot questions. As we shall see below, most other pronouncements have been negative. In the Pacific Gas and Electric case, the Court frowned upon the sinking-fund method of depreciation calculation, saying:[1]

Facts shown by reliable evidence were preferable to averages based upon assumed probabilities.

Although the Court here approved of depreciation deduction in a valuation proceeding, it leaned toward physical deterioration as the measure of that deduction. Furthermore, the Court felt that where depreciation was caused by both physical and functional factors, the accounting for each should be separated.

In the Indianapolis Water case, the Court again faced the problem of depreciation and here rejected straight-line depreciation in the valuation problem, preferring to accept the "horseback" estimates of engineers. Mr. Justice Butler said:[2]

The testimony of competent valuation engineers who examined the property and made estimates in respect of its condition is to be preferred to *mere calculations* based on averages and assumed probabilities.

The crowning blow to the advocates of scientific depreciation came in the United Railways case, in 1930. There the Court had this to say:[3]

The allowance for annual depreciation made by the Commission was based upon cost. The court of appeals held that this was erroneous and that it should have been based upon present value. The court's view on the matter

[1] *Pacific Gas & Electric Co. v. San Francisco*, 265 U.S. 393, 406 (1924).

[2] *McCardle v. Indianapolis Water Co.*, 272 U.S. 400, P.U.R. 1927A 15, 29 (1926). (Italics ours.)

[3] *United R. & Electric Co. v. West.*, 280 U.S. 234, P.U.R. 1930A 225, 231 (1930). Of this decision, Mr. Benton, general solicitor of the National Association of Railroad and Utilities Commissioners, said: "This situation, bad as it was, was rendered still worse by the decision. . . . " 1938 *Proceedings*, p. 263.

was plainly right. One of the items of expense to be ascertained and deducted is the amount necessary to restore property worn out or impaired, so as continuously to maintain it as nearly as practicable at the same level of efficiency for the public service. . . . Manifestly, this allowance cannot be limited by the original cost, because, if values have advanced, the allowance is not sufficient to maintain the level of efficiency.

It is the settled rule of this court that the rate base is present value, and it would be wholly illogical to adopt a different rule for depreciation.

It would thus appear that the one definite item in depreciation calculations—cost—has been discarded, as well as a major objective—recovery of the investment. Instead, depreciation seems to be pointed toward replacement and maintenance of efficiency.

These decisions have not been entirely accepted, even by the members of the Court.[1] Brandeis has dissented to each of them, showing an amazing mastery of the intricacies of the depreciation problem. Commissions, likewise, have objected, though of course they are bound by such decisions unless they believe that the rulings do not apply to specific situations before them.[2] For instance, the Interstate Commerce Commission has interpreted the United Railways case as not controlling accounting procedures and therefore not prohibiting an order basing depreciation on cost.[3]

SUGGESTED PRINCIPLES OF DEPRECIATION

This discussion of the attitude of the courts on the subject of depreciation can be well summarized by reference to ten conclusions in the 1938 report of the Special Committee on Depreciation of the National Association of Railroad and Utilities Commissioners.[4] We think that these items represent the best view on this most controversial subject.

[1] For an excellent defense of the deduction of the entire reserve for depreciation in valuation proceedings, see *New York Telephone Co. v. Prendergast*, 36 F. (2d) 54, P.U.R. 1930B 33, 52.

[2] For example, see *Re Chesapeake & Potomac Telephone Co.* 1 P.U.R. (N.S.) 346, 371–379.

[3] Commissioner Eastman said of that case, "In the *United Railways Case* the court was not passing upon accounting regulations or the authority to prescribe them. . . . It is not essential that the accounts should correspond in all respects with the facts which may be controlling in a confiscation case." 177 I.C.C. 351, 380, 381.

[4] 1938 *Proceedings*, pp. 438–441; 1939 *Proceedings*, p. 371. These excellent studies appear to be the work of Mr. Asel R. Colbert of Wisconsin. The objections of the electrical utilities to these recommendations are printed in the 1939 *Proceedings*, pp. 400–408.

1. The same factors that cause annual depreciation also cause depreciation to be deducted from property in determining a rate base.

2. Commissions should use consistent methods in determining depreciation expense and depreciation for rate-base purposes and stress the necessity for such consistency in their decisions.

3. Utilities should record the depreciation accruing in their property and commissions should insist that such procedure be followed under a sound method of accounting for depreciation.

4. The straight-line method is recommended for use generally for accounting and regulatory purposes.

5. The practice sometimes advocated of including straight-line depreciation expense as a cost of operation and deducting only so-called observed depreciation in determining a rate base is incorrect in principle and unjust in result and should not be permitted.

6. The reserve requirement should be deducted from a utility plant in determining a rate base.

7. The reserve for depreciation should be shown on the asset side of the balance sheet as a deduction from a depreciable plant.

8. Separate rates of depreciation and separate depreciation reserves should be used for each class of depreciable property.

9. In cases where the sinking-fund method of depreciation accounting is used, the so-called interest on the reserve balance should be included with the annuity provision in depreciation expense.

10. If the sinking-fund method is used in connection with an undepreciated rate base, the sinking-fund interest rate should be the same as the allowed rate of return.

Significantly, these principles have been endorsed by more than simply the members of the committee drafting them. Replies from state and federal commissioners, accountants, teachers, and other interested groups showed a general 84 per cent approval of all ten items. On items 2 and 3, the approval was over 90 per cent. Of all the points, only item 10 received less than majority approval. These recommendations will be attacked for one reason or another, but we think that their impartial origin demands their tentative acceptance, at least until the National Association is able to modify and improve upon them.

COMMISSION CONTROL OF DEPRECIATION

Since 1930, there has been a tendency for commissions to discard the substitute methods of depreciation. As we have seen, the Interstate Commerce Commission has gone definitely on record in favor of straight line. Other federal commissions have taken this same position. The New York commission provoked much protest because of its drastic accounting orders, including depreciation practices. State laws have been amended in this matter. In 1931, Wisconsin amended its public service law, giving its commission complete powers to control

the depreciation rates annually charged by Wisconsin utilities, including the power to approve the sinking-fund method.[1] One interesting provision makes all dividends unlawful except as they could be paid from "earnings remaining after crediting its depreciation reserve in accordance with the rates established by the commission."[2] Although sixteen state commissions exercise some degree of control over depreciation practices, most of them do not have such specific authorization as does the Wisconsin commission. All state commissions could well insist that their respective legislatures copy this Wisconsin provision.

SUMMARY

If we admit, as we must, the existence of depreciation, its proper provision becomes important to the investor, customer, and management alike. With the inevitable loss of service life of assets—an obvious cost of production—failure to provide for such loss will finally affect these interests. The customer may benefit initially by the omission of depreciation in the form of lower rates; but in the end, he will be faced with higher rates or impaired service or both. The investor may reap initial extra "profits"; but in the end, his investment will be impaired, and his equity may eventually be lost. And management, obviously, does not profit from the failure to make proper provision for depreciation, unless it is permitted to carry in its rate base all retired equipment. With the passage of time, this ever rising valuation will finally push rates beyond the demands of their customers, ending in the eventual destruction of the company. This three-sided interest, therefore, warrants a careful consideration of depreciation; and before the accumulated evidence of experts is swept into the discard, the dangers of inadequate assumptions and methods should be thoroughly recognized.

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[1] Wisconsin Stat., §196.09, C. 183 s. 3, 1931.

[2] An exemption feature reads as follows: " . . . provided, that after application and hearing the commission may, upon a finding that it is necessary in the public interest, exempt a public utility from the duty of crediting to the depreciation reserve in any accounting period a greater amount than is possible without impairing its ability to pay dividends for the current calendar year."

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CHAPTER XVII

FAIR RATE OF RETURN

We are now ready to approach the final problem in the sequence involved in the determination of a fair return on utility property. As we pointed out in Chap. XIV, several chapters were to be devoted to the solution of the formula

$$R = (V - D)r$$

Our problem now is the determination of r, the rate of return. We approach this task with the assumption that the previous problem of valuation and its relation to depreciation has been solved, and thus our search for the underlying principles of a fair rate of return will not be impeded by debate on value theory. Of course, this assumption is a bit unreal, because the rate base and rate of return cannot in practical situations be so separated. For instance, a low value and a high rate of return can be just as acceptable in its results as a high value and a low rate of return. The Massachusetts commission, for years, has prided itself in the use of the investment rule of valuation while most other regulatory bodies were being forced by court decisions to cost of reproduction. In truth, however, the liberal rates of return allowed in Massachusetts made it unwise to argue over value theory. Cost of reproduction times the accepted rate of return of the day probably would have yielded no more than actual returns allowed by Massachusetts. In this chapter, except as particular theories of fair rate of return relate to particular value theories, we shall follow our assumption that the valuation problem is settled.

In the actual process of commission consideration of reasonableness of rates, many pages of the reported decisions are devoted to valuation and but slight space to the rate of return. Yet each problem is of equal importance and, considered separately, quite meaningless. An examination of several rate cases of 1937 showed the following: Two important cases involving rates for metropolitan gas companies had in each instance over fifty pages devoted to valuation findings. The rate of return required one page in one report and six pages in the other.[1]

[1] *Re Peoples Gas Light & Coke Co.*, 19 P.U.R. (N.S.) 177; *Re Brooklyn Borough Gas Co.*, 21 P.U.R. (N.S.) 353.

The number of pages required in this book for these two problems follows this same general ratio. How can we account for this difference in emphasis? First, the finding of a rate base involves a complex series of problems, each of which can be disputed. The rate of return, on the other hand, is a single-unit problem. Second, although claims of valuation may have no limits in amounts, rates of return have tended to fall within well-defined channels.

THE ELEMENTS COMPOSING A FAIR RATE OF RETURN

If we look again to the competitive norm from which we select our objectives of regulation, we discover that the problem of rate of return is essentially a problem of the pricing of capital for its productive contribution. Since the supply of utility capital is secured in the competitive capital market, it is important that we keep this basic fact in mind. Likewise, it should be remembered that once capital is committed to any specific form, its return becomes rather immaterial so far as its continued contribution is concerned. Earnings on "sunk capital" are important only in so far as they influence future movements of free capital seeking investment opportunities. Thus, the rate of return relates definitely to future borrowing power. Specifically, therefore, so far as the utilities are concerned, if the day ever comes when they are fully matured and have no prospects of future load increases requiring new capital commitments, the economic significance of the rate of return (and therefore the valuation problem) will have disappeared. Ethical considerations may justify allowing a return upon investment, but economic needs would not. Although this relation of return to capital is a simple fact recognized by all economists, strangely enough it has seldom been considered by the jurists.

In the long run, market rates of interest are said to be made up of several parts, namely, pure interest (the true return for the productive contribution of capital), reward for assumption of risk, and expense of investment supervision. None of these items is absent from the fair rate of return for utility investment. Having stated this, two problems present themselves:

1. Are other elements to be included in the allowed fair rate of return?
2. How shall a particular rate be determined?

Many additional elements have been included in the fair rate of return. In it sometimes is included an amount for depreciation expense. Although such practice has disappeared with the better understanding of the cost nature of depreciation, such inclusion occasionally is found. In the Knoxville Water case, for instance, the court

commented on the net income to the company as being 6 per cent, "or four per cent after an allowance of two per cent for depreciation."[1] Another addition is seen in Justice Sutherland's suggestion in the United Railways case that a fair return should cover the usual items of fixed charges plus an additional residue each year to be added to surplus.[2] Such a position is inconsistent, to say the least, with Mr. Justice Sutherland's espousal of cost of reproduction as a theory of valuation. Under the terms of the Transportation Act of 1920, the Interstate Commerce Commission was permitted to add ½ per cent to the fair railroad rate of return in order to permit the accumulation of funds from which to make capital improvements. The commission soon put this provision in force.

Most important suggested additional item in the fair return, however, is a sum as a reward for efficient management. Such a reward seems to be expressed best by an added point or fraction of a point to the rate of return. Many commissions have approved of this,[3] as evidenced by their advocacy of the sliding scale provisions. Under these arrangements, rates and rates of return are coupled in inverse order. If rates are reduced (presumably as a result of efficiency), the rate of return rises. As a means of rewarding efficiency, the selection of the rate of return is understandable because there is scarcely any other proper vehicle. Any padding of expense accounts or other manipulation would provoke immediate protest. This practice of rewarding efficiency in management through the rate of return can be further defended on the ground that an extra per cent or fraction of a per cent may be enough to remove all doubt of reasonableness. Of course, such a defense is purely pragmatic. On the other hand, as a stimulus to efficiency, such a plan has all the weaknesses of the sliding scale—its appeal is monetary only and may not affect more than a tiny fraction of a company's employees. Furthermore, it assumes a greater ability to control costs than is actually possible.

HOW IS "FAIRNESS" TO BE MEASURED?

If all question of the proper elements to be included in a fair rate of return is solved, how shall we measure it? Shall it be 5, 6, 7, or 8 per cent? We do not know, for instance, exactly what part is pure interest. The older rule of assuming pure interest to be measured by the rates paid on the best of public bond issues may have gone with

[1] 212 U.S. at 17.

[2] P.U.R. 1930A at 229.

[3] As a sample, see *Re Eastern Motor Freight Bureau* (Conn.), 20 P.U.R. (N.S.) 50 (1937).

recent governmental financial practices. The part for risk and the part for supervision are no more easy to determine. Suppose we consult the cases in an attempt to get light on this problem.

Although valuation was definitely brought into the area of American law by the case of *Smyth v. Ames*, it was not until 1909 that the Supreme Court made an important pronouncement on the question of the rate of return. In the first Consolidated Gas case, it said[1]:

> 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 somewhat similar nature with regard to the risk attending them. . . .
>
> Taking all facts into consideration, we concur with the court below on this question, and think complainant is entitled to six per cent, on the fair value of its property devoted to the public use. . . .

Although not the next to deal with this problem, the Bluefield Water case of 1923 gives us the next significant pronouncement. In that case, Mr. Justice Butler had this to say:[2]

> What annual rate [of return] will constitute just compensation depends on many circumstances and must be determined by the exercise of a fair and enlightened judgment, having regard to all relevant facts. A public utility is entitled to such rates as will permit it to earn a return on the value of the property which it employs for the convenience of the public equal to that generally being made at the same time and in the same general part of the country on investments in other business undertakings which are attended by corresponding risks and uncertainties; but it has no constitutional right to profits such as are realized or anticipated in highly profitable enterprises or speculative ventures. *The return should be reasonably sufficient to assure confidence in the financial soundness of the utility and should be adequate, under efficient and economical management, to maintain and support its credit and enable it to raise the money necessary for the proper discharge of its public duties.*

The Bluefield case thus stands for a new measure of fairness, namely, a rate high enough to yield a return that will maintain the credit standing of the regulated enterprises. From a pragmatic viewpoint, there is merit in this rule. Since the normal annual new capital requirements of our utilities run into the hundreds of millions of dollars, their respective credit standings are significant. Inadequate past

[1] *Willcox v. Consolidated Gas Co.*, 212 U.S. 19, 48, 49 (1909).

[2] *Bluefield Water Works Co. v. Public Service Comm.*, 262 U.S. 679, 692 *et seq.* (1923). (Italics ours.)

interest and dividend records will impair present borrowing power, require higher interest and dividend rates for future capital acquisitions, and cause an overemphasis on bond issues because of the excessive risks attaching to stocks. This last consequence can be extremely serious in times of depressed income, as we have seen in the years since 1930.

This new measure of fairness likewise raises the question of rate-base theory. Unquestionably, investment valuations will ordinarily give rate bases that together with ordinary rates of return will yield enough total revenue to cover adequately the usual interest and dividend commitments of soundly financed and economically operated utilities. Cost of reproduction in declining price periods may not do this, and therein lies its inherent weakness. As we pointed out in a previous chapter, it was this possibility of credit impairment that most favored the rule of prudent investment in combination with a rate of return based on contractual interest-rate requirements and stipulated dividend commitments. To meet this challenge of credit stability, the cost of reproduction theory must be allowed to yield excess earnings in good times to be conserved for later payment of fixed capital charges when times get bad and values and gross incomes are depressed. The financial policy of the American Telephone and Telegraph Company over the past years illustrates this point. That company has paid a regular dividend for years in good times and bad, even to the extent of paying out more than current earnings. Such practice was possible only because in good times excess earnings were held by the company and were thus available to meet later deficits occasioned by the continuation of the older dividend rate.[1]

It must be added at this point, however, that Mr. Justice Butler was a cost-of-reproduction advocate, although he propounded this rule of credit stability. If he ever recognized the logical inconsistency of his position, he never gave any evidence of it. One expert has the following to say about the Butler rule:[2]

> The rule adopted by the United States Supreme Court in the *Bluefield case* that the rate of return allowed on invested capital is confiscatory unless it is high enough to attract more capital into the enterprise is not an easy one to apply except on the basis of resolving all doubts in favor of making the rate of return high enough.

[1] We must not be understood to be defending the past level of telephone rates. It is quite possible that they could have been materially lower without impairing the action described above.

[2] WHITTEN and WILCOX, *Valuation of Public Service Corporations*, Sec. 877.

Since the Bluefield case, little has been added by the court decisions. A 7 per cent rate of return was approved in the Indianapolis Water case, in these words:[1]

> The evidence is more than sufficient to sustain the rate of seven per cent found by the Commission. And recent decisions support a higher rate of return.

Although it was at first feared that this decision was the opening wedge for higher rates of return, such has not been the case.[2] The next important case, the United Railways case, sets the high-water mark in rates of return. There the court said:[3]

> What is a fair return . . . cannot be settled by invoking decisions of this court made years ago based upon conditions radically different from those which prevail today. The problem is one to be tested primarily by present-day conditions. Annual returns upon capital and enterprise, like wages of employees, cost of maintenance, and related expenses, have materially increased the country over. . . .
>
> [After citing previous cases, especially the Bluefield case, the Court proceeds:] What will constitute a fair return in a given case is not capable of exact mathematical demonstration. . . . There is much evidence in the record to the effect that in order to induce the investment of capital in the enterprise or *to enable the company to compete successfully in the market for money* to finance its operations, a net return upon the valuation fixed by the Commission should not be far from eight per cent.

What may appear to be a complete overthrow of all past precedent can be understood when it is remembered that this case was argued in the fall of 1929 and that the litigant, a street railway company, had for 10 years been paying over 7 per cent for its funds. It should further be added that although this extract was designed to clear the way for judicial approval of the highest rate of return ever allowed, its language came at a most opportune time and can be used quite as effectively to sustain much lower rates.

Since the United Railways case, the question of the rate of return has been passed by, almost unnoticed in the Supreme Court cases. In the Los Angeles Gas case of 1933, the Court, quoting the Bluefield case, sustained a rate of 7 per cent.[4] In 1935, in the now famous Chesapeake

[1] 272 U.S. 400, P.U.R. 1927A 15, 32 (1926).

[2] WHITTEN and WILCOX (*op. cit.*, Sec. 875) make a painstaking analysis of the cases supporting this extract, and their results show that there were unusual elements behind each of them, and therefore they should not be controlling.

[3] *United R. & Electric Co. v. West*, 280 U.S. 234, P.U.R. 1930A 225, 228, 229 (1930). (Italics ours.)

[4] *Los Angeles Gas & Electric Co. v. Railroad Comm.*, 289 U.S. 287, P.U.R. 1933C 229, 249, 250 (1933).

and Potomac Telephone case, the Court confined its attention entirely to the valuation problem; and since it appeared that the lower court and the commission were in agreement upon a 6 per cent rate of return, the Court made no comments on that question. In all subsequent rate cases, the rate of return has not been a moot question.

We conclude from this review of the cases that the Court has vague ideas on the problem of the fair rate of return, that it has formulated no specific rules for finding it in actual situations. The Court has tended to draw the lower line of fairness at 6 and 7 per cent, and at no time has it exceeded 8 per cent. This gradual rise from 6 to something over 7 per cent came during the prosperous 1920's. What the effect of the depressed 1930's and the sharply reduced rates of interest on refunded utility bonds may be on judicial pronouncements cannot now be said with certainty. There can be no question, however, if the Court adheres to its own formulations, that it ought to approve rates of return somewhat lower than the levels of the 1920's.[1]

A DIFFERENTIATED RATE OF RETURN

A review of court and commission decisions shows that the universal practice is to allow a certain percentage rate of return—say, 6 per cent. If we assume a valuation of $1,000,000, then the fair return will be $60,000. Let us suppose that the company with this valuation has the following capital structure:

4 per cent bonds	$600,000
Common stock	300,000

The bond interest payments will absorb $24,000, leaving $36,000, or a 12 per cent return upon the capital stock.[2] Thus, the undifferentiated rate of return usually yields a rather high return to the stockholders, the result of what is called "trading on the equity." As a result, it has been suggested by some students of public utilities that the fair rate of return be determined by a process of differentiation.

At the outset, it must be recognized that the principle of a differentiated rate of return assumes the validity of prudent investment valuation. Using our illustration above, the fair rate would be an

[1] In line with this, note that the Supreme Court of Illinois has approved a rate of return slightly in excess of 5 per cent. *Peoples Gas Light & Coke Co. v. Slattery*, 28 P.U.R. (N.S.) 100, 373 Ill. 31, 31 P.U.R. (N.S.) 193, 1939. A petition for writ of certiorari was denied by the Supreme Court of the United States on April 1, 1940.

[2] We have intentionally set our valuation above the sum of the capital structure; the difference can be represented either by surplus or by that elusive thing known as "going value."

average rate based on the 4 per cent interest charge and an agreed rate of dividend for stocks (say, 7 per cent). In terms of these figures, the average rate would be about 5.2 per cent. Justice Brandeis has adopted this principle, in these words:[1]

> Where the financing has been proper, the cost to the utility of the capital, required to construct, equip and operate its plant, should measure the rate of return which the Constitution guarantees opportunity to earn. The adoption of the amount prudently invested as the rate base and the amount of the capital charge as the measure of the rate of return would give definiteness to these two factors involved in rate controversies which are now shifting and treacherous, and which render the proceedings peculiarly burdensome and largely futile.

There is much to be said for this position; and except for stress periods such as the years 1931–1936, there is little doubt that the combination of prudent investment and a differentiated rate of return based on contractual interest and agreed dividend payments may accomplish the stability demanded by the Butler pronouncement in the Bluefield case.

One weakness in the Brandeis position lies in the fact that it measures fairness by past commitments. This is, in fact, the fundamental weakness of prudent investment. What may have been valid commitments in the past may not necessarily be valid today. If we adhere to the principle of flexibility in public utility rates, then we cannot accept the rigidity that past interest and dividend practices create. Present market conditions, for instance, sometimes justify sharply lowered rates of return. Therefore, why permit previous higher rates of return to carry across the present into the indefinite future? We do not say that a differentiated rate of return is invalid; we simply wish to observe that since it is a logical corollary to prudent investment, it looks to the past for guides to reasonableness. On the other hand, cost of reproduction, which deals in the present, to be consistent requires the use of present market rates of return regardless of the effect upon company financial stability.

EFFECT OF TAXES ON THE RATE OF RETURN

Taxes, in general, are treated as operating expenses. One exceptional situation relates to the treatment of the income tax. Presumably, income taxes are to be borne by the payer and therefore, act as a reduction in income. Although it is often assumed that all taxes are passed on to consumers, an analysis of income taxes on truly competitive business shows the incidence to be with the taxpayer. Should this

[1] 262 U.S. at 306.

same rule apply to income taxes on public utilities? That is, are income taxes an item of expense or a reduction of the fair return? Whatever may be the economic arguments on this problem, the Supreme Court has ruled that income taxes are proper charges to operating expense and therefore must not be allowed to effect the fair rate of return. Notice these excerpts from cases written by Justice Brandeis:

> In calculating whether the five-cent fare will yield a proper return, it is necessary to deduct from gross revenue the expenses and charges; and all taxes which would be payable if a fair return were earned are appropriate deductions. There is no difference in this respect between state and Federal taxes, or between income taxes and others.[1]
>
> The Commission treated the [federal corporate income] tax as a proper operating charge. The court [below] disallowed it; and thus increased its estimate of probable net income. In this the court erred.[2]

Mr. Justice Brandeis did add that where corporate income payments exempted the recipient of dividends from certain personal income taxes, that fact "must be taken into consideration in determining what rate of return shall be deemed fair." Otherwise, income taxes are not reductions of the fair rate of return but operating expenses. Thus, if income tax rates are increased and the judicial fair rate of return remains unchanged, utility rates must be increased to cover the tax increase.

COMMISSION PRACTICE

Commission practice, at least as shown in the printed reports, follows the general lines laid down in the decisions of the Supreme Court. Reviewing them, we find that a fair return is a fact to be determined by the evidence, that it must be high enough to act as an incentive to perform good service, that it must compensate the risks assumed by the investors, that it is affected by many elements, that it should inspire confidence in the financial soundness of companies, that economic conditions affect it, that the going bond interest rate is not high enough to be called a "fair rate of return." We cite one commission decision to show the combination of irrelevant items to which commissions pay lip service, and which could never be resolved into a working formula. For simplicity in presentation, we list them:[3]

[1] *Galveston Electric Co. v. Galveston*, 258 U.S. 388, 399 (1922).

[2] *Georgia R. & Power Co. v. Railroad Comm.*, 262 U.S. 625, 633 (1923).

[3] *Re Detroit Edison Co.*, 16 P.U.R. (N.S.) 9, 30 (1936). The Michigan Commission quotes these items from a decision of a sister state commission but fails to acknowledge the source.

1. A fair return is not a static, unchanging concept.
2. "Fairness" requires judgment in each particular case.
3. Present-day conditions control the fairness of rates of return.
4. General business conditions affect a fair rate of return.
5. A fair return is to be measured by returns in comparable businesses of similar risks in the locality.
6. A fair rate of return should enable the utility to raise new capital.
7. It should maintain the credit rating of the utility.

The Michigan Commission from which we have quoted concludes its comments with this observation: "We believe the Commission should consider the financial structure of the company, the cost of capital, the company's rate policy, the efficiency and economy of its management, the quality of service rendered and other things." Having compounded this administrative potpourri, the commission found that 5½ per cent rate of return was quite reasonable. Considering the fact that the company was permitted to use an undepreciated rate base, there was obviously no appeal from the finding.[1]

An examination of the rate cases reported since 1915 shows significant changes in rate of return levels. A summary of the cases for the years 1915–1930 as reported in the *Public Utilities Reports* is presented below in table form.[2] It will be observed that the composite allowed

TABLE 39.—RATES OF RETURN ALLOWED FOR THE YEARS 1915–1930

Utility	Number of cases						Average % rate of return
	5%, but less than 6%	6%, but less than 7%	7%	7% to 8%	8%, but less than 9%	9% and over	
Gas	5	14	45	43	57	13	7.41
Electricity	3	16	43	31	86	12	7.50
Telephone	6	24	73	38	66	16	7.22
Composite per cent	..	..	..	..	..	..	7.38

rate of return on these several hundred cases was 7.38 per cent.[3] Thus, the Court in the United Railways case was not far from commission practice when it spoke favorably of 8 per cent as a fair rate. Liberal as these figures may now appear to have been, they were less

[1] For a first-hand account of the problem of determining a fair rate of return, see Fisher, "A Fair Rate of Return for a Natural Gas Company," *Journal of Land and Public Utility Economics*, **10**:22, February, 1934.

[2] *Public Utilities Fortnightly*, **8**:330, Sept. 17, 1931.

[3] An exhibit presented to the New York Commission on the Revision of the Public Service Commissions Law shows the rates of return allowed by the New

than the fair rate generally demanded by utility leaders, who were talking in terms of 9 per cent and more. In fact, one of them argued that an 8 per cent return actually impaired the credit standing of his company.[1]

In the years since 1930, commission allowances have declined, as Tables 40 and 41 show. For instance, in the 1936 annual volume of the *Public Utilities Reports*, some thirty-four rate cases were reported, and twenty-five of them had rates of 6 or 6 plus but less than 7 per cent. A few were 7 or above, and even fewer were less than 6 per cent. The same general situation held for the cases reported in later volumes. These cases show some recession from the higher levels of the 1920's, yet they fail to evidence the marked decline that one would expect in light of the sharply reduced interest rates since the depression of 1929. During the years since 1932, billions of dollars of utility securities, mainly bonds, have been refinanced, thereby reducing interest requirements from 5 per cent levels down to 3 and 3½ per cent levels. If we again revert to the Butler formula of a fair rate of return, it would appear that a fair rate might reasonably be close to 5 per cent. Considering the high ratio of bonds to total fixed capital, it would appear that this percentage would leave a rather handsome return to junior securities after bond interest had been paid. As we see it, such result would certainly give all the credit stability desired by the Butler rule.

SUMMARY

Neither courts nor commissions have given too much attention to this all-important problem of a fair rate of return. In spite of the lip

York Public Service Commission between April, 1921, and November, 1926. The following table summarizes the figures by numbers of cases:

Utility	8%	7% plus	7%	6% plus	6%
Electricity	11	1	..	..	1
Gas	10	2	2	..	1
Natural gas	4				
Telephone	2	..	2		
Street railways	3	..	2	2	
Total cases	30	3	6	2	2

The minority opinion of the New York investigating commission concludes, "It is apparent from the figures that 8% has been accepted as the *standard* rate of return." *Report*, p. 366. Thirty cases out of forty-three, or about 70 per cent, allowing 8 per cent, certainly justified that conclusion.

[1] *Electrical World*, **75**:750, 803, 1103.

service paid to vague formulae, standard practice seems to have been to fix rates ranging between the extremes of 6 and 8 per cent. Possibly

TABLE 40.—RATES OF RETURN ALLOWED IN 278 COMMISSION DECISIONS, 1931–1939*

Utility	Less than 5%	5%	5 to 5.9%	6%	6 to 6.9%	7%	7 to 7.9%	8%	Over 8%
Electricity	2	1	1	32	18	20	5	5	0
Gas	0	2	2	13	13	16	2	2	1
Combination companies	0	0	1	7	5	3	0	0	0
Telephone	0	1	6	25	7	11	5	0	0
Water	2	2	5	27	10	8	2	0	0
Transportation and miscellaneous	0	0	0	7	2	5	1	0	1
Totals	4	6	15	111	55	63	15	7	2

* Decisions of Commissions as reported in *Public Utilities Reports*, Annual Volumes.

TABLE 41.—RATES OF RETURN ALLOWED IN 278 COMMISSION DECISIONS* (By years)

Year	Less than 5%	5%	5 to 5.9%	6%	6 to 6.9%	7%	7 to 7.9%	8%	Over 8%
1931	1	1	1	1	1	15	7	3	0
1932	0	2	1	5	2	7	2	2	0
1933	1	0	1	9	8	12	5	0	2
1934	0	1	2	22	14	10	0	0	0
1935	2	0	1	16	12	13	0	1	0
1936	0	1	3	19	6	4	0	1	0
1937	0	1	4	17	5	0	0	0	0
1938	0	0	2	15	4	2	0	0	0
1939	0	0	0	7	3	0	1	0	0

* Decisions of Commissions as reported in *Public Utilities Reports*, Annual Volumes.

the most careful research would have yielded no better results. There seems to be a tendency to consult the cases, determine what rates have been allowed, and then strike a similar result with the hope that later review will validate the original decision. Yet the difference of 1 per cent can be a significant sum. The item fair return accounts for about 25 per cent of the total expense that reasonable rates must cover. An increase of a rate of return from 6 to 7 per cent will affect total reasonable rate requirements between 2 and 3 per cent. Thus, often a 6 per

cent rate of return will validate a proposed rate level that under a 7 per cent rate of return would be confiscatory. We do not, however, wish to appear too critical, because we ourselves can suggest no better rule of fairness in this matter of rate of return. Obviously, the ease with which capital has been attracted to all but the street railways indicates the high credit standing of utilities. The growth of utility surplus accounts likewise suggests that maybe authorized rates of return have been too generous.[1] Commissions might experiment, courts permitting, with gradual and periodic reductions in rates of return, until the results indicate that a minimum point has been reached. This point, we believe, is considerably below present rate of return levels.

Bibliography

Need we repeat our comments in Chap. XVII that the problem of the fair rate of return is a neglected phase of the broader problem of reasonable rates? Thus the material for collateral reading is strictly limited. For further reading, we suggest:

DORAU, HERBERT B.: *Materials for the Study of Public Utility Economics*, Chaps. 13, 14.

RUGGLES, C. O.: *Problems in Public Utility Economics and Management*, pp. 627–669.

SMITH, NELSON LEE: *The Fair Rate of Return in Public Utility Regulation.* (We especially recommend this book, because it is an exhaustive study of the problem before 1932.)

WHITTEN, ROBERT H.: *Valuation of Public Service Corporations*, revised by Delos F. Wilcox, Chap. 34.

[1] Note how Chief Justice Hughes turns the evidence offered by the Illinois Bell Telephone Company back upon it to disprove the company's case. He cites its interest payment record and growth of its surplus account. *Lindheimer v. Illinois Bell Telephone Co.*, 292 U.S. 151, 3 P.U.R. (N.S.) 337 (1934).

CHAPTER XVIII

REASONABLE RATES: A RÉSUMÉ

We have reserved for discussion in this chapter two general topics. First, we propose to discuss our own views upon the problem of reasonable rates. In so far as it has been possible, we have attempted to keep our opinions out of the moot questions of valuation theory and practice and depreciation. In the second place, we shall present and analyze several of the leading suggestions for modification and improvement of the process of rate regulation. These are

1. Contract valuation.
2. Temporary rates.
3. Valuation short cuts.
4. Standard costs.
5. Public competition.

All these proposals accept the present predominance of private ownership of public utilities, and all but the fifth one accept the basic principles of the present regulatory mechanism; they simply look to a fortification of what appear to be its weaknesses or defects. The fifth proposal—public competition—although accepting private ownership at least for the present, assumes the failure of regulation and therefore offers a completely different means of rate control. A final proposal for solution of the rate problem (and all other utility problems, for that matter) is general public ownership and operation. Since this involves a complete change in public policy, we reserve it for discussion in Part IV. Our own opinions we present as the final section of this chapter.

CONTRACT VALUATION

As the 1920's progressed and the Court passed on case after case involving reasonable rates, it became increasingly clear that it was swinging more and more toward a kind of cost of reproduction; yet it seemed to shrink from taking the full step. The O'Fallon case illustrates that hesitancy. There the Court chastised the Interstate Commerce Commission for failure to give some weight to cost of

reproduction, although the Court again refused to indicate what that weight should be. It simply said:[1]

> The weight to be accorded thereto is not the matter before us. . . . But Congress has directed that values shall be fixed upon a consideration of *present costs* along with all other pertinent facts, and this mandate must be obeyed.

Such a decision was the despair of those who desired certainty and objectivity in the valuation process. *Smyth v. Ames* had said that the factors in valuation were to be given such weight as was just and right in each case. The Interstate Commerce Commission had supposed that it had followed this mandate because it carefully considered cost of reproduction and on the evidence gave it such weight as seemed "just and right."

How could this wavering and unpredictable position on valuation be avoided? One solution was the proposal considered by the Massachusetts legislature and recommended by the New York Investigation Commission (1930)—contract valuation.[2] The recommendation is presented in the words of the commission:[3]

> The desirability of stabilizing the valuation and providing the Commission with a definite rate base had led your Commission to propose a series of recommendations. . . . In the first place, it is recommended that basic valuations shall be worked out for all utilities in New York State with the exception of steam railways and street railways. The former are omitted because of the jurisdiction over valuations of the Interstate Commerce Commission, and the latter because of their difficulty of earning returns even on book costs. In making an appraisal of other utility companies, it is proposed that book costs and present day costs as well as the other factors prescribed by the law of the land, shall be taken into account. It is believed that the companies should and would cooperate in working out appraisals for their several properties by the aid of which the process of valuation would be greatly facilitated. It is understood, however, that the Public Service Commission, whether through spot-checking or other methods, would be responsible for the final results. It is estimated that this task would occupy three or more years and would require the expenditure of several million dollars. In spite of this large expenditure, it is our belief that the benefits to the public would more than offset the amounts to be appropriated.
>
> On the basis of such appraisals, it is recommended that the Public Service Commission be authorized to enter into contractual agreements with the

[1] *St. Louis & O'Fallon R. v. United States*, 279 U.S. 461, P.U.R. 1929C 161, 170 (1929). (Italics ours.)

[2] *Report*, New York Commission on Revision of Public Service Commissions Law, pp. 16–24, 66–69, 89–109, 210–213, 371–422. Subsequent reference to this report will be by the short title New York *Report*.

[3] New York *Report*, pp. 21, 22.

various utility companies concerning base values as of the date of the agreement, which contracts would last for a specified period up to ten years. During this period the amounts of initial valuations for the existing property would remain unchanged except that proper provisions would be made for depreciation and obsolescence.

With regard to investments in new property after the beginning of the period of agreement, it should be provided in the contract that such investments would be entered on the basis of the actual amounts expended by the company, subject to the customary approval of the Public Service Commission. Such sums would be controlled by accounting procedure and added to the amount of the initial valuation, with allowances for depreciation and other approved reserves.

In order to avoid the necessity of too frequent changes in rates, it is further recommended that a rate adjustment reserve should be provided. . . .

This plan contemplates that at the end of each contract period, new agreements may be entered into by the companies and the Public Service Commission. At the time of making new agreements, it is recommended that the then existing properties would be revalued in the same manner as at the time of initial valuation. This would mean giving consideration to changes in price levels and taking into account any modification in what, for the purpose of convenience, we have called the law of the land governing the factors entering into valuations.

Your commission has reason to believe that this plan will be in the public interest and that utility managers will find it to be in the interest of their stockholders. It will bring certainty and definiteness into a situation that may now be described as more or less chaotic. It would provide a definite rate base to which the rate of return . . . may be applied. It would at all times be subject to exact accounting control.

But in case the management of certain companies is unwilling to enter into such contracts as have been described, the Commission would have initial valuations and would keep them up to date according to accepted methods.

To this was coupled another recommendation concerning the rate of return. On the formulation of a contract, an initial rate of return was to be agreed upon by company and commission. For future investments under a contract, actual interest rates, preferred stock dividends, and a mutually agreed dividend rate on common stock were to be the reasonable rate of return.

The minority of the commission[1] disagreed with the majority, preferring a mandatory plan similar to the majority plan and perpetual in life.[2] In other words, the minority would fix an initial value (using

[1] Frank P. Walsh, James C. Bonbright, David C. Adie.

[2] The minority recommendation is called the Bonbright plan, although as Bonbright makes clear, its basic principles were propounded by John Bauer. This proposal is to be found in the *Report* of the Commission, pp. 411–422, and it has been reprinted in Barnes, *Cases on Public Utility Regulation*, pp. 467 *et seq.*

the "law of the land") and an initial rate of return. From that time forward, actual investment at the market rates of return would be the procedure. Although that plan had a 25-year optional contract provision, it was proposed to apply this principle to all utilities except steam and street railways and common-carrier motor vehicles.

The majority found two objections to the minority proposal. In the first place, its economic validity was questioned, because it would freeze forever the valuation process; and should prices undergo future upheavals, sharp injustices might result. The 10-year renewal intervals of the majority recommendations avoided this defect. In the second place, the majority questioned its legal validity. They feared that the indefinite suspension of legislative discretion in the rate problem would be held to be unconstitutional and that its basic theory of prudent investment would likewise be thrown out. In defense of the minority, it must be said that its program has economic support. Although its legal validity in view of Court decisions may be doubtful, nevertheless it also has defense. The Court rule of *Smyth v. Ames*—fair value—was created in the absence of legislative prescription of fair-rate standards. The minority proposal, if enacted, would have the merit of a positive legislative standard, and its method of initial valuations could not be said to be *ex post facto* legislation. Neither could such a proposal be said to be a perpetual suspension of the legislative power to control rates. It would be simply a positive definition of a policy heretofore left to judicial discretion. In our opinion, if contract valuation is otherwise defensible, it ought to be put squarely up to the Court to accept or reject.

Contracts, mandatory or voluntary, limited or perpetual, have the merit of defining what has been a complex and confused problem. As one solution, therefore, of that stumbling block to rate making, they have definite validity.

TEMPORARY RATE ORDERS

Out of the protest against the almost interminable delays in formal rate hearings, several expedients arose by which to short-cut the formal process. One of these was rate reduction by informal negotiation. In the late 1920's and early 1930's, for instance, many commissions followed the practice of periodic comparisons of book values and earnings; and if the comparison indicated a rate of return bordering on the extortionate side of reasonableness, informal negotiations often were initiated in an effort to lower rates. For instance, a former chairman of the Public Service Commission of New York claimed substantial

savings under this process. According to his statement before the New York investigating commission, the technique was to measure earnings against book values and, if the resulting rate of return appeared too high, to negotiate for rate reductions.[1] The effectiveness of this procedure cannot be readily measured, but much has been claimed for it.[2]

The weakness of rate making by negotiation should be quite obvious—it has no legal sanction behind it, and its effectiveness is dependent upon the good will of the companies so approached. If a company declines to bargain, electing instead to stand upon its constitutional rights (as defined by the courts, not the Constitution itself), nothing is left but to proceed under the admittedly unsatisfactory procedure of formal hearings, physical valuations, rules of evidence, examination, and cross-examination. Therefore no real whip can be held over utilities to enforce cooperation through informal negotiation. As the depression of 1929 became serious, a further way out seemed to be to amend the laws to permit commission orders of emergency rates.

Of course, emergency rate orders had been permissible under even the first drafts of public service laws, but they were not designed to meet economic emergency. For instance, the 1907 draft of the Wisconsin public service law for the protection of the interests of company or patrons "in case of any emergency" permitted the commission to "temporarily alter, amend, or with the consent of the public utility concerned, suspend any existing rates, schedules and order relating to or effecting any public utility. . . ."[3] This type of provision, extensively copied by other states, was ineffective in emergency situations because of, first, prolonged commission hearings and, second, the pinch of depression periods. In the years 1932–1936, popular demand insisted on rate reductions, fair return or no fair return. The legislation of New York in 1934 is typical of the manner in which those

[1] *Hearings*, New York Commission on Revision of Public Service Commissions Law, **1**:295–300. The following dialogue illustrates the weakness of this method:

"Mr. Bonbright—The Commission has generally applied and the companies have generally accepted a rate base which is materially different from the rate base which it seems the companies had had a legal right to insist upon if they only wanted to carry every case up to the court?

"The Witness [William Prendergast]—Perfectly expressed, professor.

"Mr. Bonbright—Thanks very much." *Hearings*, **1**:299.

[2] The Ohio Commission, for instance, announced that rate reductions by informal negotiation would have saved customers in 1935 some $3,044,000. The accuracy of such claims, however, is difficult to prove.

[3] Wisconsin Stat., §196.70. In 1931, there was added §196.395 giving additional powers. "The Commission is empowered to issue conditional, temporary, emergency and supplemental orders."

demands were crystallized into law. The amendment to the public service law reads:[1]

> The Commission may in any . . . proceeding, . . . upon notice and after hearing, if it be of opinion that the public interest so requires, immediately fix, determine, and prescribe temporary rates to be charged by said utility company pending the final determination of said rate proceeding. Said temporary rates so fixed, determined, and prescribed shall be sufficient to provide a return of not less than five per centum upon the original cost, less accrued depreciation, of the physical property of said public utility company used and useful in the public service. . . . The Commission is hereby authorized in any proceeding in which temporary rates are fixed . . . under this section, to consider the effect of such rates in fixing . . . rates to be hereafter charged and collected by said public utility company on final determination of the rate proceeding.

This provision was, of course, attacked as unconstitutional, as violative of the due process clause of the Fourteenth Amendment to the Constitution. In support of this contention was an opinion holding invalid an earlier temporary rate provision of New York.[2] The New York Court of Appeals found the 1934 provision valid because of the apparent requirement that losses sustained during periods of temporary rates were to be recouped in the final rate order. The New York Court, after an interpretation of the earlier case, said:[3]

> After this decision the legislature of the state of New York was confronted with this quaere: Was it ever possible to compel public service corporations to charge reasonable rates, pending the long drawn-out and interminable proceedings to establish a fair return? The establishment of the proper base rate, or the present capital investment, upon which a company is entitled to a fair return, has become an intricate, involved, tedious proceeding, extending into months and years. Much of the evidence produced is expert testimony, varying in worth and uncertainty, presenting a maze of detail and figures. . . .
>
> The fixing of a reasonable rate by these public service corporations, who enjoy from the public such valuable franchises, to be of any value should be a matter of speedy regulation. The courts should not encourage such finesse in figuring as to make these hearings upon rate questions an obstruction instead of a relief. Of course caution must be used on both sides, for the desire for improper gain is oftentimes as eager with the consumer, or his spokesman, as with the corporation. . . .
>
> We note at once that the temporary rate shall be sufficient to provide a return of not less than five per centum upon the original cost, less accrued

[1] Laws of New York, 1934, c. 287, Subsec. 144, Public Service Commissions Law.

[2] *Prendergast v. New York Telephone Co.*, 262 U.S. 43 (1923).

[3] *Bronx Gas & Electric Co. v. Maltbie*, 271 N.Y. 364, 14 P.U.R. (N.S.) 337, 340–342 (1936).

depreciation of the physical property of the utility company used and useful in the public service. At least there is some accuracy in these figures; they can be fixed with some certainty and are not dependent altogether upon speculative expert opinion. . . .

If the courts required the public utility company to put up a bond to pay back to the consumers the overcharges which it had exacted, pending a hearing, why was it not just as feasible and legal to turn the remedy about and provide that the consumers or the public should make good to the company the loss which it may have sustained in temporarily exacting too little? This is what our legislature has done, and this we think is the meaning which we must give to its language, if it is to have any sense at all in the light of the past. . . .

The Commission fixed a temporary rate pending the hearing. It is based upon the elements stated, which are not all of those required to fix a permanent rate. As before stated, this would be impossible, if we must consider in fixing a temporary rate all the elements required for the final rate; no temporary rate could ever be fixed. This also is self-evident. Therefore, to meet these conditions the temporary rate is fixed, within reasonable limits, upon figures which can be with some exactness obtained from the books of the company, showing original cost or investment; and if finally, when the proceeding ends, the temporary rate is proved to have been too low, the utility must be permitted and authorized to charge enough for its service to make up the loss. . . .

If the loss is made up to it in the final rate the objection is obviated. That the Commission is authorized, in fact compelled, to make up this loss, if any, through the final rate, is the meaning and must be the meaning of these words in [Sec.] 114: "The Commission is hereby authorized in any proceeding in which temporary rates are fixed . . . to consider the effect of such rates in fixing . . . rates, . . . on final determination. . . . " "Experience"—how much better this is than expert testimony, whether dealing in history or prophesy. . . .

We therefore are of the opinion that this law is not unconstitutional; that it meets the defect in prior procedure, and affords the company ample protection as well as the consumer. It is a fair attempt to meet the time element, which is necessary to be considered in rate-fixing hearings. . . .

We believe that this decision is sound, but we also fear that it may not prevail, although it is in line with decisions in other states. The lower federal courts had several opportunities before 1940 to examine emergency rate provisions, and they have unanimously struck them down as violative of due process. Their usual argument is that any rate is a final rate and therefore must be a fair one. As they have said, the constitutional prohibition against the taking of property allows no exception by which property may be taken even for a limited time.[1]

[1] The following United States District Court decisions have been adverse to emergency rates: *Indiana General Service Co. v. McCardle*, P.U.R. 1932D 378, 382 (1932); *Laclede Gas Light Co. v. Public Service Comm.*, 6 P.U.R. (N.S.) 10,

Specifically, one judge ridiculed the recovery-of-loss provision of the Pennsylvania law as follows:[1]

> This argument in effect means that it is proper and legal to violate the Constitution if at some future time that violation may be corrected wholly or in part. In other words, it is perfectly all right and permissible to take one's money by force if by and by it may be partly returned to him. If that is so, how long may the Constitution be violated during which time the injured party is without remedy?

If such naïve legalistic view is to prevail, then all economic argument to the contrary is useless.[2]

This decision under the Pennsylvania law was carried to the Supreme Court of the United States, where, unfortunately for the issue, the constitutionality of the temporary rate order was side-stepped.[3] That Court was able to say, under the "mischievous formula"[4] of *Smyth v. Ames*, that the order of the Pennsylvania commission was reasonable—therefore, it had no need to go further in its findings. The fact that Mr. Justice Frankfurter, with whom Mr. Justice Black agreed, wrote a vigorous concurring opinion condemning the older principle of rate making, gives some hope that when the Court is finally forced to face the issue of temporary rates, it will approve them. Therefore, although this solution of the reasonable-rate problem still has over it a potential cloud of judicial disapproval, it may yet gain its deserved recognition.[5]

VALUATION SHORT CUTS

In a sense, the previous section illustrates one attempted valuation short cut, namely, measuring the rate of return by comparing net income to book value. The purpose of such technique, however, is

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14 (1934); and *Edison Light & Power Co. v. Driscoll*, 20 P.U.R. (N.S.) 353, 363–366 (1937). In the third case, a Pennsylvania law almost the exact duplicate of the New York statute set out above was struck down. It was a three-judge decision, the one writing the decision holding the statute unconstitutional in its entirety.

[1] *Edison Light & Power Co. v. Driscoll, supra.*, pp. 358, 359.

[2] For excellent economic and legal analysis of emergency rates, see *Re Wisconsin Telephone Co.*, 6 P.U.R. (N.S.) 389, 446, 447, and *Illinois Commerce Commission v. Public Service Co. of Northern Ill.*, 4 P.U.R. (N.S.) 1, 69–82.

[3] *Driscoll v. Edison Light & Power Co.*, 307 U.S. 104, 28 P.U.R. (N.S.) 65 (1939).

[4] This is a phrase used by Mr. Justice Frankfurter in his concurring opinion. See 28 P.U.R. (N.S.) at 76.

[5] Since the Driscoll case, a district court of the United States has faced this problem squarely and approved the temporary rate-order statute of Pennsylvania. See *Beaver Valley Water Co. v. Driscoll*, 28 F. Supp. 722, 30 P.U.R. (N.S.) 305 (1939). See also Jackson, "Temporary Rate Making Comes of Age," *Public Utilities Fortnightly*, **24**:723, Dec. 7, 1939.

purely temporary. Other proposals have looked toward valuation short cuts in the determination of final reasonable rates. Massachusetts, for instance, is credited with the balance-sheet-valuation technique, a practical application of prudent investment.[1] The valuation short-cut methods, however, have been devised mainly to approximate cost of reproduction. As valuation practice has been developed, it has become a laborious, time-consuming, expensive method, satisfying no one (except possibly the "judicially minded"). We shall illustrate, here, one of these short cuts by the application of index figures to actual investment records. Our illustration is based on efforts of Maryland to value the property of the Chesapeake and Potomac Telephone Company.[2]

This case was an outgrowth of efforts of the Maryland Commission during the pinch period of the depression of 1929 to secure utility rate reductions through informal negotiations. The Chesapeake and Potomac Telephone Company had refused to negotiate, and therefore in 1933 a formal rate proceeding was begun to force a rate reduction. The commission, realizing the time involved in the traditional valuation proceeding, devised a valuation short cut, namely, the translation of book figures of investment to present values by means of index figures. Briefly, it developed from sixteen price series a composite price index, a "fair-value trend." The series included such diverse indexes as the All Commodities index of the Department of Labor, Bradstreet's index, the index of the American Appraisal Company, a building materials index, the telephone and telegraph index of the Interstate Commerce Commission, and a company index. Translating the composite to a base of 100 for 1932, an index figure for each previous year since 1923 was determined. Because a previous court case had fixed a value for 1923, the commission felt under no obligation to extend its calculations behind that year. The accompanying illustration, taken from the commission report, illustrates the use of the index for determination of value.

This procedure had three obvious advantages. It was estimated that it would save at least 2 years' time. Next, it was inexpensive. It was believed that the ordinary cost of reproduction proceeding would cost the company at least $300,000. In the third place, the commission believed it to be *more accurate.* The commission had had previous experience with this procedure and had heard utility testimony to the effect that[3]

[1] This has been challenged by Barnes, *Public Utility Control in Massachusetts*, p. vii.

[2] 1 P.U.R. (N.S.) 346.

[3] *Ibid.* at 351.

. . . a result within five per cent of accuracy could be obtained by the use of index numbers.

TABLE 42.—FAIR-VALUE TREND FOR CHESAPEAKE AND POTOMAC TELEPHONE COMPANY*

		Trans-lator	Value Dec. 31, 1932
Value found by court, as of Dec. 31, 1923..	$36,122,912		
Less working capital	975,000		
Amount to be trended from Dec. 31, 1923..	$35,147,912	67.4	$23,689,693
Net additions:			
1924	3,199,648	68.2	2,182,160
1925	3,493,429	68.4	2,389,505
1926	4,098,230	70.0	2,868,761
1927	2,837,050	72.6	2,059,698
1928	1,854,046	71.8	1,331,205
1929	2,205,132	72.7	1,603,131
1930	2,733,968	77.6	2,121,559
1931	1,459,483	86.4	1,260,993
1932	421,708	100.0	421,708
Totals	$57,450,606		$39,928,413
Depreciation reserve:			
Court's value, Dec. 31, 1923	$ 6,614,963	67.4	$ 4,458,485
Net additions:			
1924	(3,556)	68.2	(2,425)
1925	200,429	68.4	137,093
1926	547,335	70.0	383,135
1927	804,711	72.6	584,220
1928	658,770	71.8	472,997
1929	823,816	72.7	598,914
1930	186,846	77.6	144,992
1931	229,100	86.4	197,942
1932	342,733	100.0	324,733
Totals	$10,405,147		$ 7,318,086
Depreciated value of property, as of Dec. 31, 1932			$32,610,327
Add working capital			737,000
			$33,347,327
Deduct Pleasant Street property			137,496
			$33,209,831
Rate base			$33,210,000

* Maryland Public Service Commission, 1 P.U.R. (N.S.) at 378.

Therefore it observed:

The Commission is convinced that so close an agreement between two appraisals, independently made, cannot possibly be obtained by the use of the ordinary method of inventorying and pricing. In no case with which the

Commission is familiar do index numbers produce results which vary as widely as does the testimony of expert witnesses on opposite sides in a valuation case; and while in this particular case there is a material difference between the use of index numbers by the accountants of the Commission and accountants and engineers of the company, that difference is readily explained. . . .

We have selected this particular case of a valuation short cut because it was carried on to the Supreme Court of the United States.[1] There, the Court in a six to three decision rejected the Maryland method in language bristling with judicial censure. We quote several pertinent sentences from the opinion of Mr. Justice Roberts.[2]

We are not satisfied with the methods pursued either by the court [federal district court] or the Commission. . . . This method is inappropriate for obtaining the value of a going telephone plant. An obvious objection is that the indices which are its basis were not prepared as an aid to the appraisal of property. They were intended merely to indicate price trends. . . .

Again, the wide variation of results of the employment of different indices, already mentioned, impugns their accuracy as implements of appraisal. . . .

To an extent value must be a matter of sound judgment, involving fact data. To substitute for such factors as historical cost and cost of reproduction a "translator" of dollar value obtained by the use of price trend indices, serves only to confuse the problem and to increase its difficulty. . . . This is not to suggest that price trends are to be disregarded; quite the contrary is true. And evidence of such trends is to be considered with all other relevant factors. . . .

A more fundamental defect in the Commission method is that the result is affected by sudden shifts in price level. It is true that any just valuation must take into account changes in the level of prices.

We have cited at some length the decision of the majority, because such reasoning is the despair of all thoughtful students of regulation. The almost studied negative attitude of the Court will yet be the death of regulation, unless that body rather sharply changes its almost fanatic "protection" of private property. We will not subject the foregoing extracts to minute analysis because we believe the bad logic of the case is self-evident. One other item in the decision merits comment. The Court, from the vantage point of 1935, chastises the Maryland Commission for not forecasting more accurately price changes between the commission decision in November, 1933, and the Court hearing in 1935. As a matter of fact, the commission pared its estimate of the amount of reduction that it should require because it

[1] *West v. Chesapeake & Potomac Telephone Co.*, 295 U.S. 662, 8 P.U.R. (N.S.) 433 (1935).

[2] 8 P.U.R. (N.S.) at 436–440.

appeared in 1933 that future price trends might be upward. The Supreme Court, therefore, ought instead to have congratulated the commission for its forecasting sagacity instead of admonishing it for not giving enough weight to rising prices. All the Supreme Court position does is demonstrate the value of hindsight judgments.

It is to the credit of Justices Stone, Brandeis, and Cardozo that they filed a vigorous dissent. Although we do not wish to overburden this section with quotations, Mr. Justice Stone put the dissent in words worthy of repetition:[1]

> The sole transgression, for which its painstaking work is set at naught, is that, in the exercise of the administrative judgment of this body "informed by experience" and "appointed by law" to deal with the very problem now presented . . . it has relied upon a study of the historical cost and ascertained value of appellee's plant in the light of price indices, showing declines in prices, in arriving at the present fair value of the property, *a procedure on which the court has hitherto set the seal of its approval. Clark's Ferry Bridge Co. v. Pennsylvania.* . . .
>
> In assuming the task of determining judicially the present fair replacement value of the vast properties of public utilities, courts have been projected into the most speculative undertaking imposed upon them in the entire history of English jurisprudence. Precluded from consideration of the unregulated earning capacity of the utility, they must find the present theoretical value of a complex property, built up by gradual accretions through long periods of years. Such a property has no market value, because there is no market in which it is bought and sold. Market value would not be acceptable, in any event, because it would plainly be determined by estimates of future regulated earnings. Estimates of its value, including the items of "overheads" and "going concern value," cannot be tested by any actual sale or by the actual present cost of constructing and assembling a property under competitive conditions. Public utility properties are not thus created full fledged at a single stroke. If it were to be presently rebuilt in its entirety, in all probability it would not be constructed in its present form. When we arrive at a theoretical value based upon such uncertain and fugitive data we gain at best only an illusory certainty. No court can evolve from its inner consciousness the answer to the question whether the illusion of certainty will invariably be better supported by a study of the actual cost of the property adjusted to price trends, or by a study of the estimates of engineers based upon data which never have existed and never will. The value of such a study is a question of fact in each case, to be ascertained like any other in the light of the record, and with some regard to the expert knowledge and experience of the Commission which, in the present case, are obviously great.

And so once more the Supreme Court has nullified another effort to give meaning from an administrative standpoint to the dictum of

[1] *Ibid.* at 445–449. (Italics ours.)

that body that each utility is entitled to a fair return on a fair value. It occurs to us that regardless of the merits of the prudent-investment-cost-of-reproduction controversy, their respective advocates will join in a unanimous condemnation of the Court for its Chesapeake and Potomac Telephone Company decision.

STANDARD COSTS

A fourth proposal for modification of the older ways of rate making involves a system of standard costs. In place of relying upon the usual evidence of operating expense, valuation, and fair rate of return, this proposition looks toward the definition of cost standards and a minimum guaranteed rate of return. In short, it is the basic principle of the service-at-cost franchise and has all its strong and weak points. Now that operating public utilities are often parts of a far-flung empire, this proposal has merit. Accounting records of operating expenses and actual capital costs furnish the raw material for cost standards; and subject to proper minimum operating and service standards, the proposal may be a superior substitute for present inadequate methods.

Specifically, this method would set up a budget of all costs, and no excess expenditures would be permitted, except under extenuating circumstances to be judged solely by the commission. A minimum rate of return, such as 5 per cent upon a stipulated rate base, would also be included in the cost budget. The presumption behind this suggestion is that all future savings within the service standards would accrue to the company, thereby causing its rate of return to rise. Under this method, there would of necessity be periodic redefinition of costs to correct for

1. Changing prices.
2. Increasing technological efficiencies.
3. Changing capital costs.

If this technique of rate making were to be applied faithfully, it ought to be successful and can be used with either prudent investment or cost of reproduction.

Its weakness is twofold. Its appeal to efficiency is a monetary one only and therefore ineffective as a thorough efficiency stimulus. Its second weakness lies in the degree to which it will be applied by the commissions. Either of these weaknesses may defeat it. We still believe, however, that it has possibilities as a substitute for present defective techniques. On the other hand, if this plan ever reaches the Supreme Court for review, it will probably suffer the fate of the index-number short cut to valuation.

PUBLIC COMPETITION

Convinced that all methods of improving the process of rate control by public authority are doomed largely because of the negative attitude of the courts of the United States, a fifth suggestion for rate regulation has been proposed—public competition. From the judicial standpoint, this proposal has none of the legal barriers that now handicap commission regulation. In fact, the contrast between the solicitude of the courts in their protection of property from adverse regulation and their utter indifference to its destruction by public competition has prompted one author to dub it "the strange case of municipal ownership and operation."[1]

The proposal of public competition is not new. It was the kernel of the proposals of the Windom report in 1876 to control railroad rates. It was not, however, until after 1933 that the principle of public competition was put into practice. One of the primary motives behind the development of the Tennessee Valley Authority was the creation of "yardstick" rates by which to measure the reasonableness of rates of private companies. The many isolated municipally owned electric plants scattered throughout the forty-eight states are often held up as measures of reasonableness of private company rates. We have seen many rate comparisons between publicly and privately owned companies, and the fundamental assumption always is that the public rates are reasonable and that therefore all rates above them are unreasonable.

Public competition, as it has been developed, has several weaknesses as a means of rate regulation. The scattered municipal plants, except on the West coast, are usually located in small communities, and their accounting methods have often been so haphazard as to make it questionable that their rates cover all costs. The hydropower project can never be justified as a yardstick for reasonable rates, because power production is always in combination with one or more other objectives. The Tennessee Valley Authority, for instance, is charged with the objectives of flood control, steam navigation, and power production, to mention only three. The problem of cost allocation of the fixed charges involved in the many dams on the Tennessee River can never be solved for any objective such as yardstick rates. These joint costs must be allocated according to some rule, but their very presence condemns the yardstick objective.

[1] KEEZER and MAY, *Public Control of Business*, Chap. 8. The most recent illustration of this principle can be found in *Tennessee Electric Power Co. v. T. V. A.*, 306 U.S. 118, 27 P.U.R. (N.S.) 1 (1939); and *Alabama Power Co. v. Ickes*, 302 U.S. 464, 21 P.U.R. (N.S.) 289 (1938).

Other fundamental objections can be raised to public competition as a means of rate control. It is an admission of the inability to control economic monopoly, and it proposes to cure the problem by competition—an uneconomic process. Either regulated private monopolies should serve our public utility needs, or else regulated public monopolies should do so. Public competition is an illogical solution and should, instead, be replaced by public ownership, if its premise of the impossibility of commission rate regulation is true. A final objection to the principle of public competition as a means of regulation is to be found in the divergent objectives of private and public management. For the most part the former tend to favor large industrial users in allocation of joint costs in rate making, whereas the latter is more concerned with the lowness of residential rate levels. Although this comparison may have significant exceptions, it illustrates a general difference in fundamental policies in rate making, thereby complicating any valid use of public competition for rate making.

Therefore, public competition, to be a successful test, must adopt the viewpoint of the private industry, must have exactly similar costs, must use identical accounting practices, must pay similar capital charges, must serve similar types of load demands. One cost item, often absent for public plants, is taxes. Since private plants pay from 10 to 20 per cent of their total revenues in the many taxes levied upon them, this difference would spoil the effect of public competition for purposes of rate comparison. Of course, there is no reason to exempt any public plant from a single tax burden, and therefore this particular defect to effective public competition could be remedied. If a system of public competition should ever be urged as a general method of regulation, we propose that a number of well-located steam-generating plants be built in all parts of the country. Only thereby could the requirements set out above for fair competition be attained. We are certain that the use of hydroplants as rate yardsticks is quite indefensible.[1]

RATE REGULATION MUST BE STREAMLINED

The preceding five and a half chapters are evidence of the ineffectiveness of the regulatory process in the fixing of reasonable rates. It would appear, therefore, that to be successful this process must be streamlined in two directions; first, it must be made both speedy and inexpensive, and, second, it must be made flexible. As we have seen, both these objectives have so far been denied by the Supreme Court of

[1] This discussion is not intended to be an analysis of public ownership. That subject is reserved for Chaps. XXVIII, XXIX, and XXX.

the United States. The fair-value problem is still in as inchoate a state as it was in 1898. Valuation practice continues to be uncertain, time consuming, and costly. The Supreme Court has struck down every attempt to give objective meaning to the fair-value rule of *Smyth v. Ames*. It still clings to its verbal myth of present value though thwarting every effort to define it and through all the cases refusing to divulge any certain clues as to its meaning. Such judicial process may be the delight of the public utilities, but it is the despair of commissions and students. We think it obvious, therefore, that the first step in making rate regulation more effective is the removal of this barrier of uncertainty. The exact substitute to be used is less important than its immediate elimination.

The second barrier to a streamlined regulation is best illustrated by the New York Telephone case, decided in 1926.[1] Briefly, there the New Jersey Board of Utility Commissioners was attempting to maintain that no charge of confiscation could be raised against a proposed set of lower rates until past excessive credits to the reserve for depreciation had been absorbed by operating losses. In other words, that body was frankly trying to establish a public interest in the results of rate determinations. In this attempt, New Jersey was stopped in no uncertain terms. Mr. Justice Butler, speaking for the Court, said:[2]

> . . . Past losses cannot be used to enhance the value of the property or to support a claim that rates for the future are confiscatory. . . . And the law does not require the company to give up for the benefit of future subscribers any part of its accumulations from past profits. Profits of the past cannot be used to sustain confiscatory rates for the future.

Not content with a general condemnation, Mr. Justice Butler added:

> 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 they do not acquire any interest, legal or equitable, in the property used for their convenience or in the funds of the company.* . . . 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.

Although this was a decision of a unanimous Court, we think the New Jersey Commission was urging a defensible position. In short, it was saying, "Where estimates of cost have been based on uncertain data, if we later find we have been too generous, we should be permitted

[1] *Board of Public Util. Comm'rs. v. New York Telephone Co.*, 271 U.S. 23 (1926).
[2] *Ibid.* at 31, 32. (Italics ours.)

to recapture the excess." Under this principle, the converse would also follow: Where a commission had been parsimonious in its cost estimates, it must later allow the recouping of the resultant losses.

As it is, this decision means that the past is past and rate regulation must not be tempered by past errors. More serious, however, is the inevitable resistance of regulatory bodies to pleas of generosity in debatable situations. For instance, for a new and untried piece of machinery there can be no accurate estimates of service life. Realization that errors in favor of its owners cannot later be (at least partially) recovered will certainly cause a commission to be extra cautious in its estimates and final allowances. It seems reasonable to conclude that the New York Telephone case is an important stumbling block to flexible rate regulation. So long as it stands, none of the innovations such as stabilization reserves and temporary rate orders is secure. On the other hand, two hopeful signs point to the ultimate acceptance of some type of streamlined regulation. The first is the partial acceptance of the Court of the temporary rate order in the Driscoll case. The second, discussed below, is the rising emphasis since 1935 upon fairness of process and procedure in rate cases. In other words, the Court may be upon the verge of liberalizing its attitudes upon the exact methods of rate regulation and valuation, saying, in effect, that many of them are acceptable so long as they are fairly and consistently applied.

THE CHOICE OF VALUE THEORY

If we could choose a theory apart from judicial pronouncements, we should choose the principle of the cost of substitute service as a measure of reasonable rates. In other words, at the time of a rate determination we should ask, "What would it cost *now* to supply the service in question by means of present equipment and methods?" This is the cost of reproduction of a *substitute plant* carried to its logical conclusion. We select this principle because we believe that it best approximates the competitive principle of pricing, and it should give a maximum of flexibility in utility prices. A rigid utility price structure in the midst of fluctuating prices has, we believe, serious disadvantages. Such a relation tends to overextend the use of utility service in periods of high general prices and, conversely, unduly to curtail utility consumption in periods of low general prices. This defect was well illustrated during the depression years of 1931–1936.

We realize, of course, that this theory exposes utilities to various hazards—such as unforseeable obsolescence and general price declines. These dangers, however, are worth the gain of price flexibility. Furthermore, it is possible to guard against these hazards through such

processes as liberal rates of return and other devices, one of which is set out below. We question, in addition, the probability of prolonged price declines, or "new permanent plateaus," of lowered prices. American experience seems to indicate alternating periods of rising and falling prices, with a general inflationary trend. If this analysis is correct, the long-run danger to utility credit stability is slight. We believe that a system of standard costs and a minimum rate of return can be developed as a satisfactory means of applying our theory of substitute cost. Periodic revision of budget allowances could be made in light of price and technological changes, thereby securing an administrative approximation of this theory.

On the other hand, if courts continue to adhere to their present interpretation of cost of reproduction, with its ambiguities and costly complex application, we would quickly choose the Brandeis formula of prudent investment. It is a defensible rule of valuation and is far preferable to present methods. Even an arbitrary mid-point between investment and cost of reproduction would at least be definite and applicable.[1] Or the suggestion of a utility leader that the value rule be investment or reproduction, whichever is the higher, if some adequate means of determining reproduction were to be devised, would be preferable to the present unpredictable fair-value rule of *Smyth v. Ames*.

A PROPOSAL

In order to remove the one major hazard inherent in our theory of the cost of the substitute service, namely, its effect upon utility credit in periods of declining prices and depressions, we make the following proposal. In a word, our proposition, one not new with us yet not widely advocated, is the amortization of the interest-bearing securities of public utilities. Suppose, for instance, that we apply this theory to a utility company, having a capital structure as follows:

4% bonds	$ 700,000
Common stock	700,000
	$1,400,000

The first problem is to determine an amortization rate, and we select 2 per cent, or an annual amortization of $14,000 ($700,000 × 0.02). Each year, then, there would be charged as an operating expense this sum; and each year, that sum would be credited to a reserve. The following entry shows the process:

[1] See the senior author's statement of this point in his article "Valuation for Rate Making—1932," *Journal of Land and Public Utility Economics*, **8**:225, August, 1932. There he defended prudent investment as the better rule of valuation.

Amortization Expense	$14,000	
Amortization Reserve		$14,000

The expense charge would be an item in total reasonable expense to be covered by reasonable rates and not a reduction of earnings. The actual cash accumulations represented by this transaction could be set up in a fund or turned over to the commission for safe keeping. We assume neither of these, because such is not essential to our plan. Periodically, as bonds were to be refunded or were obtainable in the market, they would be retired by means of the cash available through this program. Suppose that this year $10,000 of such bonds were bought and canceled. Then our entries would be

Bonds	$10,000	
Cash		$10,000
Amortization Reserve	$10,000	
Public Equity		$10,000

By a gradual process, then, the bonds would be retired to be replaced by a "Public Equity" account, which should be rated after bonds and before stocks.[1]

In short, the investing public's holdings of senior securities would be replaced by customers' contributions. The public equity should draw interest at the usual rate for bonds or at the rate of the bonds displaced. In periods of stress and low earnings, the interest on the public equity account could be waived, although it might be stipulated that only partial dividends could be paid later so long as any part of the interest arrearage remained unpaid. If the amortization rate was rapid enough, the amount of bonds outstanding would be reduced sufficiently to make the worst depression an easier obstacle to weather.

The question is often raised, "What shall be done with the interest earned by the public equity account?" It could be returned to customers in rate reductions, lent to the company, used to accelerate amortization, paid to the public treasury. We should be quite content to leave this problem to the discretion of the state commissions.

The proposal to amortize fixed-interest securities has several merits. One has been explained above—the weathering of periods of financial stringency. Another would be the strengthening of the public interest in bankruptcy proceedings. The presence of that investment would justify the appointment of the commission as receiver, rather than

[1] If a 2 per cent rate is too little, then it could be increased. The rate of utility expansion should aid in determining this rate of amortization. We have simplified this problem. If these bonds were bought at either premium or discount, there would be an additional accounting problem.

private persons, as is the usual practice. Finally, a large fraction of utility capital invested by the public would facilitate the switch to public ownership, should that policy ever be chosen by the American people. On the other hand, those who fear government meddling and interference with private business will oppose this suggestion. Yet the trend in security issues since 1933, almost exclusively bonds, cannot go on without serious consequences to customers, and therefore the undesirability of stocks may commend our proposal as the only practical way out of this financial dilemma.

IS THIS PLAN CONSTITUTIONAL?

Immediately the legalistic mind will ask, "Is this plan constitutional?" A rough review of the cases already set out in detail above can easily point to one answer—"No!" Certainly, the Supreme Court of the United States, as constituted before 1937, would have struck it down by a probable six to three decision. Since 1937, however, the personnel of that body has undergone significant change. Since constitutionality is what the judges say it is, there can now be renewed hope that the Supreme Court may overrule the fair-value doctrine of *Smyth v. Ames*. In fact, this is freely predicted by its more liberal legal interpreters. In that case, then, there is a ray of hope that our plan, or some other plan, may be acceptable to that body.

One has, however, more than hope to support this forecast. Several cases point toward a liberalized, if not a changed, attitude. The cases set out above on going value suggest this. Chief Justice Hughes's use of the "offset" method in the Los Angeles Gas and Electric case is most hopeful. Later, in the Lindheimer case, the Court showed its realism, when it turned the evidence of the Illinois Bell Telephone Company back on itself with the remark that "Elaborate calculations which are at war with realities are of no avail."[1] In other words, in attempting to prove a proposed lower rate schedule confiscatory, the company had "proved" existing rates to be too low, a conclusion contrary to fact when the financial condition of the company was examined.

Recently, in the Stockyards cases,[2] there is found a growing tendency to emphasize more procedure and less substance. Such a tendency evidences what Professor Corwin would call a move "back to the Constitution."[3] In fact, these decisions were the cause of much

[1] 3 P.U.R. (N.S.) at 345.

[2] *St. Joseph Stock Yards Co. v. United States*, 298 U.S. 38, 14 P.U.R. (N.S.) 397 (1936); *Morgan v. United States*, 298 U.S. 468 (1936); 304 U.S. 1, 23 (1938).

[3] Subtitle of his research monograph *The Commerce Power versus States Rights*.

renewed discussion by the members of the National Association of Railroad and Utilities Commissioners at their 1938 Convention.[1] There it was emphasized that the Court would be likely to accept any finding by a commission following valid procedures and whose hearings showed a genuine desire to observe the principles of fair play toward its subject utilities.

If this forecast is correct, we need no longer speak of the problem of reasonable rates (and valuation, particularly) as the bête noire of regulation.

Bibliography

It is not easy to separate specific criticism and suggested reform of the rate-making process from general materials on that problem. Most of the references at the end of Chap. XIV apply here. Especially should the reader follow the footnote references of Chap. XVIII. For further reading, we recommend:

BAUER, JOHN, and NATHAN GOLD: *Public Utility Valuation for Purposes of Rate Control*, Part III.

BERNSTEIN, E. M.: *Public Utility Rate Making and the Price Level.*

BLACK, HUGO L.: Dissent in *McCart v. Indianapolis Water Co.*, 302 U.S. 419, 423–441.

[1] See *Report* of the Committee on Progress in Public Utility Regulation, 1938 *Proceedings*, pp. 275 *et seq.*; and *Report* of Special Committee on History of and Current Developments in Regulation, pp. 353 *et seq.*

CHAPTER XIX

RATE-MAKING THEORY AND PRACTICE

The problem of reasonable rates divides itself into two parts. The first concerns the reasonableness of rate levels and involves the determination of proper costs and adequate gross revenues. This problem we have presented in the preceding six chapters. The second part of the reasonable-rate question concerns the establishment of specific rate schedules which in actual use serve as the vehicle by which utility service is sold and revenues acquired. It is to this question that this and the succeeding chapter are devoted.

Rate making involves the mechanics of rate design. It likewise involves several corollary problems such as the classification of customers and the division and allocation on some basis of the joint and fixed costs of the enterprise. In other words, there is the problem of treating customers in such a way that no group is favored at the expense of other groups. To understand the problem of rate making, it is necessary to review the economic conditions of utility operation. In addition, it will be necessary to study some of the technical aspects of utility operation. In the presentation of this preliminary material, we shall use the electrical utilities as our illustration, because they have had a greater need of rate diversification and their leaders have consequently given more attention to the problem of rate design.

CONDITIONS OF UTILITY OPERATION

Public utilities must be ready to serve at the time of demand for service; and since their ability to store their product is limited at best, they must stand ready to serve the largest actual demand that may be thrown upon them. This demand, furthermore, comes unannounced and thus must be anticipated in advance of its arrival. But slight reflection will show, therefore, that in any 24-hour period or season or year, the curve of output will move from insignificant lows to at least one very high point. It is this high point which determines the minimum essential generation and distribution facilities that must be available for operations.[1] This point of production is called the "peak

[1] The possibility of meeting a temporary and short-lived demand by "overloading" the existing facilities is not overlooked, but it is not a safe way to handle such a situation and therefore should be resorted to only as an emergency measure.

load" and may be measured in terms of capacity in use or units of output.[1] There are daily peaks, seasonal peaks, and annual peaks. The annual peak is most significant in the establishment of minimum facilities, although the daily and seasonal peaks have their importance.

Any well-managed company or system will have something in the way of excess capacity over and above the capacity required to meet its peaks. It may secure these facilities by interchange arrangements, but this alters the principle not at all. This excess will be needed to protect against sudden demand increases at the peak and to guard against the failure of any one of the active units. Reserves, therefore, should not be less than the carrying capacity of the largest generating unit in active use. The ratio of the peak load of a plant or system to the rated generator capacity of that plant or system is called the "utilization factor." That factor measures the percentage of total facilities used at the peak, and the difference between it and 100 per cent measures reserve capacity. For thirty large electric systems, this utilization factor for a series of years has been:

TABLE 43.—GROUP UTILIZATION FACTOR*
(Thirty large systems)

Year	Utilization factor, per cent	Year	Utilization factor, per cent
1931	60	1935	65
1932	55	1936	72
1933	55	1937	72
		1938	

* *Electrical World*, **109**:1677, May 21, 1938. Figures for 1934 are not available.

From these figures, we conclude that the average annual reserve of these companies has varied from 45 per cent in 1932 to 28 per cent in 1937. On the other hand, for some of the companies in this sample, the utilization factor has been greater than 100, thereby indicating their reserves to have disappeared and likewise pointing to an imperative program of immediate capital additions.

Peak loads plus reserves, therefore, set the minimum limits of installation for both generating and distributing facilities. Next, in terms of the peak, what is the average use, or, on the average, what part of the peak facilities are used per day or season or year? To this relationship is given the name "load factor." In other words, it is the

[1] For an excellent discussion of the technical terms used in this chapter, see an article by Samuels, electrical engineer of the Federal Power Commission, in the *Electrical World*, **108**:50, 105, 106, July 3, 1937.

ratio expressed in percentage of the average load to the peak load. Another measure of it is the ratio of actual output in units to the potential output of the peak capacity for a given period in time. Suppose that a plant produces an average output involving 20,000 kilowatts of capacity but its peak requires a capacity of 60,000 kilowatts. The load factor would be 33⅓ per cent. In other words, measured in terms of peak load, the plant is used but one-third of the time. This factor is significant in that it measures the economy of use of installed capacity. The greater the load factor the smaller the average amount of fixed costs attributable to any one unit of output. The following figures show average load factors for thirty large electric systems:

TABLE 44.—GROUP LOAD FACTORS*
(Thirty large systems)

Year	Load factor, per cent	Year	Load factor, per cent
1931	54 3	1935	54.3
1932	52.3	1936	54.8
1933	53.3	1937	57.8
1934	54.7	1938	

* *Electrical World*, **109**:1519 May 7, 1938.

Load factors have continually risen, as newer and more diverse loads have been acquired. A system serving a purely residential area will have a load factor barely in excess of 30 per cent. For instance, in 1933 it was estimated that the load factor for residence service in Chicago was 31 per cent. At the other extreme, load factors for systems sometimes rise to almost 80 per cent. Be this factor high or low, the presence of unused but available capacity during parts of a day, season, or year is an incentive to special rate designs to attract loads for these low-use intervals. Any rate yielding something over the actual increment cost of serving such off-peak demand is advantageous to the company and, under vigilant commission supervision, to all other users. The "something more" is just that much less of overhead costs that can be removed from rates of regular customers.

So far, we have described conditions of operation from the system or company viewpoint. Next let us turn to the individual user, illustrating our problem, as above, by reference to the electrical utility. Every home has a group of electricity-utilizing devices ranging from common items such as lamps, radios, and kitchen and cleaning equipment to the more expensive items such as stoves, refrigerators, water

heaters, and occasionally furnaces. Each of these devices has a rated capacity, stated in watts or kilowatts. The total of rated capacities measures installed capacity. Rarely, however, are all appliances used at once; in fact, it is quite impossible to use certain equipment simultaneously. The sum of the rated capacity of the largest actual use is called the "active connected load."[1] The ratio between this figure and the sum of the rated capacity is called the "demand factor." This measure is equally applicable to a plant or system. It gives a picture of the utilization of the connected load and is used mainly to assist in system design.

Next, let us relate customers to the system. The average use of any customer compared to his peak responsibility, that is, that part of the system peak load created by him, is called his "responsibility load factor." The customer's individual peak is not so significant as his contribution to the system peak. "A customer with a higher responsibility load factor may always be assumed to be a better customer than one with a lower responsibility load factor."[2] In so far as system peaks are stable as to time of day or season of the year, this relationship may well reflect itself in the rate design, especially in the allocation of power costs.

From the responsibility load factor, it is but a step to an understanding of the problem of diversity. Obviously, differences in customers' habits and other forces cause differences in time of their respective peak loads. For instance, in cities where offices and factories close at five o'clock, the peak demands of office buildings, factories, street car systems, and residences follow one another in orderly succession. To imagine a simultaneous peak of these uses is to create the impossible. This fact of diverse peak loads on a system is called "diversity" and is usually measured as a factor expressed in unity. Briefly, it is the ratio of the sum of noncoincident individual demands (peak loads) of customers of a plant or system to the maximum demand (peak load) of that plant or system. This can be illustrated as shown in Table 45.

Dividing the station peak load 6,000 kilowatts into the sum of the noncoincident individual demands 9,000 kilowatts gives a diversity factor of 1.5. Expressed in another way, the actual system installation necessary to care for these customers need be but two-thirds of the sum of their individual maximum demands. This factor measures economy in installation and hence directly affects the problem of fixed charges to be recovered in rates. Assuming a constant load factor, one system with a diversity factor of 2 will need but half the installation

[1] Other names for this are "active demand" and "maximum demand."

[2] SAMUELS, *op. cit.*

of a system with a factor of 1. Thus, the former system will have a materially lowered fixed charge per unit of output. Nash states that a group of customers mainly residential in type may have a diversity factor of as much as 5, whereas, at the other extreme, his investigations of a group of textile plants showed a low diversity of 1.05.[1] On the other hand, a study of residence service in Chicago showed its diversity with respect to the system peak to be but 1.32.

TABLE 45.—A HYPOTHETICAL ILLUSTRATION OF DIVERSITY

Customer	Individual demand, kw.	Station peak responsibility, kw.
A	3,000	3,000
B	5,000	2,900
C	1,000	100
	9,000	6,000

Diversity factor and load factor have a definite relationship. To state an extreme case, if a plant served a group of customers, each with a 100 per cent load factor, diversity would be 1. If it served twenty-four customers, each with the same load of 1 hour's duration evenly spaced throughout the day, the load factor would still be 100 per cent, but the diversity would be 24. This latter illustration is fantastic and is never approached in reality. In general, experience shows an inverse relationship between load and diversity factors.[2] The net result to the station is favorable because by increasing the load factor, average use rises. Unless this increase was secured by unwise rate offers, it will be a profitable gain.[3]

[1] NASH, *Public Utility Rate Structures*, p. 8.

[2] *Ibid.*, p. 43. "High load factor necessarily means correspondingly low diversity, and diversity must be recognized in fixing the level of demand charges."

[3] We have described only such ratios as seem essential to the understanding of rate making. Other significant ratios are:

Plant factor, "the ratio of average load to the aggregate rating of generating equipment for a given period." This factor assists in the establishment of fixed charges per kilowatt-hour of output and reduces to the following formula:

$$\frac{100 \times \text{kw.-h.}}{8760 \times \text{kw.}} = \frac{0.0114 \times \text{kw.-h.}}{\text{kw.}}$$

Coincidence factor. This is the reciprocal of the diversity factor.

Operation factor, "the ratio of the duration of actual service of a machine, a power plant or a system, to the total duration of a period considered."

Output factor, "the ratio of the actual output of a machine during a certain period to the output which could have been obtained during the actually operating hours in that period by operating the machine at rated capacity." The load factor becomes more significant when considered along with this factor.

These definitions are taken from the article by Samuels cited above.

The question in the reader's mind must be, "Why all this involved description of operating conditions and their expression in ratio form?" The answer is that these concepts are involved in actual rate making. Off-peak use, for instance, is often encouraged through special rates or by the advanced steps of a graduated rate. But off-peak periods cannot be discovered except as load curves are kept and studied. More important is the problem of allocation of the fixed and joint costs of operation. Unless such allocation is left entirely to chance, it will be guided largely by load factor, peak load, and diversity. They are essential to most scientific methods of cost allocation.

THEORIES OF RATE MAKING

Once more, we must consider the cost of service versus the value of service controversy. We encountered this conflict earlier in the study of the general problem of reasonable rates. At that time, it was decided that cost was the primary basis for the establishment of general levels of rates, demand playing a supplementary and restricted role. What was said there about cost and value applies here. There are those, however, who insist that the only basis of fixing particular rates is in terms of the value of the service, or, as it has been phrased, "charging what the traffic will bear." Part of the defense of this theory springs from a rationalization of past practice, part from a reaction against excessive refinements in cost analysis and attempted application to rate making.

It would seem that actual rates must always be fixed by reference to cost. By this is not meant average unit cost but a minimum cost—the incremental cost of any one unit of service. This amount should certainly mark the least rate to be charged. Since, however, other costs must be allocated to all users as a whole, they must be divided on some basis. Again, cost analysis gives a start. As we shall show later, for those customers whose use contributes to the system peak loads, a distribution of fixed costs in accordance to their respective shares of that peak can be computed. If this sum makes a total rate too high to attract some users, then something less can be charged. Any contribution toward fixed charges will reduce the remaining share of other users. In short, therefore, cost in such situations is modified by the value of the service. We conclude that cost is the primary basis for rate making. Incremental cost sets a minimum for any unit sold, and cost analysis is the starting point for the distribution of fixed and joint costs. In so far as demand for service requires, the final result may be modified so long as the lower limit of incremental cost is not ignored.

A review of the cost classification set out in Chap. V shows that costs were divided into three groups, namely:

Capital costs.
Indirect operating costs.
Direct operating costs.

For the going concern, these merge into two—fixed costs and variable costs. Capital and indirect operating costs are generally fixed in quantity and joint in nature. Direct operating costs are variable, depending upon the volume of actual output, and in some respects also joint in nature. But for rate making, another classification has been developed, as follows:

Demand costs.
Energy costs.
Customer costs.

It is not difficult to translate the first classification into the second. Demand costs are those constant costs which flow from installed capacity and distribution equipment made necessary by the requirements of customers. In other words, the demand costs are those capital and indirect operating costs for which each customer is responsible. The measurement of these costs will be discussed below. The energy charge of the second classification corresponds, in the main, to the direct operating cost of the first, such charges being incurred only when service is sold. The most significant items in this group are wages and material costs. The third class, customer charges, partakes of both indirect and direct operating costs. They are constant per customer and cover the special expenses of meter reading, billing and collecting, and the fixed charges and maintenance of meters and lead-in connections. Thus, this charge is constant per customer and varies directly with their number. As we discuss rates later, it will be apparent that this classification often finds its way into rate forms, although many rates for good reasons do not follow it.

COST ANALYSIS

L. R. Nash, in his book *Public Utility Rate Structures*, has developed an illustration of functional cost analysis along the lines of the classification described above. He takes every phase of cost of production and assigns it to its proper class. Such items as costs incurred in the physical plant are generally allotted to the demand charges, a few being set out as customer costs. The production costs divide: seven-tenths energy, three-tenths demand. Other costs are split into their respective classes, so that the final computation shows demand costs to be $4.00 per month per kilowatt of demand, $0.0085 per kilowatt-hour of

energy consumed, and a customer cost of $1.30 per month.[1] It must be remembered, of course, that this type of analysis involves many debatable items, such as the allocation of joint costs among these three classes.

TABLE 46.—FUNCTIONAL DISTRIBUTION OF PUBLIC UTILITY COSTS*

Items	Demand (1)	Energy (2)	Customer (3)	Undistributed (4)
Fixed charges on office buildings				100%
Administrative salaries and other general expenses				100%
Income taxes				100%
Power supply system, including generating plant, transmission lines, general substations	100% usually			
Charges on distribution investment one theory; distribution-line capacity just large enough to deliver regular and dependable voltage as a customer cost. Only added cost as a demand cost	Shared with (3)		Shared with (1)	
Underground system (in business district).				100% of excess over cost of standard distributing system
Transformers	$6.00 per kw.		$25.00 plus (1)	
Meters	5%		95%	
Charges on investment in buildings, motor vehicles, supplies.	Shared with (3, 4)		Shared with (1, 4)	Shared with (1, 3)
Powerhouse production expenses	Other costs	Fuel costs		
Transmission and conversion expenses	95 to 100%		5 to 0%	
Distribution expenses	50%		50%	
Utilization expenses	5 to 0%		95 to 100%	
New business expenses			100%	Or else divided between 3 and 4
General expenses	Minor %			
	Average Figures as Calculated by Nash			
	$3.00 to 4.00 per kw. Figure here would be adjusted for diversity	0.75 to 1.25¢ per kw.-h.	$1.00 to 1.50 per month per customer	Total distributed among (1, 2, 3) according to proportions that they bear to each other

* Compiled from Nash, *Public Utility Rate Structures*, pp. 241–244.

Behind the functional cost analysis are two problems, that of allocation of costs of power production and that of distribution costs. Power costs have been allocated among classes of customers on several bases.

[1] NASH, *op. cit.*, pp. 248–253.

The earliest method was in terms of peak responsibility. Referring to our illustration on page 387, and considering each customer as a class of customers, class *A* was responsible for half the total, class *B* for almost half, and class *C* for less than 1 per cent. In devising rates for these three classes, class *C* would pay practically none of the demand costs. The weakness of such technique was discovered when annual electric peaks for many companies shifted from a residential winter peak to a summer industrial one.

The next method was to allocate in terms of the noncoincident maximum demands. Using our illustration again, class *A* would pay one-third, class *B* would pay five-ninths, and class *C* would pay one-ninth. This method definitely increases the share of off-peak and semioff-peak users. This type of allocation involves diversity and has some odd results. The higher the diversity factor the lower the per kilowatt demand charge, yet many users contribute nothing to diversity and therefore unfairly share its advantages.

The third method, one that proposes to remedy the defect of the aforementioned methods of allocation of power costs, is called the "phantom customer," a complicated process of attempting to award to each customer or class of customers his actual contribution to diversity.[1] Under this method, those customers with high load factors pay higher power costs per kilowatt of capacity than those with low load factors. "Each customer is credited with diversity to which he contributes and pays for any lack of it for which his high load factor is responsible."[2] The actual process accomplishing this is by adjusting the energy charge per kilowatt-hour, although, from pure rate theory, changes ought to be incorporated within the demand charge. It is likewise apparent that rates for genuine off-peak service must be adjusted to eliminate that part of the demand charge which creeps into the energy charge under the phantom-customer method of power-cost allocation.

In the dispute over allocation of power production costs, analysis of distribution costs has been generally forgotten. The usual argument has been that such work was unessential, because costs were not the general basis of rate design. Yet the demand-energy-customer cost classification requires such analysis because distribution costs fall definitely into the first and third of these classes. The Federal Power Commission has made an excellent sample analysis of distribution costs.[3] For that analysis, the commission selected twenty-two com-

[1] See Nash's explanation, *op. cit.*, pp. 232–238.

[2] *Ibid.*, p. 237.

[3] Federal Power Commission, "Cost of Distribution of Electricity," *Power Series* No. 3.

panies throughout the United States, six of them municipal and six of them subject to some degree of competition. We can do no more than sketch some of the conclusions. For residential service in urban territory, it found distribution costs per kilowatt-hour ranging from 0.8 cent to 3.92 cents. In rural areas, its extreme figures were 2.12 and 9.12 cents. For a detailed analysis, the student should study the sample table (Table 47) taken from the report or consult the report itself.

RATE-MAKING PRACTICE

So far, we have simply been laying the technical and theoretic groundwork to a study of actual rates. We shall find that many rates seem to have no relation to rate theory. Some have simply grown up out of the particular conditioning circumstances of the past. Others have been devised along genuinely theoretic lines. We shall also see that some of the utilities such as the street railways and the telecommunication companies have special problems of rate making for which cost has been of minor importance in rate design. We shall be especially impressed with the lack of uniformity in rates. Following the general description of rates, we shall study such related problems as discounts, penalties, minimum and service charges, and finally the recent moves to standardize rate forms and create uniform rate areas.

ELECTRICITY RATES

Our study of rates begins with those of the electrical utility. Because of the peculiarities of production and distribution and the variety of services rendered, rate research for this utility has been more extensive and thorough than for the others.

Nonmeter Rates.—To begin with, we shall classify all electric rates into meter and nonmeter rates. The nonmeter rates came first in the history of the industry, as one might expect. Among the oldest of all rates is the *flat rate*, which is a fixed sum a month or season for electric service, irrespective of the quantities of electricity used. This form encourages waste and was soon discarded.[1] A variant of the flat rate is the *fixture rate*, which attempts to fix a flat monthly charge on the basis of lamps or outlets on the customer's premises. Although an improvement over the flat rate, because it more nearly charges in accordance with consumption, this form was soon dropped. Its only use at present is in connection with contracts for electric advertising

[1] In a rate study that the senior author made in 1929, covering some 300 towns in Iowa, Illinois, and Wisconsin, he found no place using a nonmeter rate for electric or gas service.

signs. These contracts usually specify the hours of permissible use and fix the charge in terms of outlets.

Meter Rates. *The Uniform Rate.*—As a substitute for the inadequate flat rate, the uniform rate was introduced early in the history of the electrical industry and is still found in some of the smaller towns and villages. Under this type of rate, the same charge is made for each kilowatt-hour of electricity used, regardless of how little or how much. Of course, such a rate may have a minimum bill requirement, but the principle remains the same.

TABLE 47.—COST OF DISTRIBUTION OF ELECTRICITY: RESIDENTIAL SERVICE OF SELECTED URBAN COMPANIES*

Company	Cost of distribution, cents per kw.-h.		
	8 per cent basis	9 per cent basis	10 per cent basis
Los Angeles Bureau of Power & Light (M)†	2.75	2.89	3.03
Potomac Electric Power Co	2.31	2.43	2.55
Seattle Department of Lighting (M)	1.49	1.57	1.65
Puget Sound Power & Light Co	1.84	1.91	1.99
Portland (Ore.) General Electric Co	1.31	1.38	1.44
Northwestern Electric Co	1.64	1.71	1.78
Tacoma Dept. of Public Utilities (M)	0.80	0.85	0.90
Lansing (Mich.) Bd. of Water and Electric Light Comm'rs. (M)	1.44	1.53	1.62
Pasadena Light & Power Department (M)	2.18	2.29	2.40
Springfield (Ill.) Dept. of Water, Light & Power (M)	1.19	1.25	1.31
Public Service Co. of New Hampshire	3.28	3.41	3.55
San Joaquin Light & Power Corp	2.36	2.49	2.63
Superior Water, Light & Power Co	2.57	2.67	2.78
Greenfield (Mass.) Electric Light & Power Co	3.32	3.46	3.60
The Manchester (Conn.) Electric Co	3.57	3.67	3.77
Arkansas Utilities Co.:			
A	1.78	1.86	1.94
B	2.07	2.15	2.22
East Tennessee Light & Power Co	3.75	3.89	4.03
Citizens' Electric Co. of Lewisburg, Pa.	1.66	1.74	1.82
Hershey (Pa.) Electric Co	3.92	4.09	4.25

* Adapted from, Table S-1, Federal Power Commission, "Cost of Distribution of Electricity," *Power Series* No. 3.

† (*M*) = municipally owned plant.

This type of rate has several serious defects. In the first place, there is no recognition of differences in the demands of customers,

One customer may use all his current at the peak; another may use his at off-peak times. In the second place, there is no allowance for large as against small installations and no stimulus to additional use. Therefore, this rate tends to be regressive as between the large and small user and off-peak and peak user. It has been used mainly for residential service and has largely disappeared.

The Step Rate.—The next development in rate design was the recognition of decreasing unit cost by means of progressive discounts for added use. In other words, a user of 50 kilowatt-hours might have his bill discounted 10 per cent, whereas if he used 100 or 200 kilowatt-hours his discount might be 20 or 30 per cent, respectively. This type of rate has never been widely used, probably because of commission disapproval.[1] To avoid the objections against progressive discounts, the step rate was devised. It is illustrated as follows:

50 kw.-h. or less a month	10¢ per kw.-h.
50 to 100 kw.-h. a month	9¢ per kw.-h.
100 to 150 kw.-h. a month	8¢ per kw.-h.
etc.	

The criticism of the step rate is the waste that it encourages as a user nears a turning point. For instance, 48 kilowatt-hours of electricity would cost $4.80, but a bit of extravagance that would use 3 more kilowatt-hours would save money. Fifty-one kilowatt-hours would cost $4.59. Thus, such a rate encourages extravagance and is actually regressive in its effect, resulting in discrimination against those users whose total consumption falls just within a turning point. A modification of this rate has been designed to correct this defect. Under the rate schedule as given above, if a charge of $4.59 were made for all consumption falling between 46 and 51 kilowatt-hours, the incentive to get into the next higher step would be eliminated. Even as modified, this type of rate is frowned upon by commissions and is practically nonexistent. In a study made during the summer of 1929 in over 300 towns in the states of Iowa, Illinois, and Wisconsin, there were only two or three places in which this rate was in use.

The Block Rate.—The most common electric rate is the block rate, shown below:

First 25 kw.-h. a month	5¢ per kw.-h.
Next 25 kw.-h. a month	4¢ per kw.-h.
Excess	2¢ per kw.-h.

This type of rate avoids the defects of previous rates. It does not encourage waste of service, because, regardless of the quantity of

[1] SPURR, *Guiding Principles of Public Service Regulation*, Vol. III, p. 378.

electricity used per month, under the illustration here, the rate of 5 cents a kilowatt-hour is paid for the first 25 kilowatt-hours. Furthermore, this block rate is not regressive, because everyone pays the same for his initial use.

One advantage over rates discussed so far is the recognition of the fact of the decreasing cost of added service. The use of the energy allowances of the first two blocks presumably reimburses the company for at least a part of the demand costs of serving the average customer. Such a rate structure as this one implies that it costs approximately 2 cents a kilowatt-hour to cover energy costs and $1.25 per customer to cover the constant capital and indirect operating costs.[1] Two practical defects are apparent in the block rate. In the first place, customers' actual demands vary considerably, and so an assumption of an average demand is but a mathematical fiction rarely found in practice. Thus, this rate is regressive as between a user having a small demand and one with a large demand. In the second place, what of the convenience user, who seldom uses the allowances of the first block and rarely, if ever, all of the second? He obviously escapes part of his burden, throwing it upon the regular user of the system.

There are certain theoretical objections to all the rate structures presented thus far. They do not begin to approach the ideal of charging users in accordance to their demands, although the block rate is less defective than the others. But even here, the approach is far from close. In spite of these defects, the block rate has the advantages of simplicity of structure and ease of comprehension and verification. For these reasons, its popularity is understandable, and its widespread use as a residential rate is likely to continue indefinitely.

The Wright Demand Rate.—To surmount the theoretical defects of the block rate, the Wright rate, named after its creator, was early introduced into this country, and its extensive use was largely the

[1] The unstated assumption behind the rate illustrated above is an average monthly use at least 50 kilowatt-hours. The computations above are worked out as follows for 50 kilowatt-hours of consumption:

First block, 25 kw.-h. × 5¢ each =	$1.25
Next block, 25 kw.-h. × 4¢ each =	1.00
Total bill =	$2.25
Assuming 2¢ (the charge for excess consumption) to measure energy costs:	
50 kw.-h. × 2¢ each	$1.00
Balance represents demand and customer costs.....	$1.25

product of one man's enthusiasm for it.[1] It was the first rate to recognize variations in customers' demands and is illustrated as follows:

First 30 hr. use of active demand	5¢ per kw.-h.
Next 30 hr. use of active demand	4¢ per kw.-h.
Excess	2¢ per kw.-h.

This rate involves a determination of the active demand of each customer. The accurate way is to place a recording demand meter on the premises and thus get an exact measure of average maximum demand. The second way is to estimate that demand.[2] It must be remembered that this method is an approximation only and may be criticised severely because of its inaccuracies.[3] For the ordinary dwelling, however, wherever the Wright rate is in use, a form of this second method of demand determination is usually applied because of the cost of installing and maintaining demand meters.

An illustration or two will show the workings of this rate. Let it be assumed that a customer has an active demand of 500 watts, or, in other words, of 0.5 kilowatt. His rate would be, then, as follows (0.5 × 30 hours' use):

First 15 kw.-h. a month	5¢ per kw.-h.
Next 15 kw.-h. a month	4¢ per kw.-h.
Excess	2¢ per kw.-h.

Another person with an active demand of 800 watts, or 0.8 kilowatt, would have a rate as follows (0.8 × 30):

First 24 kw.-h. a month	5¢ per kw.-h.
Next 24 kw.-h. a month	4¢ per kw.-h.
Excess	2¢ per kw.-h.

In effect, this rate is a block rate, the amount within each of the first two blocks varying in accordance with the active demand of the

[1] Samuel Insull, president of the Commonwealth Edison Company, 1893–1932.

[2] One basis of estimation of residential demand has been as follows: First, a wattage count is made of all lamps in active rooms. All unused outlets are counted at a specified figure of 60 watts. Active rooms do not include halls, bathrooms, basements, attics, or garages. Next, only appliances over 600 watts' rated capacity are counted. This exemption thus encourages the use of many appliances such as toasters, fans, curling irons, and radios. These appliances are generally used for short periods and, except for radio, almost always at the off peak. Let us assume a house with a counted wattage of 3,350 watts. This figure is then reduced as follows: 75 per cent of the first 500 watts and 60 per cent of the remainder. Applying these percentages, the reduced figure becomes 2,085 watts, or slightly more than 2 kilowatts.

[3] We consider the position in this matter of the Pennsylvania Commission to be essentially sound: " . . . if rates are predicated upon a stated demand, such demand should be measured by a meter." *Re Philadelphia Electric Co.*, 20 P.U.R. (N.S.) 486.

customer. It may be assumed that the cost of furnishing energy is 2 cents a kilowatt-hour. In that case, the difference between the base charge, 2 cents, and the 5- and 4-cent charge in the first two blocks measures the demand costs incurred in standing ready to serve the customer. The greater the demand of the customer, the larger the number of kilowatt-hours within these two blocks and, *provided* the customer uses the allowances of his two blocks, the larger will be his contribution to the utility. This type of rate causes every customer to pay for his share of the costs incurred by his connection to the system and does not shift the demand costs of the large user to the small user. Its one defect, as is apparent, is that the occasional user may escape the demand charge if his use is intermittent.

As a theoretical proposition, there is no better type of residential rate than the Wright demand rate; it has been used in our larger cities, but its popularity is on the wane. It is almost impossible to get the ordinary customer to understand the theory or the method of computation. He is thus very suspicious of it. In addition, it has been costly to administer; and at the time of periodic checkups of the active demand, it is always a temptation for customers to try to hide a portion of their equipment. So, all in all, it is disappearing from use, and its place is being taken either by the block rate or by a modified form of the Wright rate, the room rate. The latter has much to commend it, as the following section will show.

The Room Rate.—To retain the basic principle of the Wright rate but to eliminate its theoretical and practical difficulties, the room rate was devised as a substitute. It has gained in popularity in the years since 1920 and rapidly has come into favor especially in those cities which have had the Wright rate. It is illustrated as follows:

First 4 kw.-h. per active room	5¢ per kw.-h.
Next 4 kw.-h. per active room	4¢ per kw.-h.
Excess	2¢ per kw.-h.

In the application of this rate, it is necessary to define the phrase "active room." If there is a local real estate board, it will in all probability have an acceptable room classification. The following are usually excluded from the classification of rooms: closets, halls, basements, attics, and bathrooms. Of course, if either the attic or the basement were adapted for living quarters, such rooms as were there would be counted. Supposing that a person has four active rooms in his dwelling, then his rate would be as follows (4 kw.-h. × 4 rooms):

First 16 kw.-h. a month	5¢ per kw.-h.
Next 16 kw.-h. a month	4¢ per kw.-h.
Excess	2¢ per kw.-h.

For a person with a seven-room house, the rate for service would be (4 kw.-h. × 7 rooms)

First 28 kw.-h. a month	5¢ per kw.-h.
Next 28 kw.-h. a month	4¢ per kw.-h.
Excess	2¢ per kw.-h.

Thus, the principle of the variable breaking point, or turning point, of the Wright rate is retained, although the basis of computation is altered. If the two cases above are compared, and assuming that both these users exhaust the first two blocks, their contributions toward the fixed costs are: The customer with the four-room house pays $0.80; the one with the seven-room house, $1.40. Under the basic assumption that the active demand bears a close relation to the number of active rooms in a dwelling, this type of rate will reimburse the utility for its station installation and distribution equipment devoted to each customer.

It is precisely on this point that the room rate as well as all other modified demand rates may be challenged. It is doubtful if there is a reasonably exact correlation between the size of the house and its demand. In so far as there is no relation, the room rate becomes simply another rate form. In the second place, the apartment house introduces a problem, especially some of the modern "three-room efficiency" apartments which are scarcely more than one large room with two or three closets adjoining. This has been met either by a scale of equivalent rooms for such dwellings or by prescribing a minimum number of rooms, usually four, to apply to all premises served under this rate.

The practical advantage of the room rate for residential service is the simplicity with which it can be stated. Almost every layman can understand it and verify easily the computation of his bill. For this reason, it has been more popular than the Wright rate. On the other hand, it has not been too favorably received by some of the commissions. One of them has ruled that it is not a true measure of demand;[1] others have ruled it to be discriminatory.[2] While these bodies were disapproving the room rate, the New Hampshire commission approved it as a substitute for the block rate.[3] The trend in residential rates seems definitely away from the demand forms to the simpler block types, designed to be promotional in effect.

[1] *Re Detroit Edison Co.* (Mich.), 16 P.U.R. (N.S.) 9.

[2] *Re Northern States Power Co.* (Wis.), 19 P.U.R. (N.S.) 153; *Re Arkansas Power & Light Co.* (Ark.), 13 P.U.R. (N.S.) 514.

[3] *Re Exeter & Hampton Electric Co.*, 18 N.H.P.S.C.R. 65.

Commercial and Power Rates.—The preceding discussion of electric rates has dealt with the nonmeter rate and the one-part meter rate. These, with the exception of the fixture rate, have been designed for the domestic or residential customer. None of them, with the possible exception of the block rate and the Wright rate, has been desirable for commercial or power service. It is not uncommon to find the block rate adapted to commercial use (stores and office buildings). In this case, the blocks are widened and increased in number, as the following rate shows:

First 50 kw.-h. a month	7¢ per kw.-h.
Next 50 kw.-h. a month	5¢ per kw.-h.
Next 400 kw.-h. a month	4¢ per kw.-h.
Next 400 kw.-h. a month	3¢ per kw.-h.
Excess	2¢ per kw.-h.

This type of rate attempts to recognize the larger demand of the office or store by lengthening the initial blocks. In addition, it encourages large use by quoting succeeding blocks at reduced prices. The defect of this type of rate for use except in the smaller stores and offices has led to the creation of special rate forms designed for that purpose.

The Hopkinson Two-part Rate.—One of the distinguishing features of the Hopkinson rate, named after its designer, is that the charge for electricity is divided into two parts—thus its title of a two-part rate. This rate is illustrated as follows:

Demand charge:

$2.00 per month per kilowatt of maximum demand.

Energy charge:

First 5,900 kw.-h. per month	2.7¢ per kw.-h.
Next 24,100 kw.-h. per month	1 1¢ per kw.-h.
Next 70,000 kw.-h. per month	0.9¢ per kw.-h.
Next 400,000 kw.-h. per month	0.56¢ per kw.-h.
Excess	0.47¢ per kw.-h.

An examination of this rate shows that charges are divided on the basis of constant costs (the demand charge) and the operating costs for the energy used (the energy charge). To serve any customer requires the dedication of plant capacity and transmission and distribution equipment to his special use. The exact amount of this dedication is easily measured by means of a demand meter. The demand charge is determined by calculating the amount of annual constant costs that 1 kilowatt of equipment and other facilities incur, dividing the sum into twelve equal parts. The customer pays this demand charge regardless

of the quantity of electricity he consumes, because these charges are independent of his use.

This type of rate follows the rate theory set out above and is designed to deliver electricity to the user at a rate that covers the cost of serving him and at the same time fully to compensate the utility for standing ready to serve. If it were a practical proposition, such a rate structure could be used in residential service. As is apparent, it is both difficult for the layman to comprehend and expensive for a company to apply. There are various modifications to suit the needs of commercial and power users. These rates usually carry riders called "coal and oil clauses" which make the energy charge subject to increases or decreases depending on specified changes in the cost of these fuels. There may be other riders as to the kind of equipment that the customer may use, power factor maintenance and correction, right of termination of contract, and the method of demand determination.

The Three-part Rate.—The three-part rate is simply the Hopkinson rate with the customer costs removed from the demand charge and set out as a third element in the rate. This additional amount is usually some such sum as a dollar per month. This type of rate is the practical application of our rate theory and is a perfect expression of it. It has not been used widely, because it has no marked practical advantages over the Hopkinson rate.

Other Electric Rates.—The list above does not exhaust the study of electric rates. As an illustration, in the rate schedules of any large city company will be found special rates for off-peak service, municipal lighting service, sign and electrical advertising service, midnight-to-dawn storage battery charging service, and wholesale and retail rural service. Such rates are carried on file in its office and the offices of the state commission and may be examined by anyone.

A new type of residential rate deserves special mention because it combines several uses under a single rate form. This rate is usually referred to as a "combination rate" and may be elected by anyone who has, in addition to the usual residential equipment, an electric stove and an electric refrigerator. In short, it has been designed for the "all-electrified home." Its form is illustrated as follows:

First 60 kw.-h. or less a month	$3.00
Next 40 kw.-h. a month	3¢ per kw.-h.
Excess	1.5¢ per kw.-h.

It will be noticed that the minimum monthly charge under this rate is $3, which for the user of 60 kilowatt-hours is at the rate of 5 cents a

kilowatt-hour. Since more than this minimum amount of energy is usually consumed by lighting and other uses, and since under an ordinary rate such use would be paid for at a higher kilowatt-hour charge, the refrigeration and heating uses can be said to fall under the 1½- and 3-cent blocks. This type of rate, therefore, makes a saving over the ordinary residential rate.

GAS RATES

The rate structures of the electrical industry are much more complicated than those of the gas and other utilities. This difference is probably to be explained by three conditions. In the first place, electricity is a nonstorable product and subject to instantaneous demands for service. In the second place, there are more diversified uses for electricity than for any of the other utility services. And, last, there has been in the electrical industry an alert attitude often absent in some of the other utilities.

In the gas industry, manufactured and natural, the common form of industrial and domestic rate is the block rate. It differs from the electric block rate in that it has more blocks or steps, and often the initial step is so designed as to constitute a minimum charge. The following is an illustration of this block rate:

First 300 cu. ft. or less	$0.75
Next 4,700 cu. ft.	0 95 per M cu. ft.
Next 50,000 cu. ft.	0.85 per M cu. ft.
Next 100,000 cu. ft.	0.75 per M cu. ft.
Excess	0.60 per M cu. ft.

One variation of this rate that is fast disappearing from use is the division of the first 1,000 cubic feet into three or four blocks. The rate applicable at one time in Quincy, Michigan, illustrates this type:

First 300 cu. ft. or less	$0.75
Next 100 cu. ft.	0.25
Next 100 cu. ft.	0.24
Next 500 cu. ft.	1.80 per M cu. ft.
Next 4,000 cu. ft.	1.70 per M cu. ft.
etc.	

The cost for the first 1,000 cubic feet would be as follows:

First 300 cu. ft.	$0.75
Next 100	0.25
Next 100	0.24
Next 500	0.90
1,000	$2.14

The purpose of this arrangement is to make the very small user of gas pay at a much increased rate for the few feet that he consumes. There is nothing objectionable to this method, but it has lost favor and is being replaced by the simplified block rate.

There is a tendency to set up special rates for house-heating service, as is shown in the rate quoted in Manitowoc, Wisconsin:

Demand charge: $0.01 per month per sq. ft. of required radiation, October to May inclusive.
Commodity charge:
First 5,000 cu. ft. ..... $ 1.80 per M cu. ft.
Over 5,000 cu. ft. ..... 0.85 per M cu. ft.
Discount ..... $ 0.10 per M cu. ft.
Minimum bill ..... $100.00 per year.

The Wyoming Public Service Commission, late in 1931, approved a three-part gas rate for domestic service. In its order, the commission took occasion to make these remarks about the relative merits of the block and the three-part rate:[1]

. . . the Commission has decided to modify its original order in so far as it relates to the form of the rate structure, this for the purpose of giving the gas customers a more equitable rate than the block rate prescribed in the original order. . . .

This type of rate is quite rare for domestic service, though there is no denying the fact that such a rate is more equitable than the block rate. The form of this Wyoming rate is as follows:[2]

Customer charge per year $9.00
Demand charge per cu. ft. of maximum hourly demand per year ..... 32¢
Commodity charge:
First 5,000 cu. ft. per month ..... 52¢ per M cu. ft.
Next 15,000 cu. ft. per month ..... 46¢ per M cu. ft.
etc.

Commercial Rates.—Many of the larger American cities have discarded the single rate for all gas service. Taking the gas company of Peoria, Illinois, as an example of one of the more progressive, it will be found that it has several gas rates: a general service rate, a residence water-heating rate, a residence space-heating rate, a commercial space-

[1] *Re Cheyenne Light, Fuel & Power Co.*, P.U.R. 1932A, 136, 137.

[2] These blocks in the energy charge are the proposal of the company. The commission made some minor alterations in its final order, but the changes were not reported in the volume from which this material was taken.

heating rate, and an optional industrial rate. The industrial rate for Peoria is as follows:[1]

Demand charge:

$10.00 per C first 200 cu. ft. of hourly demand.
6.00 per C next 2,800 cu. ft. of hourly demand.
4.00 per C excess cu. ft. of hourly demand.

Commodity charge:

(*a*) when demand is 300 to 2,000 cu. ft. per hour:
$0.08 per C first 100 hr. use per month of demand.
$0.07 per C next 100 hr. use per month of demand.
etc.

In 1938, the American Gas Association made a report of its survey of gas rates in the United States.[2] Its pertinent findings are as follows: It classified gas service into eleven different groups, and rates were divided into six classes. For all classes of service and kinds of rates for the entire gas industry it found 4,724 rates. Of this number, 2,048 were used for Class I service, regular general service or domestic rate; and of this number, 80 per cent were the block-rate type. Except for special rates for highly industrialized uses, the block rate was the most common type for all eleven classes of service. The demand rate was important only in water heating, wholesale industrial and commercial service, building-heating service, and industrial off-peak service. In none of these cases, however, was the demand rate the dominant one.[3]

As our study above has indicated, as new services were developed, new rate forms have been devised. It is our general observation, however, that not enough attention has been given to the general service rate. Too many gas companies have such a broad first block that for many residential users it becomes a uniform rate.

Therm Basis of Billing.—With the expansion of the market for natural gas after 1927, it soon became apparent to the leaders of the gas industry that the conventional basis of billing in terms of cubic footage was inadequate. Natural gas has a heat value nearly twice that of the manufactured product, and, *assuming equally efficient utilization*, a

[1] Note that the symbol C stands for hundred; the symbol M, for thousand. Under the part called "commodity charge," only a portion of the *a* option is shown. The actual rate form has, in addition, a second, or *b*, option.

[2] *Statistical Bulletin* 30, May, 1938.

[3] One factor that explains the lesser development in rate making in the gas utility must not be overlooked—the storability of the product. The gas industry is not obliged to watch every change in the system load and may prepare in advance for its peaks because of its use of the gas holder and main-line pressure. Furthermore, its use is not so diversified, and consequently there is not the need for such refinements in rates as in the electrical utilities.

given amount of work would require only about half as much of it. Thus, at the time of conversion, unless the old cubic footage rate were raised or else replaced by a new basis for billing, the gas consumer would be presented with an actual 50 per cent rate reduction. This consequence arises out of the past practice of selling gas on a volumetric basis. Actually, one buys heat, not cubic footage, when he buys gas, and therefore the logical basis for such purchases would be in terms of heat. This principle found expression in the therm rate (a new basis of billing) whereby gas is sold according to heat value delivered.

By definition, a therm is 100,000 British thermal units. The therm rate, then, is identical with any other rate except for the basis of measurement of the purchase. We show here an example:

First 15 therms per month	22½¢ per therm
Next 35 therms per month	19¢ per therm
Excess therms per month	16¢ per therm

Any cubic footage gas rate can be converted into a therm rate. Suppose that we have the following block rate for gas of 540 British thermal units:

First 5,000 cu. ft. per month	$1.35 per M cu. ft.
Next 15,000 cu. ft. per month	1 00 per M cu. ft.
Excess	0.75 per M cu. ft.

Each cubic foot of this gas contains 540 British thermal units, and therefore 1,000 cubic feet would contain 540,000 such units, or, by definition, 5.4 therms. Each therm would cost 25 cents each on the $1.35 level of the older rate, 17½ cents each on the $1.00 level, and 14 cents (approximately) on the 75-cent level. Converted, the identical rate would be

First 27 therms	25¢ per therm
Next 81 therms	17½¢ per therm
Excess	14¢ per therm

Since the therm rate here illustrated is a converted form of the cubic footage rate, so long as heat value remains unchanged, the bill for a given quantity will be the same under either rate.[1] After a therm rate is introduced, it matters not to the company what changes are made in the heat contents of its product. Suppose that natural gas of 1,000 British thermal units is introduced. Under the therm rate, the same bills will be rendered for equivalent work done. Under the older rate, the change-over, as we pointed out above, would have cut bills approxi-

[1] The table on p. 405*n*, taken from an advertisment of the Northern Indiana Public Service Co. announcing the change to a therm rate, shows this exact relationship of a new and old rate.

mately in half. The theoretic soundness of this basis of billing combined with the problem of conversion to natural gas has given it much support.

At the request of the gas industry, the United States Bureau of Standards made a study of the therm basis for billing and at the conclusion of its study recommended it as a basis for the sale of gas. The bureau concluded that the future of the industry depended upon its freedom to acquire the industrial and house-heating load, which is essentially a heating service. "This freedom the industry will have if it will base its sales on heat units delivered, and with it will come a direct incentive to find the most economical methods of supplying available heat energy in every situation."[1] At the 1931 Convention of the National Association of Railroad and Utilities Commissioners, the Committee on Public Utility Rates had this to say about the therm rate: "The approval by several commissions of a therm rate for gas is an advance in rate making which should be studied and where opportunity affords adopted by other commissions."[2]

This new gas rate did not have universal acceptance of approval when it first was proposed. The Public Service Commission of Indiana faced the problem of this rate and at one time rejected it. On November 1, 1930, an Indiana company adopted it for Michigan City. In the next few months, several other Indiana towns were introduced to it. The opposition began to make itself heard, so that in the fall of 1931 the commission, after extensive hearings, revoked its previous approval. The basis of the reversal was grounded on several facts, mainly the failure of the consumer to understand the new rate and the fact that

TABLE OF COMPARATIVE CHARGES UNDER THE OLD CUBIC FOOT RATE AND THE NEW THERM RATE

Cu. ft.	Therms	Old cu. ft. basis	New therm basis
0	0	$ 1.00	$ 1.00 (Service charge)
200	1.14	1.20	1.20
1,000	5.70	2.00	2.00
2,000	11.40	3.00	3.00
5,000	28 50	6.00	6.00
10,000	57.00	11.00	11.00

Note that the new therm rate was so constructed that the cubic foot rate and the new rate were identical in effect. With the introduction of natural gas, the company would then get the same price for the new and higher heating-value gas as it did for the older manufactured gas.

[1] *United States Daily*, Nov. 6, 1930.

[2] 1931 *Proceedings*, p. 101.

the burden of questioning its reasonableness fell upon him. In passing, it was admitted that the therm basis of billing was scientific, but the commission concluded that it "offers no advantages to the gas consumers in any instance, and no advantages to the respondent utilities except in instances where natural or other gas of high content is to be served."[1] It is not without interest that in the fifty pages following the report of this case in the *Public Utilities Reports*, there are cases in a neighboring jurisdiction approving the therm rate, and one of them for two towns just across the Illinois-Indiana line.[2]

In the minority report of the Committee of Public Utility Rates of the National Association of Railroad and Utilities Commissioners, the therm rate was opposed. A minority writer said, "I am very doubtful of the advisability under present conditions of adopting the therm basis for gas rates. . . . If the therm basis were used, the company would be in a position to retain all the benefits."[3] The Des Moines Gas Company attempted to substitute the therm rate for the cubic foot rate, to take effect on December 1, 1931. Prior to this date, the city attorney of Des Moines questioned the right under the company franchise of the substitution, and the therm-rate proposal was withdrawn.

The use of this new basis of billing seems to be as follows: It was first placed in use in 1930 by the Peoples Gas Light and Coke Company of Chicago. By January 1, 1938, it had been adopted by fifty-four companies serving approximately 500 cities and towns. Thus, its use is apparently still highly restricted. The therm basis of billing has not yet been cleared of the public suspicion that it is simply a new method of exploitation masquerading in the cloak of a supposed scientific rate design. For all this, however, there is no question that its theory is sound.[4] Under proper state regulation, the therm basis of billing does deserve to replace the now common cubic footage rate.

Bibliography

See the bibliography following Chap. XX.

[1] *Re Gas Rates on the Therm Basis*, P.U.R. 1932A 113, 122.

[2] *Re Illinois Power Co.*, P.U.R. 1932A 124; *Re Calumet City Pub. Service Co.*, P.U.R. 1932A 159. Both these are decisions of the Illinois Commerce Commission.

[3] 1931 *Proceedings*, p. 104.

[4] For a contrary view, see the dissenting opinion in *Himes v. Pennsylvania Power & Light Co.*, 16 P.U.R. (N.S.) 65, 107. The main point of the dissent appears to be the disguise which a therm rate allows. Specifically, in conversions to natural gas, it was insisted that the volumetric basis of billing should be continued, although the rate in cubic footage for the newer product would be higher than the older rate for manufactured gas. As a practical problem, it is next to impossible to explain to the satisfaction of customers how natural gas at a higher volumetric rate can possibly be a rate reduction.

CHAPTER XX

RATE-MAKING THEORY AND PRACTICE (*Continued*)

WATER RATES

Water rates contrast sharply with those for electricity. They are few in number and simple in form and have a complete lack of uniformity. The explanation of this contrast is not difficult to find. Water, of all utility service, has the least diversity of use and therefore does not need a complicated system of rates. Furthermore, the use of the storage reservoir minimizes the problem of adapting rate forms to peak-use costs. Not least in importance, however, is the predominance of public ownership. The municipal plant has not been controlled primarily by the profit motive; consequently, it has had no incentive to develop other than the simplest of rate forms. The universality of use has dictated that political considerations weigh more in management policies than scientific theories of rate design. As a consequence of this combination of public ownership and simplicity of operating technique, American waterworks rates are devoid of uniformity and scientific construction, thereby setting them in sharp contrast to the rate structures and practices of other utilities.

The quarterly basis of billing predominates, although some plants have adopted the monthly interval, and a few still cling to the semiannual basis. This use of the longer billing interval is to be explained by the predominance of the flat rate, by the small amount of the bill when the monthly basis is used, and by the pressure that a public plant may use to collect its accounts. Since it costs between 50 cents and a dollar to read a meter, bill the customer, and make the collection, it is of considerable importance to the user whether his bill is rendered monthly or quarterly, especially when it is remembered that on the latter basis it will seldom equal one month's bill for electricity. Thus, although quarterly billing would lay a heavy burden on an electric company in the matter of its working capital requirements, it does not have the same effect on waterworks. If an average quarterly water bill does not exceed a monthly electric bill (a common relationship), the working capital requirements of the two utilities will be approximately the same.

Finally, the public plant has an advantage in the matter of collections not possessed by a private company and can therefore afford to

use quarterly billing. In addition to the threat of severage of service to enforce payment—a power of all utilities regardless of ownership—the public plant can file its unpaid accounts as tax liens on the property served, even though the delinquent customer is not the owner of that property but only a tenant. Thus, the risk of unpaid bills is reduced to a minimum, thereby making the quarterly billing interval the preferable one. In fact, we conclude that the monthly interval is uneconomical to the point of recommending public ownership in order to eliminate it.

An all too common form of water rate has been the flat rate, a stated sum per month or quarter, regardless of quantity of water used. This rate has no advantages and many defects. First, such a rate discriminates against the small user, who pays as much as the large user. Second, and more important, this rate encourages extravagance and waste. There is the temptation to waste water and to neglect the repair of defective outlets and faucets. This was the experience of the city of Chicago, which had the flat rate until the early 1920's. In that city, the opposition to metering of water was sufficiently strong to prevent the installation of meters until the issue was forced by a decision of the Supreme Court of the United States.

Some water companies use a modified flat rate, a nonmeter rate based on fixtures in use. The following illustration is an exact copy of a 1939 rate of Clinton, Iowa:

One family, one faucet, four rooms or less	$5.33 per year
Each additional room	1.33 per year
Closet, self-closing, used by one family (closets not self-closing must be metered)	4.00 per year
Bath, used by one family	6.66 per year
Sprinkling and use of hose not permitted unless metered	

A modest, modern home under this rate would pay a minimum bill of $16.00 a year, or an average of $1.33 per month. For a larger house with more outlets, the bill would be considerably more, and the prohibition of sprinkling would probably mean that its occupant would choose to be billed under an optional meter rate. All that has been said about the defects of the flat rate applies to this modified rate, and, in addition, it is based on the questionable assumption that there is a correlation between use and fixture installation.

Where the meter rate is used, it ordinarily is the block form, as shown on page 409:[1]

[1] Of course, this rate form is equally available for measurement in gallons. Converting the foregoing illustration to the latter measure it would be, approxi-

First 5,000 cu. ft. per month	29¢ per 100 cu. ft.
Next 45,000 cu. ft. per month	14¢ per 100 cu. ft.
Excess	9¢ per 100 cu. ft.

Usually, such a rate as this is the general rate for all types of consumers. In larger cities, there are industrial water rates designed along the lines of the Hopkinson rate for electricity. In at least one instance, a proposal has been made to standardize the form of water rates, but as yet nothing has come of it.[1]

The Special Problem of Fire Protection.—The water utility has the special obligation of being ready at all times to furnish water at the proper pressure and quantity for fire protection. In rare cases, water facilities for fire protection and domestic use are separate; but ordinarily, the same company furnishes both services by means of a common plant and mains. It is this close relation to fire protection which in part accounts for the age of this industry. In order to meet those infrequent and unpredictable demands for fire protection, it is necessary that water companies build their plants and mains larger than the domestic use would require. In addition, they must be prepared, upon instantaneous notice, to increase their main pressure. Adequate protection also requires the installation of hydrants at strategic distances. All these items create both additional fixed and operating costs which are properly chargeable to the citizens as a whole and not to the regular customers of the water company.

It was not until after the turn of the century that the question of the adequate charge for fire protection was given its proper attention. The practice had grown up of charging a "hydrant rental" which bore no necessary relation to the cost of the service rendered. An examination shows that rentals have varied from a minimum of $10 to $100 per year, with the majority of the figures falling between $30 and $60. The opinion of one expert is that the minimum that may be expected in water rentals is $40 per hydrant.[2]

It has been one of the classic statements of water-works men that half of the cost of the entire equipment was made necessary for fire protection. Experience of many engineers shows this is more or less true in very many

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mately (1 cubic foot equals 7.48052 gallons):

First 37,400 gal. per month	40¢ per 1,000 gal.
Next 3,366,000 gal. per month	19¢ per 1,000 gal.
Excess	12¢ per 1,000 gal.

[1] See the proposal of the New England Waterworks Association, as outlined in Barker, *Public Utility Rates*, p. 265.

[2] BARKER, *op. cit.*, pp. 252, 253. Chapter XIII presents a comprehensive analysis of the problem of the proper charges for fire protection.

cases, and is probably based on conditions which prevail in cities of 25,000 to 50,000 population. But that figure is not necessarily true in any one city, so influential are the special local conditions. It has been stated by well-known experts that the cost of that part of the physical water-works plant required for fire protection over domestic and commercial service probably ranges from 10 to 20 per cent in the largest cities, and 20 to 30 per cent in cities of about 100,000 population, to 60 or 80 per cent for places of 5,000 or less.

It should be apparent that the maximum demand, or "draft," as it is called, that a water company must be prepared to supply is the sum of the potential demands for domestic use and fire protection. Of course, domestic service is benefited by facilities designed to give fire protection, and therefore some part of the cost of being ready to serve this latter demand can be passed to the domestic users. Conflagrations come but seldom; and when they do, the domestic use becomes secondary in importance and can afford to give way to the fire demand because of the benefits gained at all other times. In summary, the hydrant rental charged for fire protection should cover those additional costs of plant and equipment which that service clearly requires plus costs of maintenance and water consumed.

Because of the predominance of public ownership of this utility, one practice has grown up that merits critical examination. Should a city be charged by its waterworks for fire protection, or should this be rendered "free"? The problem is not changed, either, by making a nominal charge, because any service rendered that is in part or wholly free means higher rates to other customers. It may be answered that we are raising a nonessential issue because taxpayers pay the costs of fire protection by either method; they pay either in the tax bill or in the water bill. It should be recognized that this answer assumes a high correlation between the amount of water consumption and taxpaying ability. If the facts bear out this assumption, then the burden of fire protection is similar whether paid through taxes or through water bills. Examination shows, however, that such an assumption of correlation is questionable. Therefore, since fire protection is a protection to property owners and not to water users and is one of the proper functions of local government, its cost should be included in tax levies and paid to the waterworks whether privately or publicly owned.

TELEPHONE RATES

A study of telephone rates and rate forms, in a sense, is a study of the history and growth of the telephone itself. When it was first conceived, the telephone was thought of as a two-way connection, and

its rates were accordingly expressed in terms of an annual rental. For instance, in an early advertisement, we find the following statement:[1]

> The terms for leasing two telephones for social purposes, connecting a dwelling house with any other building, will be $20.00 a year; for business purposes $40.00 a year, payable semi-annually in advance, with the cost of expressage from Boston, New York, Cincinnati, Chicago, St. Louis or San Francisco.

Obviously, this shows no thought of the use of a central exchange, and the lessee would apparently furnish his own connecting lines. On the other hand, several fundamental rate policies yet used by the Bell System are seen in this advertisement. First, the rate is a flat type, still common for local service. Second, it is payable in advance. For all but toll service, this is the present practice. Third, the equipment of the company is leased, not sold, to the subscriber, a policy from which the Bell System has not wavered.

After the central exchange was developed whereby a subscriber could be connected to any other subscriber, new and improved rate forms were, of course, devised. For instance, in 1885, the following were the rate schedules for New England telephone subscribers in cities of 20,000 population and over:[2]

Business:	
Special wire, per month, ½ mile or less from central office	$6.25
Two on a line, per month, ½ mile or less from central office	5.00
Three or more on a line, per month, ½ mile or less from central office	4.16⅔
Residence:	
Special wire, per month, ½ mile or less from central office	$6.25
Two on a line, per month, ½ mile or less from central office	4.16⅔
Three or more on a line, ½ mile or less from central office	3.33⅓

This schedule has set the pattern for local service. The rate per month has declined, and the base-rate area has grown from the original half mile to many miles in the larger cities, yet the essential pattern has remained. At present, the telephone systems render a myriad of services for which they have devised one rate form or another. In general, all telephone rates can be grouped into five classes:

1. Local service rates.
2. Toll service rates.

[1] STEHMAN, *Financial History of the American Telephone and Telegraph Company*, p. 7. The author has taken this quotation from a study of the Bureau of the Census, *Special Report* on Telephones and Telegraphs, 1902, p. 65.

[2] *Ibid.*, p. 47.

3. Special-contract service rates.
4. Leased-wire service rates.
5. Rural service rates.

Local Service Rates.—Local service rates are those which apply to practically every city and town in the United States. For each place receiving service, a base-rate area is established, which usually, though not always, corresponds to its city limits and within which the standard rate schedules apply.[1] Local rates are subdivided into several classes such as residence, business, semipublic, and public service.

The residence service rate may be either of two types—the flat or the measured. The *flat rate*, as the name implies, is a single monthly charge paid by all users regardless of the amount of use. Some price distinction is made among the one-, two-, and four-party line; for example:

One-party line, per month	$3 00
Two-party line, per month, per party	2.50
Four-party line, per month, per party	1.75

The reductions for the two- and four-party line are understood in the light of the possible conflicts in service and reduced privacy on these lines. The policy of the telephone companies has been to discourage the use of four-party lines. This type of rate is quite common in towns under 50,000 population.

In addition to the flat rate, there is a *measured service rate*. Originally, this rate was collected by means of a coin-box telephone located in the residence of the subscriber. The coin box has now been replaced by a meter installed at the central office, by which completed calls are automatically recorded. On the basis of theory, this latter rate is superior to the flat rate and should find its way into wider use, especially in the larger cities. It is patently unfair to charge a rooming house the same rate as a private residence. To meet the problem of small usage, measured service usually has a minimum monthly charge of $2.00 or $2.50, which at 5 cents a call would equal 40 or 50 calls a month.

For those places desiring urban service but outside the base-rate area, a mileage charge is added to the standard rate. It is common practice to divide the distance between the limits of the rate area and the user into eighths of a mile, adding 20 or 30 cents per unit of distance to the base rate of the city to which such a special customer is connected.

[1] For a discussion of proper boundaries of a base-rate area, see *Eisenberg v. Bell Telephone Co.* (Pa.), 25 P.U.R. (N.S.) 148.

Business service rates are ordinarily of the same type as residence rates, except that the monthly charge, under the flat rate, is higher. For instance, using the foregoing illustration of flat rates, the business rate might be $6. It is not a rule but often the case that the business rate is twice the residence rate. With metered service, the one difference might be a reduced per call charge and a higher monthly minimum.

For users of a large volume of service, such as hotels, office buildings, and large business organizations, the *private branch exchange* (commonly referred to as P.B.X.) has been developed. For this service, the charge is based on the number of calls, such as 3 cents for each call, originating within the exchange. The subscriber for a private branch exchange supplies the necessary telephone operators who in turn are definitely responsible to the telephone company.

The semipublic service rate is available to those concerns from which there are not enough calls by the owners to justify a business rate but which have a large amount of outside use by others. There is no charge for incoming service; the outgoing calls pay, say, 5 cents each. There is usually a guarantee of a minimum income by the subscriber equal to the business rate, coupled with a percentage split of the excess over this amount. Of course, these features apply only to income from local calls; all toll revenue accrues to the telephone company.

Public Service. The fourth local telephone service is public service, or the pay telephone, such as is found in every hotel, drugstore, and railroad station in the larger cities. These telephones are not listed, and, ordinarily, no incoming service is available. They are designed for local and long-distance calls, the charge being deposited in a coin box attached to the instrument. These telephones are an important source of revenue to the city companies.

Toll Service Rates.—Toll service applies to all those calls between cities involving the use of long-distance lines. In case cities lie adjacent to each other, as is found in many of the suburban areas around the large cities, no long-distance connections may be necessary; and for the purpose of telephone calls, the rules and practices of intracity calls may apply. Suppose, however, that a person in Chicago wishes to talk to someone in Cincinnati. The Chicago operator will switch the call to a long-distance operator who, by the use of long-distance lines, will reach the desired person in Cincinnati. The available rates depend on the time of day and the desires of the caller. They are

Person-to-person rate	24-hr. service
Station-to-station rate	Day service
Station-to-station rate	7:00 P.M. to 4:30 A.M.

The person-to-person call is the most expensive of toll rates and is available 24 hours of the day. It has the advantage of permitting no one to receive the call but the person sought. A report charge is levied on the originating party in case the other person cannot be located and a report is desired by the first person. The amount of this charge is based on the standard 3-minute rate applicable to the connection attempted.

The station-to-station rate for day service (4:30 A.M. to 7:00 P.M.) is cheaper than the person-to-person call. For such service, the call is considered completed when anyone who is entitled to use the telephone at the terminating end receives the call. In case the originator of the call is fairly certain that the person he is calling is near that telephone, it is to his advantage to use this rate.

The station-to-station night rate is similar to the day station-to-station rate but lower to stimulate off-peak use. As indicated above, it applies from 7:00 P.M. to 4:30 A.M. and all day Sunday and holidays. The night rate is about 40 per cent below the day rate. In order to realize this decrease, the call must be of sufficient distance to have cost at least 40 cents under the day rate. Both this and the station-to-station day rate are available only where the telephone receiving a call is classified as a residence telephone.

Long-distance toll charges are based on a 3-minute minimum time interval and calculated on a modified mileage basis. For calls in excess of 40 miles, the telephone area has been divided into blocks, and the blocks grouped into sections. Each block is 7 miles square, and each section is a group of twenty-five blocks, or 35 miles square. A central point in each block is then established. The air-line distances between these focal points are the basis of toll fixing. These blocks and sections are used as follows:[1]

> Between 40 and approximately 350 miles, rates are based upon the computed air-line distance between the centers of the 7-mile blocks, and all points in a given block take the same block rates. For distances greater than 350 miles, the rates are based upon the air-line distance between the centers of the 35-mile sections, and all points in a section take the same section rates.

Special-contract Service Rates.—A third type of telephone service is sold under special-contract rates. This service covers short and full periods, off time, and certain instruments such as the teletypewriter. Radio broadcasting, whereby programs are carried by wire from a key station to a group of broadcasting stations, is served under both short- and full-time contract rates. An arrangement whereby a factory or

[1] HERRING and GROSS, *Telecommunications*, p. 179.

business in one town is connected with its branch establishments in neighboring towns every business day for a specified interval of time is another illustration of the short-period arrangement. Teletypewriter service, placed on a commercial basis in 1931, is leased for use to newspaper and other businesses and is sold under special-contract service rates.

Sometimes a question is raised as to the extent of this special-contract service. For instance, in 1931 in New York there was an application by a company proposing to distribute wired music programs, which was refused by the New York Telephone Company. The applicant insisted that his request was similar to the service furnished the broadcasting companies. On the other hand, the company took the position that it did not hold itself out to perform that service; that all special-contract service was rendered by means of its surplus capacity; that if wired music became a success, the company would be forced to build new facilities to handle it. Upon appeal to the New York Commission, that body found the request similar to the service for stock-ticker, radio, and burglar-alarm companies and thereupon ordered the applicant served.[1]

Leased-wire Service Rates.—A fourth type of telephone business covers those special arrangements of an extraordinary nature between telephone systems and other businesses. Obviously, these are services for which the telephone companies do not hold themselves out and for which there are, as a consequence, no standard contracts or rate schedules. Each contract is the result of individual bargain and arrangement and subject to the needs and facilities of the respective parties. Illustrations of leased-wire service are those special arrangements with the press, brokerage offices, and telegraph companies.

Rural Service Rates.—For rural rates there is no standard pattern. Farm telephone lines are of two types—those owned by the commercial telephone companies and those owned by the farmers themselves, commonly referred to as "service lines." For those telephones and lines owned by the commercial companies, the charge is usually a flat monthly rate, regardless of distance from town; and the service is a multiparty type. Whenever automatic instruments are used, the maximum number of parties per line is usually restricted to eight. The flat rate for multiparty farm service varies. Common practice is to charge the town single-party telephone rate. Of course, any farmer may have city service by paying the city rate plus a mileage rate from

[1] *Re New York Telephone Co.*, P.U.R. 1932A 262; rehearing and order affirmed, P.U.R. 1932A 433. Following this order, a standard rate form has been devised covering this type of service.

the limits of the base-rate area to his farm. The service lines of the rural mutual telephone associations are generally maintained by their owners. At a near-by town, they are connected to the lines of a commercial telephone company and thence to the latter's switchboard. For this switching service, a small charge of, say, 50 cents a month per telephone is made.

The Theory of Telephone Rates.—On the basis of this description of telephone rates, what shall we conclude to be the theory, if any, behind them? Do they bear any relation to any definition of cost? It would appear that there is none, that the only rule of telephone rate making is to "charge what the traffic will bear." There can be but little doubt that this explains many telephone rate practices. Yet the cost basis of rate making is not entirely overlooked, because it obviously is behind the actual service classifications in use. Even the relatively low night station-to-station rate, although designed to appeal to use of low demand intensity, does not ignore cost, because it is at least enough to cover the particular operating costs incurred. In conclusion, we cite the observation of two authorities, that[1]

> Telephone rate structures, therefore, represent attempts to balance cost and value factors and, as a general rule, distribute equitably among the customers the costs of furnishing telephone service.

TELEGRAPH RATES

Telegraph rate theory and practice are quite similar to those of the telephone companies. In other words, telegraph companies classify types of messages and charge on a mileage basis for a minimum number of words, the minimum depending on the type of message. The American telegraph companies classify their service into the following groups:

Telegrams.	Press messages.
Night messages.	Government messages.
Day letters.	Serial service.
Night letters.	Timed-wire service.

The telegram is the fastest and most expensive message. The night message, day letter, and night letter move more slowly and at less cost. Press-message rates are of two types, day and night, and materially less per word than commercial messages. Government messages may be of the first four types set out above; and although they take priority over commercial messages of the same type, they are sent at about 40 per cent of the commercial rates. Serial service and timed-wire service

[1] HERRING and GROSS, *op. cit.*, p. 180.

are special arrangements for the press, bankers, industrial concerns, and brokers. These services compete with similar special services offered by the telephone companies. Distances are computed on basing points, either a center point of a state or a center point of squares similar to the block and section of the telephone companies. Since we have given a detailed description of telephone rate design, we shall be content with this very brief sketch of telegraph rates.

URBAN TRANSPORTATION RATES[1]

The question of urban transportation rates has been one of more than academic interest in the years since 1920. Street-car systems have been faced with declining traffic and declining revenues. Many of these companies have found that their rates are approaching the customers' value of the service and that therefore raising rates does not increase but lowers gross revenues. The commissions are aware of this problem and have been quite willing to approve many new and novel fare and service experiments.

In the early days of the street railway, the nickel (5-cent) fare for one continuous ride was the usual thing, with or without a small additional charge for a transfer. Although there was occasional protest that the 5-cent fare was excessive, rate litigation prior to 1916 was rather uncommon. But with 1916, prices began to rise, thereby increasing operating expenses; and later, the private automobile cut in on gross revenue, so that the street railway found itself with the twin problems of rising costs and decreasing income. At first, this situation was met with fare increases to 6; then to 7; and finally, in many cases, to 10 cents for a single continuous ride. Often, however, these increases failed to help much, because, as was pointed out above, the maximum demand of many riders had been reached, and therefore each fare increase curtailed use and reduced gross revenues.

In order to stimulate new patronage and retain the regular patron, reduced fares have been offered in the form of tokens or tickets bought in groups. For instance, a fare schedule might be 7 cents for a single fare, four tokens for a quarter; or, with an 8-cent fare, five tokens for 35 cents. The theory of this fare schedule is that the occasional rider will pay the single (and higher) fare. He is the one who crowds car or bus facilities on stormy days, discommoding regular patrons, and should therefore pay more. This theory is ineffective unless the charge for tokens or tickets is high enough to discourage purchase by the occa-

[1] This section is closely related to the chapter on "The Decline of the Street Railway," because many of the rate experiments were the result of the straitened circumstances of that utility.

sional rider. Thus, at 25 cents for several tokens, many will buy them who might not if they were sold in blocks costing 50 cents or more.

Another device, the weekly pass, eliminates the need of paying fares of odd amounts and stimulates both regular and additional use. It was first tried out in Racine, Wisconsin, in August, 1919, and has been in use in several American cities. A fixed amount, say a dollar, is paid for a pass good for unlimited service during the week. This may or may not be transferable, usually not. This system has the defects of permitting abuse and giving almost continuous service to anyone who cares to use it.

A variant of the weekly pass is the nickel pass which, when presented to a conductor, requires a cash fare of 5 cents. If the standard fare is 8 cents, and if it is estimated that a regular patron uses the service twice daily, or twelve times a week, the charge for the pass itself might be 35 cents. This type of fare system has three advantages. First, it eliminates odd cents in the fare. Second, it charges the rider a stated amount to cover fixed costs, irrespective of use, thus resembling the demand charge of the Hopkinson rate. Third, it encourages off-peak use, a most desirable consequence to transportation companies because of the minimum unit of service required. Electric and gas companies can accommodate their facilities to almost any minimum demand, but transport companies must operate a car or bus and at not too infrequent intervals, even though it travels almost empty. Therefore, at off-peak periods actual facilities are already available for added patronage.

Other fare devices have been used to increase revenue. One of the problems of the city railways has been to distinguish between the short and the long haul. It has been possible to ride the street cars in Chicago the distance of 25 miles or the elevated railways almost indefinitely for one fare. Such facts as these indicate the necessity of zoning, because if all rides were long ones the street-car companies would soon be bankrupt. If one wishes to live at the city limits, 10 or 15 miles from the business district, why should he not pay two or three fares for his privilege? Some larger cities have a modified zone-fare system, charging a second fare as the patron is carried beyond the city limits into the suburbs. There should be more zoning; but the practical problem of collection at the zone limits, with its inevitable delay, has presented an important barrier. The zone system has found greater favor in Europe, where speed is less desired.

Another problem has been created by rising peak loads and declining load factors. One of the rate devices to meet this situation, often associated with Cleveland, is a 3-cent fare in the shopping district.

This fare makes it cheap for the shopper to ride between points in the business district, with but a nominal charge for service. Another system, the shopper's pass, permits unlimited use during off-peak periods, thereby increasing early afternoon and evening loads. Another plan has been to arrange special contracts with merchants, whereby on sales days tickets are issued for service good at off-peak hours. For this service, the transportation company is paid an agreed sum.

The problem of street transportation rates is particularly difficult of adequate solution because of several peculiar circumstances. First, it is almost impossible to set up a practical rate that approximates sound rate theory. Any attempt to set up a rate based on the theory of charging the patron in accordance with the fixed and operating expenses has so many problems of application as to prevent its use. In the second place, the unit of service for single fares requires the use of even money, whereas in the other utilities the unit charge may be, and is, often graduated in hundredths of a cent. Thus, a 7-cent fare may cause a loss, but an 8-cent fare yields an excess. Only the use of tickets or tokens will permit an intermediate figure involving fractional amounts.

DISCOUNTS, MINIMUM BILL, AND SERVICE CHARGES

The rate illustrations presented above were purposely described without reference to the minimum bill or other secondary features that ordinarily accompany all electric, gas, and water rates. These features involve certain special problems; consequently, their analysis has been reserved for special treatment.

Minimum Bill.—The usual utility practice in rate design has been to specify a minimum monthly charge for all rates except those which separate demand and commodity charges. For these latter types, the charge made for the demand of the customer is payable monthly, regardless of his use, and is thus a minimum bill in itself. In fact, compared with the minimum requirements of one-part rates, it is scarcely comparable to them. The theory of the minimum charge is to recover at least a part of the meter reading, billing, and collecting costs from each customer. The usual minimum bill is 75 cents or a dollar. The extremes are 25 cents to $2.50 for residential customers, but the majority are the figures above, with the dollar charge favored.

The one weakness of the minimum charge is in its application to those few customers whose use would cost slightly less than the minimum. Suppose that a customer pays a 5-cent rate and uses 18 kilowatt-hours. His bill would be 90 cents. If the minimum bill is $1,

he would then pay the minimum. The company loses money on this class of customers—more, in fact, than on those who consume no service during a billing interval.

Service Charge.—The service charge is a stated amount per meter per month and is independent of use. There is no standard agreement as to what items of expense should be included, but it usually covers those customer costs which are incurred in meter reading, billing, and collecting, and possibly something more. In the words of Mr. Justice Cardozo, "A service charge is an attempt to make the incidence of the burden as wide as the incidence of the benefit."[1] An illustration of this type of charge for gas would be

Service charge	$0.75
Commodity charge	1 30 per M cu. ft.

The service charge has met considerable opposition from persons who regard it as discriminatory and as something extra, over and above a reasonable rate. Mr. Justice Cardozo, in *Rochester v. Rochester Gas and Electric Corporation*, found it necessary to pass on these questions, and he sustained the service charge against every attack. He said, "A service charge is not something in addition to the price that would otherwise be fair and reasonable." Further on, he said, " . . . we see no escape from the conclusion that a service charge, reasonably computed, and moderate in amount, does not involve *per se* an illegitimate discrimination between classes of consumers." He found that service charges had been sustained by the courts of Louisiana and Rhode Island and by the commissions of thirty-eight states.[2]

On the other hand, the Public Service Commission of New York has gone on record as opposed to the service charge. It raised certain theoretical objections and ended by stating:[3]

> Whatever may be said regarding the accounting or theoretical justification of a service charge, *the important fact to be considered, after all else has been said, is that the service charge often arouses great opposition.*

Acting on this position, the proposal of certain New York companies for a 60-cent service charge was rejected in favor of a $1 minimum charge. It is significant, however, that at least three commissions

[1] *Rochester v. Rochester Gas & Electric Corp.*, 233 N.Y. 39, 44 (1922).

[2] An additional point which does not involve the principle of the service charge was raised in this case—that the New York Law prohibiting rentals on gas meters applied to the service charge. Mr. Justice Cardozo answered this contention: "We are satisfied that it [the service charge] is not rent, within any fair construction of a penal statute, when profit is excluded." *Ibid.* at 53.

[3] *Re Rates and Rate Structures.* P.U.R. 1931C 337, 347.

approved the service charge during the year in which the New York disapproval occurred. The Massachusetts Commission allowed a 50-cent service charge and had this to say:[1]

> Service charges . . . have been based upon the theory that a certain amount of property and service is furnished for the exclusive use of each customer and that in equity and justice to the other consumers the cost of maintaining this property and furnishing this service should be borne by the customer to whose use it is exclusively devoted.

The Railroad Commission of California at one time placed its approval upon the service charge for natural gas and electricity.[2] The Wisconsin Commission has also considered the relative merits of the minimum charge and the service charge, approving of the latter in these words:[3]

> We are of the opinion that a rate schedule which provides for a monthly service charge to be paid irrespective of whether or not the customer uses any energy is a more scientific rate at least in so far as residential and commercial lighting service is concerned than the prevalent types of electric rates in this state which provide for a minimum bill under which some energy may be used.

This same conflict of attitudes has continued to show in the cases, with the majority favoring the service charge. Among those groups favoring it, there is dispute as to the items to be included. At least, there should be covered the customer costs of meter reading, billing, and collecting, and possibly some of the demand costs. It has been commonly said that customer costs amount to about one dollar per month per meter. With this sum as a guide, it is obvious that many service charges do not cover all customer costs, let alone any part of the demand costs.

Penalties and Discounts.—To stimulate prompt payment, it has been the usual practice to bill customers at a gross rate, allowing a discount if paid by a certain date, usually 10 days after mailing the bill. If the discount is not used, the other device is to bill at the net rate, adding a penalty if the bill is not paid within a given time interval.[4] In the electrical utility, the discount might be as follows: 1 cent per kilowatt-hour. In the gas utility it may be a discount of 10 cents a

[1] *Re Customers of Boston Consol. Gas Co.*, P.U.R. 1931D 358, 360.

[2] It would appear, however, that the California Commission has changed its view on this matter. See *Re Pacific Gas & Electric Co.*, 1 P.U.R. (N.S.) 1, 7, in which preference is shown for the minimum bill over the service charge.

[3] *Re New London* P.U.R. 1931E 369, 370.

[4] Of course, the penalty and discount are but the opposite methods of securing the same end—prompt payment of bills. See *Public Service Comm. v. Kansas City Power & Light Co.* (Mo.), 2 P.U.R. (N.S.) 391.

thousand cubic feet; and in the telephone business, a flat discount of 25 cents. Substitute the word "penalty" for "discount," and these illustrations serve for the penalty device. The percentage type of discount and penalty is also used. The discount is used more often than the penalty. The Wyoming Public Service Commission has expressed its preference for the discount in these words:[1]

> The Commission is strongly of the opinion that instead of permitting a penalty for delayed payments, an inducement in the form of a discount should be given in order to encourage the prompt settlement of bills. . . .

This preference still holds among the commissions, although some are critical of any prompt payment stimulant.

A stated discount, such as 1 cent per kilowatt-hour or 10 cents per thousand cubic feet, has been the common amount. This form of discount has created an interesting problem with declining average rates. When a 10-cent top was common, a 1-cent discount was a 10 per cent discount. Now that 5 cents per kilowatt-hour is not uncommon, a 1-cent discount becomes 20 per cent. How much should a customer be penalized for failure to meet a discount date? One answer has been to allow any customer with a previous record of five or more consecutive prompt payments to claim his discount if late in payment. This permits an occasional mental lapse without penalty. A second answer is to use a graduated penalty scale, adding, say, 5 per cent for 1 to 5 days' delinquency, 10 per cent for more than 5 but not more than 10 days' deliquency, etc. Above all, any system of discounts or penalties should be handled with such discretion that its use accomplishes its purpose—prompt payments. If it becomes a source of revenue, something is amiss. At all times, its rigid enforcement must not be allowed to effect community public relations. In our opinion, the need for a prompt-payment stimulant has been exaggerated. Good public relations coupled with the best of collection techniques can do better to gain prompt payments than either penalties or discounts.[2]

PROMOTIONAL RATES

Each period in the history of the electrical utility has had its catch phrases. In the early 1920's, the phrase was "super power." In the 1930's, one phrase was "promotional rates." What is a promotional rate? Obviously, it is one that stimulates additional consump-

[1] *Re Cheyenne Light, Fuel & Power Co.*, P.U.R. 1932A 136, 138. One state, Massachusetts, in 1936, outlawed the addition of the penalty to utility bills. See 30 P.U.R. (N.S.) at 263.

[2] We have as support to our position Nash, *Public Utility Rate Structures*, pp. 297, 298.

tion. When is a rate form promotional? That is not an easy question to answer. Any rate, except the uniform rate, can be promotional in effect. It appears, however, that a promotional rate is one that charges a reasonably high price for a few units of service, then quickly drops to a low charge. This can be illustrated by the block rate. Suppose that the customer cost is 75 cents. Suppose, further, that the demand cost is $2 per kilowatt and the average householder has a maximum demand of 800 watts, or 0.8 kilowatt. Each month, then, the sum of these costs would be $2.35.[1] If energy cost is 1½ cents per kilowatt-hour, the following rate would be truly a proportional rate:

First 50 kw.-h.	6.1¢ per kw.-h.
Excess	1.5¢ per kw.-h.
Minimum bill	$2.50

Fifty kilowatt-hours would cost $3.05, which would cover the energy cost for that amount of consumption and the demand and customer costs incurred. Note that all additional use would cost but 1½ cents per kilowatt-hour—definitely a stimulant to further use.

Here we wish to comment on the excessive solicitude shown at times for the welfare of the user of small amounts of service. It is a cardinal rule in rate making that each customer should pay at least the special costs incurred in serving him. Anything less means that other users pay the deficit, and they would thereby be better off had these losing customers not been served. The interest in promotional rates has brought this fact to light. Generally, too many rates have not started high enough in the first block and therefore must be too high in the lower blocks. It is our opinion, therefore, that the promotional principle of rate design will be best served either by such a rate as illustrated above or by the service-charge type of rate, provided the amount of the service charge is high enough. So long as the predominant theory of utility rates is a cost theory, it seems to us quite unfair to serve any fraction of users, be they residential or industrial, at rates that return less than the special costs involved in their service.

UNIFORM-RATE AREAS

The final question that we have chosen to discuss relates to the area for which rates should be established. There are two extremes—individual rates and nation-wide rates—but our problem falls somewhere between except in unusual situations. An especially large industrial customer may justify a special rate; the Bell System may promulgate nation-wide long-distance tolls. For ordinary utility

[1] $0.75 + (0.8 × $2.00) = $0.75 + $1.60 = $2.35.

service, what should be the area unit for rate making? Historically, each utility, even the telephone, was an isolated unit serving a town or even a part of a town. It was only natural, under such operating conditions, that each municipality was considered a unit for rate making. Soon, however, several of the utilities began a process of expansion and integration of facilities, until the continued use of the municipality as a rate area involved complex problems of allocation of joint facilities, creating serious complications and incongruous results. First it was the telephone that outgrew the city; then electricity; and, most recently, natural gas.

Utilities and commissions have been prone, in many cases, to adopt uniform rates for their areas of service. Uniformity can be either in the form of the rate or in the form and amount of charge. For instance, one electric power company has adopted a block rate for all the communities that it serves; that is, there is the same number of units per block and price per unit to all residences in all places. This rate, then, is uniform as to form and level. Illustrations of this practice can be found in many areas in which there are neither a large number of small hamlets nor great metropolitan centers. The rate structure of the Pacific Gas and Electric Company illustrates uniformity of form but not of level. That company serves 724 communities, ranging from San Francisco to unincorporated hamlets. The California Commission has authorized the grouping of towns for rate-making purposes, each group being served by a rate of uniform level.[1] For the Bay area, the rate level was the lowest; for the unincorporated and semirural places, the level was the highest. These differences in classification were based on the relative distribution costs per customer in the respective groups.

There are many advantages in uniform rate forms. In the first place, it is difficult to justify the many different forms used in the past. The same company would have a block rate in one town, a room rate in another, a Wright rate in another, a service-charge block rate in another, etc. Public relations are better served by rates at least uniform in form. Uniformity in level can likewise be defended for many areas. Differences in distribution costs are often too slight to be recognized in rate making. In addition, cost allocation of joint facilities always creates a real problem. It is thus easier to ignore that problem (except as operating areas are interstate) by fixing rates of uniform form and level for the entire area. Valid objections to uniformity, therefore, must be directed towards the level, not the form.

[1] *Kentfield v. Pacific Gas & Electric Co.*, 13 P.U.R. (N.S.) 400, and cases there cited.

It can be argued that the uniform rate level in a diverse area discriminates against users in a congested section in which the per customer distribution cost may be very low. In so far as there may be marked differences in population densities of the communities of an operating area, the classification of cities and the establishment of a uniform rate level for each class is a defensible practice. Also, special franchise burdens in a particular city may justify a higher level for that place.[1]

One significant legal problem stands in the way of uniform rates. When early public service laws were passed, they generally specified or implied that the municipality was to be the rate area. Under such statutes, uniform rates can be prohibited. Where the state laws permit otherwise, the use of the operating area seems to be valid.[2] In the leading case on this question, the Supreme Court of the United States said:[3]

> Normally, the unit for rate-making purposes, we may assume, would be the entire interconnected operating property of a utility used and useful for the convenience of the public in the territory served, without regard to particular groups or consumers or local subdivisions.

Although this case held that the Indiana law did not allow uniform area rates, it definitely approved of that principle, state law permitting.

A study of the Federal Power Commission shows the extent to which electric rates have been made uniform in operating areas.[4] Thirty-eight companies were found to be serving 2,035 communities with a uniform residential rate. The study found, further, that forty-five companies were serving similarly three-fourths or more of their 4,176 communities. Finally, the report shows a definite trend since 1920 toward uniformity. Whereas the figures for forty-three utilities showed the average number of residential rates per utility to have been twenty-seven in 1920, the average had fallen to six by 1935.

[1] *Elmhurst v. Western United Gas & Light Co.*, 363 Ill. 144, 13 P.U.R. (N.S.) 441 (1936). See also *Re Consumers Power Co.* (Mich.), 14 P.U.R. (N.S.) 36.

[2] In 1929, Wisconsin added this provision to its law: "For rate-making purposes the commission may consider two or more municipalities, as a regional unit where the same public utility serves said municipalities, if in its opinion the public interest so requires." Wisconsin Stat. §196.03(2). The Indiana law was amended in 1933 in order to permit the establishment of uniform area rates. This amendment thus corrected the legal defect that had accounted for the decision in the Wabash Valley Electric case, cited below. See Burns Indiana Stat. Ann., §12678, 1933.

[3] *Wabash Valley Electric Co. v. Young*, 287 U.S. 488, P.U.R. 1933A 433, 437 (1933). The holding in the case turned upon an older Wisconsin case deciding that the municipality was the logical rate area.

[4] "Electric Rate Uniformity," *Rate Series* No. 7.

Bibliography

The literature on rate theory and rate design is scattered. Every utility company of consequence has a rate file for public inspection. Students of public utilities are urged to consult the rate files of a near-by company. In addition to the footnote references of Chaps. XIX and XX, we recommend for further reading:

Federal Power Commission: *Electric Rate Survey.* See especially *Rate Series* No. 7, entitled "Electric Rate Uniformity." (This series of studies deals more with matters of rate levels and related problems and only incidentally with rate design.)

———: *National Power Survey.* See especially *Power Series* No. 3, entitled "Cost of Distribution of Electricity."

HAVLIK, HUBERT F.: *Service Charges in Gas and Electric Rates,* Studies in History, Economics, and Public Law No. 435, Columbia University.

HERRING, JAMES M., and GERALD C. GROSS: *Telecommunications,* Chaps. 6, 7.

NASH, L. R.: *Public Utility Rate Structures.* (This is the standard work on the subject of rate design.)

CHAPTER XXI

THE PROBLEM OF ADEQUATE SERVICE

We are now ready to inquire into the second of the primary problems of regulation, that of adequate service. Contrary to the problem of reasonable rates, this one can be disposed of in a single chapter, although it is quite as important as the rate problem. In a sense, adequate service is even more important than are reasonable rates, because no rate can be called reasonable unless it involves service that is adequate. In the history of public control of public interest industries, the service question has been far the more important one. In the many cases in earlier days, the rate problem was hardly touched. If one will recall the common-law duties that attached to common callings, he will remember that all but one of them concerned service in one way or another. Public interest industries were required to render adequate and safe service, to serve without discrimination to the maximum of their capacities.[1] In the performance of these obligations, they were entitled to charge no more than a reasonable rate. These common-law obligations have been incorporated within and amplified by modern public service laws of state and federal governments. In the discussion of service, we are intentionally omitting some of the service problems traditionally discussed in the casebooks. For instance, we shall not concern ourselves about discrimination and valid excuses for not serving. We shall also assume that utilities give adequate service, that they serve to the limits of their capacities. Of course, occasional cases arise involving these items; but in general, they are rare, because of the high quality of utility service and alertness of management.

In recent years, the problem of adequate service has received but scant attention in the public print.[2] We have become so accustomed to adequate service that we ignore it, until a rare incident brings

[1] Of course, discrimination does involve rates, especially at the present time. Earlier, however, discrimination concerned mainly refusal to serve certain persons or groups—a service problem.

[2] In fact, service problems receive no particular attention in the meetings of commissioners. An analysis of the 1938 *Proceedings* of the National Association of Railroad and Utilities Commissioners shows a short report of the Committee on Safety of Operation and no report by the Committee on Service.

it to our attention. An Ohio Valley flood, a 60-hour rain and sleet, or other natural calamity occasionally focuses our attention upon the almost monotonous continuity of American utility service. Since in its routine performance there is nothing spectacular about it, we have come to take it quite for granted. Furthermore, there can be no controversy about adequate service. Company and commission alike agree upon this objective, and they can disagree but little on specific techniques and standards. It is a rare utility indeed that does not keep its methods and standards far ahead of commission requirements. Finally, there is the problem of measuring service standards. Rate comparisons are easily made, but the same cannot be said about comparisons of service standards. The variations in standards complicate such comparisons; what may be 100 per cent performance in one area might be graded differently elsewhere. But for all its complications, adequacy of service must not be overlooked. When one finds himself making rate comparisons in order to prove the reasonableness or unreasonableness of a certain rate, he should assure himself that the services he is comparing are similar. If not, he must make adjustments before his comparisons are valid. Not only must standards be compared, but the very product itself must be examined. This is especially the case when gas rates, for instance, are under comparison. The heat value of gas may vary from 300 to over a thousand British thermal units. To compare rates for such unlike products proves nothing. In spite of all these probable differences, however, seldom have such adjustments in service been made in the usual rate comparisons.

COMMISSION CONTROL OF UTILITY SERVICE

Service standards and requirements first made their appearance in the franchises granted to the utilities. State laws were sometimes passed requiring this or that service, such as the 80-cent gas law of New York, enacted in 1905, specifying its thermal content. After the creation of the public utility commissions, the duty of service control was delegated to them; and today, approximately forty state commissions have some power over utility service. In twenty of these states, the provisions of the Uniform Public Utilities Act drafted by the American Bar Association are closely followed.

The provisions of this Uniform Act relative to service are as follows:[1]

> Whenever the Commission, after a hearing after reasonable notice had upon its own motion or upon complaint, finds that the service of any public utility is unreasonable, unsafe, inadequate, insufficient or unreasonably discriminatory, the commission shall determine the reasonable, safe, adequate,

[1] §11, 12.

sufficient service to be observed, furnished, enforced or employed and shall fix the same by its order, rule or regulation.

The commission may, after hearing upon reasonable notice had upon its own motion or upon complaint, ascertain and fix just and reasonable standards, classifications, regulations, practices or services to be furnished, imposed, observed and followed by any or all public utilities; ascertain and fix adequate and reasonable standards for the measurement of quantity, quality, pressure, initial voltage or other conditions pertaining to the supply of the product, commodity or service furnished or rendered by any and all public utilities; prescribe reasonable regulations for the examination and testing of such product, commodity or service and for the measurement thereof; establish or approve reasonable rules, regulations, specifications and standards to secure the accuracy of all meters and appliances for measurement; and provide for the examination and testing of any and all appliances used for the measurement of any product, commodity or service of any public utility.

The Wisconsin public utilities law, a model of completeness, has many carefully drawn provisions relative to utility service. The commission is given power to classify the service of utilities and to adopt reasonable rules and regulations relative to inspections, tests, audits, and investigations. It has powers of investigation of the management of utilities.[1] It is given specific powers over the units of service, standard measurements, accuracy of appliances, meter testing, and charges for tests.[2] By the revision of 1931, the commission has been given explicit control over abandonments of service and service extensions.[3] The section covering extensions reads:

The Commission shall have original and concurrent jurisdiction with municipalities to require extensions of service and to regulate service of public utilities. Nothing in this act shall be construed as limiting the power of the commission to act on its own motion to require extensions of service and to regulate the service of public utilities.

This special problem of extensions will be considered in a latter part of this chapter.

RELATION OF RATES AND SERVICE

It seems almost elementary to say that the quality and quantity of service rendered bears some relation to the rates charged for service. For instance, the frequency of street car or bus service is directly related to the demand for such accommodations, and the type of equipment used is an even more direct expression of the rates that

[1] Wisconsin Stat., §196.02 (2) (3) (4).
[2] §196.15, 196.16, 196.17.
[3] §196.58 (5), 196.49, 196.81.

riders will pay. Similar illustrations can be found in the other utilities. The frequency of meter tests, the number of offices to which to make payment, the amount of service inspection—are all reflected in the rates the customers pay. There is, of course, a certain kind of utility service that bears little relation to rates. It should cost but little to train employees to be courteous or to require the meter reader to clean his shoes before crossing the customer's threshold. In general, however, there is some connection between the quality of service and rates. And it goes without dispute that no higher quality and quantity of service can be demanded of a utility that the users are willing to pay for, assuming the usual economy of management.

SERVICE STANDARDS

A few examples of standards of service expected of the utilities will show something of the accomplishments of the more aggressive commissions. Some of these duties are specifically required by law; others are extensions of the general power possessed by commissions to require reasonable service. In those few states which still cling to the antiquated method of city council regulation, the franchise or the council itself must be relied upon to set up required standards. Of course, it ought to be apparent by now that service rules and regulations do not enforce themselves. Herein lies one of the major advantages of state and federal commission regulation. These commissions are full-time bodies, and even the weakest of them devotes not a little of its time and energy to the task of service supervision. Lack of uniformity of service standards makes it impossible to describe minutely one system applicable to the whole country. They vary according to parts of the country, density of population, and personal ideas of commissions and company management. We can, however, outline the items that most regulations would cover.

Water.—Among the many service standards prescribed for waterworks are the following:

Meter tests.

Pressure requirements.

Purity standards. This is often a function of the state board of health or other public body rather than a public service commission.

Reserve capacity for fire protection. This is an important service of water companies and is often under the supervision of the state fire marshal.

Chemical analysis. These standards involve more than simply purity for drinking purposes but refer also to chemical contents that might be destructive to industrial boilers or inferior for certain industrial uses. Often harmful chemical contents can be removed or neutralized.

Telephone.—Telephone companies are subjected to many requirements, among which are

Hours of service. This is no problem in most areas, since the usual rule is to give continuous service.

Type of equipment. For instance, the Illinois Commission has urged the rapid replacement of older equipment by the more modern hand sets.[1]

Cable installations. This is a common requirement in the larger cities, in which the underground cable may be required.

Physical interconnection. Many state laws require the interconnection of the physical facilities of the Bell System with independent companies. Where this power has been challenged, it has been generally sustained.[2]

In general, the telephone companies have been surrounded by fewer state commission service regulations than other utilities, for the reason that they have been controlled by federal bodies to some degree or other since 1910 and have generally maintained a high degree of service.

Gas and Electricity.—We group the gas and electric utilities together because of the similarity of the service standards imposed upon them. Among the common requirements are[3]

[1] *Commerce Comm. v. Illinois Bell Telephone Co.*, 21 P.U.R. (N.S.) 273.

[2] *Fletcher v. Northwestern Bell Telephone Co.* (Iowa), P.U.R. 1932C 42, 240 N.W. 252.

[3] We quote here a sample of the rating scale used by the Illinois Commerce Commission to measure the quality of electric service.

Conditions of Service	Score
Continuity of service	30
Voltage regulation	20
Handling of complaints	8
Meter testing	7
Service improvement, attitude and policies	3
Construction of distribution lines	3
Maintenance of distribution lines	3
Provisions for emergency	2
Adequacy of capacity	1
Consumers' attitude	1
Furnishing new service:	
Where line extensions necessary	0.5
Unnecessary	0.5
Meter refunds	1
Billing	1
Grounding of secondaries	1
Records	
Records of interruptions	5
Voltage surveys and records	5
Records of meters and tests	4
Record of complaints	4
Total	100

The Commonwealth Edison Company of Chicago, for instance, for the year 1938 won the highest rating of Illinois electric companies with a score of 96.74. *Edison Round Table*, January, 1939.

Meter tests. For instance, the New York Commission rule for meters allows not more than a 2 per cent underdeviation from normal. All meters testing outside these limits must be retired from ervice until restored to conform to this standard.[1] It is common practice to require a periodic meter test; and upon complaint of any customer, a test must be made immediately.

Unit of service. For electricity companies, it is the kilowatt-hour of a specified frequency and voltage; for gas companies, a product of a given heat value such as 540 B.t.u. Periodic inspections are usually made to check these requirements.

Pressure requirements. Certain voltage standards are set up for electric companies, and burner-tip pressures prescribed for gas companies. These are subjected to periodic checks and, where possible, recorded upon permanent tape records.

Safety requirements. Safety rules have dealt with types of wires and wiring for residential service, kinds of poles and wires for open-country service, underground cables in congested areas, odorification of natural gas, pressure outlets for gas mains.

Physical interconnections. The same requirements as described for telephone companies may be invoked for electric companies. Of course, to be effective this power must be specifically stated in the statutes. The Federal Power Commission, for instance, has power to authorize voluntary interconnections of electric systems in interstate commerce; and in times of emergency, it has special powers of compulsory interconnections.[2]

Urban Transportation.—We shall illustrate the service requirements of the transport utility by reference to the street railways. What will be said of them applies in general to their successors the bus companies. The urban transport companies, because of their peculiar relation to the public, have been subjected to a multitude of service requirements. Many of these have been specified in franchises, such as type of motive power, type of equipment, minimum schedules, and a miscellany of obligations ranging from profit splitting to snow removal. In no other utility has the financial burden of service requirements weighed quite so heavily. In the years since 1918, the street railways have been faced with rising peak loads, declining load factors, and increasing operating costs. Therefore, they have found themselves caught between the dilemma of inability to buy the most recent safety equipment and that of potential damage suits and ill will in the use of older and hazardous equipment. Disregarding the problem of financial ability to carry out commission standards, some of the more common items are

Schedules. In the larger cities, schedules ranging from the rush hours to the "owl car" service after midnight are often prescribed.

Routing.

Safety devices. Orders requiring safety brakes and window and front guards are illustrations of safety devices.

[1] *Electrical World*, **103**:60, Jan. 6, 1934.

[2] Public Utility Act of 1935, Title II, Pt. II, §202.

Sanitation of equipment. Regular inspection to enforce minimum standards is common practice.

Examination of employees.

Minimum crew requirements. Under this standard, the one-man street car has been forbidden in downtown districts. The argument is that it is a public hazard in congested areas.[1]

Work hours and relief periods.

Conditions of cars, overhead wires, and poles.

Safeguards for rapid transit service.

Accident reports.

In addition to these, commissions prescribe rules for all but the transport companies covering office hours, payment procedures, penalties and discounts, disconnections for nonpayment of bills, payment disputes, meter deposits, extensions, and servicing of equipment. Except for the mere routine of doing business and other purely internal management problems, there is scarcely a phase of the utility service that cannot be covered by commission regulations. In the field of railroads, this supervision has extended down to the detail of specifications for the overhauling of engines and inspection of the watches of train crews.

LIMITS OF COMMISSION CONTROL

In summary, the power of the commission under proper statutory authorization to compel adequate utility service cannot be challenged so long as the power is exercised in a reasonable manner. In unusual cases, the commission may be limited by special franchises or legislative prohibitions. Aside from these exceptional restrictions, there are two usual limits to commission action. In the first place, the "reasonableness" of commission orders must be based on the rates that users will pay and quantities that they will buy. So long as a utility earns a reasonable rate of return, it has but few legal and no economic excuses for declining to observe commission standards.

In the second place, it is an established rule of law that the primary functions of management are beyond commission control. As was well stated by Mr. Justice McReynolds, "It must never be forgotten that 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 it is not clothed with the general power of management incident to ownership."[2] In other words, commissions may interfere with management only in so far as questions of rates and service are

[1] See an order of the Commission of the District of Columbia, *re Capital Transit Co.*, 16 P.U.R. (N.S.) 40, in which the one-man car was held not to be a hazard in congested areas.

[2] 262 U.S. at 289.

involved. Although Mr. Justice McReynolds omitted mention of service in his statement, it is a proper inclusion in the general rule.[1] An example of unwarranted interference of a state commission would be an attempt to prescribe the uniform worn by meter readers or the telephone technique practiced by utility employees in their customer contacts. On the other hand, a commission may properly require that places for receipt of payments be open during regular business hours or that a customer may claim his discount, though delinquent, if he has five consecutive prompt payments next to the month of delinquency.

As we have said before, the line of demarcation between purely management policy and commission jurisdiction is vague and shifting —shifting in favor of the commissions.[2]

THE SERVICE COMPANY

From the management viewpoint, the quality and improvement of service have always been of primary consideration. Because of the technical training of early leaders, it was natural for them to be ever on the alert for better equipment, for improved processes. Several institutions have served to further these interests. Among the earliest were the several trade organizations—the National Electric Light Association, the American Gas Association, and the American Electric Railway Association—conceived as agencies for the collection and dissemination of technical information to their members. The first of these, for instance, was organized in 1885, barely 3 years after Edison's experiment in Pearl Street, New York. An examination of the early proceedings of that society shows the engineering aspect of the industry to be the only item of discussion. Another group interested in the problem of service were the manufacturers of electrical equipment. They were constantly on the lookout for improvements. A third agency was the engineering firms, such as Stone & Webster, organized in 1889, which offered their specialized skills to operating companies. The Bell System, not content to rely upon outsiders, first acquired an equipment manufacturing company and later organized its own servicing and research departments. Out of these experiments to fortify management in its search for better service, there became established in the electrical and telephone utilities the service company. As we shall show, this organization

[1] SPURR, *Guiding Principles of Public Service Regulation*, Vol. I, p. 121.

[2] One evidence of this shift is the power of commissions to inquire into profits of a contract between affiliated members of a utility system, a power denied until after 1930.

has taken several forms. It may be a department of a company or system; it may be a subsidiary company; and it may be an independent company. However it has been organized, its function has been more or less the same.

Servicing the Bell System.—We propose to describe several of the more outstanding utility servicing organizations. As we said, the Bell System early turned its attention to the service problem. Not being satisfied with its plan of licensing manufacturers to make equipment, the first step, in 1881, was to acquire an interest in the Western Electric Company, the largest producer of telephone facilities at that time. By February 28, 1883, a majority of its common stock had been acquired. Since then, that company has been developed into an elaborate manufacturing organization with American plants located at Chicago, Kearney (New Jersey), Point Breese (Baltimore, Maryland), and Nassau (Staten Island, New York).[1] To further its research, a second step was made when the Bell Telephone Laboratories, Inc., was organized in 1924. This service unit has been described as follows by the Federal Communications Commission:[2]

> The general organization of the Bell Telephone Laboratories consists of the following departments: Apparatus development, research, systems development, patent, general staff, protection development, transmission development, bureau of publication, and personnel. The research department carries on investigations of such matters as carbon granules for telephone transmitters, the magnetic properties of iron and its alloys, the electrical characteristics of textiles for insulation purposes, laboratory study of speech and telephone quality. The apparatus development department carries on such work as the study of contact metals, loading-coil characteristics, the design of loading coils, and tests of dry cells. In the systems-development department, studies are made of the functions of assembled units incorporated in an operating telephone system, such as manual- and dial-switching systems, systems for power supply, etc.

Beginning with 1881, the Bell interests made permanent the practice of service contracts between holding company and associated companies. In exchange for a stipulated percentage of their gross revenues—4 and 4½ per cent before 1927—the associated companies acquired instruments and received the benefits of telephone engineering and research and certain accounting and financial assistance.

[1] Western Electric has from time to time maintained branch offices in such foreign cities as Antwerp, Berlin, Budapest, Buenos Aires, Johannesburg, London, Milan, Leningrad, Sydney, Tokyo, and Vienna. In addition, it owns the Western Electric Company, Ltd., of Canada.

[2] "Investigation of the Telephone Industry in the United States," *House Doc.* 340, 76th Cong., 1st Sess., p. 107.

When the instruments were sold to the licensees in 1927, the percentage of gross revenue payments was reduced to 2 per cent. Later (1929), this figure was further reduced to 1½ per cent.

Stone & Webster.—The servicing facilities in the electrical industry have been supplied by independent service companies and by companies organized as a subsidiary unit of a holding company. The first of these is illustrated by Stone & Webster, organized in 1889 as a partnership of two engineers to conduct a consulting and designing service.[1] By 1893, that organization had grown from a firm of consulting and designing engineers and operators of an electrical testing and experimental laboratory to a supervisory and consulting organization retained on a permanent basis by independent operating electric companies. As we show below, the work of Stone & Webster divides into several natural fields: construction supervision, financial supervision, and general operations supervision.

This independent contractual relationship has been the standard form of connection between Stone & Webster and its clients. Although forced to protect its interests in the hectic 1920's by becoming a holding company to some of its clients, even then the bulk of its contracts continued to be with nonaffiliates. For instance, at the peak of the holding company movement, three-fourths of its construction work was for independent clients. After the passage of the Holding Company Act of 1935, Stone & Webster was able to reassume its original pattern of independent service to nonaffiliates.

To facilitate its operations, under the top unit of Stone & Webster, Inc., three subsidiary companies have been organized. The first of these is the Stone & Webster Engineering Corporation, which engages in engineering and construction services and appraisals, supplies experts for rate controversies, and in general "undertakes consulting engineering work in a wide field of activity." The lack of crossties between this unit and the servicing unit (described below) is seen in the fact that "less than 3 per cent of the work of the Engineering Corporation has been for companies under the supervision of the service unit."[2] The second unit is Stone & Webster and Blodget, Inc., which underwrites security issues and engages in over-the-counter security transactions. This service is not confined to public utility companies.

Finally, there is the third unit, the most important one, the Stone & Webster Service Corporation. The facilities of this unit are avail-

[1] "Control of Power Companies," *Report* of Federal Trade Commission, pp. 177 *et seq.*, 1927; and information supplied by the Stone & Webster organization.

[2] Information supplied by Stone & Webster.

21. For the services covered by the foregoing paragraphs of this Part I (except the services provided in the last sentences of paragraphs 8 and 11 and in paragraphs 18 and 19 which, if availed of, are to be paid for as therein stated), we are to receive as compensation a fee which, on an annual basis, will be equivalent to the sum of the following:

(A) A percentage of your annual operating revenues, as follows:
First $4,000,000 ..... 1-½%
Next 2,000,000 ..... 1%
Excess ..... ½%

(B) Seventy-five thousandths of one per cent (.075%) of the total of your outstanding (1) funded debt and notes payable, and (2) preferred stocks and common stocks, including premium and capital surplus accounts;

(C) Fifteen hundred dollars ($1,500.) if operating revenues are less than $1,000,000 and three thousand dollars ($3,000.), if in excess of that amount per annum.

The calculation provided for under (A) above shall be based on operating revenues, exclusive of (1) revenues from merchandise and jobbing, and (2) the amount included therein, if any, paid or payable to your company by any other company the operations of which are supervised by us under a similar contract. The calculation provided for under (B) above shall be based on the par value of the securities involved, or on the amount at which they are carried in capital accounts if without par value.

If you are a subsidiary of a company having a supervisory contract with us, (1) the aforesaid charge provided for in (C) above and (2) the charge of seventy-five thousandths of one per cent (.075%) provided for in (B) above, to the extent that the securities involved are owned by such company, shall be eliminated from said calculation during the period covered by said supervisory service contract with such company.

Monthly payments of fees under (A) above shall be one-twelfth of the amount determined by the application of the above rates to the operating revenues of your company for the twelve months ending with the preceding month. Adjustments of payments under (A) above shall be made annually to the basis of actual revenues from the effective date of the contract. The charge under (B) above shall be applied to the amount determined as of January 31 each year and quarterly thereafter, and one-twelfth of such amount shall be paid monthly. The charge under (C) above shall be paid in equal monthly installments.

From the monthly fee determined as above provided, there shall be deducted an amount equal to the aggregate of the salaries for that month paid by you to such of your officers as are located in our Headquarters Offices and are available for consultation and advice with us in connection with the supervisory services rendered under this proposal.

You are to reimburse us for all expenditures made by us for your account in the performance of any service under Parts I and II hereof, including expenses of members of our organization when absent from our Headquarters Offices in your service. Except where otherwise specifically provided, however, no charge shall be made for general expenses of our Headquarters Offices applicable to our general organization and necessary to perform the services provided for herein.

CHART 22.—This is an exact copy of the compensation section of the standard contract (S. & W Form No. B. 704) of Stone & Webster Service Corporation for operating utility companies. The exceptions mentioned above refer to special rate studies, the services of tax and accounting specialists, special auditing service, and service as stock transfer agent, etc. For these additional charges are made. (Reproduced by permission.)

able to both holding companies and operating companies and are set out in detail in contracts, cancelable on 30 days' notice. They include, in addition to general supervision of a client's properties, the following specific services:

Preparation of estimates of receipts and expenditures.
Preparation of reports.
Plans for sales promotions.
Plans for industrial development.
Assistance in rate designs and rate controversies.
Assistance in tax matters.
Supervision of insurance program.
Assistance in purchasing.
Examination of accounts and records.
Service as financial agent.
Preparation of programs for development and expansion of properties.

For these services, with certain specified exceptions, a percentage of annual operating revenues is charged, ranging from 1½ to ½ per cent, plus other small charges. Furthermore, the contract permits a client to choose certain special services upon the payment of additional charges. The following statement shows the importance of the work of the Service Corporation:[1]

This organization, as of September 14, 1939, the date of this report, has supervisory contracts with nine holding companies and ninety utility companies operating in 37 states and 11 foreign countries and having annual gross revenues in excess of $68,000,000. These utility companies are engaged in electric, gas, transportation, water, and miscellaneous other businesses incidental thereto.

Servicing the Electric Holding Companies.—In general, however, the servicing function in the electrical industry has been performed by subsidiary units of holding companies. The organization of the Electric Bond and Share Company, in 1905, furnishes an excellent example. As we show in greater detail below, two deficiencies in operating companies at that time were lack of adequate financial resources and "lack of trained managerial and technical supervision."[2] The extent to which Electric Bond and Share has been able to remedy this second deficiency is best illustrated by a quotation from its severest critic, the Federal Trade Commission:[3]

[1] *Ibid.*

[2] Statement of S. R. Inch, president of Electric Bond and Share Company, before House Committee on Interstate and Foreign Commerce. See *Hearings* on H. R. 5423.

[3] *Summary Report* on Utility Corporations, Federal Trade Commission, Pt. 72-A, pp. 91, 92.

In the exercise of the managerial function, Electric Bond & Share Co. assigns two supervisors, called "sponsors," to each operating client, an operating man and an engineer. Each sponsor has a number of operating companies under his supervision and, through inspection trips and periodic reports, keeps himself informed as to conditions. Electric Bond & Share Co. receives and analyzes periodic accounting and operating reports, and uses them for the purpose of ascertaining the conditions and results with reference to each operating company. Advisory service is rendered with reference to legal matters, rate schedules, operating and engineering problems, new business problems, insurance, taxes, fiscal matters, etc. Where special engineering or other problems arise, field trips in the interest of the particular company are made by members of the staff.

The engineering staff of Electric Bond & Share Co. furnishes engineering design and specifications for plants to be constructed on the properties of the client companies. The construction itself is carried on either by Phoenix Utility Co. or by Texas Construction Co., each of which is a wholly owned subsidiary, and practically an incorporated department of Electric Bond & Share Co.; consequently all profits of these construction companies inure to the benefit of Electric Bond & Share Co.

Thus has each of its operating units had available services that could have been afforded only by the largest of independent companies.

The basis of the charge for the service of these subsidiary service companies has occasioned considerable controversy. Electric Bond and Share and American Telephone and Telegraph have charged their subsidiaries a percentage of gross revenues regardless of the quantity or quality of service rendered. In the Bell System, this has varied from 4½ to 1½ per cent. For Bond and Share, it has averaged 1.1 per cent. Where there is an absence of arm's-length bargaining, all such agreements deserve careful scrutiny, and especially can the percentage basis of charge be questioned because of its lack of correlation to cost. Two events have occurred that have settled most of the problem. First, the Supreme Court in the Illinois Bell Telephone case validated a commission insistence upon a showing of the cost of the services rendered by a servicing subsidiary.[1] Secondly, the Holding Company Act of 1935 outlaws the traditional service company. In its place may be organized a mutual service company, owned not by the parent but by operating subsidiaries, which must serve not only at cost but at a figure less than the charge of an independent service company.[2]

[1] *Smith v. Illinois Bell Telephone Co.*, 282 U.S. 133, P.U.R. 1931A 1.

[2] To comply with the Holding Company Act, Electric Bond and Share Company reorganized its service function into a mutual service unit named Ebasco Services, Inc. See the "Uniform System of Accounts for Mutual Service Companies," adopted by Securities and Exchange Commission, effective August 1, 1936.

This new form of service organization required under the Holding Company Act is not entirely strange to the electrical industry. Since 1930, the Commonwealth and Southern Corporation has been using the mutual service principle. Briefly, the stock of the service subsidiary of that holding company is held by its operating companies, the share of each participant being the ratio of its gross operating revenue to total gross operating revenues of the system. The services of the service company are available on a cost basis under contract to the subsidiaries. No fees or commissions over and above this figure are charged either by the holding company or by the service company. Thus, the top unit's income is restricted solely to interest and dividend payments by subsidiary operating units. In the event that the computations on the cost basis for services performed exceed actual cost, the excess is returned to the operating units in accordance with their holding of service company stock.

The services available to subsidiaries are similar to those described above. In the words of an officer of Commonwealth and Southern, they include "executive, financial, accounting, advisory engineering, operating supervision, purchasing, taxation, insurance, rates, statistics, development of new business, including merchandising and other services."[1] These services, as said above, are charged at cost as follows: Each company pays for services received the direct costs incurred, plus its pro rata share of the indirect costs computed by the ratio of its gross operating revenue to the total of such revenue. In the 8 years 1931 through 1938, the cost of this service has fallen from $1,830,890 in 1931 to $1,397,214 in 1938. In terms of percentage of gross operating revenues, the percentage paid for service has dropped from 1½ per cent to less than 9/10 of 1 per cent. The ultimate evidence of the acceptability of the organization of the service company of Commonwealth and Southern, the reasonableness of its charges, and the value of its services to its affiliates is its approval under the Holding Company Act of 1935 as a mutual service company. By that approval, it is "qualified to render service to the Commonwealth and Southern Corporation of Delaware, a registered holding company and its subsidiaries, the operating companies."

EXTENSIONS OF SERVICE[2]

Two important service problems deserve special attention, namely, the enforced extensions of utility service and the partial or complete

[1] Information supplied at the request of the authors.

[2] The problem of extensions of utility service to rural users is reserved for treatment in Chap. XXVII, "Utility Service in Rural Communities."

abandonments of service. These have been set out separately for treatment here because of their importance.

In addition to the prescription of service standards, commissions have extensive powers over repairs of equipment, construction or reconstruction of plants, and additions and betterments. For instance, should a gas company desire to change from manufactured to natural gas, it could be required to secure commission approval. Or should an electric company desire to extend its service to a new community, it must, in many jurisdictions, request permission to do so. Likewise, the conversion of telephone service from manual to machine switching may require commission action. In short, almost any major change in the physical properties or service rendered may be done only with the approval of a commission.

The question of extensions of service is of special interest, because it arouses both legal and economic problems. As cities grow, utility service must expand, or else such city growth will be materially hampered. Ordinarily, no problem is encountered, because much of this growth has been attractive enough to cause utilities to keep pace with it. Furthermore, enlightened management has thus far attempted to keep pace. In fact, the reverse of the problem occasionally arises in this form: Has the utility the right to make voluntary extensions contrary to the commission will? In general, the weight of authority seems to be that under certain conditions voluntary extensions may be forbidden.[1] If it could be shown that the territory into which a utility proposes to extend is already served or that the prospective revenue to be gained will be so low as to impose an undue financial burden on the older part of the system and therefore on the ratepayers, such an extension could properly be prevented.

The more pertinent problem, however, is the extent to which a commission may legally go to require extensions of service by utilities into areas that the utilities have not voluntarily entered. Does the commission have jurisdiction; and if so, what are the limits of its power? In those states in which the laws are carefully drawn, the state commissions are given specific power to require extensions. Notice the words of a revision of the Wisconsin law: "The Commission shall have original and concurrent jurisdiction . . . to require extensions of service . . . of public utilities."[2] In fact, no utility may "begin construction, installation or operation of any new plant, equipment, property or facility, nor the construction or installation of any extension, improvement or addition . . . unless and until"

[1] SPURR, *op. cit.*, Vol. I, p. 117.

[2] §196.58.

it has obtained the permission of the commission.[1] Such permission may be granted in whole or in part and on such terms as the public convenience and necessity requires or denied entirely. Similar powers are found in the laws of other states. It does not seem, however, that the specific delegation of power over extensions is necessary, for, as one authority expresses it, " . . . even in the absence of any mention of extensions in the statute, authority over that subject is evidently conferred by general provisions of the law . . . which give the Commissions power to require adequate service and facilities."[2]

A few illustrations will give some notion as to the commission powers and policies in reference to extensions. The Michigan Commission, acting under its statutory authority, has ordered an electric company to serve every town or village through which its transmission lines pass.[3] The Maine Commission denied the request of nine persons for the extension of water service. The estimated cost of the new equipment was $7,950, whereas the additional annual gross revenue to the company was estimated at $128. "If the cost of serving any community or section is more than the revenues received therefrom, such excess cost places, to that extent, an additional burden upon the remaining customers of the district."[4] At least two commissions have ruled that the prospect of less than a fair return upon proposed extensions does not justify their being required. The Wisconsin Commission considers a reasonable rule for urban extensions to be as follows: Any extension must be made which costs not to exceed two and one-half times the estimated revenue to be derived from it.[5]

Is it to be assumed that the power of the commission is without limits? Not at all. As we explained above, this power must be reasonably exercised; it must not be arbitrary. In the absence of other factors, the usual test of reasonableness is the financial one. As is illustrated in the Maine case above, the commission felt that the loss to the company would not justify the extension desired by nine people. Certainly, no utility should be forced to extend its service unless the added income pays all the special costs incurred and something more.[6]

[1] §196.49.

[2] SPURR, *op. cit.*, Vol. I, p. 113. The Supreme Court of Georgia has held that the power to require establishment of service includes the power to require extensions, *Public Service Comm. v. Georgia Power Co.*, 182 Ga. 706, 17 P.U.R. (N.S.) 94 (1937).

[3] *Re Deerfield*, P.U.R. 1931C 191.

[4] *Glazier v. Augusta Water District*, F.C. 842, *Public Utilities Digest*, p. 318, 1931.

[5] *Re Nekoosa-Edwards Light & Power Co.*, P.U.R. 1931A 69.

[6] *Re Consumers Power Co.* (Mich.), 11 P.U.R. (N.S.) 362; *re Joplin Water Co.* (Mo.), 10 P.U.R. (N.S.) 276.

In the case of a rapidly expanding outlying area, this requirement might be relaxed in view of the probable future growth in revenue from it. Subject to this economic interpretation, the utility must serve every part of the area for which it is chartered or that it holds itself to serve. It cannot discard the lean, keeping only the fat.[1]

On the other hand, it is the usual rule of law that a utility may not be ordered into an area that it does not hold itself out to serve, even though this area is not served by a similar utility.[2] Yet even this restriction is not too binding, as a review of the commission decisions will show. The Wisconsin Commission has ordered, under reasonable conditions, extension of service into areas in the face of territorial divisions by other companies.[3] Wisconsin follows the general rule that the area of holding out to serve extends with the growth of city limits.[4] On the other hand, utilities operating without franchise rights are often exempted from the general obligation to serve the entire area of their holding out. The Oklahoma Commerce Commission has held that a company operating without franchise is within its rights either in refusing to serve new customers within its area of service or in extending its service to new areas.[5] In other situations and in other jurisdictions, however, no distinction is drawn between utilities operating under franchises and utilities operating without franchises.

On the basis of the cases, we come to the conclusion, in the absence of peculiar and special restrictions, that commissions may order extension of utility service, subject to two limitations. First, is a proposed extension included within the general area that the company involved holds itself out to serve? Second, is it a reasonable order? The area that a company holds itself out to serve is discovered by examining its franchise and its actions. If the franchise specifically covers the extension, or if the company has extended service into the general neighborhood, it can be compelled by commission order to extend its service. This is a complicated legal problem and occasions many controversies. The second question involves the reason-

[1] *Beaver Brook v. Wyoming Valley Water Supply Co.* (Pa.), P.U.R. 1931D 19; *Rilling v. Tennessee Gas Co.*, 26 P.U.R. (N.S.) 194.

[2] *Scranton v. Scranton Railroad* (Pa.), P.U.R. 1915C 890; *Atchinson, T. & S. F.R. v. Railroad Comm.*, 173 Calif. 577, P.U.R. 1917B 336; *Conrad v. Western Union Telegraph Co.* (Ind.), P.U.R. 1920E 499; *Evers v. Philadelphia Rapid Transit Co.* (Pa.), P.U.R. 1931D 98; *I.C.C. v. Oregon-Wash. R. & Navigation Co.*, 288 U.S. 14 (1933); *Abington Electric Co. v. Public Util. Comm.*, 131 Pa. Super. 200, 23 P.U.R. (N.S.) 491 (1938).

[3] *Vinita v. Vinita Fuel Co.*, 11 P.U.R. (N.S.) 100.

[4] *Behnke v. Wisconsin Gas & Electric Co.* 15 P.U.R. (N.S.) 217.

[5] *Parkinson v. Camdenton Water Co.*, 12 P.U.R. (N.S.) 501.

ableness of the order. As shown in previous illustrations, the best test of reasonableness is the cost of the proposed extension measured against estimated future income. If it appears that in the near future the extension will be profitable and not burden existing customers, it may be ordered.[1]

ABANDONMENT OF SERVICE

The second special problem, abandonment of service, is most significant because with changing economic conditions it often becomes difficult for utilities to continue operations. Illustrations of this are found in the entire street railway industry and in isolated situations in all the utilities.

Abandonments first must be distinguished from reduction of service. So long as a system offers a minimum of service, no amount of reduction to that minimum can be called an abandonment. Reduction or curtailment of service is usually under direct control of a commission and normally requires its authorization. Usually, a showing of lack of public use of that part proposed to be eliminated justifies commission approval. Abandonments, on the other hand, are a complete elimination of service. If a system is involved, it is a complete abandonment; if only a branch or part of a system is involved, it can be called a partial abandonment. From the viewpoint of the patrons involved, there is no difference between a partial and complete abandonment—they are left entirely without service. From the utility and commission viewpoint, however, there is a difference. Over requests for partial abandonments, commissions have less difficulty in assuming jurisdiction because of potential effects upon remaining portions of systems. On the other side of the problem, a flourishing system can sometimes carry a losing member which, were it standing alone, would inevitably collapse from lack of financial support.

Public utility laws should be drawn so as to give to commissions full authority over both partial and complete abandonment. On too many occasions, this power has been left in doubt because of inadequate legislation. Wisconsin, for instance, in the revision of 1931, cleared this question when it gave its commission complete powers over abandonments of service on any line, branch, or extension.[2] All

[1] Alleged confiscation of existing rates, if applied to a proposed extension, cannot be used as an excuse, unless it appears that no higher rate schedule would be effective. *New York v. Public Service Comm.*, 269 U.S. 244 (1925).

[2] Wisconsin Stat., §196.81. This section was apparently passed to remove a weakness in the commission jurisdiction. It is still limited by §193.11 which

abandonments in that state require authorization, which may be issued upon such terms as the commission specifies.[1] Many other states have similar laws.

The question has sometimes been raised as to the right of a public utility to abandon its service without permission from a public body. Although occasional cases may be found suggesting that such right exists, the many statutes forbidding such action and the cases upholding those statutes make it safe to conclude that there is adequate legal support to the contrary proposition. The right of the state to control abandonments was well stated in a Connecticut case of some years ago, from which we quote:[2]

> It is true that the charter is permissive in its terms, and probably no obligation rests upon the corporation to construct the railroad; the option to exercise the grant of eminent domain and other public powers is granted. And when that option has been made, and the corporation . . . has commenced to operate the road under the granted powers, thereby inducing the public to rely, in their personal and business relations, upon that state of affairs; by so accepting and acting upon the chartered powers a contract exists to carry into full effect the objects of the charter. . . . *Having exercised these powers the corporation has no right against the will of the state to abandon the enterprise.* . . .

We conclude, therefore, that the acceptance of the franchise to operate as a public utility imposes affirmative duties of performance from which only the state or its authorized agent can grant exceptions. In fact, so important is this power that in not a few instances efforts of companies to abandon service for apparently good cause have been blocked until official permission was secured from the proper state agency—usually the state commission.[3] This point was put as

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provides that in the case of a street railway or interurban holding franchises in towns, the proper municipal authorities must, during the life of the franchise, consent to any abandonment. See *re Chicago, H. & G. L. R.*, P.U.R. 1931A 113, and *re Northern States Power Co.*, P.U.R. 1931D 177.

[1] The Wisconsin law (§181.03) covers the problem of system abandonment as follows: "No corporation owning or operating a public utility shall be dissolved, except upon consent of the public service commission to be issued only after hearing by the commission. . . ."

[2] *Gates v. Boston & N.Y. Air Line R.*, 53 Conn. 333, 342. (Italics ours.) This principle has often been reaffirmed. For example, see the decision of the Minnesota Supreme Court in *Minnesota Transfer R. v. Railroad & Warehouse Comm.*, 200 Minn. 422, 21 P.U.R. (N.S.) 108 (1937).

[3] *Oswayo Chemical Co. v. New York & Pennsylvania R. Co.*, P.U.R. 1919C 690; *People v. Colorado Title & Trust Co.*, P.U.R. 1919A 542; *Re Arkansas-Missouri Power Co.*, 24 P.U.R. (N.S.) 167.

follows by the Supreme Court of Kansas, when it said: " . . . we insist that the first official tribunal to have consideration of such matters [as abandonment] is the Public Utilities Commission."[1]

Sometimes the authority of a commission to grant permission to abandon a system or part of a system is questioned. In some of the instances in which courts have denied this authority, a franchise has stood in the way. Usually, however, the difficulty lies in the law under which commissions operate. Where laws are adequate, the power to control abandonment of all kinds is complete. In fact, it has been argued that the power to compel adequate service includes this right. We come to the conclusion, therefore, that "the weight of authority seems to support the holding, under modern utility statutes, that a public utility cannot go out of business without Commission consent."[2]

Prerequisites for Abandonment.—Under what conditions may utilities abandon service? This question must be divided into parts. Under what conditions may part of a system be abandoned, and under what conditions may an entire system be abandoned? Cases are sometimes offered as proof that assumption of a franchise requires service during its life, no matter how onerous its terms may be.[3] That position, of course, becomes sheer nonsense if it is financially impossible to do so. Mr. Justice Taft recognized this when he said:[4]

> The power of the Legislature to compel continuity in a business can only arise where the obligation of continued service by the owner and its employees is direct and is assumed when the business is entered upon. A common carrier which accepts a railroad franchise is not free to withdraw the use of that which it has granted to the public. It is true that if operation is impossible without continuous loss, *Brooks-Scanlon Co. v. R. R. Comm.*, 251 U.S. 396 . . . it may give up its franchise and enterprise, but short of this, it must continue.

Mr. Justice Holmes, in the Brooks-Scanlon case cited by Chief Justice Taft, said:[5]

> A carrier cannot be compelled to carry on even a branch of business at a loss, much less the whole business of carriage. . . . It is true that if a rail-

[1] *State ex rel. Caster v. Kansas Postal Telegraph Cable Co.*, 150 Pac. 544, P.U.R. 1915E 222, 233 (1915). This same position was expressed by the Supreme Court of Colorado in *Highland Utilities Co. v. Public Util. Comm.*, 97 Colo. 1, 10 P.U.R. (N.S.) 321 (1935).

[2] SPURR, *op. cit.*, Vol. I, p. 46.

[3] *Bearcreek v. Bearcreek Water Co.* (Mont.), 6 P.U.R. (N.S.) 380.

[4] *Wolff Packing Co. v. Court of Ind. Rel.* 262 U.S. 522, 543. Although Taft speaks of a carrier, he could have said the same of any public utility.

[5] 251 U.S. at 399.

road continues to exercise the power conferred upon it by a charter from a State, the State may require it to fulfil an obligation imposed by the charter even though fulfilment in that particular may cause a loss.

Mr. Justice Holmes's words seem to contradict each other. In the first sentence, he says that operation of a part at a loss cannot be required. In the second sentence, however, he suggests that if the franchise is not surrendered, then the loss must be borne by the utility.

In 1930, the Supreme Court in the Broad River case once more faced this problem. There the point at issue was the obligation of a public utility operating gas, electric, and street railway departments under a consolidated franchise to continue its railway at a loss. The case was heard twice; and on rehearing, the Court split exactly even, four to four. All concurred on dismissal. Mr. Justice Stone, supported by Justices Hughes, Brandeis, and Holmes, held that the three services were operated as a unit under a consolidated franchise and therefore:[1]

> It follows that it was within the constitutional power of the State to refuse to permit any partial abandonment of the consolidated franchise.

The other four Justices (Justice Roberts not participating) held that until the franchise holder had made every effort to make the railway system a success, it had no grounds to protest. They intimated, however, that had there been undisputed evidence of continued loss, they would have approved of the abandonment of the electric railway department.

As a matter of fact, commissions are constantly faced with requests for branch and system abandonments. We offer a few illustrations of their problems and decisions. The Arizona Commission has laid down the rule that one test of public convenience and necessity is financial patronage. Continued loss is evidence of a lack of public convenience and necessity and justifies abandonment of branch rail lines.[2] Several commissions have permitted street railways and interurbans to abandon service upon a showing of continued operating losses and the impossibility of increasing income by fare increases. The Indiana Commission was impressed by the probable menace to the public of a financially decrepit company.[3] Regardless of the suggestions of the several cases of the Supreme Court of the United States, cited above, it would appear that the commissions and state courts believe that abandonments must be permitted if there is undis-

[1] *Broad River Power Co. v. South Carolina*, 281 U.S. 537, 543 (1930).

[2] *Re Menderson* (Ariz.), Docket No. 3425-A-2023, Decision 5402 (1930).

[3] *Re Terre Haute, I. & E. Traction Co.*, P.U.R. 1931E 513.

puted evidence of unpreventable operating losses. This position has been taken by commissions of Missouri, Indiana, Montana, California, Oregon, and New Hampshire. If a branch only is involved, the loss must be substantial, must strain the financial resources of the entire system in order to justify its elimination. As has been said by the Colorado Commission, a public utility cannot abandon territory on the plea that it is unprofitable when operations of the whole system are financially successful.[1] Of course, if the financial integrity of the whole is endangered, a branch may be abandoned.[2]

To summarize: In most states, a public utility may not abandon its service without permission of the state. The public service commissions in these states are given specific jurisdiction (with a few exceptions) over both partial and complete abandonments. Permission to abandon either part or all of a system will be granted on the showing of loss in operation. The least that a company can insist on in the way of income is enough to cover its operating expenses, plus something more. In the case of a system, this minimum requirement will not stave off eventual abandonment. In the case of a branch or part of a system, if that branch pays its special and operating costs, then it is no great burden on the rest of the system, and enforced operations are justified. Practical examples of this problem can be seen on every hand. As one rides through the countryside, abandoned branch railroad lines and stations are much in evidence. Many places under 25,000 are finding themselves entirely without local transportation service. The street car system first disappeared; then the bus systems failed and were finally discontinued. In places where the busses succeeded, sometimes it was possible only through a receiver operating without onerous franchise provisions and offering service restricted to the settled parts of the city.

The problem of any abandonment is to balance the equities of the respective interested parties. Companies are private corporations, organized for profit; and when any portion of their service fails to make a profit, the natural reaction is to discontinue it. On the other hand, public utilities, although private corporations, have undertaken a service in which the public has an interest. Cities are built, developed, and extended because of public utilities. A railroad location accounts for a town or city. If it is withdrawn, what will its inhabitants do for its services? A suburb develops because of a street railway system. How will its citizens fare when that system is abandoned? A business enterprise is built in an out-of-the-way location under the

[1] *Re Denver*, 18 P.U.R. (N.S.) 466.

[2] *Re Service Transit Co.* (Mont.), 6 P.U.R. (N.S.) 127.

inducement of cheap power. Later, the company discontinues that power line because it has constantly lost money. How can the business dependent on that power carry on? Questions such as these illustrate the indispensable nature of the public utility in our economic fabric. Since the particular shape and pattern of that fabric has been so materially influenced by public utilities, it is right that they be held strictly to their obligations, short of their financial collapse or complete social obsolescence.

SUBSTITUTION OF SERVICE

The problem of abandonment is generally influenced, if not caused, by the presence of substitute services. The motor vehicle crippled rail carriers of all kinds; cheapened electricity and rising coal costs have pressed hard upon the manufactured gas utility. Of course, substitute competition has not been entirely to blame for all abandonments. Cut-out lumber areas, mined-out mineral deposits often have left a stranded population and a declining demand for utility service. But, in the main, substitute competition accounts for most abandonment. It is simply the old problem of obsolescence extended from internal situations to industries as a whole. In so far as a substitute is a reasonably adequate one, abandonments are not serious.

Commissions are often impressed by the absence or presence of adequate substitute facilities when faced with petitions for abandonment. They are likewise impressed with their authority or lack of authority over the substitute. A good illustration of this general situation is found in a problem placed before the Oregon Commission. That body was faced with the petition of a gas company to discontinue its service. The facts of record indicated a continuous annual loss, although the rate was quite high. It was also shown that a 68 per cent increase of rates to $3.36 per thousand cubic feet would be necessary to eliminate losses and pay all costs. Thus was there an impossible situation. To attempt to raise rates was out of the question, because they were already at the point of maximum demand. Therefore the commission did the only intelligent thing—it authorized the abandonment of the gas company because its chief use, cooking, could be replaced by electric service at an average increase in cost of only 50 cents a month to former users of gas.[1] This increase would be less than the necessary increase in gas rates. It happened that the gas business in question was operated under its own franchise, which had

[1] *Re Eastern Oregon Light & Power Co.*, 13 P.U.R. (N.S.) 4. The same principle was sustained by the Nevada Commission in *re Carson City Coal Gas Co.*, 15 P.U.R. (N.S.) 262.

expired, so the principle of the Broad River case would not apply. But this factor of the franchise seems to have played but a small part in the commission decision. Even had there been a consolidated franchise, the decision was sound. If losses of the gas department must be borne by the electricity division of a combination company, then it is to the benefit of both gas and electricity customers that the losing portion of the business be discontinued.

RÉSUMÉ

The shortness of this discussion of utility service is but evidence of our opening proposition. The problem of adequate service is too prosaic to arouse any particular discussion. Rather than fill it with minute description and detail, we have been content to sketch briefly service standards, the service company, and the two special problems of extensions and abandonments. We insist again, however, that shortness in no way minimizes the fact that service is as important as rates—is, in fact, inseparable from the rate problem.

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CHAPTER XXII

THE PROBLEM OF SECURITY REGULATION

The traditional tasks of regulation, as we have said several times, concerned rates and service. If commissions were given powers to prescribe reasonable rates and adequate service, their authority was thought to be complete. It was soon discovered, however, that to make these powers effective in fact, authority over related utility activities must also exist. Specifically, rate and service powers needed to be supplemented by commission control over security issues. During the years since the first commission laws of 1907, thirty-one state commissions and all the federal utility commissions have been clothed with some degree of supervision over the issuance of utility securities. Of course, these laws differ in degree of completeness, some being little more than advisory, others being quite mandatory. As the situation now stands, there can be no question that the third primary function of regulation has become the adequate control of utility securities issues.

THE NECESSITY OF SECURITY REGULATION

At the outset of our analysis of this problem, we are met with the question of the need for control of security issues. Assuming regulation to have as its first and foremost objective the protection of consumers, why should public utility securities be subjected to any other limitations than those provided by state blue-sky laws and the Federal Securities Act? For some time, there have been those who would answer this question in the negative.[1] They argue that neither rates nor service can be affected by security practices, because rates are fixed in terms of the fair value of property. According to this view, the amounts of securities outstanding and their interest and dividend requirements are immaterial to the performance of the primary functions of regulation.

To us, this type of argument is almost too naïve to require rebuttal. In case any doubt remains, however, as to the need for some kind of

[1] See an article by Lyons, *The Annals of the American Academy of Political and Social Science*, **63**:255, January, 1916; reprinted in part in Lagerquist, *Public Utility Finance*, pp. 186–193.

security control, we offer the following actual illustration.[1] In a rate controversy between the Washington Commission and the Seattle Gas Company, the following facts were developed. The company had a capital structure of

Bonds	$11,037,000
Notes	1,380,685
Preferred stock	2,000,000
Common stock	459,038
	$14,876,723

Although the company contended its fair value to be $14,145,090, the commission found that figure to be only $8,075,000, or less than the bond issue outstanding. The commission commented specifically upon the company's "strenuous attempt to build up a fair value for rate-making purposes in line with its capitalization" and its insistence that it "must be permitted to earn an amount over and above operating expenses and fixed charges sufficient to meet its security obligations in order to avoid insolvency. . . . " The Washington Commission found that at a 6.75 per cent return, the company's fair return would be $545,062, or $125,453 less than its interest charges. In view of the consumer rights in the situation, it felt nevertheless bound to allow not more than this amount, although its action might force a receivership and eventual corporate reorganization.

From this illustration, can there be any question of the need for some type of security control? Obviously, there is a relation between rates and securities. Any company will strive to "sell" a commission on the necessity of rates high enough to pay at least its interest requirements. Failing in this effort, a company with an excessive capital structure has but one other escape short of reorganization, and that is to skimp maintenance, to render an inadequate service. In addition to excessive capitalization, there are other evils against which customers must be protected. A company may be properly capitalized, yet it may periodically be in trouble. Specifically, a corporation with an excessive ratio of bonds to total securities is in a poor position to withstand a material shrinkage of income. A depression year may see it unable to pay its bond interest and thus thrown into bankruptcy. Such a consequence, although it may not affect rate levels, can certainly have a demoralizing influence on utility personnel and thus on utility service.[2]

[1] *Department of Pub. Works v. Seattle Gas Co.*, 3 P.U.R. (N.S.) 433.

[2] We have had the opportunity to observe the demoralizing effect upon operating personnel of a threat of receivership, although that threat did not actually materialize.

We see no escape, therefore, from the conclusion that utility consumers must be protected from the consequences of overcapitalization, excessive proportions of bonds to total securities, and a host of other evils possible in the absence of such regulation. As the Washington Commission has said, "Since customers necessarily lack a cohesive and effective organization to protect their interest the Board must be particularly solicitous of their welfare."[1] The fundamental objective of security regulation, as we see it, is the protection of utility credit. When this is accomplished, not only are rates kept at their proper minimum, but, in addition, the best of service can also be required. Thus, the customer is primarily served by security regulation, and at the same time definite benefits accrue to investors and public generally.[2]

STATE CONTROL OF SECURITY ISSUES

Security control has generally followed the first enactments of public service laws, but in at least one state, Massachusetts, it has been in existence since the 1850's. At that early date, close control of railroad securities was begun in that state and later extended to public utilities. These laws defined the types of securities that could be issued, their sales price, the consideration and purposes of issues. For instance, Massachusetts has, at one time or another, required cash as the consideration for securities, limited stock to $100 par, prescribed the exact sales prices of stocks, and limited bonds to 50 per cent of the capital structure. After 1907, either in the original public service laws or more usually as subsequent amendments, other states followed the Massachusetts example, until now over half of the state commissions have some degree of authority over public utility security issues.

TYPICAL PROVISIONS OF STATE LAWS

As one might expect, there is no standard pattern in state laws governing security issues. Even the half-dozen most progressive states in that matter have diverse provisions. In this section, we shall set out those items which are generally included.

General.—The usual preface to security regulation provisions is a declaration that the issuance of securities is a "special privilege" and

[1] 3 P.U.R. (N.S.) at 480.

[2] In the cases, one finds repeated reference to protection of utility investors as a primary duty of regulation. To us, this duty is distinctly secondary and can be justified only in terms of protection of the utility customer. If this were not so, the blue-sky laws would furnish sufficient state protection to investors.

therefore subject to state control. This control is usually lodged with a state public service commission.

Securities and Consideration.—The usual provision is to include within the scope of the act all securities and evidences of indebtedness having a maturity date in excess of one year from the date of issuance. This means, therefore, that the commission supervises bonds, debentures, stocks, both common and preferred, and demand notes.[1] Excluded securities will be short-time notes payable, items with maturities of less than one year. Even here, some laws limit the amount of exempted evidences of indebtedness to a fixed percentage—usually 5 or 10 per cent of the total par value of the capital structure. The consideration for securities may usually be cash, property, or service. If the first, a minimum is often set either by statute or by order; if property or labor, usually the commission appraises its valuation. Some states, notably Massachusetts, have been very strict in the matter of consideration. Occasionally one finds statutory prohibition of any other item except cash as payment for securities.

Purposes.—The purposes for which security issues may be approved can be defined as simply "proper corporate purposes," or they may be listed in detail. The Wisconsin law, in 1931, was amended to read that public utility corporations could issue securities to finance those purposes reasonably necessary for the conduct of public service functions. Although there may be advantages to such a general formula, its very language permits of too much dispute.[2] We are therefore inclined to favor those state laws defining specifically the purposes of issue. For example, we quote the following extract from the Oregon law.[3] Similar provisions exist in the public service laws of Illinois, Massachusetts, and New York.

> A public utility may issue [securities] . . . for the following purposes and no others: Namely,
>
> (*a*) for the acquisition of property, or

[1] Demand notes may or may not be under commission jurisdiction. The Missouri Commission disclaimed jurisdiction in *re Central Distributing Co.*, 23 P.U.R. (N.S.) 147; and at the same time, the Oregon Commission assumed jurisdiction, *re Portland General Electric Co.*, 22 P.U.R. (N.S.) 394. The Maine Commission follows the Oregon position in *Presque Isle Water Co. v. Itself*, 18 P.U.R. (N.S.) 385. We think the latter position is the better choice.

[2] As an example, see the dispute over the interpretation of the New York requirement that notes must be issued for "corporate purposes" in *Staten Island Edison Corp. v. Public Service Comm.*, 263 N.Y. 209, 2 P.U.R. (N.S.) 456, 461 (1934).

[3] §61–289 (Laws of 1933, c. 441, §11) (arrangement ours). The reference to "Commissioner" in the extract is to the one-man commission used in that state.

(*b*) for the construction, completion, extension or improvement of its facilities, or

(*c*) for the improvement or maintenance of its service, or

(*d*) for the discharge or lawful refunding of its obligations, or

(*e*) for the reimbursement of moneys actually expended from income or from any other moneys in the treasury of the public utility not secured by or obtained from the issue of [securities] . . . for any of the aforesaid purposes except the maintenance of service and replacements, in cases where the applicant shall have kept its accounts and vouchers for such expenditures in such manner as to enable the commissioner to ascertain the amount of moneys so expended and the purposes for which such expenditures were made. . . .

This extract is in a sense typical of state laws specifying purposes of security issues, yet there are significant variations among them. The Illinois law, for instance, omits the third of these—improvement or maintenance of service—a proper omission, it appears to us. Except as a company may have had inadequate past management or be faced with the threat of competition, we see no reason why it cannot maintain and improve service through charges to operations. In any case, it is poor practice to issue bonds, stocks, or notes for such a purpose. The special committee on Public Utility Finance of the National Association of Railroad and Utilities Commissioners takes this same position, because in its proposed statute the section on purposes omits all reference to this disputed item.[1] Massachusetts is unique in that her law does not allow securities for the fifth purpose, which is fundamentally a process to correct undercapitalization.[2] In other words, where equity holders choose to plow back their earnings rather than take them as dividends, they cannot later demand stocks equal to that investment. Of course, the stockholders could have taken their dividends, thereby necessitating later stock issues to be sold to themselves or the investing public generally. We think that this option demonstrates the fallacy of the Massachusetts attitude. As evidence of our position, we cite the practice of the Wisconsin Public Service Commission which has allowed stock dividends based on undistributed earnings.[3]

Bond and Stock Ratio.—Some laws have attempted to fix a specific ratio of bonds to stock. Massachusetts, for instance, at one time forbade bonds of utility companies to exceed their stock issues and limited bonds of railroads to twice their stocks. The Minnesota law limits bonds of street railways to 85 per cent of the "fair and reasonable

[1] 1938 *Proceedings*, p. 403.

[2] See *re Lowell Gas Light Co.*, P.U.R. 1933A 460, 462.

[3] *Re Bonduel Telephone Co.*, 22 P.U.R. (N.S.) 1.

value" of their property.[1] The Indiana law, assuming the realistic position that preferred stocks create practically as rigid an obligation as bonds, limits total par value issues of both these securities to a maximum of 75 per cent of the "total capitalization" of any utility. In general, however, states have been content to require that the percentage of bonds to capital structure be reasonable, leaving to their commissions the task of discovering reasonableness. In those states, we find a variety of commission rulings. The New York Commission has said that there should be a substantial stock interest in a capital structure.[2] The Pennsylvania body has said that bonds should not exceed 75 per cent of the assets of a public utility.[3] Missouri has rejected a proposed reorganization whereby bonds equal to two-thirds of the value of physical property would be issued.[4] The California Railroad Commission has disapproved of a proposed issue of preferred stocks, where that issue would be a high percentage of total securities.[5] The Oregon Commissioner has gone so far as to lay down the general rule that maximum indebtedness should not exceed 60 per cent of original cost, depreciated.[6]

What is a reasonable ratio of bonds to total capital structure cannot be set out in a stated percentage. Any figure short of 100 per cent will be arbitrary in certain situations. Yet it does appear that there should be a limit to interest-bearing obligations. The depression of 1929 showed the dangers of a high percentage of bonds. One of the distressing factors in new capital financing since 1935 has been the almost complete disappearance of stock issues. In so far as capital markets will accept stocks, companies and commissions should be on the alert to issue them instead of bonds, debentures, and notes.

Price and Conditions of Sale.—Generally, security provisions limit the prices of authorized issues and prescribe the conditions of sale. For stocks, there is a common legal prohibition of their sale at less than par. Massachusetts has had this provision, though it was relaxed in 1922, to permit less than par sales under commission approval. In that state, the commission may, and does, establish sales prices for stock at a premium, requiring the difference over par to be credited to a surplus account. The Wisconsin law requires stocks to be sold at not less than par. That law also gives its com-

[1] *Re St. Paul City R.*, 11 P.U.R. (N.S.) 508.
[2] *Re Consolidated Edison Co.*, 22 P.U.R. (N.S.) 239.
[3] *Re Bondholders' Protective Committee of Erie R.*, 24 P.U.R. (N.S.) 433.
[4] *Re Missouri Gas & Electric Service Co.*, 14 P.U.R. (N.S.) 16.
[5] *Re Wikoff*, 19 P.U.R. (N.S.) 173.
[6] *Re Mitchell*, 17 P.U.R. (N.S.) 235.

mission powers to establish the prices of no-par stocks and bonds, with the limitation that bonds shall be sold at not less than 75 per cent of their par value. Some states allow sales of stocks first to existing shareholders; some require competitive bidding on all new issues. This latter condition of sale has been required in Massachusetts, New Hampshire, and the District of Columbia.[1]

The establishment of minimum prices for stocks especially is understandable, in view of the desire of commissions to protect previous investors. If all shareholders pay no less than par, their respective equities in the assets are undisturbed. Occasionally, a commission will go even to the extent of forbidding an issue of a lower par, say, $50, where the outstanding stocks are the conventional $100 par. The argument is that $100 invested in the new low par issues will give the purchaser a disproportionate voting strength.[2] On the other hand, it is unwise to tie the hands of a commission by a statutory prohibition of stock sales at less than par. Even the Massachusetts law was amended in 1922 to permit such sales. The inflexible par requirement has produced unfortunate results; especially has it caused an undue proportion of bond issues. Under such a limitation if its financial record or the state of the market makes stock sales at par impossible, a company needing capital has no option but to ask for permission to issue bonds, and this request can scarcely be refused. We believe, therefore, that stock sales at less than par should be left to commission discretion. The accounting provisions of the Uniform System of Accounts, setting up capital stock discount as a suspense debit, to be later amortized by charges to surplus, actually protects adequately the equities of those stockholders who previously paid par or more for their shares.

The provision allowing bond sales at less than par is easily explained. Often it is easier to market a bond containing a stated interest rate higher or lower than market rates than to adjust the rate of the issue to that market. In those cases, bond premium or discount represents an advance adjustment of stated interest rates to market rates, and the difference is so handled in the accounts. An examination of commission decisions shows that many issues have been approved with sales prices in the eighties and nineties.

In the matter of commission specification of actual sales price and competitive bidding, we are not so certain. It seems that the function of regulation is adequately served when minimum security

[1] As illustrations see *re Issuance and Sales of Securities*, 12 P.U.R. (N.S.) 9; *re Public Service Co.*, 12 P.U.R. (N.S.) 408.

[2] *Re Wikoff, supra.*

prices are specified. Commissions are not underwriters and can scarcely be expected to know exact prices. Competitive bidding for bonds is quite proper but not for stocks, especially common stocks. The stockholders of a going concern have equities usually in excess of the par values of their holdings. To require public bidding for stocks, unless the market price is at least equal to book values, means a taking from old stockholders of a portion of their equities. Therefore, it would seem to be equitable to offer stocks at par to existing stockholders, permitting them to sell their stockholders' rights in case they do not desire to exercise their options.

Other Provisions.—Security issues are hedged by many other provisions. There are requirements about the relation of the total of securities to total asset values, prohibition of security issues for non-utility purposes, and such intangible items as franchise value and going-concern value. Other provisions relate to control of securities of mergers and consolidations, discussed below. Each law generally marks out a well-defined procedure by which security authorization may be procured. Wisconsin, for instance, requires each application to set out the amount and type of securities proposed to be issued, the purpose of issue, and the terms. Each application must be accompanied by adequate financial statements. Commissions then approve in part or *in toto* the request or reject it. If approved, varied safeguards may be thrown around the approval, such as requirements of periodic accounting for receipts and expenditures and a guarantee bond to insure completion of proposed construction. In Wisconsin, the commission may audit the books of a utility to verify the propriety of its security sales and disposal of proceeds, charging the audit expense to that utility.

It would appear, therefore, except as security sales in interstate commerce might escape supervision, that each state in the Union could, if it wished, control quite adequately all security issues of its operating utilities.

FEDERAL CONTROL OF SECURITY ISSUES

Several federal agencies have powers over utility securities issues. The first, of course, to secure this authority was the Interstate Commerce Commission. As each of the federal utilities commissions has been created, it has been given power in that area. Finally, the Securities and Exchange Commission has the dual role of supervising generally public offers of securities of all kinds, including those of utilities, and also the control of all electric and gas holding company issues.

The Federal Communications Commission and the Federal Power Commission are given extensive control over security issues of those electric, gas, and telecommunications companies within their respective jurisdictions. Securities must be for proper corporate purposes; short-time note issues not in excess in aggregate value of 5 per cent of the par value of other securities outstanding are exempted; and, in general, these commissions may closely supervise the sale and disposal of proceeds. The authority of the Power Commission is restricted by the proviso that its power "shall not extend to a public utility organized and operating in a State under the laws of which its security issues are regulated by a State commission."[1]

The authority of the Securities and Exchange Commission over securities of holding companies under Title I of the Public Utility Act of 1935 is quite complete. No security, other than notes of not more than 90 days' duration not offered for public sale and not to exceed 5 per cent of the par values of securities outstanding, may be issued except as authorized. All house-to-house sales of holding company securities are forbidden, and all employees of subsidiary companies are prohibited from making any sales to anyone at any time. Only common stocks with par values and bonds (with minor exceptions) may be issued. The purposes of issue must be for

1. Refunding of outstanding securities.
2. Financing the business.
3. For "necessary and urgent corporate purposes."

All securities must be sold under such terms, conditions, and other restrictions as the commission shall prescribe. As a final power, the federal agency must withhold all approval of securities until it is satisfied that such state requirements as may be involved are satisfied. Unquestionably, the powers of the federal commissions over utility securities are adequate.

MERGERS, CONSOLIDATIONS, AND REORGANIZATIONS

It is logical, if commissions are to control security issues generally, that they also be given specific powers over mergers, consolidations, and reorganizations, because these acts obviously involve security issues. An examination of the statutes of the more progressive states shows provisions requiring commission approval of all proposals for mergers, consolidations, and reorganizations. In the event that the purchase of the property of a utility by another utility is approved, sometimes it is required that a new corporation must be organized

[1] Federal Water Power Act, §204 (f), Pt. II, as amended in 1935.

and new securities issued. Concerning the capital of the new venture, the Indiana law provides:

> The capitalization of a corporation formed by the merger or consolidation of two or more corporations shall be subject to the approval of the commission, but, in no event, shall such capitalization exceed the sum of the capital stock of the corporations so consolidated, at the par value thereof, or such sums and any additional sum actually paid in cash; nor shall any contract for consolidation or lease be capitalized in the stock of any corporation whatever; nor shall any corporation hereafter issue any bonds against or as a lien upon any contract for consolidation or merger.

When one reviews the history of utility mergers and reorganizations of the 1920's, such power as this certainly is justified. On all too many occasions, a consolidated company emerged with a capital structure far in excess of the sum of the stocks and bonds of the previous companies. A commission has no obligation to recognize the burden that such overcapitalization does create; nevertheless, to allow such malpractice only needlessly complicates the already complicated task of regulation.

POWERS RELATED TO SECURITY ISSUES

Because of their close relation to securities and capital structures, some commissions have powers over related activities of public utilities. The Wisconsin law, for instance, gives its commission power to forbid all dividend payments wherever it finds the capital of any company to have been impaired. Such prohibition is to hold until the impairment has been made good. Although such a measure may be attacked as an unjust interference with management obligations, it would appear to be quite defensible. These related powers have been best summarized in the recommendations of the Special Committee on Public Utility Finance to the National Association of Railroad and Utilities Commissioners suggesting supplementary laws covering[1]

1. The sale, lease and mortgaging of public utility property.
2. The purchase of any stock, bonds, notes or other evidence of indebtedness of any other public utility.
3. The invasion of territory already served by a public utility.
4. The construction of new plants.
5. The guarantee, directly or indirectly or the performance of any contract or other obligation of any other person, firm or corporation.
6. Loans of any kind and nature to any stockholder or affiliated interest.
7. Management and supervision contracts.
8. Accounting rules and regulations.
9. Depreciation accounting.

[1] 1938 *Proceedings*, p. 405.

10. The payment of dividends if the commission has reason to believe that such payments are made from capital.

SHORT-TIME NOTES

Several important problems involved in securities regulation remain to be discussed. The exemption of notes whose maturity is less than a year often creates problems for public service commissions. As we pointed out above, no consent need be secured for these issues, although they may not later be refunded by stock or bond issues except as a commission may permit. The Illinois law goes even further in its restrictions of note issues, requiring commission approval should notes be renewed "for an aggregate period of longer than two years. . . . "

The intent of this exemption is, of course, obvious. Many situations occur when management could not conveniently wait for commission approval. Often, short-time financing is needed, and to delay action pending official sanction would be fatal. Then, again, short-time notes will tide over, say, an abnormally high capital market, whereas to have floated bonds on that market would have meant a 20- or 30-year commitment at high interest charges. On the other hand, the short-time note has been a means of defeating commission regulation. Advances from holding companies have been funded into short-time notes. Questionable accounts payable later become notes payable.

The public service laws have recognized these possibilities. One limitation was cited above from the Illinois law. On its own initiative, the Massachusetts Commission has taken the position that notes frequently renewed should be refunded in bonds.[1] The federal utility acts and some state acts limit these exempt notes to a percentage of outstanding securities. It would appear that these statutes might go even farther and either require notice to a commission of proposed note issues or else prohibit outright all issues unless authorized. The net effect of note exemption is to leave a commission in the embarrassing position of passing upon the validity of a security issue after it has been incurred. To deny later a petition to refund may be to throw a company into receivership; to approve it may be to ratify an act to which the commission would never have been an original party.

When a commission protests a proposed refunding of a short-time note issue, it may even be told by the issuing company that it cannot look to the purposes of issue—it must grant the request. In New York, for instance, an electric company had the effrontery to argue

[1] *Re Edison Electric Illuminating Co.*, 10 P.U.R. (N.S.) 99.

that under the laws of that state, the Public Service Commission could not inquire into the nature and necessity of short-time notes that it (the company) proposed to refund. This contention was based on the New York statute limiting notes to "corporate purposes." Therefore their nature and necessity must be taken for granted. The case was finally taken to the Court of Appeals (the supreme court of the state) which sustained the commission but only after it had read into the note provisions the same restrictions as existed for long-term obligations.[1] The Court reasoned that to approve a proposed refund, the purpose must be valid, as defined by the law—therefore the commission could examine the original purpose of the note issue. As it said, "The sale [of notes] must have been reasonably necessary and for a public utility purpose." Although the case required no further support, it was pointed out that the notes in question were issued to retire an account payable, and therefore there was good reason to ask whether the first indebtedness resulted in a genuine "capital investment."

If this is the way that utilities attempt to evade adequate security regulation, then exemptions of note issues from advance approval should be withdrawn.

NO-PAR STOCK

A second problem of security regulations centers around no-par stocks. In the hectic 1920's, they were freely, if not promiscuously, issued, with the approval of some and the disapproval of others. Even yet, commission sentiment is divided. The New Hampshire Commission has approved of them:[2] and for a street-railway reorganization, the New York Commission has said they were "both desirable and necessary. . . ."[3] California has objected to their use, when the stated value has been too low,[4] and the Wisconsin Commission has apparently "pulled their teeth" on at least one occasion by authorizing a no-par stock to sell at $100 a share, a usual par value figure.[5] The federal utility laws not only fail to mention no-par stock as permissible securities (thereby outlawing them) but provide that such as are outstanding shall henceforth carry as their value the "fair market value as of the date of issue."

[1] *Staten Island Edison Corp. v. Public Service Comm., supra*, p. 461.

[2] *Re New Hampshire Gas & Electric Co.*, 19 N.H.P.S.C.R. 499.

[3] *Re McPherson*, 23 P.U.R. (N.S.) 305, 310.

[4] *Darling v. Swift*, 10 P.U.R. (N.S.) 393, and *re San Bernardino Water Util. Corp.*, P.U.R. 1933C 391.

[5] *Re Wisconsin Central Util. Co.*, 12 P.U.R. (N.S.) 4.

The advantages of no-par stock are several. In the first place, par value is a fiction and a misleading fiction at that. All it was ever intended to mean was the amount of original contribution. At any time, subsequently, there would be no necessary relation between the par value of a share of stock and its recorded or book value. Yet, the very phrase—$100 par value—misleads people into assuming that figure to signify the true worth of their investment. Therefore, the no-par share remedies this fiction—it is, as stated, stock without a par valuation. It becomes what a share of stock truly is, evidence of its owner's fractional right to net equities.

On the other hand, so many financial sins were committed during the 1920's in the name of no-par stock that its use fell under justified suspicion. One group of experts took the position that "No-par value shares are not ipso facto bad," but they were obliged to admit that "neither are they a panacea for all financing difficulties."[1] To our way of thinking, therefore, no-par stock issues should be prohibited. A commission with power to authorize stock sales at less than par can give to utilities all the advantages of no-par stock. In the minds of many, there should be a desirable correlation between valuation for rate making and capital structures. The use of no-par stocks at a variety of prices, although not defeating this objective, certainly does confuse it. Massachusetts, for instance, in attempting to keep capital structure equated to actual investment, has never favored no-par stock issues.

PREFERRED STOCK

A third problem of security regulation centers around the preferred stock. As we pointed out above in Chap. VI, during the years prior to the depression of 1929, a variety of them were issued by public utilities. Although stocks may be preferred as to dividends, voting power, or distribution of assets, the utility issues generally were preferred only as to dividends, and many of them were nonvoting so long as dividends were paid regularly. The most exotic issue to come to our attention was a "Seven Dollar, No-par, Cumulative, Prior Preferred Stock." The motives behind the use of preferred stock issues have been two: the attraction of capital from sources that require a higher yield than bond interest rates; and the further dispersion of investors, thereby making "shoestring" control easier. Using the 75 per cent limitation of the Indiana law, it became possible in that state to issue nonvoting securities (say, 60 per cent in bonds and

[1] *Report* of Special Committee on Public Utility Finance, National Association of Railroad and Utilities Commissioners, 1938 *Proceedings*, p. 415.

15 per cent in nonvoting preferred stock), leaving all voting power in the remaining 25 per cent of the capital structure. Thus, possession of common stocks amounting to one share over 12½ per cent of the stated value of all securities outstanding would give absolute control, although practically a lesser percentage would be enough.

The evils of this situation are two. First, management and ownership became too widely separated, to the disadvantage of both. Second, and more important from a regulatory standpoint, preferred stocks created an ethical obligation not much less binding than the legal obligations of bonds. Preferred stockholders were sold their shares in part on the assurance of regularity of dividend payments. An examination of the literature used in the many "customer ownership" campaigns of the 1920's will disclose ample evidence of this fact. Thus, investors in preferred stocks did, of course, expect performance on these (nonbinding) promises. Failure to perform creates a bad public relation situation, which takes years to offset. Again, the events of the depression of 1929 prove this point.

Commissions ordinarily do not have the authority to forbid, or even control, the volume of preferred stocks. That omission is one of the weaknesses of state securities provisions. Rather than leave this door open to complicate further the problem of effective security regulation, we approve the federal utility laws' entire omission of preferred stocks as a proper security for utilities to issue. With their laws affecting a large portion of the electric, gas, and telephone companies, it may be that that problem has been solved.

WHAT IS A REASONABLE CAPITALIZATION?

Behind every commission decision lies the question of a reasonable capitalization; and, like so many basic utility concepts, it is seldom given objective formulation. Yet it must be apparent that every act of approval or disapproval turns on certain underlying premises. Therefore, let us raise the question "What is a reasonable capitalization?" This problem is especially illusive where, as for public utilities, the one major goal is the establishment of prices. When competition can be relied upon to determine price, one can then proceed from earnings to capitalization in a rather easy manner. For instance, with a given net income and a market rate of interest, one can find the capitalized value of property. By this figure it is an easy task to measure the reasonableness of a capital structure. It should be apparent, however, that when earnings are the thing to be established no such solution of the reasonable capitalization problem is available.

We must here note two exceptions to our conclusions. In the first place, the reasonable capitalization of any utility, such as the street railway, whose rates are fixed solely at the upper limits of the demand of customers, would be its capitalized net earnings. It matters little what the property may have cost, because changing economic conditions have removed it from the shelter of monopoly. For these exceptional cases, the rule of competitive capitalization is valid. The second exception concerns the investor's viewpoint. The investor would be inclined to relate capitalization to earnings, especially if their level appeared to be relatively permanent. That is to say, unless there is a serious threat of rate reduction, it is a safe procedure to measure utility capital structures against capitalized earnings. In fact, quite complex formulae have been devised by which to guide investors' decisions to buy or not to buy utility securities. For instance, one rule has been to say that if under existing rates and economical management the securities of a public utility sell in the market for par, that company is properly capitalized; if they sell for more, it is undercapitalized; if for less, then overcapitalized.

From the regulatory viewpoint, however, this rule is useless because it assumes a constancy of present rates—an assumption contrary to the very purpose of regulation. How, then, shall commissions measure reasonableness of capitalization? We confess we know of no answer to this question, except as the concept of reasonableness is related to cost. In other words, a reasonable capitalization is one that measures the actual investment in utility property. A public utility capital structure is reasonable if it can be shown that every dollar there represented was, when received, exchanged (without shrinkage) for productive assets designed to render utility service. All that the capital structure can possibly mean, then, is the sum of the investment of bond- and shareholders. Unless there was imprudency in expenditures, or obsolescence, internal or general, has overtaken the business, this is a workable concept of reasonableness. For indicating the present value of assets, capital structures mean nothing. Generally, there may be a close relation between present value of assets and the valuation of the bonds and stocks that they represent, but not necessarily.

Commission laws and practice indicate this to be their notion of a reasonable capitalization. In Massachusetts, there has been a determined effort to relate capitalization to the actual investment. This determination has gone to the extent of prohibiting capitalization of reinvested earnings. Other commissions have tried to be equally conservative. The New York Commission has said that the amount

and value of securities need not equal the full value of assets.[1] The Wisconsin Commission has interpreted its statute to limit securities to the value of assets.[2] The Oregon commissioner insists that one condition to approval be an acceptable sum of tangible, physical property.[3] The California Commission, in a recapitalization case, has insisted that the maximum issue was controlled by actual cost where known or by cost less depreciation plus land at current market values.[4] The Pennsylvania Commission has made it very clear that it looks to original cost as an essential element in determining present-day values of property for capitalization purposes.[5]

Enough has been said to show, we believe, that the concept of a reasonable capitalization, from a regulatory as contrasted to investment standpoint, cannot be related to earnings. If it means anything, it must be related to the original act of investment created by security issues. For a going concern, therefore, prudent management will have acquired and preserved assets at least equal to the sum of the capital structure. That structure, then, is a reasonable capitalization.

SECURITY REGULATION AND REASONABLE RATES

What can or should be the connection between rate regulation and security regulation? Commissions generally disclaim any connection, and statutes fortify that viewpoint. For instance, the Pennsylvania Commission has said that its approval of a capital structure of a public utility does not bind it in a subsequent rate valuation.[6] The California Commission has declared that although security regulation has the primary duty of protecting the investing public, its approval does not guarantee the success of the venture.[7] The Illinois statute disclaims all obligation of the state "to pay or guarantee, in any manner whatsoever," any security authorized, and it further affirms that past or future approval does not mean that the values of the approved securities "represent actual value of property owned or to be owned by a public utility or the value of such property for rate making purposes."

Enough has been said to show the official attitude of statutes and commissions. Yet, it occurs to us that the problem cannot be so summarily dismissed. In other words, despite all protests to the

[1] *Re Consolidated Edison Co.*, 22 P.U.R. (N.S.) 239.
[2] *Re Northern States Power Co.*, 22 P.U.R. (N.S.) 225.
[3] *Re Mountain States Power Co.*, 23 P.U.R. (N.S.) 497.
[4] *Re San Gabriel Valley Water Service*, 19 P.U.R. (N.S.) 168.
[5] *Re Philadelphia Rapid Transit Co.*, 14 P.U.R. (N.S.) 54.
[6] *Re Safe Harbor Water Power Corp.*, 6 P.U.R. (N.S.) 94.
[7] *Re Bridge Bus Lines Corp.*, 20 P.U.R. (N.S.) 188.

contrary, there is a relation between rate control and security authorization. A hint of this is seen in the boast of the Missouri Commission in 1935 that no security approved by it had yet to be in default, a pardonable boast in view of the financial distress of the immediately preceding years.[1] If a commission first approves of the purpose of security issues and then verifies the valid disposition of the funds received, it is certainly under some obligation to see to it that an economical management can earn sufficient funds to pay its interest requirements and dividend commitments.

The logical consequence, therefore, of security regulation should be for commissions to favor prudent investment as a rule of valuation for rate making. Such a combination would better insure stability of future earnings. Cost of reproduction, on the other hand, makes earnings depend upon price changes and technological changes, which, as we pointed out above, could in periods of price decline or rapid technological advance imperil the credit of utilities. It is a fact that commissions would generally choose prudent investment, courts permitting. Therefore, we regard their professions of no responsibility for the future of security approvals as pure lip service to a legalistic tradition. All that they can mean is that they cannot reimburse a company in cash for losses incurred. This is obvious, but it is almost as obvious that they are morally bound to help immediately in eliminating the possibility of future losses. We think the Wisconsin Commission caught the spirit of this point of view when it said in the matter of a proposed fare experiment by a street railway:[2]

> Whatever the course of future developments affecting these utilities, it is certain that the problems they present are ones which give this Commission concern. If a Wisconsin public utility is unable to maintain its credit, or if it sickens and dies, this Commission under whose supervision it has been operating during most of its life cannot disclaim all responsibility for the event.

Bibliography

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DORAU, HERBERT B.: *Materials for the Study of Public Utility Economics*, Chap. 12.

Federal Trade Commission, *Report* of, Part 69-A, pp. 224–271, 518–539, *Senate Doc.* 92, 70th Cong., 1st Sess. (This volume is a compilation of proposals for and against federal incorporation and a compilation of state laws and

[1] 8 P.U.R. (N.S.) at 410.

[2] *Re Milwaukee Electric R. & Light Co.*, P.U.R. 1931E 289, 290.

decisions pertaining to regulation of holding companies and operating companies.)

National Association of Railroad and Utilities Commissioners, Special Committee on Public Utility Finance, 1938 *Proceedings*, p. 396; 1939 *Proceedings*, p. 184. (We have mentioned only two of these reports. *Proceedings* for other years can also be profitably studied.)

SPURR, HENRY C.: *Guiding Principles of Public Service Regulation*, Vol. 1, Chap. 4.

CHAPTER XXIII

THE PROBLEM OF THE HOLDING COMPANY

This is the fourth and final primary problem of regulation, and, as was pointed out above, it has been so placed at this point because of the position that the public utility holding company now occupies in the field of regulation. The utility holding company, however, is almost as old as the operating companies, and it has been used in conjunction with all of them, even the waterworks. For instance, the American Telephone and Telegraph Company is the instrumentality by which the Bell System is controlled and integrated. In the main, however, the problem of holding company regulation has centered primarily around its relation to the electrical industry. Of secondary interest will be the holding company control of gas companies. Since, however, this control has been so completely integrated with and subordinated to electricity, the reader will not be surprised to find little specific mention of gas.

The holding company as a problem of regulation did not emerge to its present status until after the first World War; but once it had so emerged, it quickly assumed an amazingly important position. In the space of 15 years, it had grown so rapidly and aroused so much interest and opposition that in the middle 1930's it became the center of one of the most bitter fights over public policy ever witnessed in the United States. Repercussions of that conflict are not over; it will be years before it can be said that its direct effects have disappeared.

The battle broke out in earnest in the spring of 1935, when, as a conclusion to years of study by the Federal Trade Commission, the proposal was made in Congress to subject the holding company to federal regulation. When the evidence had all been gathered, it appeared that the holding company was vitally affecting every phase of the utility business. Many were saying that all hopes of accomplishing adequate regulation were lost so long as the holding company continued unregulated. Senator Bone caught this spirit when he said, during the hearings on the proposed Public Utility Act of 1935, "Personally, I think 'regulation' is a futile thing."[1] There can be no

[1] *Hearings*, Senate Committee On Interstate Commerce on S. 1725, 74th Cong., 1st Sess., p. 352.

doubt, therefore, that the most important utility problem of the 1930's has concerned the public utility holding company.

WHAT IS A HOLDING COMPANY?

It is essential at the outset that we define our term "holding company." Although definitions are legion,[1] strangely enough most official uses of that phrase do not define, preferring, we suspect, not to be too closely confined by precise nomenclature. Yet, like all widely used phrases and concepts, the holding company, although a very common term, is quite illusive when one attempts to define it. We offer a few samples:

The Federal Trade Commission, after an 8-year investigation, avoids the task of definition, preferring to say that "An essential feature of the holding company is its practical control of the policies and management of other companies. . . . "[2] In the state laws, one finds the following sample: The Wisconsin statutes control all intercorporate relations between any public utility and "any corporation . . . which holds, directly or indirectly through any chain of ownership, five per cent or more of the voting stock of such public utility or renders any managerial, supervising, engineering, legal, accounting or financial service to such public utility. . . . "[3] This would seem to be a definition of a holding company. In the original draft of the Public Utility Act of 1935, there was set up the following definition:[4]

"Holding Company" means (*A*) any company with, either alone or in conjunction and pursuant to an arrangement or understanding with one or more other persons, directly or indirectly, controls a public-utility company, whether such control is exercised through one or more intermediary persons or by any means or device whatsoever . . . and (*C*) any person or persons which the Commission determines . . . to exercise such a material influence over the management or policies of any public-utility or holding company as to make it necessary or appropriate in the public interest or for the protection of investors or consumers that such person or persons should be deemed a holding company. . . . [5]

[1] For a selected list of definitions, see Bonbright and Means, *The Holding Company*, footnote, pp. 10, 11.

[2] *Summary Report* of the Federal Trade Commission pursuant to Sen. Res. 83, 70th Cong. 1st Sess., No. 72-A, p. 83. Hereafter, the report will be cited simply *Summary Report* of the Federal Trade Commission.

[3] §196.525.

[4] §2, (7) H. R. 5423; §3 (7) S. 1725, 74th Cong., 1st Sess. The bills defined a person as an "individual or company."

[5] Because of the extreme latitude of this proposed definition, one public utility operator suggested that the definition under part (*A*) be revised to read that a

For purposes of our discussion, we shall adopt the definitions set out by two authorities on the holding company.[1] In its broadest sense, any company owning voting stock of another company is a holding company. In fact, the owner need not even be a company; he can be a flesh-and-blood person. In a narrower sense, a holding company is one that through ownership of voting stocks can directly or indirectly exercise some control over management and financial policies of operating companies. By this definition, investment trusts owning ordinary amounts of utility voting stocks would be excluded. Ability to control (dormant or active) and percentage of total income of income from subsidiaries should be the tests. Thus, an operating utility that for good reasons has a minor part of its business organized under another corporation and whose voting stock it owns would not be classed as a true holding company. The holding company relationship is too minor, too incidental, to justify such a classification. On the other hand, those holding companies as we know them which get all or nearly all their income from dividends and fees paid to them by their operating subsidiaries are true holding companies in both the strict and the popular sense of the phrase.

One significant problem arises in connection with this definition. Note its phrasing—"can directly or indirectly exercise some control." The dividing line between ownership that can and ownership that cannot exercise some control is never sharp or subject to general rule. Obviously, a holding company that owns over 50 per cent of the voting stock of another company can control it. We know, however, that much less than 50 per cent often controls. The Insulls controlled in 1929 a 3-billion-dollar empire through an investment of 10 per cent or less of that amount. The Electric Bond and Share Company owns only minority interests in several properties, yet it can properly be said that these properties are part of that great system. The president of the Union Electric Light and Power Company of St. Louis, a subsidiary of the North American Company, admitted that one man had a controlling voice in the holding company.[2] The president of the North American Company, although admitting that this person in question had a 20 per cent interest, denied that he in any sense con-

holding company is one that derives 50 per cent or more of its revenues from such operating public utilities as it directly or indirectly controls. See Samuel Ferguson, *Hearings*, Senate Committee on Interstate Commerce on S. 1725, 74th Cong., 1st Sess., p. 501; *Hearings*, House Committee on Interstate and Foreign Commerce on H. R. 5423, 74th Cong. 1st Sess., p. 1065.

[1] BONBRIGHT and MEANS, *op. cit.*, pp. 7–10.

[2] *Hearings*, Senate Committee on S. 1725, p. 363.

trolled it.[1] At the same time, the president of the North American Company testified that his company owned 18 per cent of the voting stock of the Detroit Edison Company yet in no sense controlled that company.[2] A similar denial was made for the Public Service Company of New Jersey. There it was said that neither the 28 per cent control of the United Gas Improvement Company nor the 13 per cent control of the Morgan-owned United Corporation resulted in the dictation by either or both of the affairs of the New Jersey Company.[3] Additional protestations such as these from heads of other companies could be cited from the hearings on the Wheeler-Rayburn bill of 1935 to abolish the holding company. The point, is, however, that a minority such as illustrated could control, and therefore these interests are properly classified as holding companies. If one were to confine his concept of holding company–operating company relations to those instances where the control was demonstrable, yet minor, and those where the interest was of a majority nature, he would thereby omit a wide twilight zone where control of no less a degree in effectiveness could be or was a fact.

THE DEVELOPMENT OF THE HOLDING COMPANY

The holding company, once New Jersey had opened the gates to its legal existence, grew out of several problem situations. In the first place, the early years of utility development saw many small (and later competing) units built, especially in the larger cities. When the evils of this competition became apparent, one escape was the union of the competing units by means of a holding company. The Insull technique in the 1890's illustrates this. In 1893, Samuel Insull became president of the Chicago Edison Company, serving essentially what is now known as the "Loop" district. He then organized the Commonwealth Electric Company, which in one way or another acquired the property or the corporate charters of many small competing plants within Chicago. Eventually, his two companies controlled the entire city, and later they were merged. This same experience can be found in many other cities and in the street railway business particularly.

The second situation that the holding company helped—financing—is best illustrated by the experience of the General Electric Company prior to the creation in 1905 of the Electric Bond and Share Company.

[1] *Hearings*, House Committee on H. R. 5423, p. 985.
[2] *Ibid.*, p. 986.
[3] *Ibid.*, pp. 885, 903.

In the early years of the electrical utility, selling electrical generating equipment was not an easy task. The General Electric Company found plenty of opportunities to sell its equipment to local electric light companies, but usually they had little cash to offer. An untried venture such as electricity supply could command but little capital. Therefore, the equipment manufacturers found themselves obliged to accept securities of local purchasers as part payment. The problem was to dispose of these securities. One of the predecessor companies to General Electric four times before 1890 issued trust certificates having as security its holdings of stocks and bonds of operating companies. In 1890, a subsidiary company was organized to further the sale of securities of local companies. Finally, there was organized in 1905 the Electric Bond and Share Company to hold such operating company securities as had been acquired and to supervise their operations. From this beginning, that company has grown to be the largest of all holding company units.[1]

It was of course inevitable that the need for capital would attract groups other than equipment manufacturers. Early in the field of gas company financing was the United Gas Improvement Company. This company had been incorporated under special charter in 1882. It quickly saw the financial advantages of entering the electric field and by that fact was able better to protect its gas company holdings. By 1902, for instance, the United Gas Improvement Company controlled thirty-four companies located in sixteen states. Investment bankers early saw investment opportunities; and in 1890, such interests organized the North American Company, now a leading holding company.

The last group interested in utilities were the engineering service and management companies. Their entrance into the holding company field was largely a matter of self-defense. The story of Stone & Webster illustrates this. Early in the field as engineering experts in construction and operations, Stone & Webster was soon contracting with many independent companies to assist in their management and general operations. When the scramble for added holdings began in earnest, this engineering company found it necessary to become a holding company in order to protect its contracts. As one of their leaders told the Federal Trade Commission, "Before we went into the banking business we were working for the banker." Stone & Webster

[1] In this statement of the size of Electric Bond and Share, the place and importance of the banker-organized United Corporation is ignored. Electric Bond and Share continued to be a General Electric Company-controlled company until 1925.

is but one of several of the engineering service groups that became holding companies.

Once the electric holding company was organized, it continued to expand. From 1900 to 1910, its place was rather minor. After 1910, when physical interconnection became economical in the electrical industry, the part played by the holding company rapidly began to shift to one of a major role. In 1915, the Department of Agriculture estimated that eighty-five large public utility companies controlled 68.6 per cent of electric power generated in that year. Ten years later, in 1925, the Federal Trade Commission estimated that holding companies controlled 76.5 per cent of the industry. The largest four controlled almost one-third of the total. Table 48 shows the detail of the commission's estimate.

After 1925, the leading holding company groups continued to indulge in their mad race to acquire independent and municipally owned properties. This race was in one sense very successful, although it was the consequent abuses exposed by the Federal Trade Commission that brought the strait-jacket legislation of 1935. Something of the speed of this race is shown by the figures for the organization of fifty-seven holding companies.[1] Twelve of them were chartered between 1906 and 1912; four more, before 1922. From 1922 to 1932, forty-one companies were chartered. The figures of the Federal Trade Commission for 1932 (Table 49) give an accurate picture of holding company development at its peak.[2] Note that there are several new names in this list not found in the figures for 1925. About 80 per cent of the private electric companies were within holding company systems, and about 45 per cent were dominated by the largest three.

It appears to us that this phenomenal growth of the electric holding company has one major explanation overshadowing all others. Regardless of why the institution arose, it has continued to grow mainly because it has been very profitable to its control groups. In profits, then, we find the real explanation of the growth of the holding company.

TYPES OF HOLDING COMPANIES

Holding companies have been classified in many ways, depending on what one desires to emphasize. For instance, one grouping distinguishes between the essentially financing companies—ones that exist primarily to acquire stocks of operating companies which in turn become the basis for their own security issues—and the service companies, such as Stone & Webster, which serve their respective operating

[1] Testimony of W. M. W. Splawn before House Committee on 5423, p. 68.

[2] *Summary Report* of the Federal Trade Commission, 72-A, p. 38.

units in many ways, rendering legal, engineering, and accounting supervision as well as financial assistance. This classification, however, is not especially helpful, because most holding company systems perform both these functions to some degree. To this grouping one

TABLE 48.—HOLDING COMPANY CONTROL, 1925*
(Expressed as percentage of control of generating capacity)

	Installed capacity, kw.	Percentage of total reported
Holding companies:		
Electric Bond & Share Co. and affiliated companies	2,331,141	11.7
Insull interests	1,729,021	8.6
North American Co	1,276,238	6.4
H. M. Byllesby interests	1,059,873	5.3
United Gas Improvement Co	588,209	3.0
Hodenphyl-Hardy interests	543,069	2.7
Pacific Gas & Electric Co	540,975	2.7
H. L. Doherty interests	488,830	2.4
Stone & Webster interests	430,664	2.2
Public Service Corp. of New Jersey	409,800	2.1
American Water Works & Electric Co	385,760	1.9
United Light & Power Co	347,155	1.7
North American Light & Power Co	279,624	1.4
W. S. Barstow interests	274,751	1.4
Duke Power Co	262,620	1.3
Montana Power Co	234,850	1.2
Columbia Gas & Electric Co	222,670	1.1
J. G. White Co	207,440	1.0
Other holding company groups	3,707,839	18.6
Total	15,320,529	76.5
Independent companies:		
New York Edison Co. and United Electric Light & Power Co	802,300	4.0
Detroit Edison Co	511,850	2.5
Southern California Edison Co	498,700	2.5
Philadelphia Electric Co	476,480	2.4
Consolidated Gas, Electric Light & Power Co., Baltimore	357,512	1.8
Brooklyn Edison Co	339,500	1.7
Other independents	1,124,001	5.5
Total independents	4,110,343	20.5
Municipal plants	597,624	3.0
Total reporting	20,030,496	100.0

* Adapted from *Report* of the Federal Trade Commission, "Supply of Electrical Equipment and Competitive Conditions," p. 175.

writer gave the names "holding companies" and "management companies." To complete the list, he added a third, the investment

TABLE 49.—HOLDING COMPANY CONTROL OF ELECTRIC POWER PRODUCTION, 1932*

Group	Percentage of U.S. Total Electricity Generated
United Corporation group:	
Commonwealth & Southern Corp.	5.9
Niagara Hudson Power Corp.	6.0
United Gas Improvement Co.	4.2
Public Service Co. of New Jersey	2.4
Columbia Gas & Electric Corp.	1.3
	19.8
Electric Bond & Share Co.	13.6
Insull interests	11.1
Consolidated Gas Co. (N.Y.)	6.5
North American Co.	5.6
Standard Power & Light Co.	4.9
Associated Gas & Electric Co.	2.4
Stone & Webster, Inc.	2.3
Other holding company groups	12.6
Total	78.8
Large local companies	13.4
Small local companies	7.8
Total	100.00

* Adapted from *Summary Report* of the Federal Trade Commission.

company, best illustrated by the United Corporation and American Superpower Corporation. He said of this third group:[1]

> Companies of this type do not control either operating or holding companies and take no direct share in management or financing. They have been formed for the most part either for purely investment purposes or as vehicles for the working out of eventual mergers and regroupings.

Since this statement was made, new evidence would seem to point to the United Corporation's having slipped out of its classification as an investment company into that of a holding company.

A more significant classification of holding companies in the electricity supply field is by degree and extent of territorial domination. W. M. W. Splawn has suggested the following classification of electric holding companies:[2]

[1] ROHS, "The Inter-relation of the Utilities," *Barron's*, p. 6, Feb. 2, 1931.

[2] "Relation of Holding Companies to Operating Companies, *Report* of the House Committee on Interstate and Foreign Commerce, H. R. 827, 73d Cong., 2d Sess., Pt. 2, pp. 6–8; and *Hearings* on H. R. 5423, Pt. 1, pp. 60–68.

1. Holding companies operating in urban areas. Illustrations are the Edison Electric Illuminating Company of Boston and the Detroit Edison Company. These companies control practically 100 per cent of the electricity supply of their areas.

2. Holding companies confined to regional units. This type is illustrated by the Niagara Hudson Power Corporation, the Public Service Company of New Jersey, the Public Service Company of Northern Illinois, and the Duke Power Company. These companies confine their operations to small areas but occupy them completely. Splawn says of them that they "make a unit that is ideal for the realization of the economies of unified management." In fact, although these companies may be called holding companies, they are, in reality, well-integrated and interconnected operating units.

3. Holding companies in part confined to regional units. This type is illustrated by the Commonwealth and Southern Corporation. This company, prior to the invasion of its territory by the Tennessee Valley Authority, had well-knit operating units in the states of Alabama, Georgia, eastern Mississippi, southern South Carolina, and central Tennessee.[1] In addition, it has scattered holdings in Ohio, Michigan, and Illinois. This class occupies a sort of twilight zone between classes 2 and 4.

4. Holding companies constituting a far-flung empire. Illustrations of this are the Electric Bond and Share Company, the Insull system, the North American Company, and the Associated Gas and Electric system. Systems such as these may have properties in many states. Part of their holdings will be well-organized units dominating geographic areas; others will be isolated holdings. Of course, the separate units have no interconnection; each of the larger ones can effect regional operating economies; and all may receive certain benefits from unified management.

5. Holding companies having scattered holdings. Illustrations of this class are the Cities Service Company, the United Light and Power Company, and Stone & Webster, Inc. In practically none of these companies do their operating units cover a geographic area; most of them are isolated and thus not interconnected.[2]

[1] In the summer of 1939, the Tennessee electric properties of Commonwealth and Southern were sold to a group of Tennessee cities and the Tennessee Valley Authority.

[2] Some of the holding company systems mentioned here as illustrations have, since the enforcement of the Public Utility Act of 1935, ceased to be holding companies. Stone & Webster has cut itself loose from the Engineers Public Service Company, thereby returning to its original status of an engineering service com-

The United Corporation.—One company, not easily set into the grouping above, deserves special mention, the United Corporation. This company was organized in 1929 by the banking houses of Morgan, Bonbright, and Drexel, as a vehicle through which to consolidate their several holdings of public utility operating and holding company stocks. As a result, the United Corporation by 1931 had interests in all electricity produced east of the Mississippi River, except New England and the areas of four other groups. The sum of the liabilities of these companies under the United Corporation on December 31, 1931, amounted to $8,652,988,000, or one-third of the total of all such liabilities in the United States. They generated about 27 per cent of the electrical output of the United States and almost two-thirds for the areas in which they were situated. Although this company owned but small amounts of voting stocks in each of the systems in which it was interested, it has been in a position to influence their management policies. The United Corporation was an inevitable outgrowth of the profitableness of ownership of electric properties, the many system clashes for territory, and especially the desire to defeat the drive of the Insull interests for an eastern foothold. Measured in terms of these criteria, it has been in every sense a complete success.[1]

The American Telephone and Telegraph Company.—Finally, no description of holding companies would be complete without mention of the American Telephone and Telegraph Company, which controls without doubt the largest aggregate of capital ever amassed by any single American corporation. The original home of the Bell System was in Massachusetts, and the control of the System was successively held in those early days by, first, the New England Telephone Company and the Bell Telephone Company; next, the National Bell Telephone Company; and finally the American Bell Telephone Company, organized in 1880. It was during the life of this last company that the essential features of the present Bell System were formulated. The license principle was extended and strengthened; stocks of license companies were acquired in exchange for licenses; and in 1882, the Western Electric Company was brought under Bell control. In order to avoid the burdensome restrictions of Massachusetts laws concerning capital issues, in 1885 the American Telephone and Telegraph Company was organized under New York law to hold and develop the long

pany. Others of these systems will undergo significant reorganizations and rearrangements.

[1] For further description of this company, see Notes, 37 *Columbia Law Review*, "High Finance in the 'Twenties': The United Corporation," pp. 785 and 936; and "High Finance in the 'Thirties': The New Deal Legislation," p. 1137.

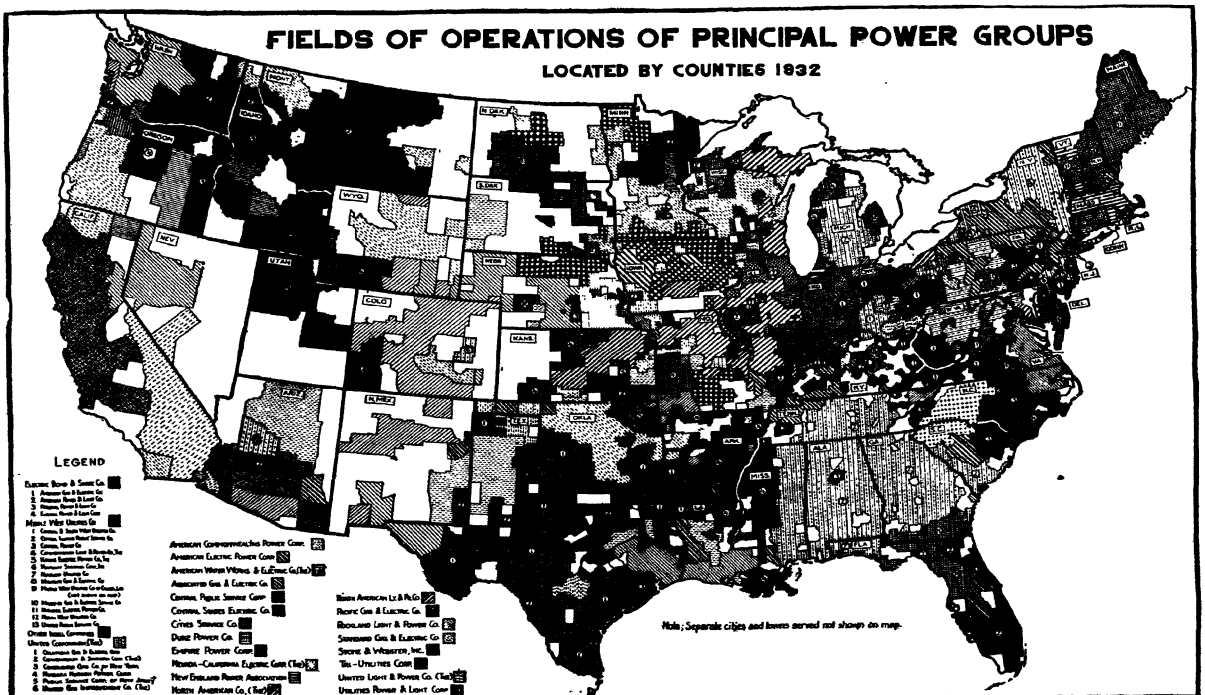

CHART 23.—This map is taken from the *Summary Report* of the Federal Trade Commission on "Utility Corporations," Pt. 72-A, p. 56. As here reproduced, it may be difficult to locate the exact area of some of the systems. Yet it will be observed (with scattered exceptions) that only in areas of scant population was some holding company not in control.

lines of the System. Finally, in 1899, to complete the emancipation of the system, the control of the Bell interests was shifted to the New York company.

The years since 1899 need no minute description. As is well known, the System under American Telephone and Telegraph began a period of rapid expansion until today that company and its affiliates represent the largest single corporate unit in the United States. The parent company itself continues to own and operate its long lines. In addition, it is the holding company for some twenty major operating companies, the Western Electric Company, Inc., the Bell Telephone Laboratories, Inc., and numerous other related and foreign companies. For the year ending December 31, 1938, the Bell System showed a consolidated gross operating revenue of $1,052,657,832 and fixed assets (mainly plant and equipment) of $4,804,562,562. All in all, the System served on that date 15,761,095 telephones from 6,975 central offices. Need any other evidence be added to show the size and importance of an organization controlling 85 per cent of the American telephone business?

THE ADVANTAGES OF THE HOLDING COMPANY

For all the emphasis upon the profit motive as the basis of the growth and development of the holding company, the fact remains that it has served and can still serve to the advantage of investor and customer alike.[1] These two interests we shall treat separately. In the years since the utilities were scarcely more than clumsy laboratory toys, the holding company has served the operating companies in many ways. First, it assisted in financing the venture; then it supervised its construction; next, it supplied a continuous engineering, accounting, and legal service; and, finally, it used its buying power to advantage in purchases of materials and supplies. When interconnection of urban units became feasible after 1910 and long-distance transmission of natural gas economical after 1927, it was logical that the holding company finance and pioneer these technological developments. The entire history of wire communications in the United States is a tribute to its leaders and their holding company organization. Let us, therefore, analyze in detail all its advantages from an operating viewpoint, because whatever benefits accrue to operations can be passed on, in part at least, to customers.

[1] For an expanded discussion of this and the following section, see the *Summary Report* of the Federal Trade Commission, No. 72-A, and No. 73-A of its "Report on Utility Corporations." See especially Chaps. 11, 12, 13, and 14. We have relied heavily on this material in these two sections.

The most significant service of the holding company has been in the field of finance. Capital has been advanced to operating units on a temporary basis on open accounts or for more permanent commitments in exchange for operating company stocks and bonds. These the holding company either holds to resell later or makes the basis for flotation of its own securities. In the latter case, only stocks should be issued by the top company, a practice not too often followed. In the hearings on the Wheeler-Rayburn bill (the proposed Public Utility Act of 1935), an illustration of the best of financial assistance is to be found in the testimony of the president of the Commonwealth and Southern Corporation. In 1933, the Illinois Commerce Commission authorized one of the subsidiaries of that system, the Central Illinois Light Company, to issue $9,300,000 of 5 per cent bonds to be sold at not less than 90. The holding company, believing that it could sell these bonds later on better terms, bought the entire issue. Months later, it sold them at 97½, at a rate of 4½ per cent, making a saving "in the sale price of those bonds of around $700,000, and of almost $2,000,000 on the interest charge during the life of the bonds."[1] Practically the entire saving in principle ($600,000) and all the interest saving accrued to the benefit of the Illinois company. Of course, not all holding company-subsidiary company transactions have been conducted with such consideration of the subsidiary. This, however, does illustrate the best practice. In many instances such as this, the superior credit position of the parent has been used to the immediate advantage of the operating unit and the ultimate advantage of its customers.

The other services are no less significant. Each major holding company has developed a construction department, a servicing department, a purchasing department, a research department. These departments may be separate (and subsidiary) companies or all merged into one subsidiary company or simply units of the top company. Thus, the best construction, the newest equipment, the most efficient methods, the cheapest supplies are always available to the operating units. Since we set out in detail in a preceding chapter the benefits of the service companies, we need not repeat them here. There can be no question that holding companies have performed a valuable service to utility patrons through these subsidiary organizations.

From the investors' viewpoint, the holding company also has had its advantages, especially when it controls small operating units. It is common knowledge that small, unknown business units have found the cost of capital extremely high. Unable to find local financial

[1] *Hearings* before House Committee on 5423, Pt. 2, p. 594.

support, they were forced to seek capital in distant markets and, being unknown, could attract investors only by high rewards. A holding company, grouping many such units together, is in a better position to secure funds at reasonable cost. Thus, both operating companies and investors profit. The former benefit through lowered financing costs; and the latter, through greater diversification and the resulting reduction of risk. Although today this point may be of no significance to the larger and well-established operating companies, it has been important and will continue to be important to the many smaller ones.

THE DISADVANTAGES OF THE HOLDING COMPANY

On the other side of the question, the holding company has been guilty of many shortcomings and abuses. The findings of the Federal Trade Commission are filled with evidence, although it does appear to us that the bad has been overemphasized. Holding companies have been guilty of charging excessive construction and management fees. These charges have been usually on a basis of cost-plus, or a percentage of gross revenues. The latter method of charging is open to serious question—not that the services received are not valuable but that that value bears no relation to the price paid. The American Telephone and Telegraph Company has used the percentage basis of charge, protests of the commission to the contrary.[1] In 1929, fees produced 26 per cent of the gross revenues of the Electric Bond and Share Company and, in 1930, 30 per cent of its gross. These figures in themselves prove nothing, but further analysis has shown them to be quite in excess of the cost of service rendered.[2] On the premise, as expressed above, that there is no place for "profits" in such relations, both the amount of the charge and the basis of charge have been unfair in too many holding company systems.

A second holding company evil has been improper write-ups of both its own and operating company assets. The Federal Trade Commission examined systems having assets valued at $3,306,000,000. It found that these systems had written up their assets by approximately $1,400,000,000. Write-ups of operating company assets

[1] For years, the standard charge to the operating companies was 4½ per cent of gross earnings. In 1926, the percentage was reduced to 4; in 1927, the instruments licensed were sold to the operating companies, and the payment reduced to 2 per cent. On January 1, 1929, the charge was further reduced to 1½ per cent of gross earnings.

[2] See BUCHANAN, "Service Contracts in the Electric Bond & Share Company," *Journal of Land and Public Utility Economics*, **9**:283, August, 1933; and **11**:209, May, 1935.

amounted to 22 per cent of their costs.[1] Of course, the usual reply is that such account manipulation cannot affect consumers. We do not share this same optimism, as we show below. We believe that indiscriminate write-ups can affect rates, service, and stability of investment. Therefore, it seems reasonable to conclude that such practice is dangerous and should be prohibited, except as a commission may find exceptional circumstances to justify it.

A third place for abuse is found in the accounting for intercompany transactions. For instance, in the transfer of natural gas from one arm of a system to another, holding companies have shown profits ranging up to 36 per cent, whereas operating companies earned nothing. "Some of them incurred losses." Middle West Utilities Company, as another illustration, transferred shares of a New England company to another subsidiary at twice their purchase price. Such transactions should be subjected to the closest scutiny, because in them there is a complete absence of "arms'-length bargaining." As a result of these intercompany transactions, the true profit picture of the participating units may become distorted. If, as is usually the case, the holding company is the main beneficiary, it will be able to pay handsome dividends while its subsidiaries can cry for rate increases.

Improper intercompany transactions take still other forms. One of the most objectionable is the sale of assets at an excessive price by one part of a system to another. In such transactions, there is double imposition upon the public. The first occurs in the act of sale; the second continues in the form of a perennially overvalued asset on which the recipient company will try to earn a fair return. An excellent illustration of this is found in the sale in 1927 by the Bell System to its operating companies of the instruments previously leased to them. The price was $14,395,800 in excess of their book value (cost less depreciation), giving thereby a profit of 60 per cent.[2] Any amount over net investment can be suspected, but this transaction was especially questionable in the face of the obvious supercession about to occur in 1927 in the telephone instrument. The handset was being introduced at that time; therefore, full reckoning of the effect of obsolescence might have made a considerably smaller sales price. We agree with the critics that all intercompany transactions should be subjected to the most rigid supervision.

[1] *Summary Report*, 72-A, p. 845.

[2] "Investigation of the Telephone Industry in the United States," *Report* of the Federal Communications Commission, *House Doc.* 340, 76th Cong., 1st Sess., pp. 151–153.

A fourth malpractice of holding companies—though not a common one—has been the making of "upstream loans." As the name implies, it is one in the opposite direction, a loan from operating unit to holding company. Such a practice, except under unusual circumstances, should be prohibited, because if it is necessary to the continued life of the parent, it indicates that the child no longer needs its support and that therefore the parent has outlived its usefulness. In other words, one of the prime arguments for the holding company has been its superior financial position. When it is obliged to borrow from a subsidiary, then one of its major reasons for existence has disappeared. When such a practice became known, many states amended their public service laws to forbid it.[1]

These disadvantages have concerned, in general, the operating company and ultimately the customer. Now let us turn to the investor's viewpoint. In the first place, it appears that the advantage of diversification has been overemphasized. In other words, scattered holdings in the four corners of the United States may represent more risk than holdings in a well-knit system confined to a small area. One student, after careful study of five leading holding company systems, comes to this conclusion. He says:[2]

> Industrial and geographical diversification of properties under the control of a single holding company adds so little to the effectiveness of operation and profitableness of a public utility group that size for the sake of diversification alone is not justified.

In the second place, holding company incomes may be subject to greater income variations than their subsidiary operating companies. We can best illustrate this by an example. Suppose that we have an operating company with a capital structure of

5% bonds	$600,000
Common stock	400,000

[1] Many illustrations of upstream loans abound. We select a little-known example because it shows the worst side of this practice. On the balance sheet of the Iowa Water Service Company, prior to 1938, there appeared an item, "Advances to Affiliated Companies," totaling $68,101.36. This was a significant sum in a total of approximately a million dollars. In a reorganization proceedings of the holding company, a federal district court approved of the settlement of this claim for 294 shares of preferred stock of the new holding company and $4.28 cash. On the 1938 balance sheet of the Iowa Water Service Company appeared a new account replacing the older one, entitled "Investment in Affiliated Companies," $2,205.00. Maybe this was an upstream loan that defied the law of gravity?

[2] WATERMAN, *Financial Policies of Public Utility Holding Companies*, Michigan Business Studies, vol. 5, No. 1, p. 2, 1932.

Suppose, further, that all the stock is owned by a holding company which on the basis of that holding has issued

6% bonds	$200,000
Common stock	200,000

Under ordinary conditions, we shall assume that the operating company earns 8 per cent, or $80,000, per year. $30,000 will pay its bond interest, leaving $50,000, or a 12½ per cent return, available to holders of common stock. If all earnings are then paid to the holding company, it would pay $12,000 bond interest, leaving $38,000, or a return of 19 per cent, on its own common.

Now let us measure the consequence of a sudden decline in operating company net incomes. Suppose that it declines to $50,000. From this would be deducted operating company bond interest of $30,000, leaving $20,000, or a 5 per cent return on its stocks. This amount, when transferred to the holding company, covers its interest charge of $12,000 but leaves only $8,000, or a 4 per cent return on the common stock of the holding company. We conclude, therefore, that owners of holding company junior securities have less genuine income stability than the stability of the operating company securities on which they have been issued.[1]

One significant social consequence of this pyramiding is the reduction in investment necessary to control operating companies. In our illustration, ownership of half the common stock of the holding company would control the operating company. There, the ratio of investment to operating company assets would be 10 per cent. When the Insull system was at its peak in size, the Insull family investment of a few million dollars controlled a 3-billion-dollar empire. The Federal Trade Commission found the equity of the top Insull company, the Middle West Utilities Company, in one of its operating companies, the West Florida Power Company, to be "0.05 of one per cent of the book investment of the latter company."[2] Henry L. Doherty, as a consequence of a special issue of common stock voted him by a willing board of directors, was able on an investment of a million dollars to control the billion-dollar empire of the Cities Service

[1] *Ibid.*, pp. 3, 4. Waterman concludes that a holding company should issue bonds only when there is an adequate margin of safety between its earnings and bond interest. The depression of 1929 showed the dangers that exist where too high a percentage of securities were in the form of bonds. It could be argued, quite validly we think, that holding companies should be confined to stock financing solely. The most successful groups, such as the American Telephone and Telegraph Company, rarely issue bonds except on the operating company level.

[2] *Summary Report*, 72-A, p. 858.

Company. The ratio here was one-tenth of 1 per cent. Such small investment by management may make it quite irresponsible.

Another evil practice of some of the public utility holding companies was their frequent attempts to control the securities market. These periods of manipulation of stock prices often came during a high-pressure customer-ownership stock sales campaign. We cite two examples of this practice, as reported by the Federal Trade Commission. In the summer of 1929, the Insull-controlled Middle West Utilities Company found it necessary to undergo a complex financial reorganization. To accomplish this, it was necessary to sell its stock at a price considerably above the current quotation of $160. For a period of over 30 days, the company bought through an investment house large quantities of its stock on the New York Curb Exchange and the Chicago Stock Exchange, causing its price to rise from $177.50 on June 15 to $340.50 on July 23.[1]

The contemplated plan of reconstituting the securities structures of Middle West Utilities Company was publicly announced on July 29 following; and the market quotations for the common stock were maintained at a high level, even in the face of the stock-market crash in October and November, until the subscriptions for the new stock were completed.

The Cities Service Company, to facilitate its stock sales campaigns, periodically bought and sold simultaneously its own stock. By this process, the price of Cities Service stock was controlled and boosted. During a 3½-year period, the management sold an equivalent of 41,488,000 shares of common stock at an aggregate value of nearly $1,146,519,000.[2] During this period, the management bought the equivalent of 34,058,000 shares at a cost of more than $965,700,000. Thus, the number of new shares issued was only 5,649,997, and new capital flowing into Cities Service amounted to only $80,741,657.57. Such price manipulations as these are indefensible and should be severely penalized wherever found.

IS REGULATION NECESSARY?

Exposure of such evils, even though practiced by a minority of public utility holding companies, created an immediate demand for their regulation. At first, company officials were inclined to argue that there was no need for regulation because of the adequacy of state commission control over operating companies. The argument was

[1] *Ibid.*, p. 867.

[2] Because a stock split-up came during this period, not the actual number of shares are quoted here but the equivalent number had there been no change during the period.

that control of expenditures and valuation of operating units made it impossible for holding companies to affect either rates or service. This position was soon exploded, however. No one not a partisan in this issue can doubt that in one way or another unscrupulous holding companies can affect adversely rates and service of operating subsidiaries. Asset write-ups, intercompany transactions, excessive construction and management fees, if uncontrolled, can increase rates or impair service.[1]

Admitting the need for regulation, the next two questions are, "Is there a valid legal basis by which to regulate?" and "Should it be by state or federal agency?" We pass the first of these, because it is a moot question yet to be settled by the courts. Both holding companies and commissions argued strongly, before the passage of the Wheeler-Rayburn Act (the Public Utility Act of 1935), that the states were adequately equipped from a legal standpoint to meet the holding company problem. During the 1930's, many state laws were amended to cover such holding-company–subsidiary-company relationships as loans and contracts. Upstream loans were forbidden, and service and construction contracts had to have commission approval. In rate cases, commissions have not hesitated to disallow certain intercompany transactions and payments.

The authority of the state commissions rests on two decisions of the Supreme Court. In the case of *Smith v. the Illinois Bell Telephone Company*, the Court overthrew the older principle of value of service as a measure of the reasonableness of parent-subsidiary contracts, substituting therefor the cost of service principle. Chief Justice Hughes, commenting on the charges of the American Telephone and Telegraph Company to its affiliate operating companies, said:[2]

> . . . but there should be *specific* findings by the statutory court *with regard to the cost of these services* to the American Company and the reasonable amount which should be allocated in this respect to the operating expenses of the intrastate business of the Illinois Company. . . .

[1] An admission, guardedly to be sure, of this point was made in the Senate Committee *Hearings* on the Wheeler-Rayburn bill (S. 1725), 74th Cong. 1st Sess., p. 487.

"The Chairman [Senator Wheeler]. I thought security issues would not affect rates at all.

"Mr. Moore [for Committee of Public Utility Executives]. It certainly may be urged that they do. . . .

"The Chairman. This is the first time I have ever heard anybody representing the power companies even intimate that the securities that they issued had any bearing whatsoever upon rates."

[2] 282 U.S. 133, P.U.R. 1931A 1, 12 (1930). (Italics ours.)

The second decision involved the right of Kansas to inquire into the costs of natural gas delivered by a supply company outside the state to a distribution company in Kansas, both parts of a holding company system. There, Mr. Justice Roberts affirmed the principle of the Illinois Bell case, saying:[1]

> Having in mind the affiliation of buyer and seller and the unity of control thus engendered, we think . . . that the court below was right in holding that if appellant desired an increase in rates it was bound to offer satisfactory evidence with respect to all costs which entered into the ascertainment of a reasonable rate. . . . There is an absence of arms' length bargaining between the two corporate entities involved, and of all the elements which ordinarily go to fix market value. The opportunity exists for one member of the combination to charge the other an unreasonable rate for the gas furnished and thus to make such unfair charge in part the basis of the retail rate.

The gas in question was undeniably in interstate commerce, but the Court declined to permit that to be a bar to the state's rights as set out above.

Fundamentally these decisions have given little actual authority to the states. If books and records lie outside state boundaries, it appears to us that the power of a state to compel their presence is of little avail. To determine the reasonable cost of natural gas delivered in Kansas may require a valuation of an entire system, an impossible assignment in so far as Kansas' legal rights are concerned. We conclude, therefore, that for all the apparent powers under these decisions, the holding company can be subject to no real control by the states. Notice that neither of these cases gives any authority in the way of positive control. Holding companies may be organized, may acquire stock, may do many things. Only as their acts may affect operating companies may the act, not the actor, be questioned. At best, therefore, state regulation of the holding company is largely negative, largely action after an event or arrangement has been proposed or made. Thus, we are forced to the conclusion that regulation, to be effective, must be on a nation-wide basis.[2]

THE FIGHT FOR FEDERAL REGULATION

With the coming of the Roosevelt Administration in 1933, there appeared for the first time a President who was vitally interested in the public utility holding company problem. The Federal Trade Com-

[1] *Western Distributing Co. v. Public Service Comm.*, 285 U.S. 119, P.U.R. 1932B 236, 239 (1932).

[2] For a detailed analysis of the defects of state authority over holding companies, see *Summary Report*, Federal Trade Commission, Pt. 73-A, Chap. 12.

mission had been carefully investigating the public utility holding company since 1928, and it had uncovered evidence that proved the correctness of earlier suspicions of many writers.[1] By 1935, the record was almost all gathered, and the time was ripe for action. Early in the first session of the 74th Congress, which convened in January, 1935, bills to regulate the holding company were introduced in both houses.[2] Each bill was sponsored by the chairman of the committee to which it was referred—Senator Wheeler and Representative Rayburn. Thus the popular name for the act as passed—the Wheeler-Rayburn Act. As originally introduced, the House bill had three major sections (titles): first, to regulate public utility holding companies; second, to regulate interstate commerce in electricity; third, to regulate interstate commerce in natural gas. The Senate bill carried the first two sections only.

These bills were referred to the committees on interstate commerce of the respective houses, and each committee scheduled hearings.[3] Before each committee of the House and Senate, representatives of electric and gas utilities made a desperate and concerted attack on the holding company section (Title I) of the Wheeler-Rayburn bill.

[1] As a sample, see article by the senior author advocating federal regulation of the holding company and published in *Public Utilities Fortnightly*, **8**:340, Sept. 17, 1931.

[2] H. R. 5423 and S. 1725. They differ in only two details. The Senate bill omitted a third part contained in the House bill to regulate gas; and in the holding company section, the two bills are numbered differently; otherwise, they are identical.

[3] The House Committee held hearings for a period of almost two months and accumulated a printed record of 2,320 pages. See "Public Utility Holding Companies," *Hearings* before House Committee on Interstate and Foreign Commerce, 74th Cong., 1st Sess., on H. R. 5423, 3 parts, 1935. The Senate Committee likewise held hearings but for a much shorter space of time, and its record amounted to 1,132 pages. See "Public Utility Holding Company Act of 1935," *Hearings* before the Senate Committee on Interstate Commerce, 74th Cong., 1st Sess., on S. 1725, 1935. In addition to this voluminous record, two other studies of the public utility holding company were also released at that time. One was a special report on holding companies for the House Committee on Interstate and Foreign Commerce, prepared by Walter M. W. Splawn. See "Relation of Holding Companies to Operating Companies in Power and Gas Affecting Control," *Report* to the House Committee on Interstate and Foreign Commerce, *House Report* 827, 6 parts, 1935. Mr. Splawn, its editor-in-chief, later was made a commissioner of the Interstate Commerce Commission. The other is the summary report of the Federal Trade Commission on utility corporations. See "Utility Corporations," *Summary Report* of the Federal Trade Commission, *Sen. Doc.* 92, 70th Cong., 1st Sess., Pts. 69-A, 71-A, 72-A, 73-A, 77-A, 84-A, 84-B, 84-C, 1935 *et seq.* These sources make up the record by which the necessity of the 1935 proposal to regulate the holding company was judged.

Every agency of appeal was used to block its passage or soften its provisions. Newspapers generally condemned it. Every magazine speaking for the utility industries in question carried on a constant attack. Congressmen were flooded with protest telegrams (some bogus, as later disclosed by the Black lobby investigation). A "Federation of Utility Investors" was organized to fight the bill. This agency permitted none of the "widows and orphans" to escape the force of its terrorizing propaganda. In general, the opposition took the position that the proposed legislation either was too drastic or else was quite unnecessary. Dozens of utility executives testified as to the great benefits of the holding company to the industry. Some of them contended that most of its evils disclosed by the Federal Trade Commission investigation had been eliminated. One change in argument was noticeable in these hearings. Whereas formerly the utilities had argued the adequacy of the states to regulate holding companies and interstate commerce in utility services, they had come to admit the invalidity of their former position. Now their efforts were directed mainly toward a modification of the extent and thoroughness of the proposed legislation.

As originally drawn, the holding company section (Title I) of the Wheeler-Rayburn bill had the following major purposes. Its immediate purpose was to subject all electric and gas holding companies in interstate commerce to stringent regulation. The old service and engineering arrangements between operating subsidiaries and a service subsidiary were to be eliminated. All financial activities of holding companies regarding either operating subsidiaries or the public were to be rigidly supervised. Soon the regulating body (the Securities and Exchange Commission) was to begin the reorganization of the holding company with a view to producing geographically and economically integrated operating systems. This would have been begun in 1938. The long-run and fundamental objective of the bill would have become effective after January 1, 1940. This was the famous "death-sentence" section and reads as follows:[1]

> It shall be the duty of the Commission, after notice and opportunity for hearing—immediately after January 1, 1940, to require every registered holding company to dispose of securities or to be reorganized or dissolved insofar as may be necessary to make every such company cease to be a holding company: *Provided, however,* That the Commission, upon such terms and conditions as it may deem necessary or appropriate in the public interest or for the protection of investors or consumers, may permit a registered holding company to continue to be a holding company (*A*) if such registered holding

[1] H. R. 5423, §10 (b) (4); S. 1725, §11 (b) (4).

company shall have obtained from the Federal Power Commission a certificate that the continuance of the holding company relation is necessary for the operation of a geographically and economically integrated public-utility system serving an economic district extending into two or more contiguous States or into a contiguous foreign country and the merger or consolidation of such registered holding company with its subsidiary company or companies is impossible under the applicable State or foreign law, or (*B*) if neither such registered holding company nor any subsidiary company thereof is a public-utility company organized or doing business within the United States.

This was the section that created most of the fireworks. The advocates of the bill staked their claims largely on the evils of the holding company and the irrationality of such far-flung empires as the Insull system, the Electric Bond and Share system, and the Cities Service system. In the words of Commissioner Splawn:[1]

> The physical set-up [of the electrical industry] . . . is local and at most, regional. There is nothing Nation-wide about this set-up except the corporate structure, the intangible thing superimposed upon these local physical conditions.

Thus, the far-flung electric holding company had, in his opinion, no *raison d 'être.* As stated above, the defenders of the holding company staked their case largely on, first, its advantages to its operating units and the consuming public and, second, on the financial havoc that the death sentence would inflict upon investors, especially the "widows and the orphans." Such slight social gain as the bill might accomplish scarcely justified the appalling loss—so it was argued.

While the bulk of the opponents contented themselves with simply being in opposition, at least two of them presented alternate proposals. Wendell L. Willkie, president of the Commonwealth and Southern Corporation, offered an elaborate series of proposed amendments to the bill.[2] His proposals called for stringent regulation of utility practices. In place of the so-called death-sentence provision, he would substitute a provision to prevent all future holding company expansion unless approved by the commission. Henry I. Harriman, president of the Chamber of Commerce of the United States, proposed to allow every holding company not one but two integrated systems.[3] Instead of being divested of its ownership of properties other than

[1] *Hearings* before Senate Committee on S. 1725, pp. 75.

[2] See his suggested *Federal Legislation & Memorandum* with reference to H. R. 5423, Apr. 2, 1935; testimony before Senate Committee, *Hearings* on S. 1725, pp. 567–623.

[3] *Hearings* before House Committee on H. R. 5423, Pt. 2, pp. 1553–1579.

these two systems, it would lose its voting rights in such stock of additional systems as it might continue to hold.

This fight was carried to the floor of both houses. The Senate by one vote sustained the original death-sentence provision. The House refused to do so, four times defeating the Senate position. Finally a conference was arranged, and the House position prevailed. As a review of the following paragraphs will show, the revised death sentence was considerably less drastic. The House accepted the compromise on August 23, and the bill became a law three days later.

THE PUBLIC UTILITY HOLDING COMPANY ACT OF 1935

The Public Utility Act of 1935, as finally passed, was a voluminous act of sixty-seven pages.[1] It contains two major parts (titles): The first part is designed to regulate the public utility holding company; the second part is an amendment to the Federal Water Power Act and designed to regulate interstate commerce in electricity.[2] It is only with the first part, or Title I, that we are concerned. This Title bears the caption of the "Public Utility Holding Company Act of 1935."[3]

The regulation of the holding company is premised on the national public interest that attaches to its operations and activities. Such companies, it is recited, are engaged in interstate commerce and carry on their business by means of the mails. In the course of their development and present actions, many abuses had developed that only federal regulation could correct. The Act (§1) contains a rather strong indictment of holding company malpractices. This recitation of abuses ends with a statement of policy, namely, "to meet the problems and eliminate the evils . . . connected with public-utility holding companies which are engaged in interstate commerce or in activities which directly affect or burden interstate commerce. . . . " To accomplish these ends, it is the purpose of the act "to compel the simplification of public-utility holding-company systems and the elimination therefrom of properties detrimental to the proper functioning of such systems, and *to provide as soon as practicable for the elimination of public-utility holding companies* except as otherwise expressly provided. . . . " (Italics ours.)

[1] Public No. 333—74th Cong. [S. 2796].

[2] Title III of the original House bill, H. R. 5423, was omitted in the final draft. Its essential provisions were incorporated later in the Natural Gas Act of 1938.

[3] An excellent shortened copy of this part of the Public Utility Act of 1935 has been included in Barnes, *Cases on Public Utility Regulation*, pp. 796 *et. seq.*

The act defines a holding company as any company that by any means owns, controls, or holds the power to vote 10 per cent of the voting stock of a public utility company, unless declared by the regulating agency—the Securities and Exchange Commission—not to be a holding company. Furthermore, if found to be in the public interest, the commission may declare any person a holding company who stands in a position of exercising a controlling interest in a public utility company or a public utility holding company. Between these provisions, every significant form of control over utilities is subject to the jurisdiction of the commission.

The first positive provision of the act outlaws every activity of holding companies not properly registered by December 1, 1935, unless such companies have by commission order been exempted from the operation of the act. Next, registered holding companies are subjected to a multitude of requirements, only an outline of which can be given here. Security issues are closely controlled. The kinds of securities that can be issued and the purposes of their issue are specified. All house-to-house sales of holding company securities are forbidden, and all officers and employees of subsidiary companies are prohibited from selling securities of their holding company. The conditions of purchase and sale of assets and of operating companies are specifically subject to stringent regulation. In this connection, the act makes it very difficult for future unions under one company of gas and electric service in a community in which these services are now controlled by separate corporations.

All holding company activities in the matter of loans, dividends, credits, proxies, and contracts are subjected to commission control. Upstream loans are forbidden, though renewals of such as existed at the time of registration are allowed. Political contributions to persons and parties are strictly outlawed, and provisions are made to bar all but registered utility lobbyists from the halls of Congress. Each registered lobbyist is required to file periodic reports of his lobby expense.

One of the major points of criticism of the holding company has been the policies of subsidiary service and construction units. It has been accused, and not without merit, as being a convenient device by which to mulct operating subsidiaries to the ultimate disadvantage of the consuming public. Even though some of the more progressive holding companies such as the Commonwealth and Southern Corporation had placed this service on a nonprofit basis, whereby the service and construction unit is owned by the operating companies, the possibility of inflated costs through inefficient operations and careless pur-

chases still remained. The act completely solves this problem. After April 1, 1936, all service, sales, and construction contracts are forbidden except as approved by the commission. If the functions of the old type of engineering and management subsidiary are to continue, they must be performed by a mutual service company which must render service and construction work to operating affiliates not only at cost but at a cost that represents a saving over the charge that an independent agency would have made. Thus, the old days of profitable intercompany contracts are presumably gone forever. It is further provided in this act that the independent service and construction company must conduct its business under the rules and regulations of the commission.[1]

THE "DEATH-SENTENCE" PROVISION

One last important section calls for discussion—the so-called death-sentence section (§11). The essential phrases of this section read as follows: "It shall be the duty of the Commission, as soon as practicable after January 1, 1938: To require . . . each registered holding company . . . to limit [its] operations . . . to a single integrated public-utility system. . . . " The commission may permit, by order, additional systems to be operated if it finds (*A*) that the additional system or systems cannot be operated as independent units without loss of substantial economies, (*B*) that all such additional systems are located in one state or in adjoining states, and (*C*) that the continued combination of such systems is not so large "as to impair the advantages of localized management, efficient operation, or the effectiveness of regulation." In this process, all intermediate holding company units are to be eliminated. All orders in connection with the simplification program must be complied with within one year from the date of the order, except as the commission may extend the effective date for a period not to exceed another year. In the event that a holding company fails either through inability or through indifference to comply with the order, the commission may petition a United States district court to take possession of the company, "and the court may constitute and appoint the Commission as sole trustee, to hold or administer under the direction of the court the assets so possessed."

A comparison of the death-sentence provisions of the original bill and the law as finally passed shows that the latter is considerably less

[1] Pursuant to the enforcement of this feature, the Securities and Exchange Commission adopted a Uniform System of Accounts for Mutual Service Companies and Subsidiary Service Companies to become effective on August 1, 1936.

drastic than the original proposal. In effect, the law allows each holding company to have one system, whereas the original bill would allow it to exist only where diversity of state laws made it impossible to create a single operating company whereby to control a "geographically and economically integrated public utility system."[1] In the final form of the law, this original provision was made one condition for the continued operation of additional systems by a holding company.

The ultimate consequence of this act, assuming at this point that it is a valid law, will not be known until the act has been in force for several years. It seems reasonable to conclude, however, that two results will unquestionably flow from its enforcement. First, most of the existing holding company evils will be either eliminated or else forced into circuitous and less obvious channels. The major avenues for holding company abuse, service and construction contracts, and capital manipulation, have been definitely closed.

Second, in the event that the commission enforces the death sentence rather strictly and thereby shrinks every holding company into a single system, the present far-flung utility empires are doomed. Even a liberal interpretation of that section will not give materially different results, because each additional utility system controlled by a holding company must be located in one state or adjoining states and be of such a type as not to be able to stand alone as an independent system. This sentence will have but little effect on such groups as the Duke Power Company, the Niagara Hudson Corporation, the Public Service Company of New Jersey, the Consolidated Edison Company (New York City), and such other city groups as the Detroit Edison Company and the Commonwealth Edison Company (Chicago). Even a group such as the Insull empire around the Great Lakes or the southern portions of the Commonwealth and Southern Corporation can escape the death sentence. The groups that will be dismembered are the far-flung systems such as the Associated Gas and Electric System, the Electric Bond and Share System, and the Cities Service System. It is physically impossible for these systems to qualify under the terms of the law.

Thus, these far-flung empires will be dismembered. This destruction may result in swapping of properties so that isolated holdings will

[1] For instance, the Illinois law requires that all public utilities operating in the state be Illinois corporations. Thus, should an integrated system find itself operating both in Illinois and an adjoining state, it would probably be obliged to set up a holding company to control two corporations—one doing business in Illinois, the other doing business in the adjoining state. See Illinois Public Utilities Act, §28.

be integrated within an adjoining system. By that process, holding company groups will concentrate their holdings. Or isolated and scattered properties may be placed on the block to be sold for what they will bring. A golden opportunity may thus present itself for the creation of new holding company units. However this dismemberment is accomplished, the net result will be the shrinking of present holding companies to regional areas and probably the creation of new and independent holding companies to integrate the properties abandoned by present companies during the period of contraction.

SINCE 1935

Almost immediately upon its passage, the holding companies affected began to plot its legal downfall. Scarcely a good word was uttered in defense of the act.[1] In an early case, a judge in a lower federal court pronounced the act void in its entirety. His conclusions were:[2]

> . . . we find the Public Utility Act void in its entirety because—*First*, [it is] not a valid exercise of congressional power under the commerce clause of the Constitution;
>
> *Second*, [it is] not a valid exercise of the postal power by Congress under the Constitution;
>
> *Third*, [it is] in violation of the due process clause of the Fifth Amendment; and
>
> *Fourth*, the multifarious invalid provisions of the act are incapable of separation from other provisions possibly valid. . . .

Upon appeal to the Circuit Court of Appeals, the decision was drastically limited to the issue in question, the applicability of the act to trustees of a public utility in bankruptcy.[3] Again, as limited, the act was declared to be unconstitutional.

All legal attack against the Public Utility Holding Company Act of 1935 was subsequently stayed pending the test case against the Electric Bond and Share Company. That case has run the gamut of successive review from a district court through the Circuit Court of

[1] One exception to this was Roger Babson. In an article published early in 1936, he said that "certain power companies may be making a great mistake in arbitrarily flouting an act passed by our duly elected representatives. I feel very strongly on this point for the act, by proper amendments, may become a real benefit to the security holders of certain companies." "Let's not get Panic-stricken," *Public Utilities Fortnightly*, **17**:163, Jan. 30, 1936.

[2] *Re American States Pub. Service Co.*, 12 F. Supp. 667, 10 P.U.R. (N.S.) 413, 478 (1936). (Italics ours.)

[3] *Burco, Inc. v. Whitworth*, 81 F. (2d) 721, 14 P.U.R. (N.S.) 495 (1936).

Appeals to the Supreme Court of the United States.[1] In each instance, the act was sustained. In these cases, the Electric Bond and Share Company had attempted to have the act tested in its entirety, but the government insisted on limiting the review to the registration provisions. This latter position prevailed. The company argued that separation of the registration provisions from the main purpose of the act was not permissible because registration was simply incidental to the attainment of a more fundamental purpose. Having taken this position, its next line of attack was against the substantive features of the law. In brief, the argument was that the act was not a regulation of interstate commerce, that it invaded the reserved powers of the Tenth Amendment and violated the due process clause of the Fifth Amendment.

As stated above, the Supreme Court accepted the proposition that the registration sections [4 (a) and 5] were separable; that, alone, they served a valid purpose. Therefore, the Court refused to discuss the purposes of the act. Speaking of the registration provisions, the Chief Justice said:[2]

> It cannot be denied that a requirement of this sort is a regulation which Congress could have regarded as important in itself and could have made the subject of a separate statute. . . . Congress may use this method in connection with a comprehensive scheme of regulation; . . . or Congress may employ this informatory process independently.

This decision, although definitely settling only the first step in the act, suggests the probable legality of its ultimate purposes. Were the Court convinced of its fundamental invalidity, it certainly lost an excellent opportunity to throw the act into the discard.

With the decision in the Electric Bond and Share Company case, the "sit-down" strike against the Holding Company Act of 1935 was broken.[3] Whereas three-fourths of the holding companies had refused to register before the Electric Bond and Share decision, there has since been a rush to register and to begin the process of conformance. Stone & Webster, Inc., has distributed pro rata to its stockholders its holdings in two underlying holding company systems. Associated Gas and Electric System for several years has been undergoing almost

[1] For decision in the Circuit Court of Appeals, see *Electric Bond & Share Co. v. Securities Exchange Comm.* 92 F. (2d) 580, 21 P.U.R. (N.S.) 299 (1937).

[2] *Electric Bond & Share Co. v. Securities & Exchange Comm.*, 303 U.S. 419, 22 P.U.R. (N.S.) 465, 473 (1938). This was a six to one decision. Justice McReynolds dissented. Justices Reed and Black took no part.

[3] This expression was used by the then chairman of the commission, J. M. Landis. See *Electrical World*, **107**:897, Mar. 13, 1937.

constant corporate simplification. Literally hundreds of corporations have been merged or eliminated within that system. Unable to satisfy the requirements of the Holding Company Act, it was finally obliged to seek relief in January, 1940, under the bankruptcy act. The United Corporation has filed a tentative plan with the Securities and Exchange Commission proposing to reduce its holdings of voting stocks of public utilities to less than 10 per cent, thereby placing it in a position to ask for exemption from the provisions of the act. It has proposed to diversify its portfolio to include nonutility investments.

Beginning in 1940, the Securities and Exchange Commission has undertaken the enforcement of the death-sentence provision. In fact, it has ordered several of the larger systems to submit plans by which to conform.[1] Until a dissolution order of major consequence is issued, we cite two minor decisions illustrating its attitudes. The first involved a request of H. M. Byllesby and Company, an investment house and for years the top holding company of the Standard Gas and Electric system, for exemption from the registration requirement. There had been created a voting trust to which H. M. Byllesby and Company transferred its utility stock. Because of the close relation of the trustees to the Byllesby Company, the commission refused that request (January 15, 1940). As a consequence, the only course will be the dissolution of the voting trust and sale of voting securities or registration as a holding company. The second concerned a request of the United Light and Power Company, one of the smaller holding companies, to sell or otherwise divest itself of its holdings of three gas properties in Tennessee. This request was granted by the commission (January 22, 1940), and in its decision is this observation:

> [These three gas properties] are presently operating companies of the United Light and Power Company's holding company system. [They] are geographically remote from the properties of the other companies of that system, and their retention in such system appears repugnant to the integration provisions of the Holding Company Act.

Probably most interesting of all proposals is that of Cities Service to turn over its public utility holdings to two Chicago banks, these institutions to be trustees of these holdings. In that way, Cities Service would cease to be a holding company and become what it originally was, a producer and distributor of petroleum products. Although the *Chicago Tribune* seems to regard this proposal as a good

[1] Early in 1940, Engineers Public Service Co., frankly admitting its nonconformance to the death-sentence provision, began a test of the constitutionality of that section of the act.

one, we look upon it quite sceptically.[1] Substitution of banker control for present control is a definite step in the wrong direction. Financial institutions have only one measure of success—profits—and too many utility enterprises have already suffered from an overemphasis on that measuring rod. The commission should either deny the proposal or else declare those banks to be holding companies and thereby subject to all the provisions of the Holding Company Act.

At this time, no better conclusion can be written than to quote from a statement of William O. Douglas, made when he was chairman of the Securities and Exchange Commission:[2]

To the extent that the holding company can justify its dominion in terms of service to the operating companies, the statute is not a "death sentence." On the contrary, it holds the promise of a long life and a happy one. It substitutes order for chaos. The system will then be soundly built and deeply rooted to withstand adversity and attack. Once a public utility system has complied with the requirements of the act, there will be no difficulty in finding investors ready and willing to purchase its securities. Within the administration of Section 11 [the "death sentence"] there will in some cases be instances where it will be necessary to rectify capital structures in such a way as to bring to light losses which have been suffered (though perhaps not yet realized) by investors. That may make some hesitant to comply with Section 11, since compliance will bring home for the first time to some investors actual facts which might otherwise be continued to be concealed for an indefinite period—to the injury of other existing investors and future investors. But until the industry makes substantial progress toward putting its house in order, by exchanging and selling properties, simplifying corporate structures, interconnecting its facilities, and relinquishing control of dispersed companies, public confidence will not be won.

Bibliography

Bibliography for this chapter is especially difficult to organize because it is so voluminous. As we have said after every chapter, the footnote references should be consulted for further reading. Especially do we call attention to the reference on page 489, where is listed a special report of a House Committee, the Hearings on the holding company bills, and the Report of the Federal Trade Commission. Further reading should include:

BONBRIGHT, JAMES C., and GARDINER C. MEANS: *The Holding Company.*

Federal Communications Commission: "Investigation of the Telephone Industry in the United States," *Report* of the Federal Communications Commission, *House Doc.* 340, 76th Cong., 1st Sess., 1939.

Federal Power Commission: "Principal Electric Utility Systems in the United States," *National Power Series, Power Series* No. 2, 1935.

[1] Issue of July 16, 1939.

[2] *Electrical World*, **109**:1604, May 14, 1938.

Federal Trade Commission: "Control of Power Companies," *Sen. Doc.* 213, 69th Cong., 2d Sess.; and "Supply of Electrical Equipment and Competitive Conditions," *Sen. Doc.* 46, 70th Cong., 1st Sess. (These are invaluable studies, made in the middle 1920's. We have leaned heavily on them for material before 1925.)

———: "Utility Corporations," *Summary Report* of the Federal Trade Commission, *Sen. Doc.* 92, 70th Cong., 1st Sess., Pts. 69-A, 71-A, 72-A, 73-A, 77-A, 84-A, 84-B, 84-C of Investigation of Utility Corporations. (Every student should be familiar with Pt. 73-A, containing the concluding chapters of the report on the holding company. Included within these volumes is a complete summary of the propaganda activities during the 1920's. This is spicy reading, to say the least.)

Massachusetts: *Report* of the Special Commission on Control and Conduct of Public Utilities, *House Doc.* 1200, 1930.

New York: *Final Report* of the Joint Legislative Committee to Investigate Public Utilities, *Legislative Doc.* 78, 1936.

WATERMAN, MERWIN H.: *Financial Policies of Public Utility Holding Companies*, Michigan Business Studies, Vol. 5, No. 1.

PART IV
SPECIAL PROBLEMS

Part IV has been reserved for the discussion of special problems, which, although important in themselves, are not essential to an understanding of the fundamentals of public utility regulation. On the assumption of privately owned corporations performing public (or quasi-public) services, our problem has been threefold, namely, first to show the peculiarities in economic organization of these companies and especially to show the undesirability of relying upon unchecked economic forces to fix prices; second, to analyze the agencies of control; and, third, to study the primary problems of regulation and their attempted solutions. In reality, these three divisions are the basis of Parts I, II, and III, respectively.

Although we believe that a text in this subject need go no farther, there is a series of special problems that merits attention. We have selected several that appear to be important, ranging from the problem of marketing to that of public ownership. Specifically, Part IV covers the following utility topics:

Marketing.
Decline of the street railway.
Taxation.
Rural service.
Public ownership.
The public power projects.
The Tennessee Valley Authority.

In a final chapter, entitled "The Public Utility Problem," we offer our views on many disputed and debated items, discussed at various points throughout the text.

CHAPTER XXIV

THE MARKETING OF UTILITY SERVICE

The marketing of utility service is one of the least discussed aspects of the economics of public utilities. This neglect may lie in the fact that it is so taken for granted and, hence, its problems are not usually recognized. It has ordinarily been assumed that the need for such service will sell itself. This was not the case in earlier times, however, and even at the present is questionable. From the very beginnings of the utilities, the search for new markets has been a constant one. For instance, it required years of salesmanship to convince industrial leaders of the merits of electricity as a power supply for industry. Furthermore, having been convinced of the economy of electricity as a power supply, these leaders then had to be converted to the idea that the central station could furnish cheaper energy than they could generate for themselves. Much of the past progress and present progressiveness of the utilities has been due to their sales organizations, ever on the lookout for new markets.

The general principles of marketing apply to the public utilities. Whatever methods are effective in demand creation generally are applicable to the utility field. In the same way do the general methods and principles of salesmanship carry over into this field. We shall not, however, be concerned with a presentation of these principles, because their analysis belongs to the study of marketing. There are, however, certain special problems in the field of utility marketing that are the result of the peculiar nature of the service. Therefore, to an analysis of these special problems this chapter is devoted.

MARKETING PECULIARITIES OF THE UTILITY PRODUCT

In an early chapter, it was pointed out that utilities sell a service or, at best, a service product. They do not deal in commodities such as loaves of bread or suits of clothes. This service cannot be stored, except within limits, and one unit of it is more or less identical to all other units; in other words, their services or service products are of uniform quality. In this characteristic, these services resemble a market grade of wheat. These are production characteristics, but they definitely influence the marketing problems of public utilities.

There are other characteristics that account for these special marketing problems. The service or service product is delivered at or near the premises of the user. All but the street railway (or bus) and the telegraph companies bring their services directly to the premises of the user by means of company-owned facilities. Even the equipment of customer utilization, as in the case of the telephone, light globes, and gas furnaces and water heaters, may belong to the utility. However that may be, there are no retail stores to which one may go to buy a cubic foot of gas or a 5-minute telephone conversation. Thus, utilities are of necessity engaged in direct, house-to-house merchandising, and the customer must accept this special relationship whether he likes it or not.

It is well to observe at this point that such direct connection gives utilities cause to be concerned about the quality of their customer contacts. The general consuming public, for instance, is not particularly concerned with the good or bad management of the Quaker Oats Company or the attitude of its employees toward the public generally. So long as the product satisfies the final consumer, no amount of discourtesy on the part of employees is likely to reduce its sales, because only a fraction of the buying public will have contact with them. With public utilities, the case is quite different. Their services come to the consumer over company property. At least once a month, a personal contact is made with the company for the purpose of paying for this service. In the case of street transportation, this contact may be made several times a day. The quality of these employee contacts is important, in more ways than one; and if they are friendly, the problem of marketing is made easier.

The one utility, street transportation, that does not come directly to the user's premises modifies this principle only slightly. Its tracks and routes are laid at convenient intervals to groups of users, thereby in a measure bringing its service to the customer's door. As in the case of the telephone, if that type of public conveyance is desired, it may be had only over the lines and by means of the equipment of the company. Thus, for this utility, the problem of customer-employee contacts looms large and for two reasons. In the first place, the service possesses some unusual characteristics. It is extremely personal; it is subject to every kind of weather condition; and it is periodic. One waits until a street car or bus comes before one rides to work. In the second place, there is the personal element. Entrance, exit, and fare payment require the personal attention of a company representative. No other utility delivers its service in the presence and by the hands of its employees as do the street transportation

companies. In spite of all these special factors involved, this utility has been the slowest to appreciate the importance of good customer-employee contacts.

SUBMETERING OF ELECTRIC SERVICE

There is one situation of indirect marketing in the electric field that has received considerable attention since 1930. In the larger cities of the East, the practice had grown up of selling electric service wholesale to apartment-house owners who in turn retailed it to their tenants. In fact, this practice was sufficiently common to warrant the organization of special corporations to handle this resale business. It was found, for instance, in 1930, in the borough of Manhattan of the city of New York, that there were 7,500 buildings reselling electricity, involving the use of 150,000 submeters and representing an investment of approximately 8 million dollars.[1] This practice of doing a wholesale business with apartment-house owners had grown out of an earlier period when it was common to install a private electric plant in such buildings. In their desire to secure the load of new apartment buildings and hotels, electric companies had been led to offer to sell service to the owners on a wholesale and submetering basis. But, as might be expected, such a situation was not ideal either for the tenant, who found that he did not necessarily profit by city-wide rate reductions, or for the company, which found itself deprived of a profitable portion of its retail business. This was evidenced by the testimony of an official of the New York Edison Company to the effect that the elimination of the practice in his city would save submeter customers 14 million dollars annually.[2]

This problem was given much attention by the New York Investigating Commission of 1930; and on the basis of its findings, it recommended:[3]

> That sub-metering companies be prohibited from charging more than the filed rates of the companies from which they purchase current and that they be subjected to the limited jurisdiction of the Public Service Commission.

As a consequence of this recommendation, there was introduced in the 1931 session of the New York Assembly a bill to bring such practices under the regulation of the state commission, but nothing came of that attempt. Failing to extend regulation to the submeter

[1] *Report* of the (N.Y.) Commission on Revision of the Public Service Commissions Law, p. 42.

[2] *Ibid.*, p. 120.

[3] *Ibid.*, p. 7.

company, the other approach to its regulation was through control of the practices of the electric companies.

The problem for the city of New York was dealt with in a general rate order issued by the Public Service Commission in the summer of 1931. Although allowing the practice in a restricted fashion upon the recommendation of the New York companies, the commission had the following comments to make:[1]

> The Commission does not look with favor upon the resale of current. The rate schedules should be so devised as to make such resale unprofitable. . . . There seems to be no motive for resale other than a financial one, and if the profit is not substantial, real estate owners will not undertake the task of providing electric meters, maintaining and reading them, issuing bills, and making collections.

New York has subsequently met this problem in several cases. On one occasion, its commission has refused to sustain a rule of the New York Edison Company prohibiting landlords from furnishing electricity to tenants without specific charge.[2] On another, it has ruled that a regulation allowing submetering to bungalow and amusement parks only was discrimatory to apartment-house owners and an entirely artificial classification.[3] Yet a New York municipal court has since ruled that neither a landlord nor a submetering company can engage in the business of buying electricity at wholesale and selling it retail to tenants.[4]

The submetering relationship has continued to be one of the unsolved problems of regulation in New York. Despite repeated recommendations by governors and commissioners, the legislature has not seen fit to include the submeter company within the jurisdiction of the New York Public Service Commission. For instance, in 1938, approximately 1,700 complaints were filed against those companies, but the commission was powerless to meet the problem. Since the public seems to fail to distinguish between a public utility company and a submetering company, the latter should be brought under state regulation, if not abolished altogether.[5]

[1] *Re Rates and Rate Structures of Corporations Supplying Electricity in the City of New York and Suburban Territory*, P.U.R. 1931C 337, 354.

[2] *Re New York Edison Co.* 10 P.U.R. (N.S.) 244.

[3] *Academy Housing Corp. v. Bronx Gas & Electric Co.* 11 P.U.R. (N.S.) 486.

[4] *Owners & Tenants Electric Co. v. Tractenberg*, 286 N.Y. Supp. 570 (1936).

[5] See 1938 *Annual Report* of the New York Public Service Commission, pp. 13, 14, 69, 70. For an excellent review of the submeter problem in New York and a summary of its solution in other states, see "Meeting the Submetering Problem," *Public Utilities Fortnightly*, **25**:109, Jan. 18, 1940.

Other state commissions have faced this problem and, in general, have been more effective than has the New York Commission. In fact, as early as 1930, eight public service commissions had forbidden such practice; and in the five states in which it was permitted, two of them treated the submeter company as a public utility.[1] In the spring of 1931, the New Jersey Board of Public Utility Commissions sustained the refusal of an electric company to furnish service to an apartment house on a submeter basis. The action of the commission was subsequently affirmed by the courts of New Jersey. The Supreme Court of the United Stated denied the application for a writ of certeriori, thereby closing the door to further litigation.[2] The Pennsylvania Commission has sustained a telephone company in its refusal to serve a private branch exchange from which service was to be resold. The commission held that the company could furnish to ultimate consumers the exact type of special service proposed by the applicant.[3] In the District of Columbia, this problem of electricity submetering has run the gamut of the commission and the courts of the District; and at each step, the refusal of the local company to enter into submeter contracts has been sustained.[4]

Other state commissions cases could be cited, but they would show attitudes similar to these given here. It seems fair to conclude that although the utilities may have initially been responsible for the practice of submetering, their present case against it overwhelms its historic justification. If a public utility is to be held responsible for the service that it renders and the rates that it charges, it should not be balked by the presence of submeter contracts. As the New York situation shows, apartment users of electricity do not recognize the wholesale relationship as absolving the electric company from its dual obligation of good service and fair rates; and if, as they do, they hold the company responsible, that company should serve them directly.

METHODS OF DEMAND CREATION

The Service Department.—Many devices and methods have been used by utilities to stimulate sales. Among these are the service

[1] *Report* of the Commission on Revision of the Public Service Commissions Law, p. 120.

[2] The case sequence is as follows: 67 *South Munn, Inc. v. Public Service Electric & Gas Co.*, P.U.R. 1929A 339 (commission decision); and 67 *South Munn v. Public Util. Comm'rs*, 106 N.J.L. 45, P.U.R. 1929E 616 (New Jersey court decision). The Supreme Court of the United States denied a writ of certeriori on March 9, 1931, 283 U.S. 828.

[3] 1015 *Chestnut Street Corp. v. Bell Telephone Co.*, P.U.R. 1931A 19.

[4] *Karrick v. Potomac Electric Power Co.*, P.U.R. 1932C 40; and *Lewis v. Potomac Electric Power Co.*, P.U.R. 1933C 114, 64 F. (2d) 701 (1933).

department, sales department, appliance salesrooms and appliance salesmen, direct-mail advertising, and newspaper and periodical advertising. First, let us consider the service department. Many of the larger utilities maintain departments that service both the customers' equipment and the company equipment on customers' premises. This service is available on call; is characterized by its promptness; and the charges made are usually nominal, if any. In the electrical utility especially, the service organization has grown into a sizable department and is a very important part of the company. Service and repair men are often trained in the art of instructing customers in the use of equipment, and they are usually encouraged to make suggestions as to needed changes or new devices. Often these employees have been permitted to make appliance sales, because it is a well-recognized fact that they have an entree with those groups which are generally suspicious of the professional salesman.

Free Lamp Renewal.—A special service, free lamps to residential customers, was developed some years ago by some of the larger electric companies. Where such service is available, each customer is permitted to exchange his burned-out or broken lamps for new ones of specified wattages. If unusual sizes are desired, they may be procured at a nominal charge of a few cents a lamp. Often these companies have delivery service for those customers who may not wish to call in person to make their exchanges.

Occasionally, this practice is attacked vigorously by the independent electric dealers as unfair competition. In at least one situation, such a charge ran the gamut of the entire judicial system of Illinois. In 1930, the Commonwealth Edison Company of Chicago was haled before the Illinois Commerce Commission on the grounds that its 30-year practice of furnishing free lamps was unjust and discriminatory to those customers who did not take advantage of that service. During the proceedings, the company made a thorough showing of the merits of the practice. Specifically, it was shown that it was the largest single American buyer of lamps and therefore imposed rigid standards upon its purchases. The commission ruled in favor of the company; but upon review, the courts of Illinois held the practice of free lamp renewal to be discriminatory.[1]

As a result of the court decision, the Commonwealth Edison Company has been obliged to show a cost segregation in order to serve those

[1] *Consumers Sanitary Coffee & Butter Stores v. Commonwealth Edison Co.*, P.U.R. 1930D 321. Upon appeal, a district court reversed the commission. Later, the Supreme Court of Illinois sustained the district court. See P.U.R. 1932D 26, 348 Ill. 615 (1932). For a later review of this situation, see *American Generator and Armature Co., Inc., et al. v. Commonwealth Edison Co.*, 28 P.U.R. (N.S.) 392.

who desire service without the lamp-renewal feature. The records show this to amount to an average of 0.15 cent per kilowatt-hour. As of June, 1939, 94½ per cent of its 109,000 small commercial users and over 99½ per cent of its 830,000 residential customers were being served under the rate allowing free lamp renewal.[1] Thus, a customer using 800 kilowatt-hours a year would pay $1.20 a year for his electric lamps. It would appear, therefore, that this practice is entirely favorable to the average small commercial and residential customer.

The opposite situation has presented itself since this litigation occurred. At one time, the Massachusetts legislature considered a measure to require free lamp renewal by all Massachusetts electric companies. In that state, the Supreme Judicial Court may be asked for an advisory opinion. Following such a request, it concluded that the proposal would be invalid.[2] It based its decision on the following points:

1. The proposed requirement would be outside the undertaking of electric companies.
2. If a valid requirement, there would be no limit to the variety of related services that electric companies might be required to furnish.
3. The proposal would confiscate property. This point was fortified by the additional statement that "it is of no consequence [to the validity of the proposal] whether the charge therefor can be included in their rates."

In conclusion, if one were cynical, he might say that attitudes on this problem depend on whose toes are pinched. Free lamp renewal is a defensible practice, and it is not without adequate precedent in the field of public utility service. Appliances such as stoves, water heaters, and gas furnaces are rented to customers. The telephone companies have never permitted their instruments to be owned by subscribers. There is thus adequate support for the practice of electric companies of supplying in their rates charged the lamps by which their illuminating service is made available.

The Sales Department.—A little known but effective unit is the sales department. Although it may not be known by such a title and its members may be "engineers," not "salesmen," it exists in every progressive gas, electric, and telephone company. This unit of the gas and electric utilities is interested primarily in new commercial and power sales; whereas in the telephone company, the interest runs to business and factory installations and private exchange boards. Ordinarily, the personnel of this department are technicians rather than salesmen, and theirs is a responsible position. Such victories as

[1] The power rates of the company do not include lamp-renewal privilege.

[2] *Re Opinion of the Justices*, 14 N.E. (2d) 392, 23 P.U.R. (N.S.) 349 (1938).

factory gas installation and substitution of electricity for steam power in factories and on the railroads are the results of their efforts. The development and widespread use of the telephone extension, the teletypewriter, and the electric sign are other illustrations of the accomplishments of the technical and sales departments. In short, these sales employees are the new business agents of the utilities for all but domestic sales.

THE MERCHANDISING OF UTILITY APPLIANCES

Because of the infinite variety of electrical and gas appliances which may be used in homes and shops, there grew up in these utilities especially the appliance retail merchandising department. Originally developed as a side line to build up the domestic load, these departments became important units in the larger gas and electric companies. In earlier days, display rooms were usually maintained at or near the collection and cashier's departments in order to catch the eye of the customer on the occasion of his monthly trip to pay his bill. In the larger cities, the salesrooms were located not only in the central downtown section but in the more important neighborhood shopping districts. From a simple display of an electric iron or a single-burner gas plate, these departments grew into medium- and large-size stores, especially in the electrical appliance field.

The reasons for the early development of this side line by the electric utilities are obvious. Most of the appliances sold built up the domestic load and, because it was largely an off-peak load, added to the net income of the utility. Nor has this early importance disappeared with the present position of the industry. Every technique known to marketing and sales experts has been employed to stimulate the sales of appliances. Among these are advertising, posters, sales featuring leaders, and solicitations. Especially in the matter of leads for personal solicitations have utilities an advantage over other sales organizations. In the first place, they have the name and address of every customer and information indicating the financial rating of each of them. In the second place, an employee of the utility enters the premises of the customer at least once every month. If his observation powers have been trained, he is able to furnish many leads for the appliance salesmen. In some cases, he is encouraged to try his hand at making a sale. In other cases, he is paid a bonus on every reported lead that later develops into a sale. Thus have the progressive utilities taken advantage of the contacts that their service and meter-reader employees can furnish.

In the years since 1920, the volume of electrical appliance sales has grown rapidly. A survey of 110 electrical companies for 1935 and 1936 showed total sales of $66,575,750 and $81,431,199.[1] Of course, these figures would be much higher were the estimates for sales of independent dealers to be included. The *Electrical World* has the following figures for 1937 and 1938, taken from a survey of 140 electric companies, 129 of which engaged in merchandising.[2] Utility and independent sales for 1937 totalled over 200 millions. The figures for 1938 were:

Sales by 129 utility companies	$ 58,619,094
Sales by independent dealers	108,502,288
	$166,121,382

For the utilities, the sales per customer averaged $11.92, at a per sale cost of $2.88. This expenditure was almost equally divided between direct sales expense and promotion expense. In terms of types of appliances sold, dealer sales were larger for refrigerators, washers, ironers, and vacuum cleaners. On the other hand, the utilities sold three-fifths of the water heaters and almost half the ranges.

TABLE 50.—SALES OF ELECTRICAL APPLIANCES, 1937*
(Not including radios)

Appliance	Sales by electric companies	Other sales	Total
Lamps (bulbs)	$ 4,608,700	$ 20,958,300	$ 25,567,000
Refrigerators	45,704,700	359,337,300	405,042,000
Ranges	21,233,300	33,036,700	54,270,000
Water heaters	6,235,100	3,264,900	9,500,000
Small appliances	31,513,000	265,279,000	296,792,000
Total	$109,294,800	$681,876,200	$791,171,000

* Edison Electric Institute, *Statistical Bulletin* May, 1940. Figures for 1938 and 1939 show smaller total appliance sales, although the division between independent dealers and power companies remains approximately the same. The annual totals are

Year	Sales by electric companies	Other sales	Total
1938	$77,583,300	$418,323,400	$495,906,000
1939	$83,000,000	564,617,700	$647,617,000

These figures show dealer participation to be approximately 85 per cent of all sales.

[1] *Electrical World*, **107**:1061, Mar. 27, 1937.

[2] *Ibid.*, **111**:697, Mar. 11, 1939.

Obviously, these figures are far from complete, because many sales of electrical appliances are not included within them. *Moody's*, for instance, reports sales of refrigerators, ranges, and water heaters, by years; and for 1937, there was a total of $465,000,000 of sales for those three alone.[1] From these figures and Table 50, it is quite apparent that total sales of electric appliances are a significant amount and probably approach a billion dollars a year.

TABLE 51.—DATA ON GAS APPLIANCES*
(Thousands of units)

	Appliance sales					Appliances in use, end of year				
	1929	1935	1936	1937	1938	1929	1935	1936	1937	1938
Gas ranges	1,600	1,100	1,464	1,448	1,025	14,801	15,149	15,512	15,943	16,135
Gas water heaters	895	549	648	850	740					
Gas central heating installations	30	68	70	100	90	148	566	634	735	825

* Estimates of the statistical department, Association of Gas Appliance and Equipment Manufacturers.

The Pricing of Appliances.—In the light of these figures, the amazing changes that have occurred since 1930 in the policies of companies and commissions toward merchandising become even more significant. It must not be forgotten that the utilities are regulated enterprises, whereas appliances are usually sold in a competitive market. Among the problems created by the combination of these major and side-line activities is that of the allocation of the common costs arising out of joint use of facilities. As has been shown, there are no principles upon which such a separation may be made.[2] As an example: If a ground-floor space houses the collections department and the appliance sales department, a very common situation, how is

[1] MOODY, *Public Utilities*, 1938.

[2] That this problem has more than academic interest is seen in its discussion at the Third National Accounting Conference, held in 1939. There it was suggested that joint costs could be allocated on the basis of increment cost; that is, charge to merchandising such directly allocable costs as it incurs. Recognizing that this theory was unacceptable to the commissions, it was then suggested that joint cost allocations could be made in terms of:

1. Square feet of floor space for determination of rents and building service costs.
2. Number of accounts for allocation of accounting and collection expenses.
3. Ratio of utility operating expense to merchandising operating expense for allocation of administrative and general expense.

the rent charged for this space to be divided between them? On the basis of the percentage of the floor space occupied? If so, the sales-room will carry, let us say, seven-eights of the total charge. On the other hand, the collections department must be conveniently located, preferably on a ground floor, and thus ought to bear a larger share of this charge than would be paid on a space basis. One rule of common cost allocation is to determine the amount of rent and other costs that a comparable competitive establishment in the same line of business would pay and charge the same to the merchandising department. On this basis, it is a safe guess to say that many of them would operate at a loss, because of the high-priced spaces that they now occupy.

Of course, it might be argued that if the prices of utility appliances are determined in a competitive market, the problem of cost allocation illustrated above cannot create real difficulties. Were both utility sales and appliance sales made in a competitive market, this argument would be valid. If, however, allocations of joint costs are made in favor of the merchandise departments—in other words, if they are charged only a fraction of their proper share—then the prices charged for appliances could be consistently lower than those of the independent dealers. The possibility of unfair cost allocations and the charging of sales department losses to utility service cannot be controlled by the forces of the competitive market and therefore may require a certain amount of commission supervision to ensure, on the one hand, fair appliance competition and to protect, on the other, the users of utility service from unduly high rates.

The Anti-merchandising Campaigns.—As the depression of 1929 became more serious and the margin of profit in retailing declined perilously near to zero or below, the independent electrical appliance dealers began an organized campaign to eliminate utilities from the appliance field. At one time, there was organized in Cleveland to combat this utility activity "the American Bureau of Commerce" working for "independent business men and the rate-payers."[1] The usual charges against utility merchandising were well summarized in an Indiana grand jury indictment of seven officials of the Indiana Public Service Company. The jury charged, among other things, that:[2]

1. Appliances were sold at a loss.
2. Such losses were charged as new business expense.
3. Exorbitant profits were charged by utility wholesale unit to local company retail unit.
4. The business of "legitimate handlers" (independent retailers) was reduced.
5. The net result of the practice was to increase the rates for utility service.

[1] 1930 *Proceedings*, American Gas Association, p. 49.

[2] Reported in the *Electrical World*, **103**:91, Jan. 13, 1934.

There is no need to elaborate on these, for they are rather clear though by no means correct. Although personal observation is at best quite limited, we feel that charges 1, 2, 4, and 5, above, are indeed questionable.

The opposition to utility appliance merchandising has taken two directions. Some have insisted on reform; others, on prohibition. Let us first examine the latter of these. Between 1930 and 1937, in the legislatures of twenty-three states were presented bills designed to prohibit utility merchandising.[1] In two of these, Kansas and Oklahoma, such bills were enacted into law.[2] The Kansas law was immediately challenged as a violation of the equal-protection clause of the Fourteenth Amendment to the Federal Constitution. In the trial court, the act was sustained on the ground that it was within the power of the legislature to protect the people from monopoly. As a further point, the court said that a state may deny or take away from utilities any or all of their corporate franchise rights. Upon appeal to the Supreme Court of Kansas, the lower court was reversed, and the act held to be unconstitutional. There it was argued that sales of appliances by utilities were intimately connected with and incidental (in this case) to the sale of gas. Such activity was held to be valid under the implied power of the company's corporate charter because it tended to further the business for which it had been issued.[3] Thus was the Kansas law discarded.

Another approach was made in Texas in the form of a suit to have merchandising by a public utility declared to be an act *ultra vires* and therefore illegal. In other words, it was urged that since such activity was not specified in the corporate charter, its performance was beyond the power of the company. The Texas trial court upheld the suit of the attorney general to forfeit the charter of the San Antonio Public Service Company.[4] Upon appeal, however, the lower court was reversed.[5] The appellate court held merchandising to be within

[1] These states are Alabama, Arkansas, California, Connecticut, Illinois, Indiana, Kansas, Massachusetts, Michigan, Mississippi, Missouri, Nebraska, Nevada, New Hampshire, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Tennessee, Texas, and Wisconsin. In 1939, once more such a proposal was defeated in Connecticut.

[2] Kansas Laws of 1931, c. 238; Oklahoma Stat., §5301, as amended by S. 96, 1931 Sess. Laws, p. 188.

[3] *Capital Gas & Electric Co. v. Boynton*, 137 Kan. 717, P.U.R. 1933D 435. In May, 1934, the Supreme Court of the United States refused to review this decision.

[4] *Texas v. San Antonio Pub. Service Co.*, P.U.R. 1932B 337 (1932).

[5] *San Antonio Pub. Service Co. v. State*, 62 S. W. (2d) 585 (1933); and *State v. San Antonio Pub. Service Co.* 69 S. W. (2d) 38 (1934).

the implied powers of utility corporations holding Texas charters. In this case, the court pointed out that approximately $150,000 was required to conduct these activities, an amount but a fraction of the capital of the company and less than its working capital. The court said that although the practice of the industry was not conclusive, widespread use of a merchandise sales division suggested that it has been regarded as a legitimate means to further the business for which utilities have been incorporated. In one other state, Pennsylvania, a similar situation had been placed before the courts, and the same conclusion had been reached.[1] It seems reasonable to conclude, therefore, that even in the absence of specific charter provisions, the merchandising of appliances is not *ultra vires*. Finally, the constitutionality of prohibitory acts seems doubtful.

Reform in Merchandising Practices.—This leaves for consideration the second type of reaction against the old-time utility merchandising —reform. When the opposition became serious, the utilities, especially the power and gas companies, generally adopted one of two policies. One was closer cooperation between the utility and the independent merchant; the other was the voluntary abandonment of the appliance field. The merchandising code of the utilities and the retail hardware dealers of Colorado, New Mexico, and Wyoming illustrates the first of these alternatives.[2] Cooperative advertising,

[1] *Malone v. Lancaster Gas Light Co.*, 182 Pa. 309 (1897); *Commonwealth v. Philadelphia Electric Co.*, P.U.R. 1929D 335.

[2] As reported in the *Electrical World*, **102**:2, July 1, 1933. This agreement bound both parties to:

1. The sale of standard, preferably American, makes.
2. The elimination of premiums and free merchandising, except as a part of a national selling campaign.
3. The curtailing of free trials of all accepted lines.
4. The pricing of accepted appliances at cost plus a fair profit.
5. The elimination of credit terms as a competitive basis.
6. A minimum carrying charge of ½ of 1 per cent.
7. A maximum payment period for large appliances of not to exceed 24 months.
8. Maximum loss on trade-in-allowances of not to exceed 5 per cent of resale price except on items sold through a national selling campaign.
9. Billing at the net price of credit sales of not more than $10.
10. Offer of no guarantees other than that of the manufacturer.
11. Conformity to these principles in all advertising or other representations.

In addition, the utilities agreed to

1. Refrain from billing for appliances sold on the form used for monthly gas or electricity bill.
2. Advertise merchandise of all dealers on inserts with monthly service bill.
3. Confine merchandise sales to territory in which company does a retail

buying, and financing became more common. Furthermore, a few companies discontinued their merchandising departments. This last step, however, has not been widely followed. One plan has been to support qualified independent dealers by extension of credit and the sales promotion of new and novel appliances. In fact, when such a plan was challenged before the Public Service Commission of New York, it was approved.[1] Another electric company arranged to finance discounts on merchandise purchased from approved dealers. Still other plans have been devised. A New York company at one time offered special "bargain packages" to its customers, with considerable success. These are but stray illustrations of the new methods of retailing utility appliances. In practically all these experiments, the local independent dealers participate to some extent.[2]

In conclusion, although there has been some withdrawal, the bulk of the electric and gas utilities still engage in the business of appliance selling. Many of them, of course, now confine their major sales efforts to the promotion of new and expensive equipment. As one writer has well pointed out, one should not pay too much attention to the protests of the dealers, because theirs has been a protest motivated solely by self-interest.[3] If, as we shall see below, a genuine separation of costs of utility and nonutility services can be made, then that agency—utility merchandise department or independent dealer—which can do the job the more cheaply and efficiently, and at the same time maintain a high quality of merchandise and service, should have the business.[4]

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utility business.

4. Refrain from the sale of unrelated lines of merchandise.

5. Encourage cooperative advertising.

6. Install appliances sold by independent dealers free-of-charge if they offer the same free service to buyers of similar appliances sold by them.

7. Make available to all established retailers adequate financial service for installment sales.

This agreement appears to be one of the many codes of fair practice drafted in accordance with the National Industrial Recovery Act of 1933 and has probably fallen into disuse, as did codes generally following the decision of the Supreme Court in the *Schechter Poultry Corp. v. United States*, 295 U.S. 495 (1935).

[1] *Groggins v. New York Edison Co.*, 16 P.U.R. (N.S.) 365, 367–370.

[2] For illustrations of these practices, the reader is referred to such trade journals as the *American Gas Journal* and the *Electrical World*. In the latter of these, see especially the issues of Aug. 12, 1933; Dec. 11, 1937; Sept. 24, 1938; and Oct. 8, 1938.

[3] HARVILL, "Opposition to Public Utility Appliance Merchandising," *Journal of Land and Public Utility Economics*, 8:299, 300, August, 1932.

[4] Opposition to appliance sales or promotion by public utilities never seems to disappear. For an illustration of an attempt of an ice company to prevent an

COMMISSION CONTROL OF UTILITY MERCHANDISING

Several state commissions have had occasion to consider the questions of accounting for merchandising sales and the disposal of profits or losses from such activities. Several of them have set up accounting systems segregating nonutility accounts, or at least they have ordered utilities not to include such accounts in their utility statements. As we shall see below, the purpose of such orders is to allow commissions to consider utility rate and valuation problems entirely apart from the profits or losses of merchandising departments.

We illustrate first an accounting system developed by a joint committee of the American Gas Association and the National Electric Light Association (now the Edison Electric Institute).[1] It is as follows:

CLASSIFICATION-OF-ACCOUNTS SUMMARY

1. Merchandise Sales Revenue

1.1 Gross Sales.
1.2 Discounts and Allowances—Dr.
1.3 Merchandise Returns—Dr.

2. Cost of Merchandise Sold

2.1 Cost of Merchandise.
2.2 Cost of Merchandise Returned—Cr.
2.3 Delivery Expense.
2.4 Installation Expense.
2.5 Storeroom Expense.
2.6 Replacement Repairs and Expenses.
2.7 Reconditioning Expense.
2.8 Returned Merchandise Adjustments.

3. Selling Expenses—Direct

3.1 Sales Salaries and Commissions.
3.2 Advertising and Demonstrations.
3.3 Miscellaneous Sales Expense.

4. Selling Expenses—Indirect

4.1 Administrative Salaries.
4.2 Miscellaneous Supplies and Expenses.

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electric company from underwriting a mechanical refrigerator sales campaign, see *City Ice & Fuel Co. v. Consolidated Edison Co.*, 29 P.U.R. (N.S.) 193. For an unsuccessful effort to prevent a municipal plant from merchandising gas appliances, see the decision of the Nebraska Supreme Court in *Nelson-Johnson & Doudna v. Metropolitan Util. Dist.*, 291 N.W. 559, 34 P.U.R. (N.S.) 59 (1940).

[1] *Report* of Joint Committee, 1930 *Proceedings*, American Gas Association, pp. 1860–1865.

4.3 Rentals.
4.4 Uncollectible Merchandise Bills.
4.5 Merchandise Insurance.
4.6 Merchandise Taxes.

5. Jobbing Revenue

5.1 Job Work Sales.
5.2 Allowances on Job Work Sales—Dr.

6. Cost of Job Work Sold

6.1 Cost of Job Work.

This classification is annotated with ample directions as to what are proper charges and credits to the respective accounts. As an example, for Account 4.3, Rentals, the instructions read: "This account shall be charged with the rent or the rental value of properties leased or owned by the accounting company which is fairly determined to be a necessary cost of selling merchandise."[1] The advantage of this arrangement of accounts is that the system may be expanded indefinitely, new accounts carrying an added figure to the right of the decimal point. For instance, if it is desired to separate Account 3.2, Advertising and Demonstrations, the new accounts may be 3.21, Advertising, and 3.22, Demonstrations.

The Uniform System of Accounts of the Federal Power Commission makes special provision for separation of merchandising income and expense. A choice is provided between recording these items as "Other Income" (Account 520) in the Income Account or as a "Sales Promotion Expense" (Account 789) in Operating Expense Accounts. We shall describe the latter of these choices. The account is entitled "Merchandising, Jobbing, and Contract Work." It is to include all expenses and income from these activities and is to be subdivided into Account 789.1 for revenues and Account 789.2 for expenses. The latter account is then to be subdivided to show the following expenses:

1. Advertising in connection with the sale of merchandise.
2. Cost of merchandise sold and of materials used for jobbing work including transportation, storage, handling.
3. Depreciation.
4. Direct taxes.
5. Discounts and allowances made in settlement of bills for merchandise and jobbing work.
6. General administrative expenses.
7. Insurance.
8. Inventory adjustments, merchandise.
9. Light, heat, and power.
10. Losses from uncollectible accounts.

[1] *Ibid.*, p. 1864.

11. Miscellaneous.
12. Pay and expenses of employees engaged in clerical work and bookkeeping in connection with merchandising.
13. Pay and expenses of all employees engaged in selling, delivery, installation, etc., as well as supervision of such employees.
14. Reconditioning repossessed appliances.
15. Rent of general quarters.
16. Revenue from the sale of merchandise and from jobbing and contract work.
17. Stores expense on merchandise stocks.

Thus, only the net difference between revenues and income would be carried to the final statement of profit and loss.

A conscientious accounting for merchandising income and expense along the lines of the foregoing classifications will go a long way toward creating an adequate separation of utility and nonutility income and expense, thus protecting the ratepayer from bearing the losses of the latter departments. As has been suggested before, however, one significant problem of utility merchandising is the allocation of joint costs, and neither this system nor any other can solve this problem. These costs can be allocated only by rule-of-thumb methods and consequently should be under constant commission supervision. Only commission scrutiny and approval of their division can assure the customer of utility service of approximate fairness. For instance, at least two states have considered the problem of allocation of rental costs between utility and nonutility departments, ruling not only that such must be made but that the nonutility portion must not find its way into utility expense.[1]

Another problem concerns the inclusion of merchandising income and expense within the operating statement of the utility, and the majority of the state commissions (fourteen during the years 1931–1936) considering this problem have ruled against such inclusion.[2] The usual line of argument is that merchandising expense should be charged against merchandising income; and that if there is a net loss, it should be borne by stockholders, not utility customers. In fact, in those cases where the net merchandising loss has already been treated as a utility expense, commissions have sometimes added this amount to the utility income figure to determine the true utility net income. The Arizona and the New York Commissions seem to have wavered

[1] *Department of Public Works v. Olympic Pub. Service Co.* (Wash.), Cause No. 6679, 12–31–34 and *Re Union Electric Light & Power Co.* (Mo.), 17 P.U.R. (N.S.) 337.

[2] The cases are too numerous to warrant citation. The student is referred to the annual *Public Utilities Reports*, topics, "Expenses," "Merchandising Sales," etc.

on this problem, because both have on different occasions ruled for and against the inclusion of merchandising expense and income within the utility operating statement.[1] In an Arizona case allowing such inclusion, it was pointed out that the net loss was extremely small and that the company had not been guilty of unethical competition. In general, however, as was pointed out, commissions have ruled against such practice.

One item of cost closely akin to merchandising is new business expense. In fact, the division between these two activities is often quite difficult to draw. Commissions have been more favorable to the inclusion of new business expense because it relates to direct load building and therefore promotes the main purpose for which utility companies are organized. In fact, it can validly be argued that merchandising has this same objective; and were it not for its effect upon the competitive independent dealers, the charging of small merchandising losses against utility income could be easily defended. This position was stated by one student of the problem as follows: "It would seem to this writer that merchandising losses might fairly be treated as promotional [new business] expenses to come out of rates at some time when expedient."[2]

In the light of this discussion, then, it will be no surprise for the student to learn that utility merchandising activities are usually not allowed to enter into valuations, nor can proceeds of authorized utility security issues be used to finance such. The one exception that has been brought to our attention occurred in New Brunswick. There the value of the merchandising inventory was allowed in the working capital valuation of the utility in question.[3]

In conclusion, through this minutiae of cases, one thing stands out. As a result of public opposition to the old-time practices of public utilities in merchandising appliances, two changes have occurred. First, the utilities have either discontinued their sales activities or modified them materially. Secondly, the commissions have tried diligently to close the door to the possibility of charging merchandising expenses and losses as utility operating expense. It would seem, therefore, that the reformed, strait-jacketed utility merchandising of today ought to be acceptable to most of the older critics.

[1] New York, *re Utica Gas & Electric Co.*, P.U.R. 1931D 289, and *re Rochester Gas & Electric Corp.*, case No. 8428, Mar. 31, 1936; Arizona, *re Central Ariz. Light & Power Co.*, 9 P.U.R. (N.S.) 270, and *Douglas v. Arizona Edison Co.*, 1 P.U.R. (N.S.) 493.

[2] WRIGHT, "Appliance Merchandising by Public Utilities," *Journal of Land and Public Utility Economics*, 7:391n, November, 1931.

[3] *Moncton v. Moncton Tramways Electric & Gas Co.*, P.U.R. 1932B 368.

ADVERTISING

The utilities have not lost sight of the value of all types of advertising. In general, it has taken two forms: direct-mail advertising and the usual newspaper and magazine advertising. Considering the first of these, we note that it has been common practice to enclose with each monthly bill an advertising circular pertaining to such subjects as new appliances, new uses of old appliances, stock purchases, or general good-will building. The amount of this direct-mail advertising is suggestive of the high regard held for it by company advertising officials.

More important, however, is the periodical and newspaper advertising that has been more and more used since 1918. The power of the printed page was not fully appreciated until the first World War; but having been shown its effectiveness in the many war and war loan drives, electric utilities, especially, soon set about using this medium to build up sales and good will. The telephone utility likewise realized the value of newspaper and periodical advertising as a means of demand creation. The American Telephone and Telegraph Company, for instance, advertises in such diverse organs as the *New Republic*, college alumni magazines, technical magazines, and the thousands of daily newspapers. The Bell System is primarily interested in good-will building, though at the same time it stresses the need for better telephone facilities in the home. In many ways, it has developed a high type of commercial advertising.

How much do the utilities spend in this manner? The figures are not easy to find, but such as are available indicate that less than 1 per cent of gross income even in 1929 was spent on advertising.[1] During the 1920's, the persistent hope of advertising specialists was to boost the utility advertising bill to the 1 per cent figure. Of course, 1 per cent of a 6 billion dollar income is no small sum. In 1929, advertising of appliances cost about 3.45 per cent of the gross income of that business. Since then, the changed merchandising policies of utilities have resulted in sharp curtailment in advertising budgets.

Although the advertising bill has been rather moderate, a more fundamental question concerns the right of a regulated enterprise to spend any of its income in that way. At the outset, it should be kept clearly in mind that only that part of the utility advertising bill which is properly charged to utility operations can be questioned. So long

[1] The Wisconsin Utilities Association, representing 90 per cent of the industry of that state, reported that less than 1 per cent of the aggregate gross revenues of its members was spent for advertising and publicity. *Electrical World*, **109**:1391, Apr. 23, 1938.

as a utility charges its appliance advertising against incomes from appliance sales, there cannot be much question of the propriety of the expenditure. Utilities have not felt the necessity of spending large sums in advertising their main products, and undoubtedly they are right in this attitude. Such large expenditures on the part of businesses operating as economic and legal monopolies should lead to suspicions that they are attempting unduly to entrench themselves.

Commissions have had occasion to consider the legitimacy of advertising costs. State commissions of Kansas, Texas, Missouri, Illinois, and New York have held that advertising costs designed to stimulate load building are valid charges as operating expenses.[1] As was said in a New York case, advertising to increase volume of company business, to explain rate changes, to instruct customers in the operation of equipment, and to meet the company's employment requirements constitutes a legitimate operating charge, if reasonable in amount. The Missouri Commission, however, has drawn the line against advertising to combat municipal ownership movements. Although a utility is privileged to fight that movement, the cost must not be charged as an operating expense, since the purpose is to protect its investors.[2] The commissions have emphasized the point that advertising expenditures must be reasonable,[3] though in one case the majority of the Supreme Court of the United States did not agree with the Ohio Commission as to the limits of reasonableness.[4] In this case, Mr. Justice Cardozo said, "Within the limits of reason, advertising or development expenses to foster normal growth are legitimate charges upon income for rate purposes as for others." Otherwise, said the Justice, business would disintegrate, to the damage of both stockholders and customers. To disallow such expenditures, a commission must prove improvidence or inefficiency of advertising expenditures.[5]

[1] *Texas Border Gas Co. v. Laredo* (Tex.), 2 P.U.R. (N.S.) 503; *Public Service Comm. v. Missouri Southern Public Service Co.* (Mo.), 6 P.U.R. (N.S.) 269; *Wichita Gas Co. v. Kansas Public Service Comm.* (U.S. Dist. Ct.), 3 F. Supp. 722. The Illinois and New York cases are discussed, but not cited, in Welch, "Utility Advertising," *Public Utilities Fortnightly*, 11:42, Jan. 5, 1933.

[2] *Re Union Electric Light & Power Co.*, 17 P.U.R. (N.S.) 337.

[3] *Re Lone Star Gas Co.* (Okla.), P.U.R. 1933C 1.

[4] *Re West Ohio Gas Co.*, P.U.R. 1933B 433, overruled by *West Ohio Gas Co. v. Ohio Pub. Util. Comm.* 294 U.S. 63, 6 P.U.R. (N.S.) 449 (1935).

[5] Concurring, Mr. Justice Stone said, "I think that the petitioner has failed to sustain the burden . . . to show that the item of expense for 'new business' was a proper charge against gross income. . . . I know of no constitutional principle upon which this expenditure must be taken from the pockets of the patrons of the present business, any more than the cost of future service lines required to carry on the new business."

SUMMARY

The marketing problems of public utilities are, as we have seen, divisible into two areas: those related to direct sales promotion and those connected with indirect sales promotion through the medium of appliance merchandising. Although the line between these may not be easy to draw, it nevertheless should be drawn. The direct sales efforts of the utilities are, if reasonable in volume, legitimate activities chargeable to operating expense. These expenses include such items as the new business and sales departments and the advertising pertaining thereto. Over these activities, the state commissions should have full control. The other area, appliance merchandising, is also legitimate; but its losses, if any, must not be treated as an operating expense. Such activity should be made to stand on its own financial feet, pay its own fair share of joint costs of space and advertising. Over this area, the commission's jurisdiction need extend no further than the accounting control necessary to ensure its complete separation. In so far as prices of appliances are competitively determined, no commission control over price could be necessary. If commissions see to it that the joint costs are split equitably, they have gone far enough. When such control is exercised, then the utilities, in the interests of high standards and pioneering, should continue in the appliance business.

It might be a solution to follow the suggestion of at least two commissions,[1] and the practice of some utilities, to organize separate corporations to handle this area of appliance sales. Such a practice would make the accounting easier, especially if the appliance company were separately quartered; and surely the regulatory problem would be simplified. As has been said of similar moves, it will increase good will, reduce cost allocation problems, and reduce the utility tax load.[2]

Bibliography

We can do no better than repeat our regular statement: See the footnotes accompanying this chapter. The problems of merchandising are discussed in annual reports of the state commissions and in trade journals such as the *Electrical World*. The best articles on this problem are:

HARVILL, RICHARD A.: "The Opposition to Public Utility Appliance Merchandising," *Journal of Land and Public Utility Economics*, **8**:287, August, 1932.

———: "Regulation of Appliance Merchandising," *ibid.*, **8**:74, February, 1932.

WRIGHT, WARREN: "Appliance Merchandising by Utilities," *ibid.*, **7**:386, November, 1931.

[1] *Re Central Ariz. Light & Power Co.* (Ariz.), 6 P.U.R. (N.S.) 49; *Luckey, Platt & Co. v. Central Hudson Gas & Electric Corp.* (N.Y.) P.U.R. 1932B 165.

[2] Editorial, *Electrical World*, **108**:1879, Dec. 4, 1937.

CHAPTER XXV

THE DECLINE OF THE STREET RAILWAY

Rapid, indeed, is the speed with which industries sometimes rise to importance and then in the space of a very few years practically disappear. In fact, this sequence is almost a characteristic of American industrial development. Although the public utilities may have been thought to be apart from this tempo, such, in reality, is not and has not been the case. True, water, telephone, and electric companies appear to occupy an untouchable position of public importance, but that appearance may be deceptive. Who can say with assurance that some new device or new industry is not now "just around the corner," ready to play havoc with one of them in the next few years? But we need not confine our attention to the speculative, because two of the traditional public utilities have been victims of such events. Both have been obliged to meet the competition of substitute services. In a general way, the gas utility has been obliged to be ever in the process of adjustment to changing conditions. In its history, it has no more secured a type of business than it has soon been under attack from a competitor—usually electricity. First in the field of illumination, that business later was entirely surrendered to its competitor. In the life-and-death struggle over the lighting load, an escape was found, namely, the field of cooking and heating. Here, however, possession has not gone without challenge. In the cooking field, electricity is an ever dangerous competitor; and in the field of heating, one may choose from among several fuels. Thus, the future of gas, either manufactured or natural, as a public utility is precarious to say the least.

In the urban transportation utility, the force of social obsolescence has been most disastrous. The electric street railway, born in 1888, definitely made antiquated all other forms of street transport. The horse car, the cable car, the steam-powered bus or car, all were cast quickly into the limbo of discarded experiments. Yet, within 25 years after 1888, the electric street railway was itself under attack; and before its fiftieth birthday, it had succumbed in many places to its competitors. In a study of the electric street railway, therefore, we can review almost the entire life cycle of what was formerly an indispensable

ingredient of American urban life. We shall not be so bold as to suggest that other utility industries will run a similar cycle of events, yet this story is suggestive of the dangers that lurk in an assumption of permanence for any of them. What may seem permanent in today's economic fabric may be absent from the pattern of tomorrow.

A DESCRIPTION OF THE ELECTRIC RAILWAY[1]

The first successful electric street railway system was placed in operation in Richmond, Virginia, in 1888. The secret of its success was the combination of a central power supply, overhead wires for power distribution, and the electric motor directly geared to a drive shaft on the wheels of each car. From this beginning, the electric street railway spread rapidly, first to the larger cities, then to the medium-sized cities, and finally to the smaller ones. The rapidity of this growth is shown in the figures gathered by the Bureau of the Census. In 1890, there were 789 companies operating 8,123 miles of single track (1,261 of which was powered by electricity); by 1902, there were 987 companies operating 22,576 miles of single track, almost exclusively powered by electricity. In the peak year, 1922, the single-track mileage operated stood at 43,931.[2] It is certainly no exaggeration to say that it was a rare American town of over 10,000 that did not have at least one railway promotion scheme before 1910 and almost a rare place that did not see built such a railway. We can speak confidently when we say of the Middle West that practically every community of any size at one time had an electric railway system in operation.

Electricity as power for urban transport was not confined to the railway operating on public streets. When it had been proved a success for that use, plans were quickly formulated to use it as the power source for the rapid-transit facilities of the metropolitan areas. Therefore, in 1895, the elevated railways of Chicago were electrified, and all the American subways have been so powered. In 1922, for instance, we find the elevated mileage to be 601 miles and the subway and tunnel mileage to be 325 miles.[3] To complete the picture of metropolitan transport facilities, there are the suburban and inter-urban railways, some independent railroads, other divisions of the

[1] In part, this section is a duplication of material used in Chap. III, but because of our plan to make each of the chapters in Part IV complete, we feel that this duplication is necessary.

[2] Census of Electrical Industries: 1922, Electric Railways, p. 8. These figures for 1922 include electric interurban railway mileage of 17,807 miles. Since that development came generally after 1902, the earlier figures are almost entirely for urban railway mileage.

[3] *Ibid.*, p. 19.

steam roads. Again, Chicago can serve as the example. In addition to its surface, subway, and elevated lines, it is served by three electric suburban lines, from the north, west, and southeast, each line terminating at or near the Loop district. Each of the major steam roads likewise operates suburban service; and one of them, the Illinois Central, has electrified these facilities, thereby offering the fastest, smoothest, and cleanest suburban service in the city. Thus, metropolitan Chicago is served by four types of electrified transport, not to mention the more recently developed bus lines.

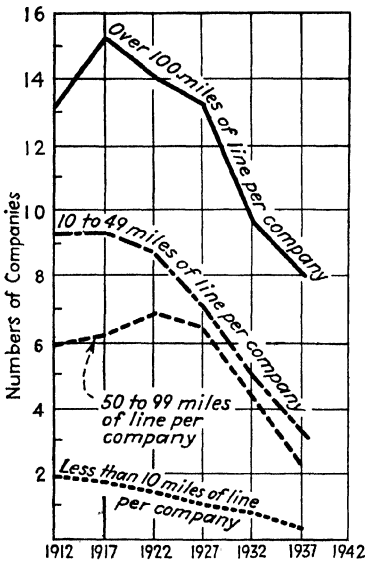

CHART 24.—Changing mileage of street railway companies, grouped by miles of line per company. It will be observed that small and large companies alike have suffered from the devastating competition of the motor vehicle. (*Census of Electrical Industries.*)

THE REVOLUTION IN URBAN TRANSPORT

We have intentionally refrained from using figures of electric railway development beyond the year 1922 because those of that year represent the best available data of that utility at its peak. In a very few years, there was to occur a veritable revolution in urban transportation. Just as the 1920's saw the rise of the motor vehicle to upset the monopoly of the steam railroads, so it likewise and simultaneously became the entering wedge in the monopoly of the electric railways. The automobile industry is almost as old as the electric railway, but its development was much slower and scarcely competitive until after the first World War. Once that competition began, however, it took two directions. First, the privately owned motor vehicle cut in on street railway traffic, both as a means of conveyance to and from work and as a means of recreation. Studies of the Boston elevated railways have shown, for instance, that Sunday and off-peak evening traffic declined significantly after 1917.[1] The following table on private car registrations, by years, shows this growth:

[1] A study of the traffic conditions of the Boston elevated railway shows clearly the changes that occurred in the 10-year period 1917–1927. During this time, the

TABLE 52.—AUTOMOBILE REGISTRATIONS*

Year	Number of Registrations
1913	1,258,062
1915	2,445,666
1920	9,231,941
1925	19,937,274
1930	26,545,281
1938	29,485,680

* Includes all types of motor vehicles.

The second point of automobile competition came primarily from the motorbus and secondarily from the taxicab. In the early 1920's, there was a short period in which every type of automobile, from a dilapidated touring car to the large-sized passenger bus, was running competition to street railways. To these smaller vehicles was given the name "jitney bus" from their practice of charging a flat 5-cent (jitney) fare. Such competition was very unfair, because neither the cars nor their operators were licensed, the equipment was likely to be very unsafe, they were inclined to serve only the more congested areas, and they covered identical routes running only slightly ahead of the electric cars. This unregulated and unfair competition soon gave way, however, to the motorbus operated by reputable companies, serving under conditions similar to those imposed on their rail competitors. As we shall show later, these buses either continued to compete or were integrated with the older equipment in a complementary or supplementary capacity. The growing importance of the bus is seen in several of the charts and tables shown in this chapter. The Bureau of the Census reports 301 motorbus lines for

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annual number of revenue passengers remained more or less fixed, fluctuating between 360 and 380 million, but the change in the character of the riding is significant. In the first place, the pleasure riding practically ceased. The number of Sunday and holiday passengers declined about 20 per cent. This is to be accounted for by two things—the automobile and the increasing prevalence of the summer vacation. On the other hand, the use of the rapid-transit facilities on business days for the same 10-year period increased slightly, especially during the winter months. In short, "since 1917 not only has there been a change in character of riding, as between business days and holidays and as between winter and summer, but, also there has been an accentuation of the peak hour of the day. This is but another example of the fact that the railway service is becoming more and more a business service. Its main and primary function is taking people to work in the morning and home at night." Observation of transit facilities in other American metropolitan centers points to the conclusion that this picture for the Boston elevated railway is typical of the whole country. "Changing Characteristics of a Metropolitan Rapid Transit Service," Dorau, *Materials for the Study of Public Utility Economics*, pp. 224–226.

1927 and 498 such lines for 1932. The 1932 figures break down as follows:[1]

Operated by electric companies	268
Directly	173
Through subsidiaries	95
Operated as successors to electric companies	230
By former railway interests	81
By independent companies	149

Table 53, especially, shows this growth of busses. There it will be observed that 1922 is the first year showing the number of new busses purchased. Within 4 years (1922–1925) the number had almost a tenfold increase. For the 5 years ending with 1938, although 1,175 new electric railway cars were purchased, 17,404 new motorbusses were placed in service.

Complete figures on urban motorbus operations are difficult to find. The 1937 Census of Electrical Industries reports such for "motorbus operations of street-railway companies, and their affiliates, subsidiaries, and successors, and other short-haul lines having terminals in cities with population of 100,000 inhabitants and over."[2] These figures show 988 companies, operating 95,537 miles, by means of 28,056 busses. This equipment carried 3,363,228,810 passengers 958,769,181 revenue miles, and resulted in a total income of $219,-520,782. Other sources show, as of December 31, 1938, that busses accounted for one-third of all street transport equipment, carried 27 per cent of all passengers, and received the same per cent of total revenues.[3]

The consequences of this revolution are easily demonstrated, visually and statistically. The street railway has practically disappeared in towns under 100,000 to 150,000 population. In Iowa, for instance, in 1922 there were twenty-two electric railway companies, operating 975 miles of track. Later figures of the census do not show a breakdown by states; but in 1939, there were but three city electric railways and not more than three interurban electric railways in operation. We cite one more sample. In 1922, there were eleven railway companies in Georgia operating 458 miles of electrified track. By 1939, there were only two electric street railways—one in Savannah, the other in Atlanta. The former was operating at a loss, and the latter was not earning a fair return on its investment.[4] Such an

[1] Census of Electrical Industries: 1932, Electric Railways, p. 81.

[2] Census of Electrical Industries: 1937, Street Railways and Trolley-Bus and Motorbus Operations, pp. 61–65.

[3] *Transit Journal*, **83**:2, 10, January, 1939.

[4] *Electrical World*, **112**:184, July 15, 1939.

unsatisfactory financial situation was possible only because of the support from the electric power companies of which they are a part. Figures for the nation as a whole for 1938 showed for communities less than 25,000 that 75 per cent of all common carrier urban traffic

TABLE 53.—PASSENGER VEHICLES ORDERED BY YEARS*

Year	Electric surface cars	Rapid-transit cars	Electrified suburban cars	Trolley busses	Motor busses	Total
1912	5,228	70	86	...	.....	5,384
1913	4,253	128	114	1	.....	4,496
1914	2,431	200	99	...	.....	2,730
1915	2,348	901	60	...	.....	3,309
1916	3,363	242	57	...	.....	3,662
1917	2,153	412	30	...	.....	2,595
1918	2,097	100	...	...	.....	2,197
1919	2,257	200	...	...	.....	2,457
1920	3,101	200	15	...	.....	3,316
1921	1,160	25	28	12	.....	1,225
1922	3,067	140	30	24	240	3,501
1923	3,168	180	174	24	621	4,167
1924	2,245	154	278	7	963	3,647
1925	1,331	160	43	...	2,171	3,705
1926	1,401	67	157	...	1,972	3,597
1927	924	70	21	...	1,711	2,726
1928	664	...	30	12	2,120	2,826
1929	1,042	...	242	20	1,813	3,117
1930	608	...	361	112	1,614	2,695
1931	55	500	55	84	1,150	1,844
1932	65	...	90	41	709	905
1933	62	5	...	113	1,280	1,460
1934	48	5	...	58	2,110	2,221
1935	100	651	...	211†	3,864	4,826
1936	399	176	...	545‡	4,743	5,863
1937	342	300	2	492§	4,033	5,169
1938	286	53	...	190	2,654	3,183

* *Transit Journal*, **83**:8, January, 1939.
† Includes 62 "all-service" vehicles.
‡ Includes 100 all-service vehicles.
§ Includes 195 all-service vehicles.

was carried by the bus and that for communities above 25,000 and under 100,000 the figure stood at 64 per cent. Only in communities over 500,000 did the street railway carry over 50 per cent of the traffic. Truly, therefore, has there been a revolution of urban transportation. In 20 years, the electric railways have been toppled from a position

of complete control to one of doubt of their ultimate survival. A tentative estimate gives them a place only in the larger city and metropolitan areas where people must continue to be moved in mass units at frequent intervals.

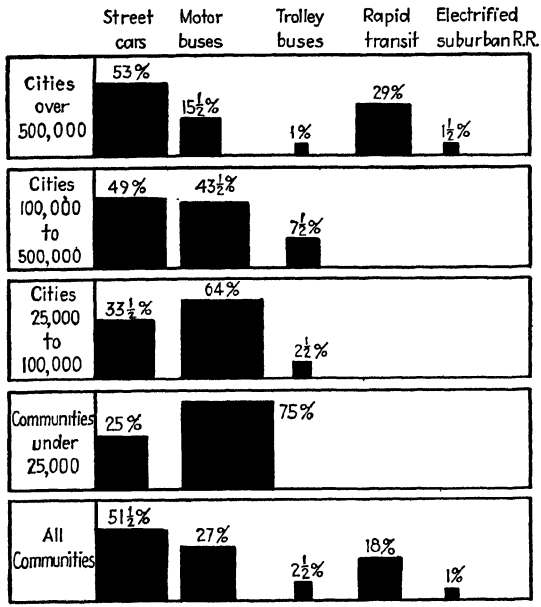

CHART 25.—Comparative use of different forms of transportation in cities, grouped according to size. In places under 100,000, the street car definitely is overshadowed by the motorbus. (*Transit Journal, January*, 1939.)

THE CRISIS IN URBAN TRANSPORT

Where the urban electric railway (street, elevated, and subway) continues to exist, it has definitely faced a crisis of several dimensions. The competing transport agencies, the privately owned automobile, the taxicab, and the common carrier passenger motorbus have cut into its business from several directions. As we pointed out above, these agencies have made even more serious inroads into the off-peak and Sunday and holiday patronage. Both the bus and the street car have become primarily means of transport to and from work, except for those few persons of the low-income group who wisely have refrained from buying automobiles. As a consequence, these facilities are used intensively but a few hours each day, creating a rather low load factor. The generalization is not without its support, therefore, that the remaining street railways have been caught between the pincers of

rising peak loads and declining load factors, much to their embarrassment in making ends meet.

In fact, this crisis has left many communities without any type of common carrier. First the street railways failed; then their successors, the bus companies, failed. The presence of the private automobile has destroyed the destroyer. Smaller places may generally get along without any form of common carriage, yet not a few persons have been permanently inconvenienced by this sequence. Even in the larger cities, the car and bus companies do not find the going easy. Many of these systems are subjected to periodic intervals of operation by court receivers. Whatever may be the causes of the disappearance of all forms of transport in the smaller places and their instability in larger places, the real problem now seems to be to devise an alternate plan whereby to secure any form of adequate service. Whereas the "traction baron" of the 1900's was the symbol of swollen profits in street railways, the question now appears to be whether to do without service or to subsidize some agency in order to ensure its survival.

The fundamental cause of this crisis has been the unique character of the service. Transport agencies stand ready to deliver people from one point to another. This service requires minimum schedules and a certain amount of equipment, no matter how slack its use. Thus, the thing sold has but one use, and it is in a sense highly perishable. For instance, a half-empty bus passing along a line has a potential service to sell. Once it has passed by, that potentiality perishes, yet its costs are nonetheless incurred. Whereas gas, when threatened in its early years by electric competition for the lighting business, could and did develop new loads, when the street railway is attacked by the automobiles it has no alternate service to develop—it must stand or fall solely on its ability to meet that competition.

THE PLACE OF THE MOTORBUS

Previous discussion and the tables and charts exhibited in this chapter indicate the almost phenomenal development of the motorbus. Let us cite a few more evidences of this growth. Chart 26 shows the trend in bus operations. There it will be observed that there has been a sharp decline in the number of "all-rail cities," from 560 in 1922 to 33 in 1938. Even the combination rail and bus companies have declined during these years. On the other hand, the increase in the numbers of cities served exclusively by buses has been rapid since 1930. In summary, at the end of 1938, there were 982 towns in the United States with a population over 10,000. Of these,

389 were served exclusively by bus service, 273 by rail and bus, and 33 by railways only. In that year alone, 39 cities joined the "all-bus" ranks. They varied from the largest, Grand Rapids, Michigan, to one North Carolina town of 3,000 and were located in twenty-two states.[1]

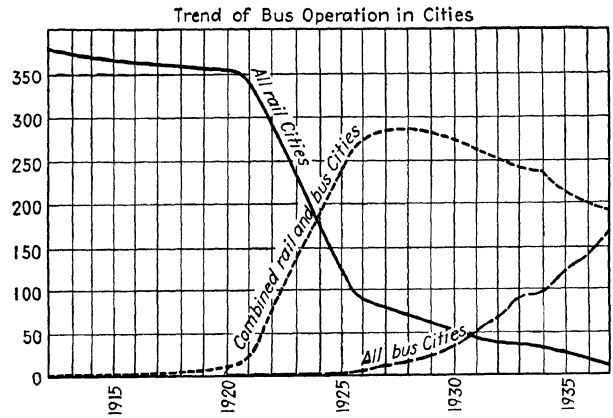

CHART 26.—Changing relation of rail and bus transportation in American cities. Notice the almost complete replacement of the street railway as the leading medium of urban transport. (*Transit Journal, January*, 1939.)

The motorbus has had many advantages claimed for it, some important, some but temporary. In the first place, it is a more flexible unit of transportation. It is not confined to a particular traffic lane or to a particular street. If traffic congests certain main arterials, it can pick the best lane, thereby moving more rapidly. If a street is blocked for any reason, the bus is easily detoured. As cities grow, and especially as they change, the adjustment of bus service to this growth and change is easy, whereas a railway would be put to the expense of tearing out old rails and laying new ones. In the next place, the bus is a quieter, more acceptable means of transportation. Its quietness comes from the use of the pneumatic tire, and its acceptability is a matter of public taste. In a survey made in Detroit, for instance, out of seventy-one persons having a preference, fifty-three favored the bus.[2] Other claims have been made for the motorbus. It is said to be faster, thereby covering greater territory. This point we assume to be a debatable one.

[1] "And So They Ride," *Bus Transportation*, **18**:56, January, 1939.

[2] THEISINGER, "In Detroit Buses Swing the Job," *Bus Transportation*, **18**:4, January, 1939.

The most important argument for it has been its economy of operations. Again, on this point, the evidence is in dispute. One study made in Detroit for busses at nonrush hours and Sunday showed the following costs for November, 1938:[1]

Cars	Cents per mile	Busses	Cents per mile
Way and structure	1.83	Maintenance of plant and equipment	2.44
Equipment	2.40	Operating garage expense	2.25
Power	5.61	Transportation	8.02
Conducting Transportation	20.55	Administration and general	1.21
General and miscellaneous	3.33		
Total	33.72	Total	13.92

In general, it seems to be conceded that, for smaller cities and for feeder service to electric railways in larger cities, the bus has a definite cost advantage. We cite the conclusions of one electrical engineer, who said:[2]

> Buses seating 20 passengers and carrying ten standees, on 15-minute headways [schedules], can carry away from a given area 120 passengers per hour, and the installation cost per mile of route will be very small compared to other types of service. With the cheaper types of gas buses of this size, a route giving 15-minute service may be equipped, including garage facilities, for $3,000 to $4,000 per mile. When pioneering into new territory in small- or medium-sized cities, this is probably the logical equipment to use.

On the other hand, it must be recognized that, in part, the superiority of the bus is based on two factors, both of which need not continue indefinitely. The first of these is the fault of the electric companies in allowing their facilities to become run-down and refusing to adopt newer methods and equipment. Naturally, if one must choose between a new, modern bus and an old, noisy, uncomfortable street car, he chooses the former. Therefore, in so far as the bus wins in this type of race, it beats an inferior competitor. Obviously, then, old equipment cannot give good service, is costly to operate, is slow, and is subject to frequent interruptions in service.

The second factor giving the bus a superior position has been the onerous burdens of the typical street railway franchise. Elsewhere we have pointed out the multitude of requirements of special service

[1] *Ibid.*

[2] DAVIS, "Application of Modern Electric Vehicles to Urban Transportation," *General Electric Review*, p. 125, March, 1938.

imposed on many street railways. Let us repeat a few of them. They have been required to pave, repair, and maintain streets between tracks and a foot on either side; furnish free service to special groups; sprinkle streets in summer, remove snow in winter; even "build a picket fence around the school, and remove trees from the property of Mrs. Johnson." Such contributions as these, although possibly small in amount, add just that much to the disadvantage of the street car company. These franchise restrictions, relics of the days of "swollen profits," now serve to handicap the electric company when it is threatened by the bus. It seems a reasonable observation, therefore, that in part the superiority of the bus has resulted from the carelessness of management and the unfair burdens imposed by public authority. Although the bus does have its superiority in many ways, the presence of these factors has exaggerated its natural advantages.

THE STREET RAILWAY MEETS ITS COMPETITOR

Of course, not all street railways took this competition with private and common motor vehicles lying down. Some of them, especially in the larger cities, faced the situation courageously and have made notable recovery strides. Meeting this competition resulted in many innovations, such as fare experiments, franchise modification, improvement of equipment, and unification of facilities. In addition, many managers for the first time saw the value of good public relations and so began a process of employee good-will training.

Some of these changes we can describe in a sentence or two. State commissions and city councils have been disposed on occasion to waive their rights to claim performance of special franchise provisions. Where such generosity has not been forthcoming, operations under court receivership have forced relaxation of the more onerous provisions. In general, however, this has been the least important factor in recovery.

Of immeasurable value has been the belated drive to create good will. Employees have been trained in the simple art of common courtesy, a notorious failing of the old-time motorman and conductor. "Courtesy always" and "Courtesy pays" have been made real slogans. Even car signs have been altered to read "*Please* enter at front," a slight but significant concession to the feelings of the riding public. Advertising, newspaper and billboard, now is brought into play. To induce the motorist to leave his automobile at home, he is told about the accident-free record of street car service, its cheapness and promptness, its convenience to work and shopping districts. "When one uses a street car, he has no parking problem." Of course, all these

good-will and selling efforts have helped. Alone, however, they would have been quite inadequate to meet the competition of the 1920's. Therefore, let us review some of the significant innovations.

Fare Experiments.—So long as the electric railways had an unchallenged monopoly of urban transportation, they were content to

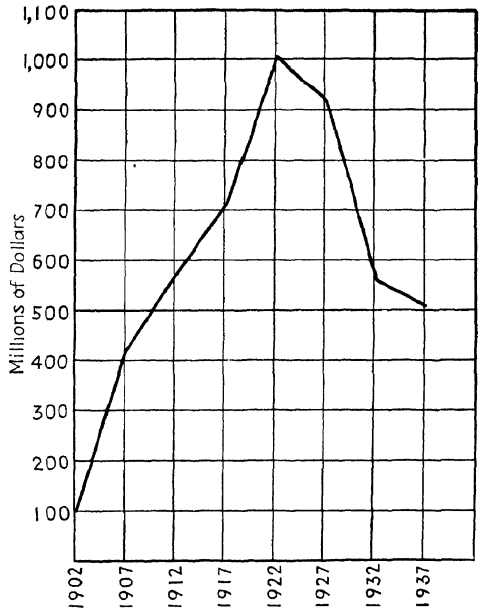

CHART 27.—Operating revenues of street railways, by five-year intervals. It will be seen that 1922 marks the peak of the advancement of that utility. (*Census of Electrical Industries.*)

charge a single fare for one unlimited continuous ride. Traditionally, that fare was 5 cents. When the war period brought rising operating costs, the usual procedure was to raise this fare to 6, 7, 8, and occasionally 10 cents. With the declining traffic of the 1920's, it became obvious to the more alert managers that fare hikes were a futile way of securing increased business. In fact, such increases often brought about sharp declines in use and certainly would not restore lost patronage.

Therefore, during the 1920's, there occurred many fare experiments.[1] First, in combination with an 8- or 10-cent fare for a single ride were offered groups of tickets or tokens, such as three for 20 cents or seven for 50 cents. Then the nickel pass, the weekly pass, the

[1] For a complete analysis of these, see *supra*, pp. 417 *et seq.*

shopper and theater pass were tried. In a few places, special shopping zones were created. More recently, companies have even returned to the single-ride 5-cent fare.

The success of these experiments is difficult to measure because patronage is affected by so many other factors besides rate changes. Two cases, however, do indicate commission and company attitudes in this matter, as well as the complexities of the problem. We have had occasion several times earlier to cite the Wisconsin Public Service Commission as one of the more alert state bodies. That agency has been particularly aware of the problems of urban transportation. It has been quite ready to cooperate in new and novel fare proposals, even going to the extent of ordering on its own volition such experiments. For instance, in early 1933, it issued an order to the Madison Railways Company to show cause why that company should not attempt certain fare experiments. Specifically, that utility was earning considerably less than a reasonable return on its investment and was faced with a most vicious kind of competition from the local taxicab companies. The company had tried the following fare schedules:

January 5, 1925, 8¢ cash fare, seventeen tokens for $1.
February 4, 1928, 10¢ cash fare, sixteen tokens for $1.
September 11, 1930, 10¢ cash fare, weekly pass, $1.
February 23, 1933, free transfers to bus or car for cash fare customers.

Yet revenues continued to decline. The commission therefore concluded: "This experience fortifies us in the belief that some further experimentation in rates may be justified and may be the only presently feasible solution of a difficult situation."[1]

Our second illustration is taken from a decision of the California Railroad Commission.[2] Prior to the case in question, the Market Street Railway Company, in San Francisco, had been charging the following schedule of fares:

Cash fare	5¢
School children	2½¢
Full-fare tickets	5¢
Sunday and holiday pass	20¢

The initial proposal of the company, in 1937, was to substitute the following schedule:

[1] *Sauthoff v. Madison R.*, 1 P.U.R. (N.S.) 519, 521, 522.
[2] *Re Market Street R.*, 20 P.U.R. (N.S.) 278.

Cash fare	7¢
Tokens (four for 25¢)	6¼¢
School children (sixteen for 50¢)	3⅛¢
Sunday and holiday pass	25¢

The problem of the company was complicated by the fact that there were three street railways in San Francisco, one a municipal property, and bus lines, all in partial competition. The commission felt that the 7-cent cash fare would immediately divert a certain volume of patronage to the municipal line especially, because of course that agency would continue to charge a 5-cent fare. To permit the Market Street Company to charge 5 cents on its competing line and 7 cents on its other lines would also be confusing. It was estimated that the new fare schedule, after deductions for loss of business, would yield an additional revenue of $1,350,000 but that the gross earnings would rise only $350,000. Therefore, in order not to penalize remaining customers a million dollars to net a third that sum, the commission denied the request and, in its stead, ordered a 5-cent fare coupled with a 2-cent transfer charge. It concluded:[1]

> The adoption [of this substitute schedule] will at once spare almost 60 per cent of applicant's patrons from any increased fare whatsoever, and will save all of applicant's patrons increased annual transportation costs aggregating $1,000,000.

Improved Methods and Equipment.—There have been many experiments in improved and new equipment. The simplest efforts have been to redecorate and improve existing facilities. One writer describes one of the more bizarre experiments in these words:[2]

> Times are hard in Pennsylvania mining towns and Scranton is no exception. With many of the mines closed, the street railway officials began to see more and more red ink on their books. Something had to be done. The Scranton traction officials thought a long while. Finally one of the officials walked to the outer office and giving a bright young lady some carfare he told her to go take a ride, and not to come back until she had figured out what she would do to make the street cars more attractive. The official had decided that the street railway business could not pick up until the Scranton street cars had something more to offer than everyday humdrum street car service.
>
> The young lady went for a ride. She came back with some red-hot suggestions—just the sort of suggestions one would expect from an attractive and alert young lady.

[1] *Ibid.* at 284.

[2] "Securing Cooperation of Business Men in Scranton," address by H. H. Dartt before 1931 Convention of American Electric Railway Association, abstracted in *Public Utilities Fortnightly*, **8**:561, Oct. 29, 1931.

She wanted the street cars painted apple green with jade trim. She wanted the seats covered with cretonne of a color that would shout, "Hallelujah!"

The Scranton officials did not throw up their hands and groan "Just like a woman!" Instead they painted some cars green with jade trim and covered the seats with brilliant cretonnes. And what is more, they painted the cars many other colors. Probably many a grizzled miner scratched his head and contemplated signing the pledge as he witnessed a pale mauve street car swing around a Scranton corner, followed by another painted a baby blue with silver polka dots.

Of course, the writer exaggerated his report, but both he and the Scranton railway officials were aware of the lack of consumer appeal in the conventional car, its color and furnishings. On every hand, evidences of more attractive equipment, both old and new, can be found. Other innovations have been the improvement of interior arrangements, smoothing of track and track joints, use of new and more silent wheel material. For instance, the best of ability has been engaged to study causes of noise and its elimination. Service has been speeded up by the introduction of partial "limited" service and the skip-stop system.

In cities especially, have new and improved equipment been acquired to replace older cars. For instance, on the elevated and subway lines of New York and Chicago, there has been developed a new "faster, smoother, quieter and cleaner" coach. These cars are in three-section units, made of aluminum alloy with rubber-cushioned trucks to eliminate noise and shock. In short, "The car adapts to rapid transit operation all of the innovations in the modern street cars introduced two years ago."[1] These new trains are mechanically ventilated with filtered air and have twice the power per ton of gross weight as the older types. Each three-section unit is 80 feet long and will accommodate 300 passengers. In New York, they are operated in groups of seven, thus giving space for 2,100 persons. Yet, for all these innovations, they cost but 70 per cent of conventional equipment.

The Presidents' Conference Committee Car.—As a final example of the reawakened interest in improved equipment, we cite the results of the experiments of the Electric Railways Presidents' Conference Committee. This group, organized in 1931, devoted 5 years and a million dollars to the development of a new car, commonly called the "P. C. C. car." This product is quite similar to those described above for the high-speed service of New York and Chicago. It is a light, comfortable car, capable of increased speed and quick pickup,

[1] *Chicago Tribune*, Sept. 4, 1938.

built with the most modern appointments. Its basic dimensions are

Seating capacity	54 persons
Weight	38,000 lb.
Maximum safe speed	50 m.p.h.
Cost (average) per car	$15,000

According to a report presented in 1938, 570 of them have been placed in operation in nine American cities and 140 in Toronto, Canada. In every place, there is evidence of better, faster, and more acceptable service. There is also evidence of increased revenues and decreased costs.[1] One enthusiast lets his judgment waver a bit with this observation on the P. C. C. car and other innovations: "There is no revolution in the street railway business, but the horoscope points clearly to better times. The industry is ready to go."[2]

The Trolley-bus.—The most interesting experiment in new equipment is that cross between the electric street car and the motor-bus, called the "trolley-bus." This vehicle looks like a bus, yet it is electric powered, taking its energy by means of a double-poled trolley from overhead wires. Table 53 shows the extent of its use. A few were placed in service in the 1920's, but it was not until 1930 that any large number of them came into use. Including the "all-service" vehicle (described below), in the 9 years ending with 1938, 1,846 trolley-busses have been placed in operation on American city streets. The 1937 Census of Electrical Industries shows similar trends. Between 1932 and 1937, the number of trolley-bus companies increased from sixteen to thirty-six; and the number of vehicles in operation, from 247 to 1,655. Twenty-six of these thirty-six companies were affiliates of street railways, and twenty-seven of them were operating in cities of more than 100,000 population. Of course, the investment in trolley-bus equipment represented but a minute fraction of the total investment of transit companies.

The advantages of the trolley-bus are the strong points of both bus and electric car. It is not confined to one lane of traffic, having instead a permissible deviation of about 14 feet. On the other hand, it cannot be rerouted except on streets with overhead wire facilities. Like the bus, it can draw to a curb to receive and discharge passengers. It also has the power advantage of the electric car. Often the power cost per mile is cheaper with electricity, and the overload capacity of the electric motor creates definite advantages

[1] Pamphlet of General Electric Co., a résumé of paper presented at the 1938 meeting of the American Transit Association.

[2] HALL, "The Street Railways Come To," *Public Utilities Fortnightly*, **19**:496, Apr. 15, 1937.

not possessed by the gasoline motor. Because of existing installation of overhead electric distribution facilities, the trolley-bus often has an advantage in other costs, thereby enabling it to meet the competition of the bus.[1]

A variation of the trolley-bus is the motorbus equipped with an electric drive. These vehicles have a generator directly connected to a gasoline motor, thereby delivering electric power to a motor geared to the driving axle. Thus, clutch and transmission are eliminated. This type of vehicle has been improved to allow the use of electric power from overhead wires, where available, and has been named, consequently, the "all-service vehicle." Such busses can be used on detour routes and for special Sunday and holiday excursion trips.

These electric-powered vehicles, the trolley-bus and the all-service bus, seat approximately forty people and can carry significantly larger loads than the motorbus. They would seem, therefore, superior vehicles and, except in congested areas, to have all the advantages of the street car and motorbus without most of their disadvantages.

Unified Service.—Originally, the motorbus was operated by independent companies, competing directly with the electric street railways. In the largest cities, such competition still continues, although one proposed reorganization of the transit facilities of Chicago calls for the unification of the rails (surface, underground, and elevated) and the Chicago Motor Coach Company.[2] In smaller places, the bus has been more often controlled by street car companies. We cited above the figures for 1932, showing 268 railway companies operating busses, and 81 bus companies operated by former railway interests. The figures of the 1937 Census of Electrical Industries show 988 motorbus companies related to street railways as follows:

Affiliates of street railways	143
Subsidiaries of street railways	48
Successors to street railways:	
Same corporation	62
Other corporation	220
All others	515
Total, motorbus companies	988

This same report discloses a total of 28,056 busses in operation, representing an investment of approximately 270 million dollars.[3]

[1] For further and more detailed discussion of this problem, see Davis, "Application of Modern Electric Vehicles to Urban Transportation," *General Electric Review*, March, 1938, p. 125.

[2] *Report* of Walter A. Shaw, court adviser to the District Court of the United States, Northern District of Illinois, Eastern Division.

[3] The 1937 figures do not cover all bus-line operations, being restricted to

In the larger cities, the bus often serves a dual function. It is a primary source of transport and a supplementary facility to rail lines. Together, these services carry approximately 15 per cent of all passengers carried. The experiment in Detroit illustrates a third use of the bus in periods of low traffic density. Whatever may be the dispute about the relative merits of the rail and bus service, the latter facility does have a place and, where possible, should be integrated with existing street car systems, where they have survived. Of course, in smaller places, the bus has come to play a primary rather than a supplementary role in the matter of transportation.

THE ONE-MAN CAR

One change in car operations deserves special consideration. The traditional car crew for a single car was two men: a motorman and a conductor. This was a logical arrangement in the days when all car controls were manual and required the undivided attention of one person. In fact, the two-man crew is probably a carry-over from the days of the horse-drawn street car; because as early as 1893, for instance, the Congress required all such conveyances in the District of Columbia to be manned by such a minimum-sized crew.[1] Although there may have been occasional question of the need for a crew of two in the early years of the street railway, it was not until the period of rising costs and declining patronage following the first World War that actual experiments in one-man operation were attempted. Since that time, the many commissions have faced this problem and, subject to proper restrictions, have generally approved of it. The problem has even gone to the courts of the United States. In 1919, the Supreme Court of the United States upheld a Louisiana ordinance outlawing one-man operation,[2] although later a federal court, in 1930, held that changed conditions made the former ruling inapplicable.[3] This newer position was reviewed and affirmed by the Circuit Court of Appeals,[4] and this decision the Supreme Court declined even to hear argued.[5] Thus, it would appear that the one-man-operated street car has both commission and judicial approval.

There can be only two arguments against its use. First, labor groups often are opposed because of their fear that its use will increase

successors of street railways and other bus companies operating in cities with populations in excess of 100,000.

[1] 27 Stat. at L. 334, cited in 16 P.U.R. (N.S.) at 42.

[2] *Sullivan v. Shreveport*, 251 U.S. 169 (1919).

[3] *Shreveport v. Shreveport R.*, 37 F. (2d) 910 (1930).

[4] Same, 38 F (2d) 945, P.U.R. 1930B 469 (1930).

[5] Same, 281 U.S. 763 (1931).

unemployment. This argument has been especially urged since 1930. The other argument concerns the safety, comfort, and speed of the one-man car. Rather than discuss these objections in general terms, we present here an analysis of a decision on this problem by the Public Utilities Commission of the District of Columbia.[1] In 1935 and 1936, the Capital Transit Company of Washington, D.C., asked permission to operate as one-man cars its twenty P. C. C. cars and permission to purchase twenty cars from a company in Providence, Rhode Island, renovate them, and operate on the same basis. After careful investigation of experience in its and other jurisdictions, the Commission found the merits of one- versus two-man cars to be as follows: Substantial equality was found in the matter of speed, safety, and comfort. The two-man car was found to be slightly faster. On the other hand, the one-man car was found to be materially cheaper to operate. Back in 1921, the commission had found an annual saving of $72,308.18,[2] and it still found significant savings.[3] An analysis of the proposed service showed, furthermore, no probable layoffs of employees. "The policy has been to make the conversion so gradual as to insure continued employment of the men already in service."[4] The commission, therefore, granted the petitions of the company, although it stated that hereafter it would prefer the company to buy only P. C. C. cars for one-man service.

The question of one-man cars (and busses, too) is scarcely one open longer to debate. They have been proved to be as safe and satisfactory as two-man-operated vehicles, and they are certainly more economical to operate. In short, except in the downtown and main lines of companies in the largest cities, two-man operations are a thing of the past.

METROPOLITAN SERVICE

Although we have been discussing urban transport wherever such facilities exist, we have not devoted any special attention to the metropolitan areas, such as New York, Chicago, Philadelphia, Detroit, and Los Angeles. In these, there can be no question of the need for several kinds of transport facilities. As Chart 25 shows, in such places, the street cars carry 53 per cent of all traffic; rapid transit, 29 per cent; and the busses, 15 per cent. Each serves a particular need, and the elimination of any one of them is quite unthinkable.

[1] *Re Capital Transit Co.*, 16 P.U.R. (N.S.) 40.

[2] P.U.R. 1922C 848, 859.

[3] The California Railroad Commission estimated that the Market Street Railway Company in San Francisco saved in the year ending March 31, 1937, $84,751 by the use of one-man cars. *Re Market St. R.*, 20 P.U.R. (N.S.) 278, 280.

[4] 16 P.U.R. (N.S.) at 46.

Congestion is the keynote of urban transportation. The massing of people into business and industrial areas, their arrival and departure almost simultaneously result in its being physically impossible for any group of transport systems to handle this volume adequately. At best, at rush hours congestion must result. The problem, then, of the metropolitan areas is to hold to a minimum such evils. Therefore, except as cost is a factor, the fastest and largest capacity vehicles are the best. Thus, the ideal system for each center would be overhead and subsurface passenger movement. Of course, cost here has been the limiting factor. The largest of such facilities is that in New York. In that city is a four-track subway, capable of handling eleven-car trains, each holding 3,080 passengers, on ninety-second headways. On express tracks alone, 123,000 passengers can be moved; and adding the local service, the figure per hour rises to 180,000 persons. Using a figure of 100,000 passengers per hour, to handle such by street railways would require eleven routes or, by busses, nineteen streets.[1] The fact that these subways and their equipment cost approximately 12 million dollars and more per mile of route limits them definitely to these few cities of extremely high population density. Yet, as one expert has said, "No form of surface transportation in metropolitan areas can approximate the speed of rapid-transit trains. No possible expenditures can be made that will permit the movement of an equal number of people in small, individual vehicles, autos, or buses as fast, or as economically as can the subway."[2] We add to this analysis the further comment that the mass transportation requirements of metropolitan areas can begin to be handled effectively only by a reliance mainly on street and underground facilities.

It would appear that the chief problem of these areas is to make these transport agencies self-sufficing. Unfortunately for a clear analysis of this question, the history of city street railways and subways has been so filled with overcapitalization, political tampering, and even corruption that one cannot safely say how much of their present operating difficulties are inherited from this past and how much is a product of changed rider habits. Whatever may be the causes, the metropolitan transit companies have needed help and are in trouble. The Boston elevated railway, operated in city-owned subways, is in fact directed by a state agency called a "Board of Trustees." A major portion of the subway system of New York is municipally owned. Specifically, the city owns one system entirely and the tubes of two other systems. These three systems represent an investment of $1,480,000,000, of which 78 per cent is the city's

[1] Davis, cited *supra* at p. 540.

[2] *Ibid.*

contribution. In Philadelphia, again the city owns a portion of facilities operated by a private company. Even this joint venture, however, has not prevented operations under the Federal Bankruptcy Act. In Chicago, the same situation generally exists. There, the city owns the tubes of the subway system, leasing them to existing agencies to operate. The street and elevated lines of that city are in bankruptcy and have been for some years. As a result of intensive study of the Chicago situation, Walter A. Shaw, adviser to the District Court of the United States in Chicago, under whose jurisdiction these facilities have been operated, finds the only possible solution to be a unified transportation system, "given every assistance reasonably possible from governmental authorities including financial assistance, in the construction of the ways and structures through which and over which the systems operate."[1] In short, since even to think of abandonment of these facilities would be nothing short of fantastic, the present question in metropolitan transportation is whether to subsidize private operators or to subsidize a program of public ownership and operation.

URBAN TRANSPORT IN REVIEW

Nothing much can be added by way of summary of this material on the decline of the street railway. It is significant, however, that one of the public utilities, the electric street railway, within 50 years ran its complete life cycle so far as the medium and small cities are concerned. All efforts to save these railways failed. Even their successor, the motorbus, finds the financial sledding hard in those places. In the metropolitan areas, the "swollen profits" of bygone days appear to be gone forever. Thus, urban transport facilities, because of changed rider habits occasioned largely by our 30 million automobiles, have a very uncertain future. If we were to hazard a "moral" to be drawn from this story, it would be that reliance on cost as a measure of the success of utility ventures is to inject a large element of risk in the security of their investments.

Bibliography

Materials on the subject of this chapter must come from trade journals, association proceedings, and commission deliberations. See the *Transit Journal, Bus Transportation, Proceedings* of the American Electric Railway Association, and *Proceedings* of the National Association of Railroad and Utilities Commissioners.

[1] *Report* of Walter A. Shaw, court adviser to District Court of the United States, for Northern District of Illinois, Eastern Division, p. 46, September 26, 1938. This is the finest study of the metropolitan transit problem known to the authors.

CHAPTER XXVI

THE TAXATION OF PUBLIC UTILITIES

The problem of the taxation of public utilities can be treated either as a problem in reasonable rates or as a special problem. We have chosen to do the latter on the ground that although utility taxation is a significant item of cost to be considered in the establishment of rate levels, it creates little dispute between companies and commissions. Thus, in the discussion of reasonable rates, we took it for granted that one of the valid expenses of doing business was the tax bill. The problem of taxation, therefore, is more than a problem of regulation; it is a special problem concerning taxing officials, legislatures, and the public generally.

The taxation of public utilities involves more than mere technical phases of public finance. Public service corporations for many years have been singled out as objects of special taxation, and, particularly since the depression of 1929, the result has been a relatively heavy tax burden. David A. Wells's remark, readapted to fit the occasion, seems to apply—as the Irishman said at the Donnybrook fair, "Whenever you see a head, hit it; whenever you see a commodity [public utility], tax it."[1] A few random samples will illustrate the present tax burden and its recent growth. The following table shows the tax burden, measured as a percentage of gross revenues, to have grown in the electrical utilities from 3.4 per cent in 1902 to 16.5 per cent

TABLE 54.—ELECTRIC LIGHT AND POWER COMPANIES
(Taxes paid as a percentage of total revenues)

Year	Per cent	Year	Per cent
1902	3.44	1927	9.46
1907	4.06	1932	11.73
1912	4.89	1937	15.19
1917	6.43	1939	16.30
1922	8.28		

in 1939. A study of leading electric power systems discloses their tax burdens to range generally from 10 to 20 per cent of gross revenues,

[1] Quoted from Wells in Taussig, *Tariff History of the United States*, 7th ed., p. 164.

with a few of them paying in excess of 20 per cent of gross as taxes.

Other public utilities are subjected to heavy taxation. In 1929, for instance, the Bell Telephone System paid 7.8 per cent of its gross revenues in taxes. Since that year, the ratio has risen until it has exceeded 13 per cent. The following table shows the figures since 1929. Figures for other utilities would show similar trends, except for street railways which have the highest tax burden of all public utilities. Since operating losses are not uncommon for them, their ratios of taxes to net income would be infinite.

TABLE 55.—TAX BURDEN OF THE BELL TELEPHONE SYSTEM
(000 omitted)

Year	Operating revenues	Operating income	Dividends (A. T. & T. Co.)	Taxes	Percentage of taxes to		
					Operating revenues	Operating income	Dividends
1929	$1,070,794	$247,181	$116,378	$ 83,468	7.8	33.8	71.8
1930	1,103,939	235,843	139,238	86,291	7.8	36.6	61.9
1931	1,075,757	237,106	163,588	90,630	8.4	38 2	55.4
1932	956,354	191,900	167,954	86,621	9.1	45.1	51.6
1933	872,406	170,874	167,960	84,880	9.7	49.7	50.6
1934	884,532	178,994	167,960	89,485	10.1	50.0	53.3
1935	919,116	183,160	167,960	94,506	10.3	51.6	56.2
1936	994,852	219,487	168,081	116,339	11.7	53.0	69.2
1937	1,051,379	206,982	168,180	135,910	12.9	65.7	80.8
1938	1,052,657	190,500	168,181	145,113	13.7	76.2	86.4
1939	1,107,187	217,345	168,181	156,308	14.1	72.0	93.0

Of course, one must not conclude too quickly that the tax burden is moving on an unbroken, upward-trend line. The period shown by our figures covers years of general tax increases and depression. Either of these factors would tend to cause the percentage burden to rise. Investigation shows a lack of correlation between income changes and tax payments; therefore, as incomes decline, although taxes may decline too, they do so less rapidly, thereby causing the burden to rise. Unless new taxes are added or old ones made more severe, prosperity will bring greatly increased incomes and a consequent decreased tax burden. Final conclusions on this possibility must be reserved until the end of this chapter.

With this as a setting to our problem of public utility taxation, we are now ready to break our study into its major divisions. The first

relates to tax fundamentals, touchstones by which to measure the validity and consequences of taxes that have been levied.[1]

TAX FUNDAMENTALS[2]

Taxes Are a Cost of Production.—The first significant tax fundamental is that, under ordinary circumstances, taxes paid by public utilities to the support of government are a cost of production. This share—taxes—can no more be overlooked than can the wage bill or materials cost. If a plant is able to cover all costs except taxes, it will wither and eventually blow away just as surely as if it covered all costs (including taxes) except, let us say, bond interest or rents on buildings. Hence, the first fundamental: Taxes are a cost of production and in the long run must be included in the prices charged for utility services and products.

The legal right of a utility to charge its tax payments to operating expense—in other words, its right to insist on rates high enough to cover all costs including taxes—is unquestioned, as a reading of the several cases cited below will demonstrate. As the Wisconsin Commission has so concisely stated, "The rates of a public utility to be reasonable and equitable, should provide revenues sufficient to cover only operation, maintenance, *taxes*, depreciation, and a reasonable return on the earning value."[3] This right to regard all taxes as costs applies not only to the ordinary levies but to net income taxes.[4] Of course, as a matter of proper accounting, the net income tax payments are charged against earnings, yet, in effect, they are costs because the net after taxes must be at least equal to the fair return required by the rule of *Smyth v. Ames*. To be specific, if a net before taxes is reasonable but because of an income tax is materially reduced below this level of reasonableness, rates must be raised (if they fall short of the full monopoly price) to cover this tax. Thus, in effect, net income taxes are costs of operation.[5]

[1] In this chapter, we confine our attention to taxation of privately owned utility companies. For the problem of taxation of publicly owned utilities, see Chap. XXVIII.

[2] This section is a revision of material of the senior author which originally appeared in the *Journal of Land and Public Utility Economics*, **11**:146, May, 1935, under the title "Some Fundamentals of Utility Taxation."

[3] *South Milwaukee Taxpayers Alliance v. South Milwaukee*, **2** P.U.R. (N.S.) 423, 429. (Italics ours.)

[4] *Galveston Electric Co. v. Galveston*, 258 U.S. 388 (1922). See *Spiess v. Manchester Electric Co.* (Conn.), P.U.R. 1933B 262.

[5] This Supreme Court view on income taxes is sometimes objected to by the commissions. The Washington Commission said, "This Department must perforce accept the law as declared by the highest court in the land." *Department*

The federal 3 per cent tax on domestic and commercial electricity sales, but not industrial sales, illustrates this problem. In 1932, it was provided by act of Congress that such sales of electric current should be taxed at 3 per cent, and it was usually plainly marked on utility bills. In at least one case, plain marking was ordered for all electric companies in the state.[1] Because of the protest by various groups, in 1933, Congress transferred the tax from the customer to the vendor. Could this tax be passed to the customer in the face of this change by Congress? The answer is unequivocally "yes." This tax, as any other, can be considered an operating expense. If its payment reduces net earnings below the fair-return level, the company has full constitutional right to ask for and receive a rate increase. The New York Commission, for instance, found a quick reversal at the hands of the courts when it ruled otherwise.[2]

The Shiftability of Utility Taxes.—Of course, it must not be thought that every individual tax increase will result in an immediate rate increase. In some instances, the utility is charging its full monopoly price, and any price change becomes futile. In the next place, regulation cannot be made to operate so precisely that a fair return and no more will be earned. Actually, something more than a fair return is often earned; and for one reason or another, the excess is left undisturbed. So long as a new tax is not greater than this excess, existing rates should continue unaffected. In this case, the burden remains on the owners and is not—cannot—be shifted to

of Pub. Works v. West Coast Telephone Co., P.U.R. 1933A 487, 491. The Wisconsin Commission has taken the occasion to point out some of the "absurd and inequitable" results that flow logically out of this position of the Court. *Re Barron County Telephone Co.*, P.U.R. 1933E 403.

[1] *Re Federal Tax on Electrical Energy* (Wis.), P.U.R. 1932E 508.

[2] *Re Rochester Gas & Electric Corp.*, 4 P.U.R. (N.S.) 513; *re Rates and Rate Structures*, 1 P.U.R. (N.S.) 113; *New York Edison Co. v. Maltbie*, 1 P.U.R. (N.S.) 481; *re Rates and Rate Structures*, 2 P.U.R. (N.S.) 307. The first case, in spite of its later citation, precedes these other cases. It would appear that the commission felt bound by its interpretations of the federal statute, because it later found no difficulty in ordering a telephone rate increase in Rochester on the grounds of the rising tax burden. *Electrical World*, **108**:1878, Dec. 4, 1937.

In connection with the sales tax levied on the seller rather than the buyer, some of the commissions have been quite reluctant to admit the legal right of the company to pass it to the consumer. The Illinois Commerce Commission, for instance, hedged its position denying utilities the right to pass the Illinois sales tax to the consumer, by saying that it would make exceptions "where the burden on the companies would be unreasonable." *Public Utilities Fortnightly*, **16**:149, 166, Aug. 1, 1935. This alleged "exception" is all that the Supreme Court of the United States ever exacts in its decisions. It is only on a showing of unreasonable burden that the courts sanction rate increases.

the users. This may be the result of a particular tax increase, but it is not the rule, and all additional burdens, if it is economically possible, will be eventually passed forward. A third factor may delay the shifting of new taxes—public relations. During periods of hostility such as came with the depression of 1929, it was often wiser to pay the tax out of existing income than ask for increased rates. When the New York Edison Company asked in 1934 for an increase of over 8 per cent to cover new taxes (federal 3 per cent, city 3 per cent, and other new taxes), the mayor of New York immediately proposed a municipal plant. Sometimes, therefore, public relations are better served by paying the tax, because to demand a constitutional right may result in eventual economic annihilation. Eventually, however, these burdens will be shifted to the user of service. As the Washington Commission has said, "Under effective regulation any tax imposed upon a utility is a tax imposed upon its customers."[1]

The Special Case of the Street Railways.—It logically follows from the foregoing discussion, therefore, that eventually all taxes paid by the public service corporations are shifted to the shoulders of their customers. This holds even in the case of net income taxes. Thus, a certain portion of the rates charged goes to pay the utility tax bills. If taxes are increased (other costs being constant), the rate must be raised sufficiently to cover this increase. One must not conclude, however, that the problem is simply one of taxing the utility and letting it pass the tax along. Certain significant consequences of this shifting must not be overlooked. Although the general proposition that the utility tax burden is, in the long run, shifted to the consumer is true, it may not always be so. The street railway, for instance, because of various available substitutes, is often unable to shift more than a small portion of its tax load to its patrons.

The inability to shift street railway taxes is to be explained by the low intensity of demand for urban transportation service. As a consequence, this industry finds that it may shift toward only a part of its tax burden to its users, the remainder being borne by its stockholders in the form of reduced dividends. Why does the street railway not exercise its constitutional right of charging a rate that covers this tax burden? The following illustration answers this question. A certain street railway system, let us suppose, is charging that rate of fare which yields the maximum net profit. Any other rate, therefore, would yield less. The next higher charge would cause enough traffic loss to more than offset the increases paid by the remaining patrons; the next lower charge would not attract sufficient

[1] *Department of Pub. Works v. Seattle Gas Co.*, 3 P.U.R. (N.S.) 433, 479.

additional traffic to offset the loss in revenue on existing patronage. Let it be supposed, further, under the existing rate, that all operating and fixed expenses (and of course taxes are thus included) can be paid and still there is left a 5 per cent return on the common stock equities.

It will be observed, however, that the slightest increase in costs or decrease in demand will seriously affect the company because its rate stands at the point of monopoly price—there is no margin of safety! What will happen if taxes are raised? Since the rate of fare is the full monopoly price, fares will be neither raised nor lowered, because the company would then, in either event, be even worse off. Instead, this new and added burden will be shifted backward to the stockholders in the form of reduced dividends, or, if that is insufficient, then the bond investment will suffer. Concisely stated, the new tax, in effect, confiscates part of the investment of the security holders.

We must, therefore, qualify our conclusions as to the shifting of utility taxes to read: Any utility whose rate level is less than its monopoly price may shift its taxes to its customers. So long as this differential between actual rates and the monopoly rate is more than enough to cover additional tax burdens, in other words, so long as new taxes do not force rates to this point of monopoly price, they may be shifted forward to consumers.

Economic Consequences of Shiftability of Taxes.—Except for the street railways, public utility rates fall something short of the point of monopoly price. The high intensity of demand for utility services, the result of widespread use, and a general lack of acceptable substitutes explain this situation. Thus, rates could be drastically raised before they would pass that point beyond which net profits would decline with successive rate increases. As a result of this present ability of all but the street railways to pass along their tax burdens, we are inclined to dismiss their complaints as having little, if any, merit. Such is not the case. In the first place, assuming production methods to be unchanged and no change in the numbers and quality of substitutes, every tax raise brings rates nearer to the point of monopoly price. Then, the nearer rates are to this point the more difficult it will be for a utility to meet significant changes in either demand or costs.

Second, although taxes may be entirely shifted, every rate increase, regardless of its cause, reduces output and thereby raises unit price. Thus, a tax will increase rates by more than the amount of the tax. This curtailing of the market has the social consequence of depriving the previous marginal user of this service. Where this fact is carried to an extreme, in the absence of the counterforce of improved tech-

nology, the availability of utility service could be materially reduced, thereby depriving many persons of its benefits.

Uniformity of Tax Burden.—One might logically argue on the basis of the foregoing analysis that to widen the availability of its service the utility should be relieved of a part, even all, of its tax obligation. To put the question boldly, should public utilities be tax exempt? One has three choices in this matter of utility taxation: tax exemption, uniform taxation, special and burdensome taxation. Either of the extremes—exemption or special burdens—is manifestly unfair. As has been shown above, the imposition of special burdens, if it does nothing else, narrows the availability of the service of the utility, may result in confiscation, and always is regressive in its burden. On the other hand, tax exemption or tax reduction, if accompanied by a proper rate reduction, will widen the availability of service. The question, however, cannot be controlled by this fact alone. In the first place, tax favoritism can be justified only under exceptional circumstances. Tax payments are as valid a cost of operation as wage payments, and their remission (partial or complete) would be a form of public subsidy. Only in case of an imperative public need should this favoritism be permitted. If a certain amount of tax remission means the difference between bankruptcy and success, and if the public does not wish to own and operate the utility so affected, then tax exemption may be countenanced as good public policy. In any case, however, it is a subsidy.

In the second place, whatever reduction or exemption is granted simply raises the burden on other taxpayers. The needs of government are no less because of tax favors to utilities. Thus, widening the availability of utility service through tax favoritism narrows the availability of nonutility goods and services. To conclude, our third tax fundamental is: There should be substantial equality of tax treatment of all business enterprises. Utilities should be neither favored by exemptions nor loaded with special burdens.

The Benefit Theory of Taxation.—The fourth fundamental concerns the theory by which utility taxation is justified. Whereas personal taxation is usually justified in terms of ability to pay, this measure loses much of its vitality when applied to corporation and business taxes. As one writer has phrased it:[1]

> Ability is an attribute of the individual rather than of the corporation *per se*. The only disposition for the latter to make of its earnings, after meeting all requirements of the business, is to distribute them to the stockholders. It cannot spend or enjoy them. . . . A large volume of corporate

[1] LUTZ, *Public Finance*, 2d ed., pp. 466, 467.

net income may be said to indicate great ability to pay taxes, but this obviously depends on the degree of concentration or diffusion of the stock. Two corporations may have equal net earnings, but if one has ten stockholders while the other has ten thousand, a given tax on the net earnings will have very different economic effects in the two cases.

A more acceptable theory of corporate taxation is found in the benefits that corporations receive from government. Though these benefits may be impossible of precise measurement, they are nonetheless real. The corporation is created by action of government and given powers and rights similar to those possessed by natural persons. It receives the right to contract, to appeal to the courts. It receives police and fire protection and protection from foreign invasion. In short, the organized force of society expressed through governmental agencies creates an environment in which the corporation is able to flourish and do business. For these benefits, business must pay; and in so far as the tax system can be made to do so, it ought to spread its burden uniformly over business and industry, irrespective of utility or competitive status.

Revenue versus Regulation.—The fifth fundamental relates to regulation. Can a tax program be designed to supplement regulation, or are the two goals of revenue and regulation opposed to each other? In other words, if taxation is designed for regulation, what of its revenue qualities? In 1922, a committee of the New York legislature proposed to make utility taxation supplementary to regulation. We quote directly from its report:[1]

> The true function of a public-utility tax under these circumstances is to supplement rate regulation. It should be so designed that, in cases where several companies operate under the same controlled rate, as much as possible is recouped for the State from the profits of the companies which are so favorably circumstanced as to be able to earn more than a fair return. It should be so arranged, also, as to bring back into the public coffers in the case of all companies as large a share as possible of the profits arising from the necessary inexactness of the rate fixing process.

This view of the New York Committee represents a widely held opinion; historically, one that arose in the days before effective regulation.

Is this position valid under present-day conditions? The best approach to this question lies in a thorough understanding of the primary purpose of taxation, which is to raise revenue for the support

[1] *Report, Legislative Doc.* 72, p. 111. Quoted in Dorau, *Materials for the Study of Public Utility Economics*, pp. 482, 483.

of governmental activities.[1] Regulation, on the other hand, looks to the securing of the best possible service at the lowest rate consistent with that service. Hence, the two goals of taxation and regulation are very different and not at all harmonious. To resort to taxation as a form of regulation implies that the usual regulatory machinery is defective—a questionable assumption, at best. Furthermore, such a use of the power of taxation may defeat its primary function of raising revenue. As the foregoing quotation indicates, the principal purpose of taxation under the aforementioned plan is to capture whatever excess profits may exist. Low profits or lack of profits reduce or eliminate revenues, thus making such taxation of doubtful fiscal value. To make this tax an adequate revenue producer might easily lead its administrators to relax their vigilance in the matter of lowest possible rates. Not the least objection lies in the proper theory of taxation—benefits. To make taxation "a supplement to rate regulation" throws too much emphasis on net income taxes. This type of tax as a prime source of public receipts serves best neither government nor business. Its yield is too fluctuating; it bears no relation to benefits.

It must be conceded, in passing, that one point of the New York suggestion has merit. For those utilities, such as carriers, where a common rate is essential, the stronger and better situated groups may earn in excess of the fair-return level. Any method of recapture of these excess earnings is desirable, but the problem is not easy. The practical unworkability of the recapture provision of the Transportation Act of 1920 led to its repeal in 1933, and there is no reason to believe that the instrument of taxation could do this task any more easily. A genuine recapture of excess earnings involves the two problems of valuation and rate of return and cannot be side-stepped through use of taxation in lieu of direct recapture. Our fifth fundamental is: The purposes of taxation and regulation are so different that any attempt to make taxation supplementary to regulation is likely to destroy the primary purpose of taxation—the raising of revenue to finance the essential operations of government.[2]

[1] We do not overlook the fact that taxation often has nonfiscal as well as fiscal purposes. They are, of course, ends that war with each other, and so far as a tax accomplishes the one, it will not accomplish the other. We therefore assume that the purpose of taxing utilities is fiscal, as the millions paid by them would seem to indicate.

[2] For an excellent analysis of the conflict between taxation and regulation, see Simpson, "Regulation vs. Undistributed Profits Tax," *Journal of Land and Public Utility Economics*, **13**:228, August, 1937.

HISTORY OF PUBLIC UTILITY TAXATION[1]

If we include the railroad within our area of study, we find that public utility taxation in America has run a cycle of four phases: subsidy, exemption, uniform taxation, and finally special taxation. We pass quickly over the first two periods, because they have no bearing to our selected group of utilities. Briefly, in the early years of our nation, transport and communication companies were regarded as public benefactors and thus recipients first of public subsidies and later of tax exemption. Except for the public largess to the railroads in the years 1850–1875, the subsidy period ended with the panic of 1837. Between then and 1850, tax exemption was the rule and was often incorporated in the charters issued during those years. For instance, New Jersey gave perpetual tax exemption to carriers and telegraph companies chartered before 1850.[2] Of course, these provisions arose to block later attempts to tax the property of their holders; and even though the principle of strict construction was applied to them, many were untouchable. Fortunately, most of such charters are now extinct and therefore create no problem.

Following 1850, public leaders began to demand that railroads and other public utilities be taxed on the same basis as other business. In fact, many state constitutions were overhauled to include a "uniformity clause" making this mandatory. The weaknesses of attempting to apply mainly a general property tax to railroad properties are too well known to be repeated here. Often the companies assessed themselves, and their reported valuations should have made even their officials blush with shame. As a result, many of the states began to bolster their machinery of local taxation by creating state assessing agencies, and finally there was developed the state tax commission.

Our fourth period, special tax burdens, begins after the panic of 1873 and is, in reality, an expansion of the third. In short, it is a period, first, of attempts to improve the general property tax and, second, of explorations to discover special taxes. In general, the period began with the assumption that there were excessive profits in the railroad and utility business and that, in the absence of adequate regulation, taxation seemed to be the only solution. In spite of the constant improvement in the regulatory mechanism since 1873, this

[1] For an excellent and far more complete history of utility taxation, see Simpson's material in Dorau, *op. cit.*, Chap. 9.

[2] WALTERDORF, "Taxation of Public Utilities in New Jersey," *Bulletin* of the National Tax Association, **20**:9n, 10, October, 1934.

basic philosophy still predominates. Therefore, despite all efforts to the contrary, we still are in the fourth period in our taxation of public utilities.

The imposition of special tax burdens has taken two forms. In the first place, new types of taxation were devised, and franchises and charters were loaded with special burdens. The street railway, of all the public utilities (excluding railroads), came in for the largest amount of this type of "loading." These special burdens were continued after the creation of state commissions; and since the depression of 1929, many new ones have been imposed, especially on the electrical industry. The present tax period has seen a second line of attack on the utility tax problem, namely, the abandonment of local assessment in the administration of the general property tax. After experiments with a special railroad tax commissioner, the work has been placed in the hands of state tax commissions. Indiana led off with this in 1891, and now over forty states have such a body. The results of these state bodies will be discussed in detail below, but suffice it to say here that one result was to increase markedly the tax burden.

One last feature of the present period has been the efforts of some of the states—California, Connecticut, Maine, Minnesota, New Jersey, North Dakota, and Wisconsin—to replace the general property tax with the gross earnings tax. In several more, this tax has been added to the property tax. Rather than go further in our picture of the present tax situation, we must proceed to an analysis of these major types of utility taxes.

STATE AND LOCAL TAXATION

The existing body of tax laws can scarcely be dignified by the term "system," as it is a miscellany of taxes applied by the many taxing bodies without reference to any tax theory or tax pattern. The many local tax units—municipality, township, county, school district—the states, and the federal government have each added its share to the utility tax load. In the following description of the major utility taxes, we shall separate federal from the state and local levies, and in no sense can our analysis be either complete or exhaustive. We shall content ourselves, therefore, with a description of major tax types.

Ad Valorem Taxation.—The ad valorem (according to value) tax is essentially the application of the principles of property taxation to property employed in transportation and other utility service. With the failure of local assessors to make reasonable valuations of such property for tax purposes, there were created the many state

tax bodies (see preceding page) whose special task was to administer this phase of the tax laws. The name "ad valorem" has been substituted for the older and more common phrase "general property tax" because the state boards have tried to arrive at valuations that cover intangible as well as tangible taxable values, and they have developed rules and methods of measurement that only state bodies would be able to use. This tax is the most common of all, and it is found in most of the states. In a few, it has been replaced by the gross receipts tax for some of the utilities. With these exceptions in mind, it is safe to say that the bulk of utility taxes paid to state agencies and subdivisions is through the medium of the ad valorem tax.

As was stated above, the essence of this tax is administration by a central agency. In a few states—New York, for instance—the anachronism of local assessment for all utilities still persists; in other states, only some of them or portions of their property are under the jurisdiction of a state body. We shall assume here that the only intelligent way in which the ad valorem tax can be administered is through a state tax commission.

The application of the ad valorem tax involves five steps, each one a problem in itself. They are

1. The determination of the total tax base (valuation).
2. The allocation to the state of its taxable portion of the tax base.
3. The equalization of the state portion.
4. The rate or rates to be applied against this equalized portion.
5. The allocation of tax payments to local taxing districts.

The solution of the first of these problems by its very nature can be undertaken only by a state agency such as a tax commission. The conventional general property tax law usually directs that the "fair market value," or "actual value," be the basis of the assessed valuation. Since utility property is never bought and sold under ordinary market conditions, local assessors were quite helpless in following this provision. When the state tax boards faced this problem, they cast about to find substitute measures of valuation. During this search, several methods were created. The fiction of a "constructive market" was devised; it was assumed that a willing buyer and willing seller existed. Thus, tax valuation became essentially a question of proper judgment. Other measures of value (ad valorem) were sought. The accounting records of property investment were used. The net income of the company was capitalized, and any differences between the investment and this capitalized figure were assumed to measure intangible values. Less valid methods were used, such as market prices of stocks and bonds. Regardless of the method, the

net result was generally to raise utility assessments far beyond the level of other property.[1]

The usual process is to value property as a unit—by use of the so-called "unit rule of assessment." By this rule, the system, no matter how local or how widespread, is valued as a whole. The next problem, in case the utility is interstate in character, is to allocate to the state its share of this unit value. Many rules have been used, such as a percentage of physical property, originating tonnage, and gross receipts. One authority recommends following the data of the Interstate Commerce Commission on actual location of physical property.[2] Thus, if a state has 20 per cent of the total physical property, it would use the same percentage of the unit valuation. This final assessed value may be either used as it is or equalized to bring it in line with the assessments of other property. If, for instance, the underassessment of property usually amounts to 25 per cent, then the assessed value of this utility should be so reduced.

[1] It is often argued that the rate base (valuation for rate making) and the tax base should be the same figure; in other words, it is sometimes insisted in tax cases that the rate base be made the tax base, and in rate cases it has been likewise argued that tax value be the rate base. Of course, the reasons for these positions are apparent when one notices marked discrepancy between them—the tax base being often but a fraction of that rate base. In Florida, for instance, a Citizens Finance and Taxation Committee found in 1930 that five electric companies with a net worth of $193,000,000 had an assessed valuation (tax base) of only $8,000,000. 1931 *Proceedings*, National Tax Association, p. 79. Notice the consequences of using either figure in cases involving the other problem—an $8,000,000 rate base or a $193,000,000 tax base!

Admitting that such discrepancies as the one in Florida are never justified and can be laid solely to the door of poor administration of the tax laws, can it be argued that a tax base and a rate base must be equal? The answer is that they are different things and that there may be marked differences between them. "The rate base is not really a value at all; it is simply a quantity used in determining a level of rates that will continue to draw capital into the utility business. On the other hand, the tax base is truly a value." Groves and Keith, "Problems of Public Utility Taxation," *Journal of Land and Public Utility Economics*, **10**:109, 110, May, 1934. It seems to us that this concedes too much to tax valuations, and so we prefer to argue that neither a rate base nor a tax base is a value in any real sense of the word. The confusion comes in this ill-advised term of "valuation." Value, or pricing, is a market phenomenon, and neither "value for rate making" nor "value for taxation" may bear any relation to market valuations. Therefore, there need be no similarity in the estimates for a particular property of its tax base and rate base. This question received careful attention during the 1927 conference of the National Tax Association. See Tunell, "Valuation for Taxation and Value for Rate Making," *Proceedings*, p. 263; Bonbright, "May the Same Property Have Different Values for Different Purposes?" *Proceedings*, p. 279. The Bonbright article is especially recommended.

[2] LUTZ, *op. cit.*, p. 473.

The next step is to determine the tax rate or rates to be used. Here there are two choices—either the rates of the location of the property or a state-wide average such as is used in Wisconsin. This first method makes for a multiplicity of tax rates and tax payments and necessitates allocating the assessed valuation among each of the taxing districts in which the utility has property. Such a situation should be avoided because it encourages gerrymandering and gives too much taxable value to a district that happens to possess a large unit of utility property. For instance, a wholesale generating plant is located in a given place because of certain physical advantages. To permit the municipality of that location to profit thereby to the exclusion of all other places served by this station is manifestly unjust. An average state rate is to be preferred, although its use creates the problem of allocation of taxes to local taxing districts. If the average rate is used, the utility makes one annual payment, a part of which (65 per cent in Wisconsin) is returned to the local taxing units. Massachusetts distributes its railroad taxes in proportion to the payments of cities and towns to the state tax. In Wisconsin,[1]

> . . . the apportionment [of taxes on gas and electric companies] among specific municipalities is based upon the location of the property and business transacted, with equal weight accorded each factor. . . . [Hence] the distribution which results from apportionment with equal weight to both factors gives very substantial revenues to a relatively few towns, villages, and cities and gives these few municipalities more revenue . . . than they are entitled to or can use to good advantage.

The ad valorem tax has most of the theoretical weaknesses of the general property tax. The formula of "fair-resale," or "market," value is meaningless when applied to public service corporations. From its practical side, ad valorem taxation has worked only because of the use of the state commission and then usually worked to discriminate against the utilities. Because of the inapplicability of the usual methods of property valuation and under the spur of public demand that the utilities pay their fair share of the tax load, commissions have devised a hodgepodge of methods of assessment. These methods even get themselves enacted into law. We can do no better than quote the conclusions of an expert:[2]

> There is danger that the valuation may become, in the end, merely a matter of judgment, and possibly even of guesswork. The secrecy which

[1] GROVES and KEITH, "Problems of Public Utility Taxation," *Journal of Land and Public Utility Economics*, 10:109, 113, May, 1934.

[2] LUTZ, *op. cit.*, p. 475.

may be cast around the whole affair tends to give color to the charge of star chamber proceedings. . . . Unless a state were willing to establish a thoroughly competent state tax commission and equip it with the necessary staff and financial support to conduct a proper kind of physical appraisal, the ad valorem method presents rather dangerous possibilities. . . . It would be better for the states which are unwilling to introduce proper methods of appraisal [of physical properties] to substitute outright the plan of taxation on gross earnings.

Gross Earnings Taxation.—The next most important tax applied to public service corporations is based on gross earnings. Approximately half the states use this tax, with seven of them—California, Connecticut, Maine, Minnesota, New Jersey, North Dakota, and Wisconsin—using it in place of the ad valorem tax for certain of their utilities. Wisconsin and Minnesota, for instance, use this tax in lieu of a property tax for the telephones; North Dakota has a 12 per cent rate on gross receipts of electric and steam companies; in California and New Jersey it is applied as a lieu tax to all utilities. This tax had its origin in the reaction to the weaknesses of the ad valorem and general property taxes—in the underassessment which was so common to the latter. Its major advantages lie in its ease and cheapness of administration and stability of yield. Furthermore, it is fundamentally founded on the benefit theory of taxation; gross income is an acceptable measure of these benefits.

Similar problems are involved in the use of gross income taxation as in ad valorem taxation, namely, the determination of the taxable base, the state unit, the rate or rates, and the basis of apportionment to the local taxing bodies. In the matter of the taxable base, certain definite rules must be set up by which to measure gross income. Some states deduct nonoperating income; some do not. A Pennsylvania county court, for instance, has held that all gross receipts of an electric company from its auxiliary activities—appliance sales—are income included in the taxable gross receipts of the company.[1] If the tax is in addition to other general levies, care must be taken to deduct income in interstate commerce.[2] In those instances in which the tax is in lieu of other general taxes on property within the state jurisdiction, then it may be applied on all gross receipts.[3]

[1] Abstracted in 1932 *Annual Public Utilities Reports*, p. 250.

[2] *Adams Express Co. v. Ohio State Auditor*, 166 U.S. 185, 218 (1897). As the court phrased it: "Again and again has this court affirmed the proposition that no state can interfere with interstate commerce through the imposition of a tax, by whatever name called, which is in effect a tax for the privilege of transacting such commerce."

[3] *Report* of the Committee on Model System, National Tax Association, 1933

Having established the taxable corporate gross earnings, the next step is to determine the rate to be applied. The rate may be set by statute or more rarely by the constitution, as in Minnesota. Either method has the defect of requiring a legislative or popular vote in order to change the rate, thereby defeating most efforts to attain equality of burden in the tax system. The final problem is the allocation of the tax proceeds to the local taxing districts. In Wisconsin, the yield of the gross earnings tax on telephone companies is divided into two sums according to the ratio of local revenue to toll receipts. That part of the tax representing local revenues is allocated 15 per cent to the state and 85 per cent to the municipalities in which revenues originated. On the other hand, that part allocated to toll receipts goes entirely to the state. In the determination of a state's portion of such business, many bases of division have been used, such as track or wire mileage, gross earnings, traffic units, and physical valuation. The proper rule of allocation carries us too far into the field of tax administration to be considered here.[1]

If the ultimate goal in utility taxation is equality of burden (and this is the proper objective) between the public service groups paying on the gross receipts basis and business generally paying on other bases, the administration of this tax is not so simple as one might suppose. Equality demands the calculation of an equivalent ad valorem burden which would be represented by a certain rate on gross earnings and the adjustment of these gross earnings rates to attain this goal. The maintenance of parity of burden in the face of rising taxes means, therefore, a continuous revaluation of utility property. Hence, "the gross earnings method, properly applied, does not wholly free a state from all the disadvantages of the ad valorem method."[2]

It is generally conceded, where the gross earnings tax is used in place of general taxes, that it operates to make the tax burden upon the utility higher than the tax burden on business generally. Such was found by a subcommittee on public utilities of a taxation committee in Ohio.[3] In 1928, an official of California told the

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Proceedings, p. 353; Magill, "Taxation of Property and Business as Affected by the Commerce Clause," 1932 *Proceedings*, National Tax Association, p. 249. For cases involving the taxation of public utilities doing business in interstate commerce, see *East Ohio Gas Co. v. Tax Comm.*, 283 U.S. 465 (1931); and *Utah Power & Light Co. v. Pfost*, 286 U.S. 165 (1932).

[1] For a critical analysis of the operation of both ad valorem and gross earnings taxes in Wisconsin, see Groves and Keith, *loc. cit.*

[2] LUTZ, *op. cit.*, p. 479.

[3] *United States Daily*, Feb. 20, 1931.

National Tax Association, speaking of the gross earnings tax in his state:[1]

> The people demand equality of burden and . . . the present system does not contemplate equality. Moreover, there is no ready method of determining equality of burden; nor is there any relation between the value of property taxed and a tax upon gross receipts; nor does the gross-receipts tax relate in any fashion to net income.

Ad Valorem versus Gross Earnings.—If one were free to choose between these two types of taxation for public service corporations—ad valorem or gross earnings—which should he choose? In the first place, there is no out-and-out choice. Either can be ruined by poor administration. Assuming the best of administration, which should be chosen? Professor Lutz prefers ad valorem, though he is positive in his belief that, if a state is unwilling to provide proper administrative and technical facilities, it should use gross earnings. In the case of utilities other than railroads, the problem of property in interstate commerce is relatively insignificant. There is no great problem of state apportionment. Furthermore, the appraisals of these companies by the public service commission makes a convenient point of departure for a tax commission to apply an ad valorem tax. Lastly, the gross earnings tax rate must of necessity be uniform over the state, thereby discriminating as between cities with high tax rates on the one hand and villages with low rates on the other and as among utility companies. We conclude, therefore, that substantial equality is better secured by ad valorem taxation, *properly administered,* in combination with tax rates of the location of the property taxed.

Net Income Taxation.—In spite of the clarifications that federal administration has brought to income taxation, no state as yet has seen fit to use it as a major or sole source of taxation of public utilities. It is used in seventeen states, all of which have general property (ad valorem) taxes, and six of which have also the gross earnings tax.[2] In most states, this tax is moderate in burden and proportional in form. It is designed to furnish a supplementary yield, not a major source of income, and the proceeds usually go entirely to the state.

The defects of the net income tax are still significant. The determination of net income is always a problem. Its yield is widely fluctuating, a defect from the standpoint of government. Its major

[1] RILEY, "The California Tax Problem," 1928 *Proceedings*, p. 55.

[2] States with property tax and income tax: Arkansas, Idaho, Iowa, Missouri, Nevada, Montana, Oklahoma, Utah, Washington, Vermont, Wisconsin. States with property tax, income tax, and gross earnings tax: Georgia, Mississippi, North Carolina, South Carolina, Tennessee, Wyoming.

advantage lies in the fact that it best approximates the theory of ability to pay. Since our position discards ability in favor of benefits, the net income tax on business corporations should not play a major role in a model tax system.

Franchise Taxation.—The fourth type of tax commonly levied by states and municipalities upon the public service companies goes under the name of "franchise tax." It grew up in the days prior to state commission regulation and was designed either to recover excessive profits or to tax those intangible utility values which had escaped the general property tax. Contrary to the previous taxes, the franchise tax is simply a name that is carelessly applied to a congeries of tax forms. In most cases, the state franchise tax returns are kept entirely by the state, and the local franchise tax returns kept by the local bodies.[1] The usual forms included under the name of franchise tax are

1. Capital stock tax.
2. Corporate excess tax.
3. Flat sum payment.
4. Physical unit tax.
5. Gross earnings tax.
6. Net income tax.

The capital stock tax originated in Pennsylvania and Massachusetts and was primarily applied to railroads. The former state still levies a rate of 0.5 per cent on capital stock. Missouri taxes corporations, after allowing certain deductions, one-twentieth of 1 per cent on capital stock and surplus. In Alabama, the rate is $2 for each $1,000 of capital stock for domestic corporations, the same rate applying to that part of the stock of a foreign corporation used in the state. A rather complicated type of capital stock tax in Maryland has been upheld by the United States Supreme Court.[2] There the tax might be called a "tax on corporate excess," except that the tax base is divided by the number of corporate shares, and the value of each share assigned to the taxing district in which the stockholder resides. For foreign stockholders, this value is assigned to the district in which the company has its principal place of business. When challenged by a Pennsylvania stockholder, the Supreme Court of the United States accepted the construction of the Maryland Court which had ruled the tax valid because it was levied in lieu of a tax on tangible personal property. This tax, although called a "capital stock tax," is actually

[1] SCHULZ, "The Menace of Mounting Taxes," *Public Utilities Fortnightly*, 9:528, Apr. 28, 1932.

[2] *Susquehanna Power Co. v. State Tax Comm.*, 283 U.S. 297 (1931). This case is analyzed and discussed in the 1931 *Proceedings*, National Tax Association, p. 113.

a form of ad valorem, the location of shares being used as a basis of allocation of assessed values.

The corporate excess tax, designed to tax the intangible and personal values that may escape under property taxation, can be computed several ways. In Illinois, the sum of the average values of the stocks and bonds is compared with assessed values; and if the former figure is the larger, the difference between them is called the "corporate excess." This is taxed at the same millage rate as tangible property. Another way of computing it is to capitalize earnings instead of using stock and bond prices and to proceed as described for Illinois. This tax is probably the most archaic of all the so-called "franchise taxes."

The gross receipts and net income taxes often masquerade as franchise taxes. When they do, their rates are usually small. Rhode Island, for instance, uses the net income tax as a substitute for corporate excess taxation. In New York State, the net income tax is used to measure the "franchise value" of the privilege of occupying and using public streets and roads. As has been pointed out, its use in that state "produces ridiculous results."[1] It may happen that, of two utilities occupying a given street, because of different net earnings, the privilege is many times more valuable to one than the other—yet in neither case is there any direct or indirect relationship between this privilege and the amount of income!

A common practice in larger cities has been to insert in franchises a gross receipts or net income tax provision. The elevated railway, electricity, gas, and telephone franchises in Chicago call for the payment of 3 per cent of gross receipts to the city. The unified transportation ordinance (now lapsed) for the same city had a similar provision. The surface lines of Chicago, under the franchise of 1907, split with the city all excess income above 7 per cent. These examples can be duplicated for almost every large American city.

A state franchise tax takes other forms, such as an annual flat sum or payments based on miles of track or wire, poles, transformers, cars, and instruments. Montana has a tax ranging from 10 cents to $1 per telephone pole; the city of Chicago had a flat car tax on each street car and elevated car used. Florida has a tax per mile of railroad mileage; and in 1933, North Carolina raised its telephone tax from $6 to $7 per instrument.

Miscellaneous Taxes and Contributions.—Since the depression of 1929, legislatures in their frantic efforts to raise revenues have turned once more to the public utilities. Their apparent "depression-

[1] Speech of Mark Graves, tax commissioner, reported in the *United States Daily*, Sept. 11, 1931.

proof" condition made them obvious victims. In several states, Alabama, Illinois, Indiana, Iowa, Mississippi, Missouri, New York, Oklahoma, and West Virginia, for example, the sales tax has been levied against them.[1] In these states, electric and gas companies (and telephone companies if included by statute) pay a stated percentage tax on gross sales (gross earnings) which is added to the monthly bill. The Illinois law was phrased in terms of commodities; therefore, an attempt was made to secure exemption of utility sales on the ground that the thing sold was a service, not a commodity. The Illinois courts, however, held electricity to be a commodity and thereby taxable. In other states, this problem cannot arise, since utility sales are specifically mentioned as taxable under the sales tax.

Another tax of recent origin is the millage tax per kilowatt-hour levied against all electricity produced in such states as Alabama, Idaho, South Carolina, and Vermont. This type of tax resembles the severance taxes familiar in the mining states. It has been argued that it was a tax on interstate commerce and therefore void in so far as such movements are concerned. When challenged, the Supreme Court ruled it to be a production tax, one that strikes the product before it enters, if it actually does so enter, into interstate commerce.[2] Public antagonism toward the electrical industry ought to make this a very common tax, especially in those states from which a high percentage of power is exported.

Still the picture of state and local taxation is not complete. Some of the utilities, particularly the street railways, render many services that in their nature are tax contributions because, were they not so burdened, city governments would be obliged to pay for them. Suppose that we consider first the most "ridden" utility—the street-car company. Before the first World War, it was the butt of many political and reform movements. The "traction barons" of that day

[1] Indiana has amended its chain-store tax law to include electric companies, thereby subjecting them to a highly progressive occupational tax. The significance of this type of law, when applied to the branch offices of a large city electric company, is seen in the case of the Detroit Edison. In 1937, the Supreme Court of Michigan ruled that branch offices in which appliances were sold were taxable under the 1933 Michigan chain-store tax law. The Detroit Edison had over sixty branches and would thus have paid $250 tax on each store, over twenty-five in number. To avoid the higher brackets of the Michigan tax, the company discontinued the sale of appliances in many of its smaller branches. *Electrical World*, **108**:1886, Dec. 4, 1937.

[2] *Utah Power & Light Co. v. Pfost*, 286 U.S. 165 (1932); *Broad River Power Co. v. Query*, 288 U.S. 178 (1934).

were as publicized as the "power trust" has been since 1930. As a result, every time a franchise was granted, on the theory that there were excessive and otherwise inaccessible profits in the business, it was loaded with a multitude of burdens. Typical examples are clearance of snow on both sides of right-of-way, paving and maintenance of streets between tracks and a foot on either side, sweeping and sprinkling of streets, reduced fare or free transportation to certain groups such as firemen and policemen in uniform. More extreme examples include maintenance of free street lighting; pavement of entire width of streets occupied by tracks; and building of sidewalks, gutters, and storm sewer outlets.[1]

Telephone companies often must furnish free fire, police, and city hall service; electric companies are sometimes forced to furnish free lighting service for streets and public buildings. With the mounting numbers of persons on relief during the depression of 1929, the question often arose as to whether or not such persons were entitled to utility service. The suggestion was made in the state of Washington that public utilities supply free service or service on credit to all persons approved by the county welfare boards. Such a program surely would fall under the heading of contributions in the nature of taxes. One company made the countersuggestion that it pay its state excise taxes in electricity to be distributed as the state directs. This was a far more sensible plan than the original one.[2] To require utilities to give away their service is as unjust to companies and their paying customers as to require grocery stores to feed at their own expense people needing relief.

Again the reader is to be reminded that we have not given a complete picture of utility taxation, only sketched the high lights. Much of the burden that the public service corporations bear is caused by the cumulative piling of tax on tax. If the ad valorem, or gross earnings, tax is not excessive in itself, these franchise and miscellaneous taxes and contributions in the nature of taxes surely will make the total tax on utilities far heavier than that borne by ordinary business corporations. Many of these taxes are vestigial remnants of the days before effective regulation and, on any theory of equality of tax burden, should be abolished. Discrimination is an almost inevitable result when one type of business corporation is singled out as a target for a multitude of special tax levies.

[1] The classic example of extremes in this matter is found in a Pennsylvania case, *re Swarthmore*, P.U.R. 1921E 252, 254, cited in Nash, *Economics of Public Utilities*, 2d ed., pp. 298, 299.

[2] *Electrical World*, **101**:706, June 3, 1933.

FEDERAL TAXATION

So far, our analysis has been concerned with state and local taxation. To make the picture complete, there must be added the federal taxes applicable to utilities. In general, the federal government has not singled out the utilities as special objects for taxation (with one exception), nor has it used such diverse and numerous kinds. Thus, those federal taxes levied upon corporations apply to utilities in their corporate capacity. Federal corporate taxation began in 1909 and, after the ratification of the Sixteenth Amendment, was rapidly expanded first under the stimulus of war financing and later by the necessity of financing at least a part of the relief expenditures during the later years of the depression of 1929.

The revenue acts of 1936, for instance, created the following corporate taxes affecting public utilities. First, there was the capital stock tax of $1 per $1,000 of declared capital value. Next, there was the normal income tax, with rates varying from 8 to 15 per cent. Added to this was the excess profits tax applicable to all earnings in excess of 10 per cent on the declared capital value. This tax varied from 6 to 12 per cent. Third, there was the undistributed profits tax, ranging from 7 to 27 per cent, applicable to such portions of earnings as were not distributed to stockholders. In addition to these, utilities paid a special retail sales tax described above, an unemployment insurance tax, and a federal pay-roll tax.

Little need be said about these taxes, except that they violate practically every rule of sound taxation and regulation. The use of progressive rates for business taxation has been condemned by the National Tax Association. The undistributed profits tax, if it had any merit for business generally, certainly had none in the field of regulated enterprise.[1] Unless regulation is utterly inadequate, average earnings of public utilities are not likely to be excessive, and any measure that forces them to pay out as dividends every last dollar of earnings will destroy whatever preferred position utility securities have in the past possessed. Finally, such a law would rather definitely close the door to reinvestment of earnings and to amortization of any portion of senior securities.[2]

[1] See SIMPSON, *loc. cit.*

[2] Since this was written, the federal tax laws have been changed several times. Since this seems to be an annual event, we see no need to attempt to keep this section up to date. Whatever we may describe may be superseded even before this book is set in type!

PROPOSED TAX REFORMS

In the face of a "system" that has been called a "chaotic condition of affairs," it is small wonder that many proposals have been advanced to cure existing tax defects. Some would even go so far as to propose bigger and better taxes. Our assumptions here bar this as a reform measure. We shall assume, first, that the goal of utility taxation is equality of burden for all business corporations and, second, that under existing taxes the burden on the utilities is far heavier than on business generally.[1]

The proposed tax reforms to be discussed are suggestions of the National Tax Association. With the possible exception of a report some years ago by a committee of the New York legislature, no other merits consideration.[2] In 1922, there was presented to the National Tax Association, as the fixed element in utility taxation, a combination of gross earnings and net income taxes—commonly known as the "gross-net income tax."[3] The plan called for a flat tax on gross earnings, supplemented by a graduated tax on net earnings. This gross-net tax would give in practice a progressive gross earnings tax "but a regressive net income tax, beginning at 100 per cent 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."[4] The gross-net tax proposal has been sharply condemned by students of public finance, mainly on the grounds that it was in effect a regressive net income tax and an expression of the ability-to-pay principle. Since no effort has been made to put this proposal into actual use, we shall be content with this very brief presentation.[5]

[1] "The problems of public utility taxation . . . are largely the problems of taxation in general. . . . The public utilities should not be made the target of unfair discriminatory taxation." Buehler, "The Growing Tax Menace," *Public Utilities Fortnightly*, **20**:766, Dec. 9, 1937. See also his "Problems of Railroad Taxation," *Journal of Land and Public Utility Economics*, **9**:75, February, 1933.

[2] The New York Special Joint Committee on Taxation and Retrenchment, *Report* of the Committee, Mar. 1, 1922, *Legislative Doc.* 72, summarized by Prof. Simpson in Dorau, *op. cit.*, pp. 482–484. This report leaned toward the use of two taxes only for public utilities—"a tax on real estate" and "a tax on pure economic profit." Its major thesis that taxation is supplementary to regulation is presented above (pp. 552 *et seq.*).

[3] Committee on Taxation of Public Utilities, 1922 *Proceedings*, National Tax Association, pp. 162–194. For a discussion of this plan, see Prof. Simpson's presentation, Dorau, *op. cit.*, pp. 484–490.

[4] *Ibid.*, pp. 484, 485.

[5] For a critical analysis, see Lutz, *op. cit.*, p. 476.

The other proposal for tax reform is the *Second Report on a Plan for a Model System of State and Local Taxation*, made in 1933 to the National Tax Association.[1] According to its authors, the three fundamental principles behind existing state tax laws are

1. Every person having taxable ability should pay a direct personal tax to the government of his domicile.
2. Tangible property should be taxed by the jurisdiction of its situs.
3. "Business carried on for a profit in any locality *should be taxed for the benefits it receives.*"[2]

Accepting these principles of existing taxation as valid, the following model tax system is proposed:

1. A personal income tax at place of domicile.
2. A property tax on tangible property at place of situs.
3. Business tax by jurisdiction in which business is transacted.

We shall omit discussion of the first of these three recommendations, since it in no way concerns the public utility as such.

How would this second recommendation affect existing utility taxation? On this matter, the report says:[3]

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. . . . 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 . . . [and thus] they are today discriminated against. . . .

Of course, the committee members were realists and aware that their proposals stood little likelihood of adoption in those states which had made a success of either gross earnings or ad valorem taxation. Because of the discrimination thus caused, the committee was content to urge an adjustment in the tax burden by some such process as the omission of the business tax.

The business tax was proposed as a substitute for the existing hit-and-miss variety of business taxes.[4] It was likewise designed to

[1] 1933 *Proceedings*, pp. 353–428. For the *First Report*, see 1919 *Proceedings*, pp. 426–470.

[2] *Ibid.*, p. 361. (Italics ours.)

[3] *Ibid.*, p. 386.

[4] The *Report* concludes the section on business taxes: " . . . the business tax we have recommended is proposed as a substitute for all such taxes now existing, except as may need to be retained for the single purpose of police regulation." *Ibid.*, p. 399.

correct the inequalities in those states in which a corporation did much business but had little tangible property. It was exactly this situation which led to the special taxes on the intangible values of the corporate franchise. This business tax could take one of several forms, namely:

1. Fixed sum or physical unit tax.
2. Gross earnings tax.
3. Net income tax.

The first of these bases is obviously inadequate. The second, gross earnings, could be made to work, but it would require constant administrative vigilance to prevent inequalities of burden as among businesses. Weighing all possible measures that might be used for a business tax, the net income tax seemed most desirable. The report favored the use of a proportional, moderate rate of taxation administered solely by a state tax commission.

One more point made by the report deserves notice. All business taxes would be assessed by a state body. Furthermore, this same body would assess all business property of a state-wide character and the property of all utilities regardless of size. This is an excellent suggestion and has only one possible weakness. Care must be taken by the state board to see that property under its jurisdiction is equalized with property remaining under the control of local assessors.

The proposal of this 1933 report to the National Tax Association has several merits. It would eliminate the present "chaotic condition" in state and local taxation, and it is designed to establish an equality of burden on business corporations. Next, it would eliminate the present grotesque efforts to get at intangible values—the corporate excess. Reliance upon a property tax as the fixed element of the system assures government of a stabilized revenue of a sizable amount. Not the least of the merits of this proposal is that the utility would not be singled out for special treatment and special forms of taxation but simply regarded as a business corporation to be taxed as are other corporations. A thoroughgoing adherent to the benefit theory of taxation might object to the use of a net income business tax; but since it would obviously create a modest burden on business, and since the proposal is such an improvement over the present-day tax situation, this defect is not particularly serious.

SUMMARY

Since public utilities and not taxation is our major field of study, we shall not indorse one tax system to the exclusion of all others. Certain conclusions, however, seem unquestionably sound. First, the present tax situation is unsound in theory and practice and can never

accomplish our ideal of equality of burden. Second, public utility taxation should be a part of an integrated corporate tax system. Justice can be done by the use of special taxes for special businesses, but the cost and effort to administer such a system equitably is not warranted by the results. Lastly, the most essential factor in tax justice is in the functioning of the tax machinery. The finest system in the hands of a poorly trained or poorly financed tax commission or, worse yet, in the hands of a partisan body can never bring tax justice. A defective tax system intelligently administered is to be preferred. The ideal, of course, is a good tax system in the hands of an efficient, well-paid state tax commission.

Bibliography

Supporting material on the problem of public utility taxation is so scattered that we must repeat (and emphasize) our usual introduction to chapter bibliography, namely, examine the supporting footnote references. We have intentionally made our footnotes a basis of additional reading. Further reading ought to lead into the standard texts on public finance and the annual *Proceedings* and monthly *Bulletin* of the National Tax Association. For an exhaustive study of the problem of valuation for purposes of taxation, see James C. Bonbright, *Valuation of Property*, Chaps. 17–20.

CHAPTER XXVII

UTILITY SERVICE IN RURAL COMMUNITIES

In the early chapters of this book, we pointed out that one of the factors setting public utilities (as a narrow classification) apart from other businesses was their relation to city development. In fact, until the 1920's, they were often called "local utilities" because of their primary confinement to urban areas. Although relation to urban growth has been extremely important, it by no means followed that businesses originally confined to areas of high population density would not eventually expand to include first suburban and finally rural communities. Two utilities have become important in this respect—telephone and electricity—and to their use and problems this chapter is devoted. Of course, other utilities, especially natural gas, may have occasional rural use, but the instances are too rare and scattered to deserve particular attention.

Our first problem is to define a rural community. According to the Bureau of the Census, all persons living in open country or in places of less than 2,500 population are classified as rural. Section 13 of the Rural Electrification Act of 1936 defines a rural area[1]

> . . . to mean any area of the United States not included within the boundaries of any city, village, or borough having a population in excess of fifteen hundred inhabitants, and such term shall be deemed to include both the farm and non-farm population thereof. . . .

We have no quarrel with either of these definitions; but we believe that rural areas should include, in addition to open-country farm territory, only those small hamlets of a few hundred persons or less the existence of which is dependent solely upon the surrounding agriculture. In this chapter, we shall follow this restricted usage, although we shall direct our primary attention to the farm user of utility service.

[1] Public No. 605—74th Cong. (S. 3483). An illustration of the difficulty of all definitions is seen in the comment of the Massachusetts Commission that "There may be, therefore, some authority for deciding that the REA does not have the right to take part in this [proposed] enterprise on the ground that Massachusetts has no unincorporated villages." *Re Tri County Electric Co.*, 19 P.U.R. (N.S.) 113, 122.

TELEPHONE SERVICE

The earliest and for years the only utility service to rural communities was the telephone. Other utilities in their formative years were of necessity restricted to areas of high population density, but the telephone industry early was extended to the farm. This was possible because of the presence of two factors—the evident need for intercommunication and the use of inexpensive lines, equipment, and multiparty service. In other words, although urban telephone service was occasionally of a four-party type, there seems to have been almost no limit to the number of rural subscribers attached to a single line. Thus it was that the telephone soon became an institution to farm users, being, in addition to a two-way communication service, a vehicle for dissemination of news generally.

The extent of rural telephone service has been shown by figures gathered by the Bureau of the Census. In 1930, for instance, there were 2,139,194 farms, or 34.0 per cent of all farms, with telephone installation. Classified by ownership, the figures showed that 43.2 per cent of all farms operated by their owners had telephone service; 50.8 of all farms operated by managers had service; and only 21.4 per cent of all farms operated by tenants had service. The percentages of farms with telephones in 1930, by geographic divisions, were as follows:

Division	Per Cent
New England	61.1
Middle Atlantic	45.3
East North Central	58.0
West North Central	65.1
South Atlantic	11.1
East South Central	13.4
West South Central	16.5
Mountain	28.3
Pacific	40.7

From these figures, we can conclude that except for the states of the cotton belt and the mountainous West, the extent of telephone service in rural areas is high, varying from 40 to 65 per cent. In many communities, the percentage is certainly close to 100.

Such figures for rural mileage and numbers of companies as are available are included in Table 56. In general, the bulk of this service is controlled by the nonprofit farm telephone associations. The usual practice is to bring these lines to the corporate limits of a near-by town, at which point they are connected to the lines and switchboard of the local commercial telephone exchange. The remainder of

the rural telephone service is owned and operated directly by either the Bell System or one of the many independent commercial companies.

TABLE 56.—MUTUAL AND COOPERATIVE TELEPHONE COMPANIES, 1937*

	Total	Percentage of telephones on farms		
		50 per cent and over	Less than 50 per cent	Not reported
Operating switchboards:				
Number of companies	2,620	2,220	127	273
Miles of single wire	346,697	293,360	28,989	24,348
Number of telephones	392,091	333,153	29,032	29,906
Operating revenues including assessments of mutual companies	$4,370,776	$3,573,545	$488,422	$308,809
Investment in plant and equipment, Dec. 31, 1937	$15,718,942	$13,133,652	$1,423,789	$1,161,501
Amount of borrowed money	$377,889	$263,677	$109,912	$4,300
Miles of grounded (one-wire) circuits	161,757	152,599	8,820	338
Not Operating Switchboards:				
Number of connecting lines	31,187	30,812	358	17
Miles of single wire	418,485	413,855	4,067	563
Number of telephones	370,967	366,658	3,813	496
Investment in equipment, Dec. 31, 1937	$15,692,199	$15,466,644	$204,065	$21,490

* Census of Electrical Industries: 1937, Telephones and Telegraphs, Tables 6 and 7, p. 11.

RURAL ELECTRIFICATION

The second utility to be extended to rural communities is electricity. In the course of its search for markets, that industry has successively invaded the following areas:

Domestic lighting.
Commercial lighting and power.
Street railway power.
Industrial power.
Rural lighting and power.

Except for the street railway power load, which has declined sharply because of the partial disappearance of the electric railway, each of these now represents an important segment of the electric utility business. Since 1930, there has been a revival of interest in the first and last of these fields.

The domestic area has been reexplored, largely because of the development of superior lighting fixtures and price reductions of many

domestic power appliances, such as the refrigerator, range, and water heater. The results of this program were pointed out in an earlier chapter. As was shown there, this reexploration was so successful as almost to offset the sharp loss of the industrial load during the worst days of the depression of 1929. Coincidentally with the revival of business after 1934, there was also a significant revival in rural electrification. Next to the development of the public hydropower

TABLE 57.—SALES OF ELECTRICITY TO CLASSES OF CUSTOMERS EXPRESSED AS PERCENTAGES OF TOTAL SALES

	1926	1930	1934	1938	1939
Farm	1.3	2.4	2.6	2.7	3.1
Residential	12.0	14.3	17.2	19.7	18.6
Small light and power	16.9	18.6	17.3	19.5	19.1
Large light and power	57.0	53.6	52.0	47.8	49.7
All others	12.8	11.1	10.9	10.3	9.5
	100.0	100.0	100.0	100.0	100.0

* Edison Electric Institute, *Statistical Bulletin* 7. These are percentages of total kilowatt-hours sold, not revenue received. The corresponding percentages of revenues paid by these classes of customers in 1939 were 4.1, 34.7, 28.2, 25.9, and 7.1, respectively.

projects, this movement to electrify the farms of America has probably been the most outstanding event in electricity supply in the 1930's.

THE DEVELOPMENT OF RURAL SERVICE

So long as the electric utility was confined in its service to areas of high population density, rural and even suburban service were out of the question. Continued technological advance, however, ever widened the area of economical distribution. The first expansion was into the smaller urban areas. From that point, the electrical industry continued its rapid penetration of towns and villages. By 1920, the interconnection of communities had brought to most of them electricity on a 24-hour basis. The extent of the penetration of incorporated places is shown by figures for 1932.[1] In that year, there were 16,598 communities in the United States. Of these, only 1,071 were not served. Of this group, 33 had populations ranging from 500 to a 1,000 people; the rest, 1,038, were places of less than 500 inhabitants. Thus, in places over 500, for all practical purposes, there is universal electric service.[2]

[1] Edison Electric Institute, *Statistical Bulletin* 6.

[2] We include towns in the 500 to 1,000 population group within this generalization, because those thirty-three places without service are but 1 per cent of the group total.

A similar penetration, but at a slower pace, has been occurring in rural service. Between 1910 and 1920, there were occasional experiments in farm electrification. Specialized farms of limited acreage near city limits found electricity not too much of a luxury to be economically installed. But for all these experiments before 1920, the extent of rural electrification was slight. After 1920, the movement to electrify farms began in earnest though at first at a cautious pace. This is seen in Table 58 and Charts 28 and 29. By the time the depression of 1929 had brought rural electrification to a standstill, slightly over 10 per cent of the farms of the United States had been electrified by public utilities, and almost 17 per cent of all farms with dwellings valued in excess of $500 had been so serviced.

TABLE 58.—FARM ELECTRIFICATION*
(Figures on electrified farms do not include those with individual lighting plants)

Dec. 31 of year	Number of farm homes			Farms using electricity			
	Number all farms	Farms with occupied dwellings	Farms having dwellings valued in excess of $500	Number electrified	Per cent		
					Based on farms	Based on occupied dwellings	Based on dwellings in excess of $500
1924	6,371,640	.....	.....	204,780	3.2		
1925	.....	.....	.....	246,150			
1926	.....	.....	.....	309,125			
1927	.....	.....	.....	393,221			
1928	.....	.....	.....	506,242			
1929	.....	.....	.....	576,168			
1930	6,288,648	5,954,194	3,860,198	649,919	10.4	10.9	16.8
1931	.....	6,071,167	3,977,173	698,786	....	11.5	17.6
1932	.....	6,188,144	4,094,148	709,449	....	11.5	17.3
1933	.....	6,305,119	4,211,123	713,558	....	11.3	16.9
1934	6,812,350	6,422,088	4,328,092	743,954	10.9	11.6	17.2
1935	.....	6,422,088	4,328,092	788,795	....	13.7	20.3
1936	.....	6,422,088	4,328,092	1,042,924	....	16.2	24.1
1937	.....	6,422,088	4,328,092	1,241,505	....	19.3	28.7
1938	.....	6,422,088	4,328,092	1,406,579	20.6	21.9	32.5
1939	.....	6,422,088	4,328,092	1,786,000	....	27.8	41.3

* Edison Electric Institute, *Statistical Bulletin* 7. The 1938 percentage of the number of farms electrified has been supplied by the authors.

Average figures for the entire country, however, do not tell the whole story. From various data, therefore, we present a picture of the extent of rural electrification before its revival by the Rural

Electrification Administration.[1] The states having the heaviest percentage of farms electrified were either in the Far West or on the eastern seaboard. For instance, those with over 50 per cent of their farms electrified were, in order, New Hampshire, California, Utah, and New

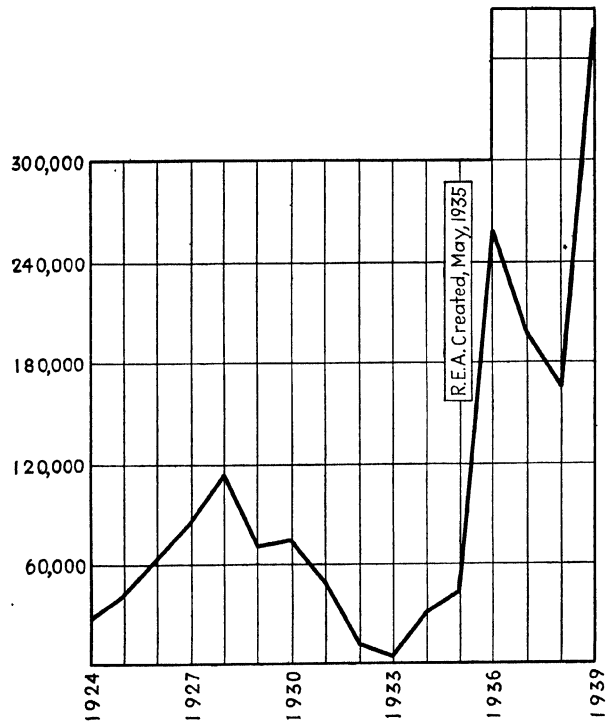

CHART 28.—Number of new farm customers added each year. The years of depression as well as those of REA activity are in sharp contrast. In 1940 there were added approximately 300,000 new farm customers.

Jersey. If we add the next six ranking states, we have Washington, Rhode Island, Massachusetts, New York, Maine, and Idaho. The high degree of electrification in these states is to be explained by specialized farms of small acreage in the East and in the West by the concentration of agriculture in irrigation districts. Electricity becomes obviously economical under such circumstances. If the states of

[1] The following sources were used: Leaflet of Rural Electrification Administration, entitled *Electric Service at a Price the Farmer Can Afford; Report* of the National Electric Light Association, entitled, "Progress in Rural and Farm Electrification," August, 1932; and other publications of the National Electric Light Association, the Edison Electric Institute, and the *Electrical World*.

Pennsylvania, Michigan, and Wisconsin—states of agricultural specialties and medium- to small-sized farms—are added to the foregoing list, we find that together they had the bulk of rural electrification before 1935.

On the other hand, when the areas of the great agricultural staples —corn, cotton, and wheat—are examined, rural electrification is found to have been small. In the cotton belt, the figures were less than 5 per cent; in the wheat states, only slightly better. For the leading states of the corn belt, the percentage of electrification varied from a high of about 20 per cent in Ohio to a low of 6 to 8 per cent on the western edge. Although we shall discuss below the minimum essentials to a successful rural electrification program, certain reasons stand out for the lack of development in these three great staple areas. In the cotton belt, the lack of power uses and the poverty of tenants and sharecroppers certainly have retarded the movement. In the wheat states, the sparseness of population has been the retarding factor. If the commonly accepted figure of three customers per mile of line is used as a minimum measure, rural electrification could not and cannot be widely developed in the wheat states. A significant substitute facility for that region may be the wind motor and the farm power plant. In 1929, for instance, 4 per cent of the farms in the United States were supplied by electricity generated in farm plants. So long as the wheat farms continue to be large, these may be their only source of electricity supply.

In the corn belt and the areas of general farming, there has existed the greatest potential rural electricity market. The average size of a corn-belt farm ranges from 155 acres in Iowa to 90 in Ohio. In those states, therefore, properly laid-out lines can serve the bulk of the farms on an economical basis. The importance of the presence of cities in this area must not be overlooked. From Lincoln, Nebraska, to Columbus, Ohio, the corn belt is studded with many cities of significant size and industry. These places are already interconnected, thereby furnishing the basic power system for a farm electrification program. As the work of the Rural Electrification Administration after 1935 shows, the general farm as well as the areas of small specialized farming possess most of the conditions necessary for successful rural electrification.

THE RURAL ELECTRIFICATION ADMINISTRATION

An examination of our charts and tables shows that the extension of electric service to farms came to a halt in the years after 1931. In the meantime. the Tennessee Valley Authority experiment had been

set in motion in 1933, and quickly an interest was re-created in the rural market. In 1934, the Mississippi Valley Committee recommended federal encouragement of rural electrification. In the 1935 emergency relief appropriation, Congress designated rural electrification as one of the specific catagories of permissible expenditure. Therefore, by executive order, in May, 1935, was created the Rural Electrification Administration, and to it was allocated 25 million dollars, to be used to "initiate, formulate, administer, and supervise a program of approved projects with respect to the generation, transmission, and distribution of electric energy in rural areas."[1]

In 1936, the presidentially created Rural Electrification Administration was given official status by the Norris-Rayburn Act, or, as it is officially known, the Rural Electrification Act of 1936.[2] The purpose of the act as set out in Sec. 2 is as follows:

> The Administrator is authorized and empowered to make loans in the several States and Territories of the United States for rural electrification and the furnishing of electric energy *to persons in rural areas who are not receiving central station service*, as hereinafter provided; to make, or cause to be made, studies, investigations, and reports concerning the condition and progress of the electrification of rural areas in the several States and Territories; and to publish and disseminate information with respect thereto. (Italics ours.)

The original bill would have provided for a 10-year appropriation of 100 million dollars a year. The act, as passed, carried a reduced amount. In the first year, the administrator was empowered to borrow 50 million dollars from the Reconstruction Finance Corporation. For the next 9 years, it appropriates 40 million dollars annually, to be lent by the administrator under the following restrictions:[3] 50 per cent of each year's appropriation is to be allotted yearly

> . . . for loans in the several States in the proportion which the number of their farms not then receiving central station electric service bears to the total number of farms of the United States not then receiving such service.

This is merely an allotment basis, because funds need not be lent unless acceptable projects are available. The remaining 50 per cent, plus all previous unexpended balances, may be lent in any amount to

[1] Quoted in booklet of Rural Electrification Administration, *Rural Electrification on the March*, p. 14.

[2] Public No. 605—74th Cong. (S. 3483).

[3] By special act, the 75th Congress appropriated an additional 100 million dollars for the fiscal year ending June 30, 1939. This sum was to be used exactly as other moneys of the Rural Electrification Administration. For the fiscal year July 1, 1940–June 30, 1941, the appropriation was raised to 100 million dollars. It is expected that this sum will build 92,000 miles of rural lines.

approved projects, provided no one state receives in excess of 10 per cent of the total so available. By these restrictions, the states of low electrification will be preferred in the program. The following table shows the possible allocation of the earmarked half of the 50 million dollars lent by the Reconstruction Finance Corporation for the first year:

TABLE 59.—MAXIMUM ALLOCATIONS TO STATES IN 1936 ACCORDING TO THE RURAL ELECTRIFICATION ACT*

State	Amount	State	Amount
Alabama	$1,087,500	Nebraska	$ 513,250
Arizona	53,500	Nevada	11,250
Arkansas	1,034,250	New Hampshire	31,250
California	287,500	New Jersey	58,250
Colorado	234,000	New Mexico	166,000
Connecticut	90,000	New York	479,500
Delaware	35,250	North Carolina	1,201,250
Florida	278,750	North Dakota	343,000
Georgia	1,010,250	Ohio	839,250
Idaho	125,500	Oklahoma	861,000
Illinois	837,750	Oregon	189,000
Indiana	728,250	Pennsylvania	596,500
Iowa	784,750	Rhode Island	9,750
Kansas	666,500	South Carolina	667,250
Kentucky	1,117,750	South Dakota	333,500
Louisiana	692,750	Tennessee	1,091,000
Maine	114,500	Texas	2,029,500
Maryland	151,500	Utah	58,750
Massachusetts	84,750	Vermont	78,750
Michigan	604,500	Virginia	753,500
Minnesota	785,000	Washington	182,250
Mississippi	1,280,500	West Virginia	414,000
Missouri	1,078,250	Wisconsin	661,750
Montana	197,750	Wyoming	70,250

* *Rural Electrification News*, p. 5, June, 1936.

The administrator is directed to make loans to

> . . . persons, corporations, States . . . and subdivisions and agencies thereof, municipalities, peoples utility districts and cooperative, non-profit, or limited dividend associations . . . for the purpose of financing the construction and operation of generating plants, electric transmission and distribution lines or systems for the furnishing of electric energy to persons in rural areas who are not receiving central station service. . . .

In these loans, preference is to be shown to public borrowers and cooperatives. They are to be self-liquidating within a period of

25 years and must bear a rate of interest "equal to the average rate of interest payable by the United States of America on its obligations," or approximately 3 per cent.[1] If any loan is for "the construction, operation, or enlargement of any generating plant," it must have the consent of the proper state body, presumably the public service commission. It would appear that loans for distribution equipment need no prior state approval. A final section allows loans for electric wiring and electrical and plumbing fixtures. Moneys borrowed from the Reconstruction Finance Corporation cannot be loaned for this purpose beyond "two-thirds of the assured life thereof and not more than five years." Moneys appropriated in other years and lent for this purpose have no such restriction attached, although the administrator has continued to require a 5-year maximum.

THE RURAL ELECTRIC COOPERATIVES

Soon after the creation of the Rural Electrification Administration, it was decided that the most acceptable agency to which to make loans was the rural electric cooperative. Since the law gave preference to public agencies, loans to private companies could be made only in the absence of all other applicants. But at the outset, the administration found very inadequate existing legislation under which co-ops could be organized.[2] Fortunately for the program, the Federal Emergency Administration of Public Works had prepared, as one of three model state laws to facilitate its works program, one covering the cooperative; and from 1935 to 1938 this type of law, with one modification or another, found its way on to the statute books of eighteen states. So rapid has been the growth of cooperatives and so favored has it been by the Administration that the bulk of its loans (in excess of 85 per cent) has gone to them alone.

We illustrate from the law of Alabama, one of the first states to pass the suggested statute.[3] This act authorizes the creation of electric membership corporations, nonprofit companies of perpetual life. Any three persons may organize such a company to serve its members only. The corporation is to be controlled by a board of directors, possessed of the usual powers of acquisition and sale of

[1] According to official reports, the actual average rate of interest on loans has been 2.88 per cent, and the period 20 years.

[2] *Ibid.*, p. 42. Iowa was the only state before 1935 having such a statute.

[3] H. 133, Regular Sess., 1935, Alabama. Approved February 7, 1935. In spite of protests from the Administrator of the Rural Electrification Administration, Alabama in 1939 amended its law by requiring all public projects to offer to buy existing privately owned facilities. A similar change was made in the Ohio law.

property, issuance of bonds, and supervision of rates and service. The only restriction placed on the Alabama cooperatives is the requirement that the bonds be approved by the Public Works Board of Alabama or, in the event that that body be abolished, by the Public Service Commission. All bonds shall have a life not to exceed 40 years and bear a rate of interest not to exceed 6 per cent.

In addition to laws authorizing rural cooperatives, some of the states have created state-wide facilitating organizations. In 1935, the office of Rural Electrification Coordination was created in Wisconsin.[1] Other states have organized similar coordinating agencies. South Carolina has created a State Rural Electrification Authority to accomplish rural electrification on a state-wide basis.[2] The Authority is placed under a board of directors of nine, seven exofficio, the remaining two appointed by the governor from recommendations of the House and Senate. The board has such powers as might be expected —powers to acquire or build electric properties, to sell service, to establish reasonable rates, to borrow money. The authority's bonds cannot become a general obligation on any subdivision of the state, nor can they become a debt of the state. The purpose of the authority as set out in the act is as follows:

> The corporate purpose of the authority is to encourage and promote the fullest possible use of energy by all of the inhabitants of the state by rendering service to said inhabitants to whom energy is not available *or, in the opinion of the board, is not available at reasonable rates.* (Italics ours.)

The cooperative form of organization has several advantages. The co-op is not designed to make profits; and if any one person appears to have too much financial stake in one, the Rural Electrification Administration will decline to deal with that group. Furthermore, its very nature creates a sense of personal responsibility in each member. They may (and often do) contribute certain work such as pole setting, and, obviously, there is no problem of securing a free right-of-way. In addition, so long as loans are outstanding, the Rural Electrification Administration is able to supervise to some extent the co-op's management and policies. Thus, the administration approves project superintendents, managers, and bookkeepers. It has a training course for officers and employees. To accomplish this, there has been created a Division of Operations Supervision, under the following authorization:[3]

[1] See *re Extension of Rural Lines of Electric Util.*, 14 P.U.R. (N.S.) 25. In August of 1939, this divison was made a section of the State Department of Agriculture.

[2] Act 105, Regular Session, 1935, South Carolina. Approved March 14, 1935.

[3] *Rural Electrification on the March*, p. 9.

As rapidly as is consistent with our limited budget, the Division of Operations Supervision will organize its work in detail and integrate it especially with project examination, engineering, accounting, and utilization with a view to coordinating these activities where they affect management and the pay out and ultimate success of the projects.

RURAL ELECTRIFICATION SINCE 1935

Either coincidentally with the creation of the Rural Electrification Administration or because of its creation, the extensions of farm service began to rise rapidly after 1935. According to the figures, new farms electrified each year since 1932 have numbered as follows:

1933	4,109	1937	198,581
1934	30,396	1938	165,074
1935	44,841	1939	379,421
1936	254,129		

According to the report of the Rural Electrification Administration to July 1, 1939, it had allotted over $226,000,000 to 635 borrowers in forty-four states for the construction of 225,000 miles of line to serve 675,000 new farm customers.[1] Over 90 per cent of these loans have been made to the rural cooperatives. As of January 1, 1940, $6,500,000 had been allotted for the building of thirty-six power plants, the largest of which has an ultimate capacity of 12,000 kilowatts.[2]

It was inevitable that the Rural Electrification Administration and the private companies would collide in this rush to extend rural lines. The latter were accused of building spite lines in order to block the administration because of the phrase in its law limiting it to areas that "are not now receiving central station service." In other words, when a company learned of proposed rural cooperative movements, it would sign up a group of farmers in that area and extend service to them immediately. This procedure is illustrated by a case before the Wisconsin Public Service Commission in 1937. There the conflict was

[1] *Rural Electrification News*, p. 3, July, 1939.

[2] This plant is a part of the Tri-State Power Cooperative serving parts of Wisconsin, Iowa, and Minnesota. For a description of it, see 1939 *Report* of the Rural Electrification Administration, pp. 90–92. The sources of electricity used by the Rural Electrification Administration-financed retail organizations are as follows:

	Per Cent
Purchased from private utilities	67.0
Purchased from municipal plants	22.2
Purchased from other public plants	3.8
Purchased from T.V.A.	3.4
Generated by R.E.A. plants	3.6
	100.0

occasioned by the petition of fifty-seven farmers signifying their desire to be served by a local private company instead of a proposed rural electric cooperative.[1] Unquestionably, what had happened was this: Following an announcement of plans of a co-op, the private company had solicited those farmers nearest its existing line, offering them

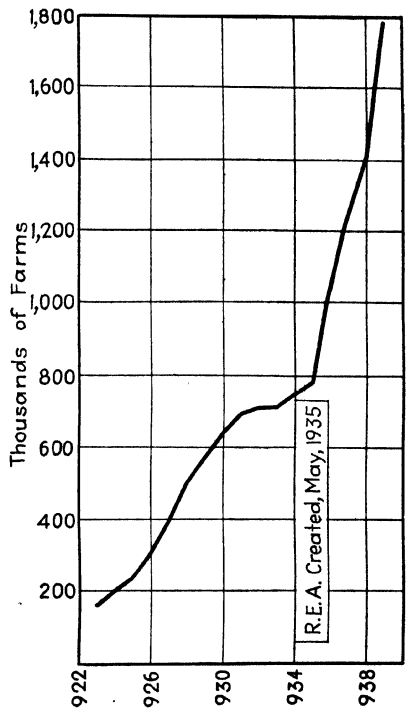

CHART 29.—Number of farms with electric service, end of each year. Note the results of the activities of the Rural Electrification Administration.

immediate service instead of merely a proposal to request federal assistance.

The building of spite lines, according to official admission, has been declining.[2] The combination of the fact that its program usually contemplates purchase of electric current from existing plants and the pressure of the state commissions probably accounts for this changed attitude. Wisconsin, for instance, came to the rescue of its rural electrification programs by an amendment in 1937 protecting the rural

[1] *Millard v. Wisconsin Power & Light Co.*, 18 P.U.R. (N.S.) 400.

[2] 1939 *Report* of Rural Electrification Administration, p. 151.

co-op from spite-line competition of private electric utilities. That law reads:[1]

> If a cooperative association has been incorporated . . . for the production, transmission, delivery, or furnishing of light or power and has filed with the Commission a map of the territory to be served by such association and a statement showing that a majority of the prospective customers in the area are included in the project, no public utility shall begin any such construction, installation, or operation within said territory until after the expiration of six months from the date of the filing of said map and notice. In the event said cooperative association has entered into a loan agreement with any Federal agency for the financing of its proposed system and has given written notice thereof to the Commission, no public utility shall begin any such construction, installation, or operation within said territory until after the expiration of twelve months from the date of said loan agreement.

Obviously, there can be no defense of the building of spite lines by either private or public agency. This is especially true of the private companies, because they almost always supply the energy to be distributed by the rural co-ops and are thus relieved of the responsibility of servicing and maintenance of lines and collection of retail accounts.

THE SUCCESS OF RURAL ELECTRIFICATION

In a real sense, the Rural Electrification Administration has introduced a new approach to the problem of rural electrification. Instead of following the older practice of simply "skimming the cream" of the farm business, that is, serving only the more populous and prosperous neighborhoods, it has looked to the inclusion of the "skimmed milk" as well. In other words, its program contemplates the widest possible economical use of electricity. Although the publications of that agency make much of its policy as contrasted with the cream-skimming tactics of the private companies, the facts are that the entire program has been possible only because of the combination of rapid technological advance in rural line design and sharply lowered interest costs. Loans at 3 per cent are certainly one way of reducing costs below older levels. More significant has been the improvement in line construction. The older "battleship" type of construction for rural lines at $1,500 to $2,500 a mile has been "streamlined" to considerably less than $1,000 a mile.[2] This has been possible, in the main, by the introduction of new and improved equipment and the use of

[1] Laws of 1937, c. 17, Amendment to §196.49 of the Public Service Law. Cited at pp. 401, 402 in 18 P.U.R. (N.S.).

[2] A study of the Federal Power Commission showed rural lines at one time to have a cost of $1,740. Rural Electric Service, *Rate Series* No. 8, p. 15.

less expensive methods of installation. For single-phase lines, the crossarm has been eliminated. The span between poles has been doubled; conductors have been strengthened; and, most important, newer and cheaper transformers have been obtained. As a consequence, average costs per mile have been coming down. In 1938, they were reported as low as $700 a mile, with the over-all average in that year for all construction standing at $970. The 1939 figures show continued cost reduction. "After 3 years of successful experimentation, REA borrowers now build rural lines for an average of less than $750 per mile for construction alone, and for an average of less than $825 a mile including overhead."[1] This is truly a remarkable record of technological progress. Whether or not these streamlined lines can withstand the elements as well as the older construction remains to be completely demonstrated, yet they seem to be at least as storm resistant, if not superior. We already have a test of one line covered with a 3-inch load of sleet whipped by a 60-mile wind. In this instance, it was more resistant than other neighboring power and telephone lines.

One significant advance has been made in the matter of cheaper connections for the small rural user of electricity. Using the standard equipment, it is necessary for customers to have monthly uses ranging from $2.50 per customer per month in the South to $4.00 in the North. A survey of rural users in the South, especially, shows many of them unable to afford even this small sum. Therefore, the Rural Electrification Administration has had designed for it a cheaper transformer and circuit breaker costing together not more than $24. By carrying electricity to premises through a trench rather than a line swing from a transformer pole, another saving is made. As a result, a 600-watt load (with provision for a 25 per cent overload) can be provided for small users at not to exceed a charge of a dollar a month for service. Such a low maximum load will carry only a few lights, a radio, and one or two other low-wattage appliances, yet its significance to those rural areas of low income and slight power needs must not be overlooked. Thousands can now be served who formerly found service to be prohibitive.[2]

One limiting factor yet to be reduced significantly is the average number of customers per mile of line. Before the creation of the Rural Electrification Administration, private companies had built lines

[1] 1939 *Report*, p. 99. One line is reported as costing, exclusive of overheads, $425 per mile.

[2] See the story about this in the *Electrical World*, **112**:807, Sept. 16, 1939, and 1939 *Report* of the Rural Electrification Administration, p. 81.

with a minimum of three customers per mile, at average costs of $400 to $500 per customer. Estimates for 1935 showed that private lines cost $1,252 per mile, representing, in terms of an average of 3.5 farm and 1.9 nonfarm customers per mile, a cost of $233 each.[1] According to general estimates for 1936 and 1937, the American average was about five customers per mile of line. The Rural Electrification Administration has done a better job of approximating the goal of three per mile. Using its figures of July 1, 1939, its allotments serve 675,000 farms by means of 225,000 miles of line, an average of 3.3 customers per mile. Lowered costs have, therefore, enabled the approach of this minimum.

A final requirement to successful rural electrification is the use of electricity for power in addition to residence and barn lighting. In fact, studies during the late 1920's by the experiment stations of the agricultural colleges made this point quite clear. Many electric companies have required a minimum use amounting to $150 per year; and under the usual rates, lighting service only would seldom cost this amount. Electricity on the farm thus becomes economical when it is used as a power source in addition to the usual house uses. The following illustration of comparison of costs of farm services performed without and with electricity, although probably not typical, at least demonstrates this point.[2] According to estimates for the area of the Humboldt (Iowa) Rural Electric Co-op, it would cost $15.51 to perform the services of lighting, laundry, refrigeration, radio, water pumping, cooking, and feed grinding by means of the usual nonelectric power sources, whereas these same operations could be performed electrically for $8.54.

This illustration assumes a monthly consumption of 250 kilowatt-hours, or an annual average of 3,000 kilowatt-hours. As a matter of fact, only in the West do we find any such rural consumption figures. In a study for 1933, the Federal Power Commission found the following sectional consumption data. In the eastern half of the United States, rural consumption ranged around 800 kilowatt-hours a year; in the irrigation sections of the western half, the figure was close to 2,000 kilowatt-hours except for California, which had an annual figure of 16,745 kilowatt-hours.[3] Since then, the figures have been rising, as the following table shows. Even so, the average in the eastern half of the United States is far from the assumption of our foregoing illustration.

[1] *Electrical World*, **106**:3236, Oct. 17, 1936.

[2] Taken from *Rural Electrification News*, p. 5, October, 1938.

[3] "Rural Electric Service," Electric Rate Survey, *Rate Series* No. 8, p. 18.

At this point, the query is properly raised as to the justification of much of the earlier farm electrification. If we assume a line cost of $1,000 a mile and annual revenues of 18 per cent of that figure, we can measure minimum consumption requirements. At 4.5 cents per kilowatt-hour (see Table 60), average annual consumption per mile should be not less than 4,000 kilowatt-hours. If there are three customers per mile, each must average 1,333 kilowatt-hours of use per year, a figure still well above the 1938 figure for farms in the eastern

TABLE 60.—PERTINENT DATA ON FARMS HAVING ELECTRIC SERVICE*

Year	Farms in eastern half of the United States			Farms in western half of the United States		
	Kw.-h. per customer	Average annual bill	Revenue per kw.-h.	Kw.-h. per customer	Average annual bill	Revenue per kw.-h.
1926	586	$51.86	8.85¢	5,882	$120.58	2.05¢
1927	618	50.99	8.25	5,629	113.71	2.02
1928	670	52.86	7.89	7,791	136.34	1.75
1929	672	50.40	7.50	7,804	127.21	1.63
1930	745	52.37	7.03	7,768	128.95	1.66
1931	775	53.71	6.93	7,479	125.65	1.68
1932	765	50.64	6.62	5,727	104.80	1.83
1933	770	49.59	6.44	6,041	104.51	1.73
1934	811	49.63	6.12	6,833	110.69	1.62
1935	873	48.63	5.57	5,673	100.98	1.78
1936	954	48.65	5.10	5,618	96.63	1.72
1937	1,014	47.86	4.72	5,179	93.22	1.80
1938	1,045	47 03	4.50	4,435	85.60	1.93
1939	1,127	49.70	4.41	5,201	88.94	1.71

* Edison Electric Institute, *Statistical Bulletin* 7.

part of the United States. If the 1.5-cent per kilowatt-hour figure of the Rural Electrification Administration is used in these computations, each customer of this illustration must consume an average of 2,400 kilowatt-hours each year. We do not offer these estimates as proof of anything; but they do suggest that in the past, at least a part of the program must have been uneconomical, especially in those rural sections of the South, Middle West, and Great Plains where power uses were slight and the number of customers per mile near the minimum of three. Unless a project has the good fortune of having an extraordinary number per mile of line (five or more), use of electricity can be economically justified only by its extensive application as a farm power supply. On this basis, only the rural electrification of the eastern

seaboard and the Far West has obviously been on an economical basis. In the East, farms are small; on the west coast, consumption has been large, as the figures above so eloquently show.

This requirement of power use on the farm has been demonstrated by the experiment stations of the agricultural colleges and more recently by the Electric Farm and Home Authority, the farm agents, and the Rural Electrification Administration. These agencies have supplied the actual proof of the economy of electricity on the farm. On specialized farms, it can increase egg production, replace manufactured ice for cooling dairy products, operate milking machines, even operate movable machinery. In the staple-crop areas, power uses have so far been limited mainly to water pumping, hoisting, and feed grinding. The ultimate conquest, therefore, of the staple areas depends, in the main, upon the continued "streamlining" of the rural line *and* the discovery of more power outlets. If, for instance, electricity can be brought to movable machinery, a tremendous area will be opened.

While the farm power uses in the staple-crop areas are being developed, there is an available market awaiting immediate exploitation. In other words, we must not overlook the farm domestic market for the sales of electric appliances. A survey of eight states of the upper Mississippi and Missouri River valleys, covering over 7,000 farm homes, showed 32 per cent of them to have high-line electric service and 14 per cent to have individual electric plants. As service is extended to the remaining 54 per cent of the farms, an untapped territory will be opened. On the electrified farms, only the radio, washing machine, and iron showed use approaching a saturation point. In other home appliances, the numbers in use were small. Of these farms, 44 per cent had vacuum cleaners, 28 per cent had refrigerators, 20 per cent had electric fans.[1] Thus, the extensive and intensive application of electricity to the farm both as a home and as a factory holds great prospects for use of power by rural customers on a scale undreamed of even a few short years ago. To the Rural Electrification Administration and allied agencies must go much of the credit for these broadened horizons.

POLICIES OF RURAL EXTENSIONS

The conditions under which rural electric service has been extended have been quite varied. Some extensions have required customer

[1] *Electrical World*, **111**:1761, June 10, 1939. Similar figures are reported for Rural Electrification Administration cooperative areas. See 1939 *Report* of the Rural Electrification Administration, p. 56.

contributions, others not; and these payments or lack of payments have, of course, affected the retail rates charged. Thus, rates for rural service cannot be divorced from the conditions under which that service was secured. In a study by the Federal Power Commission, covering practices before 1935, that body found it necessary to classify extension policies and rates into six groups.[1] We summarize them in the following paragraphs.

Group 1.—This plan depended on a contracted kilowatt load per mile of line and per customer and had been used in several southern states. It is illustrated as follows: An Alabama company has required a connected load of at least 10 kilowatts per mile. In addition, each customer must guarantee a minimum load of 1.5 kilowatts, or $2 per month. Thus, if a line had five customers per mile, the 10-kilowatt per mile guarantee would require each customer to increase his individual guarantee to 2 kilowatts. The additional guarantee would be charged at a rate of 15 cents per 100 watts, thereby increasing each individual monthly minimum in our illustration to $2.75.

Group 2.—The second group of extension policies required a guarantee of a fixed payment per mile per month and was found in use in New York. There, it was common practice to require a monthly minimum bill per mile of $12. Assuming four customers, each one would be charged a $3 minimum, which would include a use of 43 kilowatt-hours of energy. Companies in other states had higher mileage minimums, the highest found by the Power Commission being $37.50 in Kentucky.

Group 3.—This plan, found in Wisconsin, required a stated company expenditure per rural customer, excess costs being borne by the customers. As an example, one company would spend not to exceed $300 per customer. If there was an average of four customers per mile of line costing not more than $1,200 per mile, then no extra contributions would be required.[2]

Group 4.—This plan called for advance financing by customers at the rate of, say, $1,000 per mile, with a $100 refund to each customer actually connected.[3] Thus, a mile of line serving four customers would cost each of them $250 minus a $100 refund. For each additional customer secured within 5 years, the company would refund to the original customers $60 per new customer; but in no case would refunds,

[1] "Rural Electric Service," Electric Rate Survey, *Rate Series* No. 8.

[2] A similar plan has been approved by the Michigan Commission in *re Menominee v. Menominee Light & Traction Co.*, 18 P.U.R. (N.S.) 61.

[3] Occasionally, this general plan, often called the "Michigan plan," is based on a $500-a-mile advance, with a $100 refund for each customer..

original and additional, exceed the total of the initial advance. Under these arrangements, urban rates were usually applied. This plan was developed in Michigan. Subsequent to the Federal Power Commission investigation, the Michigan Commission has approved of the following plan of the Consumers Power Company.[1] On the basis of extending its urban rate to rural service, the company was authorized to make rural extension as follows:

1. For all extensions where there was found to be an average of five (or equivalent) farm customers per mile of line, each customer would make no contribution but instead guarantee an annual use amounting to at least $150.
2. For other rural users, not qualifying under this first option, the principle of advance financing would be required.

Group 5.—This plan, followed by almost half the utilities studied by the Power Commission, used urban rates and required a customer guarantee of a minimum annual revenue based on a percentage of line cost. A common figure was 18 per cent a year, or 1½ per cent a month, though the monthly guarantee varied from 1¼ to 6⅔ per cent. Let us illustrate by assuming a certain line to cost $1,500 a mile, serving an average of three customers. Each would guarantee, then, an annual payment of 18 per cent of his share ($500), or $90 a year. If a customer happened to be an exceptionally large user, he might be permitted to assume a larger guarantee, thereby reducing the obligations of other customers.

Group 6.—The final plan of electric extensions covered some 102 utilities, mainly operating in California. Utilities there generally made free rural extensions in accordance with the following schedule of use:

	Feet
Each lighting customer	100
Each kw. of heating or cooking load	75
Each hp. of power load less than 5 hp	75
Each hp. of power load over 5 hp	100

For extensions in excess of these limits, a charge of 25 cents per foot of excess was made. Since California users require large power installations, this basis of extension seems quite equitable.

Since 1935.—The tendency since 1935 has been to eliminate, as far as possible, advances by customers for line construction. Under the plan of the Rural Electrification Administration, the cooperatives build their lines from borrowed funds; buy their energy from a near-by plant; and, from their retail rates, pay for this energy, repair and

[1] *Re Consumers Power Co.*, 11 P.U.R. (N.S.) 363.

maintain their lines, and eventually retire the loans made to them. Although the rates charged have not followed a uniform pattern, we present what seems to us a typical rate structure, that of the Benton County (Iowa) Electric Cooperative.[1] This project called for an allotment of $200,000 to construct 200 miles of line by which to serve 597 customers. The retail monthly rate schedule, approved by the Administration Rate Section, is as follows:

First 40 kw.-h.	$3 50
Next 40 kw.-h.	4.0¢ per kw.-h.
Next 120 kw.-h.	2.0¢ per kw.-h.
Excess kw.-h.	1.25¢ per kw.-h.

We quote the following comment from a *Progress Bulletin* of the Rural Electrification Administration:[2]

> This schedule is based upon experience and careful study. It is believed that it will give service at the lowest prices consistent with the cost of serving you and repaying the Government loan. It will enable you to make full and effective use of electricity—to install a variety of labor-saving and money-making appliances.

Lest there be any doubt, we emphasize the point that payments under this rate schedule for service are the sole monetary contributions of the co-op members. Although they may donate rights-of-way, render free services in construction, and later do their own meter reading and minor repair work, they make no capital contributions toward the line costs. Those funds have been borrowed from the federal agency, and it is expected that rates charged will cover interest and amortization of principal.

A case decided in 1939 by the California Railroad Commission illustrates the effect of the Rural Electrification Administration upon the policies of the private companies. Specifically, it involved an application of the Pacific Gas and Electric Company to serve a rural area of 266 customers by means of 132 miles of line.[3] The proposal was to serve this area at regular rates plus a 33⅓ per cent surcharge. The significant thing about this application is, first, the absence of requirement of customer advances and, secondly, the willingness of the private company to serve a rather lean area. Whereas the usual ratio of investment to income expected in California was 5 to 1, Pacific Gas and Electric was proposing to serve a territory under an estimate

[1] Supplied by the Rural Electrification Administration at the request of the authors.

[2] *Bulletin* of Rural Electrification Administration, Iowa 41 Hancock, June 17, 1938.

[3] *Re Pacific Gas & Electric Co.*, 28 P.U.R. (N.S.) 307.

of 7 or 8 to 1. The willingness of the company to serve this territory rather than only a smaller and more prosperous portion came directly out of a threat of organization of a rural cooperative. Thus, the cooperative has not only itself brought electricity to the farm, but it has obviously stimulated extensions on the part of the private companies.

Jumping across the nation to New York, let us see what has happened to the electrification of farms in that state. On December 31, 1938, there were 34,500 miles of rural lines, 8,500 of which had been built in 1936, 1937, and 1938. These miles serve 93,000 farms. The movement in that state now approaches saturation. In 1937, the New York State College of Agriculture estimated that 44,500 miles of line would serve all farms likely to remain in agriculture. Thus, only 10,000 miles of line remain to be built, and the 1937 study cited above showed that at least 7,000 of these remaining miles would need subsidy to justify construction.[1] Although in no sense typical of the progress in rural electrification in other states, this illustration shows how closely the goal of an all-electrified America can be approached.

WHOLESALE RATES TO CO-OPS

Since the policy of the Rural Electrification Administration has been to require its borrowers to purchase energy where possible, it has been necessary to design some type of wholesale rate for that service. Several state commissions have dealt with this question, and they seem to approve of the Hopkinson demand type. For instance, the Wisconsin Commission has approved the following monthly wholesale rate for co-ops:[2]

Demand charge:

First 50 kw. of maximum demand	$2.00 per kw.
Excess	1.75 per kw.

Energy charge:

First 1,000 kw.-h.	3¢ per kw.-h.
Next 2,000 kw.-h.	2¢ per kw.-h.
Next 7,000 kw.-h.	1.5¢ per kw.-h.
Next 40,000 kw.-h.	1¢ per kw.-h.
Excess kw. h.	0.9¢ per kw.-h.

Let us assume that a particular co-op served by this Wisconsin utility has 200 customers with a total maximum demand of 400 kilowatts. Let us further assume that the system load factor is 40

[1] See 1938 *Annual Report*, New York Public Service Commission, pp. 78–80.

[2] *Wisconsin State Rural Electric Cooperative v. Lake Superior Dist. Power Co.*, 16 P.U.R. (N.S.) 238, 241.

per cent. Such a set of conditions would give an average monthly consumption of 116,800 kilowatt-hours. The bill for this service would then be:

Demand charge:		
50 × $2.00 =	$	100.00
350 × $1.75 =		612.50
	$	712.50
Energy charge:		
1,000 × $.03 =	$	30.00
2,000 × $.02 =		40.00
7,000 × $ 015 =		105.00
40,000 × $.01 =		400.00
66,800 × $.009 =		601.20
		$1,176 20
Total monthly bill..		$1,888.70

The average cost per kilowatt-hour to the co-op would be $0.0161, a figure considerably above the 1939 objective of the Rural Electrification Administration of less than 1 cent per kilowatt-hour.[1]

Other filed rates, selected at random, are as follows: The Kentucky Commission has approved of a two-part Hopkinson rate, with the energy charge constructed as a Wright rate.[2] It is

Demand charge:	
First 50 kw. of maximum demand.....	$1.25 per kw.
Next 150 kw. of maximum demand.....	1.00 per kw.
Excess..	0.75 per kw.
Energy charge:	
First 50 hr. use of maximum demand.....	1¢ per kw.-h.
Excess.....	0.75¢ per kw.-h.

For our illustration, above, this rate would result in an average of about 1.1 cents per kilowatt-hour and therefore is more favorable.

A still different wholesale rate is that of the Washington Power Company.[3] It is as follows:

[1] See 1939 *Report*, p. 85. According to Rural Electrification Administration computations, excluding service supplied by the Tennessee Valley Authority, the electric co-ops in 1939 paid an average wholesale price of 1.2 cents per kilowatt-hour. "So high an average demonstrates that many rates are still decidedly out of line."

[2] *Re Wholesale Rates for Power to Rural Co-ops*, 19 P.U.R. (N.S.) 22, 33.

[3] *Electrical World*, **108**:1644, Nov. 13, 1937.

For each kw. of maximum demand (including 200 kw.-h. use per kw.)	$ 3.00
Next 100 kw.-h. per kw. of demand	1¢ per kw.-h.
Excess	0.6¢ per kw.-h.
Minimum demand charge	$100.00

Under this rate, the co-op of our illustration would be billed as follows:

Demand charge:
400 × $3.00 = $1,200.00

Energy charge:
80,000 kw.-h.
Included in foregoing, no charge
36,800 × $0.01 = 368.00
Total monthly bill.. $1,568.00

This rate would yield an average of 1.34 cents per kilowatt-hour. It will be observed from the computations that the energy charge does not get into the final (and lowest) block. This type of rate is obviously designed for high load-factor use, because it requires better than a 40 per cent factor to permit electric use in the 0.6-cent block.[1]

State Control of the Rural Co-ops.—Federal loans to groups organized under state laws immediately raise the question of the right of the states to control them. Really two questions are raised. In the first place, how far generally can states go in matters involving federal participation and financing? It could be argued that, save as the Congress may have given the states rights of control and direction, all such federal activity is beyond state jurisdiction. This principle has been established for federally incorporated banks, and one might argue that it extends to all activities of the federally financed rural co-ops except as the Rural Electrification Act of 1936 requires state approval of expenditures for generating units. So far as we know, this point has not been particularly argued or, if argued, has not been settled.

[1] This point is proved as follows: One kilowatt of capacity used continuously for one month (30 days) would consume (24 hours × 30 days) 720 kilowatt-hours. Such usage would yield a load factor of 100. Under this rate, the initial charge per kilowatt of capacity allows 200 kilowatt-hours. The next block covers the next 100 kilowatt-hours. Totaled, they equal 300 kilowatt-hours. Therefore to consume, *per kilowatt of capacity*, enough energy to get into the final block of charge would mean using over 300 kilowatt-hours. Since 300-kilowatt-hours use gives a load factor of 41.6 per cent, it would require, as we said above, under this rate a load factor in excess of 40 per cent in order to consume electricity at the 0.6-cent level.

In the second place, the propriety of state regulation of publicly owned utility ventures is involved. As we have pointed out previously, some states give to their state public service commissions quite as extensive powers over such utilities as over privately owned ones. On the whole, however, such extensive regulation is not the rule. Most states exempt public plants from control of any sort. In reality, then, we have the old argument of the necessity of public control of public enterprise transferred to the field of rural electric cooperatives, semi-publicly owned enterprises.

On this question the Rural Electrification Administration has taken a positive and unmistakable stand. In a sentence, it is unequivocally opposed to state regulation of the rural co-op. Its argument is that the co-op is an organization not for profit, existing solely to serve its members—that therefore such an organization has no incentive either to render inferior service or to charge extortionate rates. Its very self-interest is to do the best possible job at the least possible cost. Its second line of attack is to question, at times, the motives of state regulation, to imply that state commissioners favor unduly private companies when they are involved in a competitive situation with a rural co-op.[1]

Before we analyze this situation, let us examine the reported cases of state commission actions involving federally financed rural cooperatives. In general, the commissions have been more than fair to the co-op—whether they had jurisdiction over it or not. The Wisconsin Commission has objected to unnecessary competition between co-op and private company; and even before the amendment of 1937 giving

[1] This position was stated as follows in the Rural Electrification Administration publication *Rural Electrification on the March*, pp. 25, 26: "With the REA cooperatives, as has been suggested, regulation of the usual type has too often resulted in undue delay, expense, and difficulty. The sole principle of proper regulation is to protect the public against private claims adverse to the public interest. When an electric cooperative is required to obtain a certificate of convenience and necessity, the situation, as a practical matter, is exactly reversed. Whatever theories may be advanced, the practical effect is to provide a forum where private interests may appear and attempt to hamper or thwart a social program in which the public good is deeply implicated.

"With respect to rates, conditions of service and extension rules, the usual forms of regulation are also inappropriate to self-service enterprises. There are no conflicting interests to be arbitrated between buyer and seller. There is obviously no need to protect against themselves a group of farmers who are *sui juris* and who have elected to furnish themselves at cost with a service which is essential to modern standards of life and work, and which has hitherto been denied them by agencies for profit."

priority to cooperative projects, it had attempted to protect them.[1] Although the Tennessee Commission found that the law denied all control over co-ops, it has likewise protected them from proposed competition by private companies.[2] One case in particular has aroused controversy between the administration and a state commission. The Massachusetts Department of Public Utilities was called upon to review a proposal of a rural co-op, the Tri-County Electric Company, for an issue of securities.[3] The commission was asked to approve a financial plan of $25,000 in capital stock and a $255,000 mortgage to the United States (the Rural Electrification Administration). Under the laws of Massachusetts, no public utility can issue bonds or mortgages in such excessive proportions, and therefore the petition was denied. Although it might be argued that co-ops were not utilities in the proper sense of the word,[4] and thus exempted, the real fault in the decision, if one there be, lay in the failure of the Massachusetts law to make special provisions for co-ops. At least the care of the commission in reviewing the financial merits of the applicant can scarcely be condemned.

Of course, occasionally a commission does show an attitude not to be commended. For instance, the Missouri Commission has certified a private company to extend its lines into an area proposed to be served by a rural co-op.[5] The argument of the commission was that the private company simply requested permission to extend its service under existing rules. Anyway, argued the commission, a large part of the area—that part not wanted by the company—would be left to the federally financed co-ops. It would appear in this case that the commission was guilty of approving a spite line, of permitting the company to "skim the cream." Except as interest costs and taxes may be a heavier burden on private enterprise, the company ought to have been as willing as the Rural Electrification Administration to undertake to serve the entire territory in question. In fact, if these differences in cost materially curtail the ability of the private company to serve rural areas, it should either have tried to secure a federal

[1] See *re Extensions of Rural Lines of Electric Util.*, 14 P.U.R. (N.S.) 25, 15 P.U.R. (N.S.) 364; and *Millard v. Wisconsin Power & Light Co.*, 18 P.U.R. (N.S.) 400.

[2] *Re West Tenn. Power & Light Co.*, 18 P.U.R. (N.S.) 369.

[3] *Re Tri-County Electric Co.*, 19 P.U.R. (N.S.) 113.

[4] *Re Harrison Rural Electric Ass'n, Inc.* (W. Va.), 24 P.U.R. (N.S.) 7. In this case, it was held that, since the law gave the commission jurisdiction over municipal plants, the rural co-op was a public utility so far as securing a certificate of convenience and necessity was concerned.

[5] *Re Ozark Util. Co.*, 21 P.U.R. (N.S.) 47.

loan or else have surrendered the entire territory to a co-op. Assuming the proposal of the co-op to serve that area to have been economical, then the Missouri Commission should be roundly condemned for permitting the entrance of the private company.[1]

In general, however, we believe that all producers and distributors of electricity service, whether publicly or privately owned, and no matter how financed, should be subjected to the complete control of the commission of the state of their location. The very fact that the Rural Electrification Administration supervises the construction and management of the co-ops is evidence of the validity of this position. Public ownership does not guarantee of itself low rates, efficient service, and a willingness to keep apace of the ever changing art of electricity production and distribution. Therefore, we should extend the jurisdiction of every public service commission to the rates, accounts, service, financing, and extensions of the rural co-op and all other forms of public operation.[2] Of course, any federal agency such as the Rural Electrification Administration should have something to say about the organization and operation of the beneficiaries of its largess; but that authority should be coordinate with, not exclusive to, state commission jurisdiction.[3]

Bibliography

The best materials for that part of this chapter dealing with rural electrification are the annual reports of the Rural Electrification Administration and that agency's monthly bulletin *Rural Electrification News.* See also its special publications *Electric Power on the Farm* and *Rural Electrification on the March.* The administration has prepared contract forms and construction specifications. For criticism of the work of the Rural Electrification Administration, see the various trade journals dealing with the electrical industry.

[1] In the light of this decision, it is easy to understand the opposition of the administrator of the Rural Electrification Administration to a law passed in Missouri in 1939 placing safety operations of cooperatives under the Public Service Commission. He feared the co-ops would be thereby saddled with unnecessary expense.

[2] For contrary views on this problem, see *Inland Empire Rural Electric, Inc. v. Department of Pub. Service*, 199 Wash 527, 30 P.U.R. (N.S.) 173 (1939); and *Re Moon Lake Electric Ass'n, Inc.*, 30 P.U.R. (N.S.) 189.

[3] For a caustic article on this problem, see the article by Will M. Maupin, of the Nebraska State Railway Commission, "I'm in a Ticklish Spot—What Am I to Do?", *Public Utilities Fortnightly*, **24**:195, Aug. 17, 1939.

CHAPTER XXVIII

PUBLIC OWNERSHIP OF UTILITY SERVICES

The study of public utilities to this point has taken for granted the present preponderance of private ownership. Our purpose has been to describe the industry as it actually exists and, on this basis, to state its problems. It must not be thought, however, that the present status is of necessity either right or permanent. Although American utilities have been generally privately owned, it does not follow that they might not have been publicly owned instead. *However they may be owned is a matter of public policy.* In so far as there has been a consciously expressed American attitude, it has been to leave almost all business in the hands of private enterprise curbed only by some form of government control.

One need not search far to discover the basis of this philosophy. Historically, it arose in the natural-rights philosophy of the late eighteenth and early nineteenth centuries, and its expression in economics is best exemplified by the phrases "laissez faire," "competition," "individualism." The economic conditions existing on this continent prior to the first World War nurtured this philosophy. Our fathers found a land of opportunity beckoning the strong to exploit it, and to the strong went the rich prizes of nature. Where in such a situation could any theory of mass action or social control be fitted? The first reactions, however, came shortly after the close of the War between the States. Following the depression of 1873, there emerged the Granger movement, the Populist party, and similar groups, all of which advocated either the ownership of public utilities (mainly the railroads) or at least their stringent regulation.

Thus far, the regulatory movement has been harmonized with the older philosophy of competitive economics. We have revived the legal fiction of "public interest" to justify the monopoly status of the public utility. We have said that the sole purpose of regulation is to approximate, in an artificial and man-made fashion, the competitive ideal. So far, so good. We have thus emerged from an earlier period of almost uncontrolled private initiative into the present period in which general business is restricted to clearly defined competitive limits and private ownership of public utilities allowed but under very positive institutional controls.

Are we about to emerge into a third period? and, if so, what will be its main characteristics? The frontier in American history disappeared by 1890, and the frontier philosophy of rugged individualism has been severely strained by the depression of 1929. If we are to change our economic philosophy, our economic order and political structure, how shall we deal with public utilities? Shall they be left as they are, subject possibly to more effective regulation, or shall they be converted to public ownership? In short, whether this third period is a continuation of the present regulatory stage, one of public ownership, or one of some other markedly different form is a matter of extreme importance and, in the last analysis, one of *public policy*. It will be as much an expression of public policy as regulated private ownership has been an expression of that policy. Calling the change by horrid names or bewailing the possible consequences does not change this fact. Whatever the people prefer, they will have. So recognized, much of the smoke screen cast around the question of public ownership ought to evaporate into thin air.

RIGHT OF GOVERNMENT TO ENGAGE IN BUSINESS

At the outset, the question of the right of a city, state, or the national government to engage in business must be settled; because if under our system of government no such right exists, then, no matter how desirable public ownership may be, it will be delayed at least until the incapacity is removed. Public ownership may be accomplished by three agencies or any combination of them: the national government, the states, and the municipalities or other subordinate divisions of the state.

The right of the federal government to engage in the utility business is limited by the specific powers enumerated in the Constitution or to implications reasonably flowing therefrom. In so far as a federal utility enterprise can be said to relate to national defense or interstate commerce, there are no constitutional prohibitions to it.[1] Judging from the liberal interpretation in the past of these powers, it seems reasonable to assume that there are no insurmountable obstacles to public ownership of utilities by the federal government. Several developments in the past are cases in point, the most outstanding being the Boulder Dam and Tennessee Valley Authority (Muscle Shoals) hydropower developments and the federal irrigation and reclamation projects in the Far West.

[1] See the case of *Ashwander v. T.V.A.*, 297 U.S. 288 (1936), in which these two powers were cited by the Court to sustain the power development at Wilson Dam. Further consideration of this problem will be found in the chapter on the Tennessee Valley Authority.

The states may also engage in the utility business except where forbidden by state constitutional provisions. The economic history of the United States is replete with examples of state enterprise—banks, canals, railroads. More recently, North Dakota embarked on an extensive program of state enterprise which included state-owned and -operated grain elevators, banks, and flour mills. The state floated bonds for this program to the amount of several millions of dollars. In addition, it even went into the real estate loan and home building business. Upon appeal to the Supreme Court of the United States, the entire program was sustained without dissent.[1] The only possible ground of attack on a state program of public ownership, other than state constitutional prohibitions, would be to question its public purpose, an essential prerequisite to the use of the powers of eminent domain and taxation. Although such an objection might be well founded were the state to engage in the grocery business, for instance, it cannot apply to public utility enterprises, because, by legal definition, they are vested with a public interest and perform a public function even though privately owned. Therefore, the state may exercise its sovereign power to further a state-owned utility program, because the public purpose of such a business is universally conceded and thus no longer subject to question.

Since a city or other local governmental unit is a creature of the state, it may exercise whatever power the state itself possesses, subject to two conditions. First, there must be no constitutional bar to the exercise of the power in question; second, the power must be specifically granted to the city (by statute or city charter) or be reasonably implied from a specific power. It thus happens that the city in its proprietary capacity can, if permitted, engage in public business. There is no longer any question of the right (within the limits set out above) of a municipality or other local unit to engage in the production and distribution of any or all utility services. In fact, the limits of public purpose are quite broad when a Supreme Court can approve a municipal coal and woodyard operated by the city of Portland (Maine) out of its tax funds. The Court, relying on the similarity between the heating services of wood and coal and the heating services of certain of the utilities, held that there was an analogous public purpose in the use of tax funds for the maintenance of a nonprofit-making city fuel yard.[2]

[1] *Green v. Frazier*, 253 U.S. 233 (1920).

[2] *Jones v. Portland*, 245 U.S. 217 (1917). This case is an excellent illustration of the judicial process of reasoning by analogy, thereby sidestepping the fundamental issue of the extent of municipal entry into business enterprise generally.

There may be statutory limitations to this power of the state to enter the utility business. As an example, in earlier times, some public utilities occasionally acquired exclusive franchises. In such situations, a city or other governmental unit is stopped from all public competition.[1] On the other hand, state laws permitting, cities or other public agencies may exercise their power of eminent domain to acquire both the property and the franchise of the holder.[2] Furthermore, except as an exclusive franchise is perpetual, after its expiration it need not be renewed in any form, nor would there be an obligation on the part of government to acquire the existing facilities of the private company in the event of a decision to change to public ownership.

A similar situation exists wherever the indeterminate permit law is in use. Under this type of franchise, municipalities are prohibited from rendering a competing service except as such competition has been certified by a public service commission. Because such certification is generally possible only upon a showing of willful neglect of public obligations, rarely have municipal plants been permitted to compete with private companies holding indeterminate permits. Therefore, for all practical purposes, cities in those states having indeterminate permit laws may engage in public ownership only by acquiring the plant of the existing company. In short, no city so situated may build and operate a new and consequently competitive plant.[3]

On the other hand, both the older exclusive franchise and the indeterminate permit are not common. Thus, in most states, privately owned utilities are serving under nonexclusive term franchises. In such situations, there is no legal bar to public competition, no matter whether this competition is locally or nationally financed. Specifically, the problem has arisen since 1933. As we show in detail later,

[1] At least, this is the inference in *Tennessee Electric Power Co. v. T.V.A.*, 306 U.S. 118, 27 P.U.R. (N.S.) 1 (1939).

[2] "Irrepealable contracts may be condemned under the state's power of eminent domain. *West River Bridge Co. v. Dix*, 6 How. 507 (1848); *Long Island Water Co. v. Brooklyn*, 166 U.S. 685 (1897)." Hall, *Constitutional Law*, p. 829. "But a grant of an 'exclusive privilege' to supply water forbids the competition of the city itself. *Vicksburg v. Vicksburg Water Co.*, 202 U.S. 453 (1906)." *Ibid.*, p. 833n.

[3] The Wisconsin law requires a certificate of convenience and necessity to operate a second utility, whether this second operator is an individual, corporation, or municipality. After a circuit judge had ruled that the city of Beloit was not required to obtain such a certificate to build an electric plant to supply street lights and public buildings, he was overruled by the Supreme Court of Wisconsin. See *Wisconsin Power & Light Co. v. Beloit*, 215 Wis. 439, 3 P.U.R. (N.S.) 113 (1934).

one of the objects for which the Federal Emergency Administration of Public Works has lent its funds has been for construction of municipally owned electric plants. Since many of these loans were made to communities already served by adequate private facilities, inevitably the validity of such action by a federal agency would be challenged. This question was raised and answered in the case of *Alabama Power Co. v. Ickes.*[1] There the main argument of the power company was that it would suffer a loss of business to a competing public plant, that the act of making a loan by a federal agency was illegal. The Court declined to accept either of these points as a basis for enjoining federal loans to be used to construct publicly owned electric plants. Such injury as may occur is not the kind against which a company can invoke the protection of the court. It is, to use a legal phrase, "a clear case of damnum absque injuria."[2] Under the laws of the state of the city of this litigation, there was a lawful right to engage in competition with the Alabama Power Company, "since it had been given no exclusive franchise." The company tried to make a special case out of competition financed by a federal agency, but it failed to convince the Court. We conclude, as we did above, that in the absence of exclusive franchises there is no judicial barrier to public ownership and operation of utilities even though the result is the most ruthless kind of competition.

HISTORY OF PUBLIC OWNERSHIP

The history of public ownership in the United States is almost as old as the utility industries themselves. Except for early state enterprises and the present federal developments, it has been one of municipal ownership. Thus, the movement grew up alongside the policy of private ownership and, except for one utility, has played a not too important part in utility development.

Water.—The oldest of the utilities, water, has the largest amount of public ownership, although this has not always been the case. The first American waterworks—built in Boston in 1652—was privately owned. It was not until the Philadelphia plant was opened in 1798 that the first successful municipal waterworks was established. The figures of the growth of waterworks and their ownership are shown in the following table. Several conclusions seem to follow from them. First, the importance of municipal ownership has grown from a minor to a major place. Second, municipal ownership predominates in

[1] 302 U.S. 464, 21 P.U.R. (N.S.) 289 (1938). See also *Duke Power Co. v. Greenwood County*, 302 U.S. 485, 21 P.U.R. (N.S.) 298 (1938).

[2] 21 P.U.R. (N.S.) at 294.

cities both large and small. In fact, of the thirty-six largest American cities, only one—Indianapolis—is exclusively served by a privately owned plant. Four other large cities have a mixture of private and municipal waterworks systems. They are San Francisco, New Haven, Denver, and Birmingham.

TABLE 61.—WATERWORKS OWNERSHIP*

Year	Number	Number municipally owned	Municipally owned, per cent
1800	16	1	6.3
1850	83	33	39.7
1890	1,878	803	43.0
1896	3,179	1,690	53 2
1915	4,440	3,045	68.6
1920	204†	155	76.0

* Statistics on waterworks are difficult to find. This table is a composite of figures given by Baker, *Municipal Ownership of Water Works*, American Economics Association, p. 56, 1892, and Dewey, "Municipal Ownership of Water Utilities," *Public Utilities Fortnightly*, 9:634, May 26, 1932. All figures except those for 1890 are from Dewey's article.

† Cities over 30,000 population.

There are several reasons for this predominance of the public plant in water supply. The early private development occurred largely in those cities in which the need and the profit were most apparent. The later growth of the municipal plant occurred in the smaller cities, towns, and villages and was, of necessity, municipal because of the probable unprofitableness of the enterprise. In the meantime, many of the plants in the larger places were acquired by condemnation. In the second place, there is a close relation between water supply and the admitted governmental functions of health and fire protection. Since certain minimum standards of water purity, quantity, and pressure must be enforced to safeguard health and combat fire hazards, it was an easy transition to the municipal ownership of waterworks. In the third place, their equipment and operating techniques are, relative to the other utilities, simple and standardized. The notorious weaknesses of low salaries and political tampering are the least damaging in the waterworks. Almost any employee could learn his job well enough to render reasonably adequate service. Fourth, and very significant, is the almost complete lack of risk in the industry. It is impossible to imagine the time when cities will dispense with their water supply systems. Finally, the area of operation logically coincides with municipal boundaries. Therefore, this is one industry that is dominated by municipal ownership and will so con-

tinue until finally practically 100 per cent of it will be so owned. Even the most ardent defenders of private ownership usually concede the merits of public ownership of the facilities of water supply.

Communications and Gas.—In neither the communications nor the gas utilities has there been any significant amount of government ownership. In fact, with one or two exceptions, there has seldom been important agitation for such. Of course, some persons advocate, for instance, the public operation of telephone and telegraph companies. At one time, between 1912 and 1920, there was more than casual debate on this point. With the nationalization of telephone

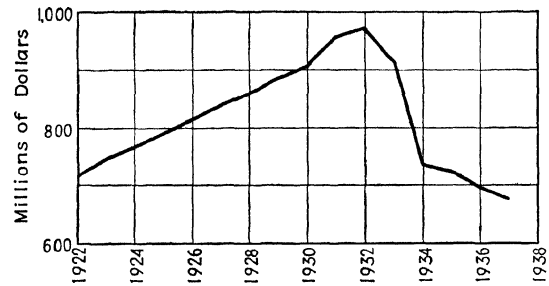

CHART 30.—Changing investment in privately owned waterworks. Could the rapid decline after 1932 be explained by the advantages that a publicly owned plant had in securing federal financial assistance? (*Conference Board Studies in Enterprise and Social Progress*, p. 60.)

service in Great Britian on January 1, 1912, interest in a similar transfer grew in the United States. Certain congressmen and the postmaster general urged that program. Although nothing came of these proposals, there was the wartime experience of government operation of communications. This experiment seemed to be sufficient to still the demands for public ownership; because after the return of the companies to their owners on July 31, 1919, all agitation disappeared. It is almost too obvious to need stating, but of course any program of conversion of ownership of communication industries could be only on a national basis. To consider state or local ownership is unthinkable.

Gas plants, likewise, have not been publicly owned except in rare instances. In Massachusetts,[1] for instance, there are four municipal gas plants, and a like number in Iowa. Omaha, Nebraska,

[1] "Municipal ownership is of far less importance in the gas than in the electric business. There are [in Massachusetts] only four municipal gas plants, doing 2.1 per cent of the business. They are all operated in conjunction with municipal electric plants." Massachusetts *Report on Control and Conduct of Public Utilities*, p. 23, 1930.

and Memphis, Tennessee, are the only American cities with a population in excess of 100,000 operating municipal gas plants.[1] According to the *Municipal Yearbook* of 1937, of the 935 American cities exceeding 10,000, only 31 of them owned their gas plants, and 4 of them owned gas distribution facilities. Together, these thirty-five establishments accounted for only 4 per cent of the plants in places over 10,000.[2]

Urban Transportation.—The amount of municipal ownership in the street or urban transportation business is negligible, although in its heyday it was the center of a most bitter debate over the merits of public ownership. In those days, the financial manipulation and political alliances of the "traction barons" made the street-car companies the target of every reformer. For one who knows the history of this utility only since the first World War, the period of conflict between 1900 and 1920 over its ownership is almost too fantastic to be believed. The net results of this agitation were the municipalization of street railways in such places as San Francisco, Detroit, and Seattle. Public ownership, however, never accounted for more than a fraction of the total mileage of lines, as is shown in Table 62. More tangible results of these periodic squabbles are found in a multiplicity of franchise limitations, an unsympathetic or even hostile public, and crippled and insufficient service.

The movement for public ownership of street car lines has almost disappeared since 1920. Since that time, the lines have been caught between rising costs on the one side and declining revenues on the other; no matter what fare schedule has been charged, their net revenues have steadily declined. The automobile has robbed the street railway of its original monopoly, until it is now a question if towns under 100,000 inhabitants can support any type of adequate

[1] Philadelphia owns its gas plant but leases it to the United Gas Improvement Company for operation.

[2] Reported in the *Public Utilities Fortnightly*, **20**:293, Sept. 2, 1937. Because of the publicity given to the Public Works Administration assistance in the construction of municipal electric properties, its aid to municipal gas plants has been generally overlooked. In the years from its creation to March 1, 1939, the Public Works Administration has allotted $2,358,442 to thirty-three municipal gas projects having an estimated total cost of $3,401,398. The breakdown of these figures is: Twelve allotments of $771,009 for generating or generating and distributing facilities; fourteen allotments of $1,045,556 for distributing facilities only; seven allotments of $541,877 for extensions to existing facilities. In the face of allotments of over $200,000,000 in the same period to nonfederal public power projects, the amounts allotted to gas developments have been slight. For further detail, see "Allotments for Non-federal Electric Power Projects," a *Report* of the Projects and Statistical Division of the Public Works Administration of the Federal Works Agency.

urban common carrier facilities. Whatever "swollen profits" there may have been in the past are now gone; and if any future public action is taken, it will probably be to subsidize the street transportation companies.

Electricity.—The electrical utility, for good reasons, has been placed last in this history of public ownership. First, the municipal ownership of electric plants is as old as the industry itself. The first commercial generating station was built in 1882, and this same

TABLE 62.—COMPARATIVE STATISTICS OF MUNICIPALLY OWNED AND PRIVATELY OWNED ELECTRIC RAILWAYS*†

Item	1922	1927	1932
Operating companies:			
Municipal‡	17	21	17
Private	858	682	485
Miles main track:			
Municipal	733	863	896
Private	40,364	37,027	28,356
Number of passenger cars:			
Municipal	2,358	2,567	3,216
Private	77,301	70,309	59,692
Revenue passengers (000 omitted):			
Municipal	485,485	626,746	413,966
Private	12,666,557	12,174,592	7,955,980
Operating revenues (000 omitted):			
Municipal	$ 23,244	$ 33,956	$ 19,482
Private	$1,016,719	$927,773	$566,748

* Census of Electrical Industries: 1932, Electric Railways and Motor-Bus Operations of Affiliates and Successors.

† Since the 1937 Census of Electrical Industries fails to segregate the municipally owned electric railway, no comparative figures are available for that year.

‡ The 1922 and 1927 figures include the state-owned system of North Dakota.

year saw the birth of four municipal plants. Second, next to waterworks, the public ownership movement has had a significant place in this utility. Finally, it has become the center of a revival of the movement, a revival of such potential magnitude as possibly to change the entire status of its ownership. In the years since 1922, the investment in this utility has increased at an average annual rate of ½ billion dollars. During this same period, revenues have exceeded 2 billions of dollars a year. In fact, for the 7 years 1932 through 1938, operating revenues have totaled 13 billion dollars. No other utility and scarcely another business of any kind has had such a record of growth. It is small wonder, therefore, that with the depression of 1929 there emerged an ever growing suspicion and opposition to the

"power trust" which has resulted in a major revival of public interest in municipal or public ownership.

Beginning with 1882, the numbers of private and public electric plants have grown together, with the former type of ownership predominating. In terms of numbers of plants municipally owned, the 500 mark was reached in 1898; the 1,000 mark was passed in 1904; the 2,000 mark was passed in 1914; and the peak (in terms of numbers) was reached in 1923, when 3,066 municipal plants were in existence on December 31 of that year. Each year thereafter saw a progressive decline in the number of municipal plants, until in 1932 the figure stood at 1,802. This decline after 1923 was the result of a very large number of sales of public plants to private companies and a sharp decrease in the numbers of new public establishments. After 1930, however, the numbers of new establishments began to increase, and conversions of municipal plants to decline; so that since 1932, the total number of such plants has been increasing. At the end of 1937, there were 3,200 electric plants in the United States, 1,860 of them publicly owned.

These figures include both types of municipal plants, namely, the generating and distributing system and the distributing system only. The latter type buys its power supply wholesale, often from a near-by private system. Before 1926, over half these municipal establishments were of the former type. After that date, the majority swings to the other side, over half of these plants buying their power. In 1930 and 1937, the figures were

TABLE 63.—MUNICIPALLY OWNED ELECTRIC PLANTS
(Classified according to source of energy)

Classification	Number of establishments	
	1930	1937
Generating all	835	885
Generating part	96	
Generating none	1,006	975
Total plants	1,937	1,860

The movement of public ownership has corresponded roughly to the growth of the entire industry from East to West. The East North Central group of states led in the building of plants from 1882 to 1907. The lead then shifted to the West North Central group where it has remained ever since. No part of the country, however, has been exempt from municipal development, although in terms of numbers

the states bounded by Pittsburgh on the East, Denver on the West, and the cotton belt on the South have led the rest. In this area is

TABLE 64.—LEADING STATES IN NUMBER OF MUNICIPAL ELECTRIC PLANTS, 1927 AND 1937

State	Number	
	1927	1937
Nebraska	267	170
Kansas	241	141
Iowa	156	138
Minnesota	155	124
Ohio	119	121

to be found over a third of them. Measurement in numbers of establishments, however, does not tell the entire story. In the Pacific states of Washington, Oregon, and California are to be found only fifty-two municipal plants; yet when they are measured in terms of installed generating capacity, they are first, with over one-third of the total for public plants. In a real sense, therefore, although numerically the states of the upper Mississippi River Valley are first, the most significant group of states in the public ownership movement are those on the Pacific. Their operations, plus those of the federal power projects, will furnish the best tests of the merits of the private versus public ownership controversy.

Causes of the Decline of the Public Plant.—The history of municipal power plants shows that many of the earlier ones were built either in areas beyond the pale of private development or else in areas too small and poor to be penetrated by private capital. Before 1910, every town was an isolated area; after 1910, interconnection rapidly widened the scope of private operations to include these previously isolated municipal ownership areas. This new movement caused many of the municipal establishments to be sold, so that "A great preponderance of the municipal establishments changing to private ownership since 1914 are located on transmission lines."[1] Furthermore, between the creation of these plants and their absorption by a private system, the technological strides in electricity production had left many of them with extremely antiquated equipment. In fact, in the smaller areas of less than 1,500 people, the best of new

[1] RAVER, *Recent Technological Changes and the Municipally Operated Power Plant*, p. 7.

machinery in terms of kilowatt-hour costs could not compete with the high-line service of private systems. Therefore, a municipality had but two real choices—to sell out to a private system or to junk its generating equipment, retaining its distribution lines and facilities and buying energy from a near-by private system. All possibility of municipal plant interconnection was at that time out of the question. Larger places, although denied the advantages of interconnection, by keeping abreast of technological change were able to meet the competition of private utilities because of the economies of their installations and local diversities in their demand.

Another cause of the decline of municipal ownership in the electric light and power industry had been the failure of many plants in even the larger cities to keep abreast of technological development. Such failure meant higher rates and poorer service or else tax subsidies, so that, when approached by private companies, the citizens were often only too glad to be rid of an antiquated white elephant. Couple this with the bitter race during the 1920's among holding company systems for enlarged territories and their resulting unconscionable bidding for municipal establishments, and the picture is complete. Bribes and political manipulations were too often used. In spite of these factors, a private company could often pay an excessive price for an obsolete power plant; junk it after acquisition; serve a community from an adjoining high line; and, in spite of the cost of all this, give better service at lower rates and still earn a liberal return upon the purchase price plus the cost of new installations. Even so, any community accepting too high a price for its municipal plant really penalized itself, because a fair plant price would have justified still lower rates.

Lastly, the number of establishments declined because of the limitations that law had placed on municipal enterprise. Municipal plants were usually confined to their municipal limits and were not allowed either to connect with other municipal establishments or to serve adjacent municipalities. Only by legislative sanctions could such extraterritorial business be done. Thus, in so far as legislatures failed to permit this extraterritorial expansion, they condemned to an impossible competition with private companies those municipal generating establishments located in places below the "subsistence level."[1] Such places were obliged either to discontinue generation and buy their power wholesale or else to quit altogether. For those places above this subsistence level, the situation was made more

[1] Term used by Raver, *op. cit.*

difficult than it otherwise would have been, because their plants were denied the obvious economies practiced by private systems through interconnection and a widened market. In so far as this legal barrier can or should be removed, it will be considered below.

Of course, figures on numbers of municipal establishments are not solely conclusive. A complete analysis should include kilowatt installations, types of prime movers, revenues, output, and quality of service. A lack of complete data and the lack of space forbid further extended consideration. In capacity, the municipal plant has accounted for not more than 10 per cent of the American total of all types of electric plants. Though losing ground in numbers of plants since the peak year of 1923, the municipally owned capacity has continued to grow. In the 1930's, public establishments accounted for less than half of all plants and sold approximately 5 per cent of the American electric output. By whatever index the municipal establishment is measured, although small, it is not insignificant.

TABLE 65.—COMPARATIVE STATISTICS OF PRIVATELY OWNED AND MUNICIPALLY OWNED ELECTRIC UTILITIES, 1937*

Item	Privately owned utilities	Publicly owned utilities
Total number of establishments	1,340	1,860
Reporting generating equipment	847	925
Kilowatt capacity of generators	32,192,918	2,499,347
Number of generating stations	2,916	963
Kilowatt-hours generated (000 omitted)	109,919,649	5,253,821
Per cent of generation	95.4	4 6
Total customers served	24,432,724	2,656,958
Residential customers	19,365,677	2,174,752
Revenue per kilowatt-hour, cents	2.1	2.6
Revenue per kw.-h., residential customers, cents	4.4	3.8
Total utility plant assets (000 omitted)	$14,048,706	$794,308
Electric plant (000 omitted)	$11,936,205	$701,671
Operating revenus (000 omitted)	$ 2,207,109	$154,976

* Census of Electrical Industries: 1937, Electric Light and Power Industry.

DEVELOPMENTS SINCE 1933

The combination of the depression of 1929 and the Roosevelt administration has served to revive interest in the public ownership of electric light and power plants. In addition to the public projects under federal supervision (discussed in the following two chapters), the more important of the new developments since 1933 are: financing by

means of revenue bonds, financial assistance by the Emergency Administration of Public Works, and the public power district. We discuss these in detail in the following paragraphs.

The Revenue Bond.—Traditionally, our cities and towns have embarked upon the ownership and operation of utilities by means of the issuance of the usual municipal bond, an obligation resting upon taxable property and limited in amount to a stated percentage of that property. As a result, the desire of any municipality to switch from private to public ownership of one of its utilities, if all other obstacles were removed, was distinctly conditioned by its existing total debt structure and its relation to the maximum debt allowed by state constitutional provisions. As a matter of fact, extensive programs of improvements had resulted in the bulk of our cities' being bonded up to their debt limits, thereby closing tightly the door to further debt extension even though it were for the purpose of acquiring a commercial enterprise.[1] As an escape, the legislatures of about half the states have made it possible for cities, in their proprietary capacity, to issue revenue bonds for the purchase of a utility plant, pledging only the plant itself and its future earnings. In no way can these obligations become liens upon the taxable property of their communities.

Such a legal innovation was, of course, challenged on technical and constitutional grounds, but it has generally survived both these attacks.[2] Clearly, it does permit the city to do what the old debt limitation may have prevented, but it has real merit. In the event of the failure of the project, citizens as taxpayers will not be forced to pay the bill. As in the case of a bankrupt private corporation, only the assets of which can be used to pay its creditors; so in the case of a failing municipal utility, only the plant and system are involved. Furthermore, if one does not wish to patronize the municipal plant, he makes no contribution to it or its debt retirement; whereas if the plant had been built by the issuance of general municipal obligations, he might find himself taxed to retire its bonds or make up a deficit whether he liked it or not and regardless of his use of its service. The principle of the revenue bond is sound enough to suggest that in the future all

[1] For instance, a common debt maximum has been 5 per cent of assessed value of property. Thus, a city with assessed property values of $100,000,000 would have a debt limit of $5,000,000. With declining property values, many cities find themselves with a debt burden in excess of constitutional limits. Obviously, it will be years before they could be in position again to issue legally general obligation bonds in any significant quantities.

[2] See "The Simmer Law and Municipal Ownership of Electric Utilities in Iowa," 20 *Iowa Law Review* 493.

moneys needed in the exercise of the proprietary powers of government should be so raised, reserving the general tax-secured city obligation for the financing of strictly governmental functions.[1]

Loans and Grants by the Federal Government.—As a part of the Roosevelt program to curb the "power trust" and to speed the reemployment of those suffering from the depression of 1929, there were created by Congress in its special session in 1933, first, the Tennessee Valley Authority and, second, the Public Works Administration.[2] The first of these projects we reserve for discussion in a later chapter. The Public Works Administration and its policies does concern us, because it has contributed directly to a revival of the public ownership movement. It has had as its main purpose the financing of public works in order to relieve unemployment and, at the same time, to construct needed public improvements. The many projects approved have ranged from the construction of schools in out-of-the-way places to the building of enormous water power facilities. What primarily concerns us here is the manner in which the municipalities of the United States have been encouraged to apply for loans and grants of federal funds with which to build electricity generation and distribution systems, with utter disregard for the quality of service or the reasonableness of the rates of existing private companies. Because the purpose of the Public Works Administration has been to stimulate employment, grants during the early years were not ordinarily made to cities for the purchase of existing facilities.

As a consequence, we have witnessed the spectacle of the creation of employment by the destruction of existing wealth. Of course, in isolated instances, one may condone the result; but as a general policy, it has doubtful merit. Over 14 billions of dollars is invested in the electrical utility; and that policy, if carried to its logical conclusion, would destroy this under the guise of making employment. Nothing could be more wasteful socially than to destroy wealth to create wealth. If public ownership is a desirable objective, little will be lost and much may be gained by the public purchase of existing privately owned physical equipment. Whatever else may be the shortcomings of the leaders of private enterprise, they cannot be

[1] For a critical view of the soundness of the revenue bond as an investment, see McDiarmid, "Buying Municipal Revenue Bonds," *Barron's*, July 10, 1939, abstracted in *Public Utilities Fortnightly*, **24**:167, Aug. 3, 1939.

[2] When created, this agency was officially known as the "Federal Emergency Administration of Public Works." By presidential order, in 1939, it was made a division of the Federal Works Agency and christened officially Public Works Administration.

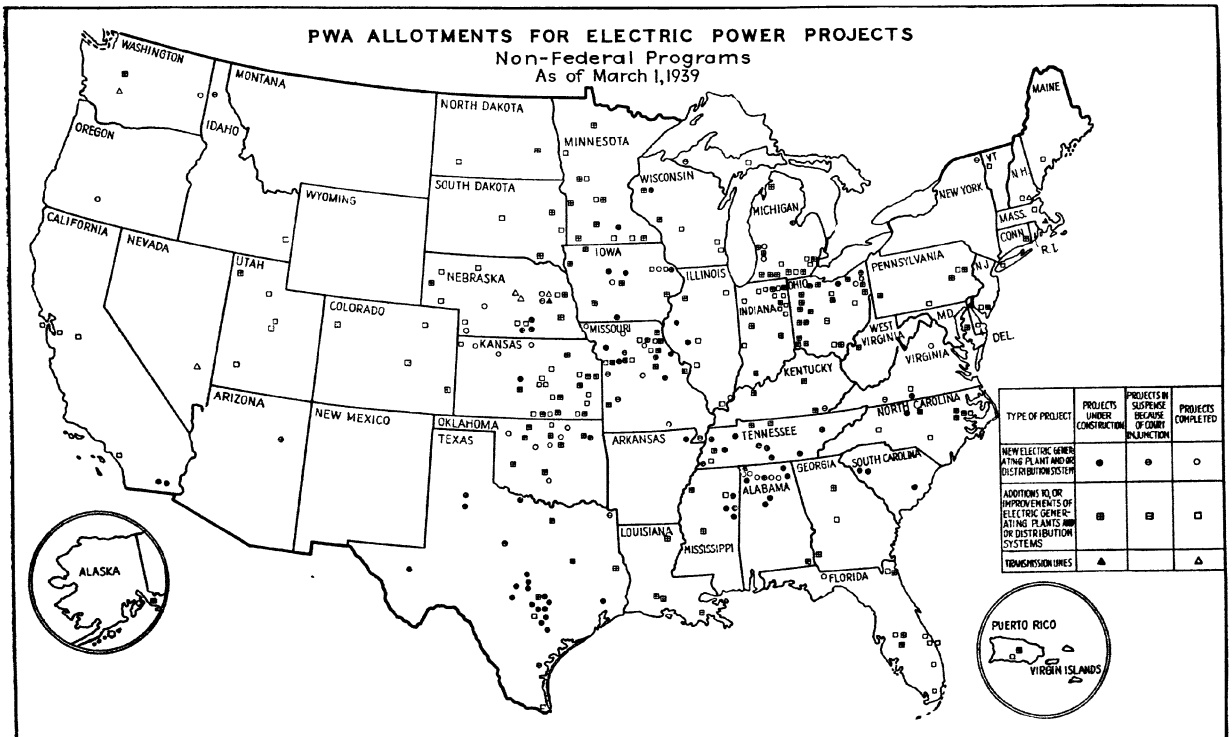

CHART 31.—(*Reproduced from Allotments for Non-federal Electric Power Projects, a Report of the Public Works Administration.*)

accused of having anything less than the best of equipment and anything less than the finest of operating results.[1]

Since its organization in 1933, the Public Works Administration has had a decided influence upon the public ownership of electrical utilities. According to a report as of March 1, 1939, it had allotted[2]

> . . . $204,766,665 to 339 non-federal electric power projects estimated to cost $249,000,111. These amounts include only the power part of multiple-purpose projects, with the exception of six large projects for which the separation of cost by type of construction is impracticable. The allotments for these six projects total $115,589,600 . . .

The breakdown of these 339 allotments shows that 118 of them provide for new construction and 212 of them for extensions to existing systems. This report fails to state the number of these projects which are competitive in nature; but another study of 477 such nonfederal power projects shows an even hundred of them to be in competition with previously existing private electric facilities; and of this number, 46 are located in the areas of the Tennessee Valley Authority and the Lower Colorado River Authority.[3]

The report of March 1, 1939, has other interesting data. These projects have a capacity of 833,797 kilowatts, two-thirds of which is represented by hydroelectric plants. To finance these, the Public Works Administration has agreed to accept on sixty-eight projects $105,171,640 par value of revenue bonds and on nineteen projects $1,980,900 of general obligation bonds. Thus has the new instrument of utility finance—the revenue bond—played an important part in the revived development of public ownership of electric facilities.

The Public Power District.—Just as the revenue bond and its acceptance by the Public Works Administration broke the traditional financial restriction to public ownership, so the public power district released that movement from the confines of municipal corporate limits. In other words, both these devices were the legal recognition of the changed financial and technical organization in electricity production. Although many may bemoan these innovations, there certainly can be no fundamental objection to the release of the isolated

[1] Glaeser, after careful study of the Los Angeles Bureau of Power and Light, says, "There exists at present a movement to foster municipal or government competition. I am not convinced that this represents the best public policy." *Journal of Land and Public Utility Economics*, **9**:227, August, 1933.

[2] "Allotments for Non-federal Electric Power Projected," a *Report* of the Projects and Statistics Division of the Public Works Administration of the Federal Works Agency.

[3] Cited by Kellogg, *Electrical World*, **111**:1753, June 10, 1939.

publicly owned public utility from its legal confinement to corporate limits. The privately owned companies burst these boundaries after 1910; therefore, the emancipation of the public plants was an inevitable step. The marvel is that it was so long delayed.

The emancipation of the isolated (city-confined) public establishment was first begun by special legislation permitting interconnections and completed with the creation of public power districts. Certain district experiments (such as that in Crisp County, Georgia) had been in existence for some years, but the significant start was made in 1931 when the legislatures of Washington, Oregon, and Wisconsin made it possible for groups of public plants to band together into power districts. By this legislation were these establishments permitted to secure for themselves the advantages of interconnection and load integration.

"Nebraska's Little T.V.A."—Since 1931, under the impetus of Public Works Administration assistance and the federal program of hydropower development, many states have passed public power district laws, and many districts have been created. Because of its prominence, we illustrate this development by describing the power districts in Nebraska, called collectively the "Little T.V.A." because of Senator Norris' interest in them. In 1933, in that state was passed by a referendum vote a power and irrigation district law; and under it, three major districts have been organized stretching along the Platte and Loup rivers in the center of that state (See Chart 32).[1] Their official and unofficial names are

Platte Valley Public Power and Irrigation District (the Sutherland project).
Central Nebraska Public Power and Irrigation District (the Tri-County project).
Loup River Public Power District (the Columbus project).

The first two of these use the waters of the North and South Platte rivers for the combined purposes of irrigation and power production, but the Loup river district is a power project only.[2] Considered as a group, they represent an investment of over $55,000,000, supplied by the Public Works Administration as follows:

Loans	$34,678,000
Grants	20,713,000

[1] Many districts have been organized in Nebraska. We confine our attention to the three which produce almost all the electricity of these districts.

[2] Together those two districts irrigate approximately 400,000 acres. Were it not for a State Supreme Court decision restricting the use of water for irrigation to lands within the water shed of that water, more acres could be irrigated. See *Osterman v. Central Nebraska Public Power and Irrigation Dist.*, 131 Nebr. 356.

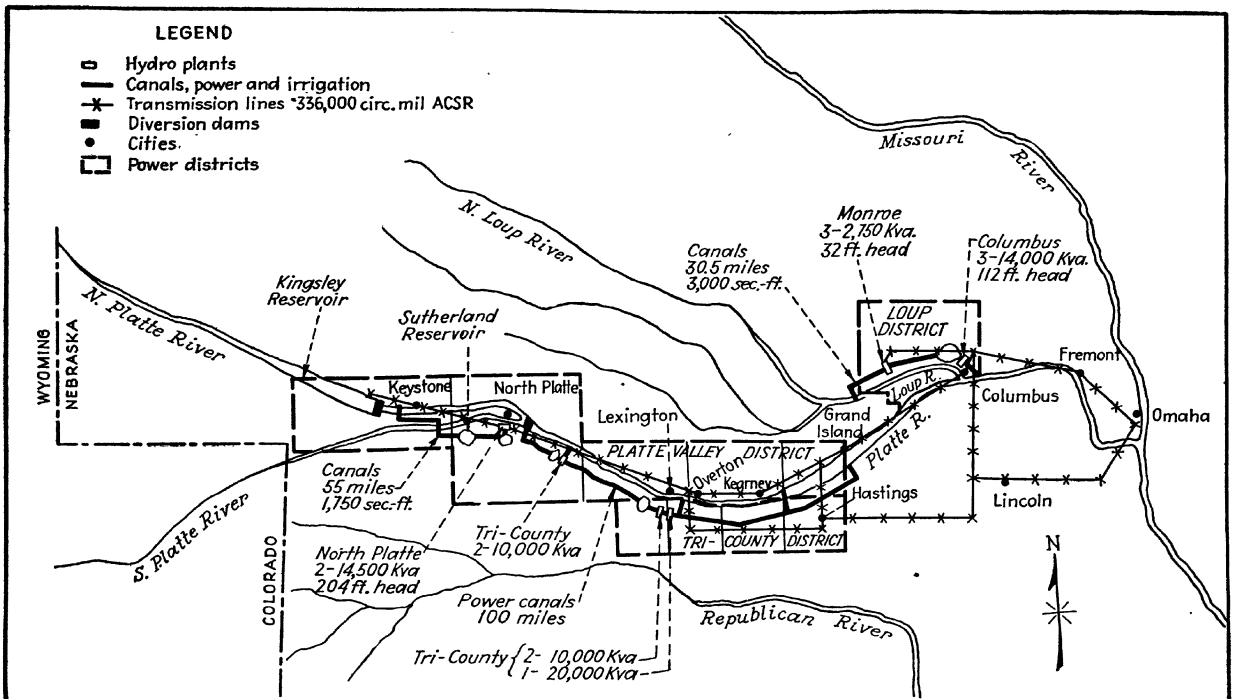

CHART 32.—A map of Nebraska's Little T.V.A. The boundary between the Platte Valley and Tri-County districts may be difficult to see. The latter is entirely to the south of the Platte River. The Platte Valley District stretches from Grand Island to the west jog in the Nebraska line. (*Adapted from Electrical World*, **112**:1601, *Dec.* 2, 1939.)

The loans are to be repaid in 33 years beginning in 1942, at 4 per cent interest. This investment will give an ultimate installed capacity of 237,600 horsepower and will make available approximately 500,000,000 kilowatt-hours of firm power per year (see Table 66).

These projects have been criticized on several points. In the first place, hydroelectric developments in Nebraska are complicated by such natural hazards as irregular water flow, siltation, seepage, and land slides. There, projects have had all those to contend with. Second, irrigation developments in Wyoming on the North Platte when complete may materially curtail the water flow in Nebraska. Finally, these projects cover areas of slight electricity consumption. Of Nebraska's power production, 80 per cent is used to the east of these districts. Since their combined facilities when completed will be able to produce from 70 to 100 per cent of the state's present production, it is imperative that markets be developed.

A further criticism relates to the lack of state control of these projects. In the 1933 law, no provision was made for cooperation among projects; and in 1937, the State Railway Commission was specifically denied all authority over "rates, tolls, rents and charges of districts. . . . " In fact, considerable difficulty was occasioned because of the failure of these three districts to be integrated. Fortunately, the interest of the Public Works Administration made it possible for it to force interdistrict cooperation. The districts have since been united for sales, servicing, and collections. Finally, at one time there were a few municipal plants lying within these districts which had no desire to trade their locally produced power supply for the uncertain future of dependence upon these new agencies. We conclude, therefore, that the merits of the Little T.V.A. of Nebraska are difficult to delineate.

As was suggested above, the prime problem of these power districts is one of securing profitable markets, either within their borders or on the outside. Because of the population concentration on the eastern edge of Nebraska, there lies the best actual power market, and it is with the private companies in that section that the first wholesale contracts have been executed. The Nebraska Power Company has signed a 5-year "peace pact" with the Loup river district whereby it will take after 1942 over half the latter's output. Similarly, the Iowa-Nebraska Power and Light Company has agreed to purchase a significant fraction of the output of the Tri-County district.[1] It would appear, then, that Nebraska's Little T.V.A. may have surmounted

[1] See reports in *Electrical World*, **112**:1038, Oct. 7, 1939; 1098, Oct. 14, 1939; and 1457, Nov. 18, 1939.

temporarily at least a portion of its power marketing problem. The ultimate solution, however, may be the integration of all electricity supply facilities in the eastern two-thirds of Nebraska into a close-knit public power system.[1]

TABLE 66.—NEBRASKA'S LITTLE T.V.A.*
(Cost, capacity, power production)

	Central Nebraska	Loup River	Platte Valley	Total, three districts
Estimated cost	$33,000,000	$11,000,000	$11,000,000	$55,000,000
Initial installed capacity, hp.	77,000	63,600	36,000	176,600
Ultimate installed capacity, hp.	102,000	63,600	72,000	237,600
Estimated annual power production, kw.-h.	353,368,000	184,550,000	193,431,000	731,349,000
Estimated annual firm power, kw.-h.	.....	.....	.....	500,000,000

* From information supplied by the Denver Regional Office of the Federal Power Commission. According to another source of information, the annual output after 1943 will be 731,000,000 kilowatt-hours.

Accomplishments since 1933.—The combination of a new instrument of finance, the public power district, and a new source of finance from the federal government would inevitably give impetus to the public ownership movement. As shown above, the Public Works Administration has advanced several millions to several hundred projects. This agency has also been the moving spirit in the developments in Nebraska and in Texas, the latter known as the "Lower Colorado River Authority." In almost every state, there were bound to be clashes over public ownership. During the years since 1933, hundreds of elections were fought in cities and towns ranging from

[1] Since making this suggestion, it has in part been accomplished. The Consumers Public Power District has bought the electrical properties of seven private companies, making it a "public holding company" with assets of approximately 12 million dollars. The seventh of these, acquired in January, 1941, added facilities serving 41 towns at retail and 11 at wholesale and cost $5,775,000. To purchase that system, 30-year revenue bonds bearing interest ranging up to 3 per cent were sold. These properties are to be served eventually from Nebraska's Little T.V.A. (described on pages 615 to 618). The only important private electric companies remaining in the state are those serving Omaha, Lincoln, and Scottsbluff.

For further analysis, see Kennedy, "The Nebraska Public Power Districts," *Journal of Land and Public Utility Economics*, **15**:29, February, 1939; and Morrow, "A Look at 'Little T.V.A.'," *Electrical World*, **112**:1601, Dec. 2, 1939. See especially, also, McNeill and Jones, *Nebraska's Electric Power Development in Relation to Municipal Service*, University of Nebraska Studies in Business No. 44.

small hamlets to cities the size of St. Paul, Cincinnati, Salt Lake City, Birmingham (Alabama), Memphis, and Knoxville (Tennessee). Figures for the years 1933 through 1937 show 453 municipal plant and franchise elections. The municipal forces won 251 of them.

Another study for the 6-year period 1934–1939 shows 561 municipal elections fought over a public plant. In these years, 561 elections were held, with 306 of them favorable. Analyzed by years, for each year except 1938, the same number were won as lost. In 1938, 106 were favorable to public ownership; 66, unfavorable. It is significant, however, that 52 of those 106 elections occurred in Tennessee and Texas, states with active public power projects.[1] From these figures, one might conclude that the public ownership movement was more often successful than not. Yet, viewed from other angles, this conclusion may be questioned. In the first place, favorable elections represented a population of 2,059,371, whereas unfavorable elections represented a population of 6,985,798. In the second place, as these figures suggest, the private advocates have usually won in elections in places over 10,000 people.[2] Since 1938, it does seem that, except as federal aid is involved, the intense drive to "municipalize" privately owned electric facilities has waned. One fact cannot be denied: Since 1932, the number of municipal establishments rose from 1802 in that year to 1860 in 1937 to 2102 in 1939.

THE CASE AGAINST PUBLIC OWNERSHIP

In the usual debate over the relative merits of public ownership, more heat than light is ordinarily generated. Extravagant claims are made by both sides of the controversy; passion and prejudice are often inflamed to the point where fundamentals are entirely forgotten. The opposition is painted in the blackest hues, accused of being racketeers in contrast with the simon-pure defenders of the "right" side. In short, under the usual forms of thought on this subject, the advocate of either side assumes his opponent to be moved by the basest of motives. There is no denying that selfish motives do play a part in the discussion over public ownership. Management of private enterprise never welcomes the possibility of losing a lucrative establishment such as an electric plant, nor will a salesman of electrical equipment and machinery let any stone remain unturned in his efforts to create a municipal

[1] "Municipal Utility Ownership Elections, 1934–1939," *Public Utilities Fortnightly*, **25**:294, Feb. 29, 1940. See also in the same magazine: **20**:300, Sept. 2, 1937; **20**:775, Dec. 9, 1937; and **24**:339, 424, Sept. 14 and 28, 1939.

[2] The major exceptions to this generality are the large cities of Tennessee. In areas beyond the pale of the federal power projects, this proposition is ordinarily valid.

market for his product. In this problem of public ownership, the interplay of personal and selfish forces must be recognized and reckoned with, but there are fundamentals to be considered that go far beyond these narrower factors. It is upon higher grounds that the case should and must turn; and on these grounds, the sincerity of these respective sides should be accepted without question.

Efficiency of Service.—Since most of the arguments are directed against public ownership, let us consider that side first. The public plant is charged as being inefficient, as subject to the baneful influence of politics and political corruption, and as being a first step to socialism or, worse yet, communism. First, is inefficiency a major characteristic of the municipal plant? If it is, there will result higher rates or poorer service or both. The answer is "Not necessarily," although the odds may be against as efficient operation of the public as of the private establishment. There is an unfortunate tendency under democratic government to assume that any citizen is qualified to perform public business and at a salary none too high. Thus, the possibility of short tenure of office coupled with low reward often does result in less efficient or more costly service. Another cause of inefficiency of municipal operations as compared with private operations arises out of the greater rigidity of public ownership. To make major changes of equipment or major plant improvements, sometimes requires popular sanction, an expensive and time-consuming process. Taken by and large, however, there is nothing basic in any of these causes of inefficiency, and continued experimentation with the machinery of government operation may eliminate them.

Political Interference and Corruption.—Next, what is the extent of political interference and political corruption? The opposition has phrased the charge in these words: "The baleful influence of political patronage and favoritism forever dog [*sic*] the footsteps of the managements of political undertakings."[1] This charge is not subject to quantitative measurement, only specific instance. One need not search long or far to find examples of interference and corruption. For general evidence, the spoils system in politics furnishes more than enough. Thus, on the basis of this evidence, the public plant stands convicted of the charge of being open to political graft and corruption. The utility may easily become the football of politics, changing its management with every change of the wheel of politics and awarding its jobs to the politically deserving followers. Designing men may

[1] *Gov't (Political) Ownership and Operation of the Electric Light and Power Industry*, National Electric Light Association publication, p. 34.

capture control, vote themselves lucrative contracts, and generally paralyze the service.

But political interference and graft are only subspecies of the larger problem of interference and graft. No organization, no business, private or public, is free of its influence. The downfall of the Foshay and other systems has exposed all too much of these forces in the private utilities. It was not uncommon for utility officers to be interested in equipment companies and accessory houses, thereby selling materials and supplies to the utility and at handsome figures. Pull and interference are found in private business as well as in public affairs. When all other explanations of the presence of certain employees on a pay-roll fail, examine the list of large stockholders and their relatives, and politicians. The most sinister alliances in city politics have too often been financed by the local utilities. Stuart Chase has concluded that the graft in public affairs is insignificant compared to the graft in private enterprise. As a member of a Middle Western state tax commission has so aptly said, behind one crooked politician are to be found at least three crooked businessmen who finance him solely for their own selfish schemes.

We conclude, therefore, that the possibility of graft, incompetence, and interference exists everywhere around us; it is not confined to public affairs. These evils can be met only through a high personal sense of social responsibility and a vigilant citizenry.

Communism.—Lastly, is municipal ownership merely a first step to socialism or communism? Does it violate the American tradition of the proper sphere of government activity? Was the late President Coolidge correct when he said, " . . . the alternative to private ownership and control is public ownership and control, which, broadly extended, is communism"? Notice that two assumptions are involved. First, socialism or communism is something undesirable; second, municipal ownership is this undesirable thing. Of course, these are two different propositions, and they do not necessarily follow each other. Socialism may not be bad but good, and public ownership may not be socialism. Furthermore, there is no fixed line of demarcation between the proper and improper spheres of government activity. This line is, in reality, a zone or border area whose position is constantly shifting. There is, therefore, between these spheres no traditional boundary that need bother us in this problem. To answer the question propounded above, it is immaterial whether or not public ownership is a first step toward a new economic and political state. It can just as easily be a feature of the present

economic order. Any industry "vested with a public interest," as are utilities, performs a public function and therefore might as well be owned by public authority. Nothing in our present economic and political philosophy is violated by this conclusion. In short, to condemn dogmatically public ownership as a first step to a radically different economic order is to fail to realize the elementary differences between public utilities and business generally. It may become the first step but not necessarily so.[1]

THE CASE FOR PUBLIC OWNERSHIP

The Breakdown of Regulation.—The friends of public ownership, on the other hand, stake their defense mainly upon the sins of private management and the alleged impossibility to force by regulation these private utilities to conform to a socially desirable pattern of conduct. To state it briefly, regulation has broken down in the utility field. This notion of the failure of regulation is as old as regulation itself. As early as 1886, for instance, we find it being said that regulation of the gas industry had failed. Therefore, nothing was left but its public ownership. "The final and decisive argument . . . is the fact that the control of a necessity of life should not be handed over to a private company, *however carefully its conduct may be watched.*"[2] Almost everywhere one turns today, he finds the same criticism. John Bauer, an outstanding critic of regulation, asserts it is broken down

[1] The following resolution adopted at the 1931 convention of the Natural Gas Department of the American Gas Association is typical of the expressions by the private industry against municipal ownership. "Whereas, the public welfare is menaced in some localities by ill-considered proposals for municipal ownership and operation of public utilities, and whereas, many, if not all of these movements, are inspired on the spur of the moment either by temporary conditions adversely affecting the gas industry or are the deliberate design of political groups who agitate the municipal ownership idea in order to create for themselves political issues. These movements generally are born out of the temporary distress of the people and have no sound economic basis nor are they justified by failure of the gas industry to adequately serve the public under regulation. Therefore be it

Resolved, By the Natural Gas Department of the American Gas Association that it is and shall be the duty of the natural gas industry to warn the public of the hazards of municipal ownership, its economic fallacies, *and its inherent inconsistency with the true principles of American citizenship.* And further, that we pursue diligently and execute energetically a policy of informing the public on all the facts surrounding any specific proposal for municipal ownership, as well as continue with vigor the policy of giving the public all relevant facts concerning our own industry." (Italics ours.)

[2] JAMES, *The Relation of the Modern Municipality to the Gas Supply,* publication of the American Economics Association, **1**:118, 1886. (Italics ours.)

and ineffective.[1] And as one bit of convincing proof of this position, the alleged enormous past and recent profits of the electrical utility are cited. Of course, if regulation is ineffective, there is little doubt that the possibility exists for private managers to reap excessive profit.

As was pointed out in a preceding chapter, to assume that regulation has broken down is to assume that it had been given a fair trial and has at one time been more or less effective. It is not mere cavil to insist that an institution must be given a fair opportunity to establish its worth before it can be said to have failed. Regulation is still in its formative state in this country; it has come to the foreground only since the first World War. During that period, the state regulatory commissions have been given no more than 7 millions of dollars a year to regulate industries worth in excess of 20 billions. In addition, much of the so-called failure of the commissions has been the result of our legal system, which divides state from federal jurisdiction and permits the tedious and expensive process of court reviews of almost every utility commission order. As a result, much capital has been made over the disagreement of courts and commissions in the matter of valuation theories. Whatever blame there is in this controversy, it attaches more to the courts than to the commissions. It has been unfortunate that the critics seize upon the valuation side of regulation to prove its breakdown. One might almost imagine that each time a commission holds a hearing, a valuation is at issue. The facts are to the contrary. The establishment and enforcement of service standards, the settling of complaints, the adjustment of rate inequalities, security issue hearings, and a host of similar nonvaluation problems are involved in the regulatory process. Before we admit that regulation has failed, we insist that regulation should be given a full chance. We must give our federal commissions full rein, place an effective commission in each of the forty-eight states, give each of them sufficient funds to hire an adequate staff and to conduct adequate hearings. Furthermore, we must make such changes in the laws of court procedure as to eliminate the present duplication of effort, slowness of movement, and general unsatisfactoriness of results. We are slowly in the process of creating another body of law, administrative law; and if the process is not cut down at this stage, much of the present quarrel with the court system will pass away.

[1] BAUER, "Can Utility Rate Regulation Be Made Effective?" *Public Utilities Fortnightly*, **19**:797, June 24, 1937. Many other citations of this position could be made, but the frequency of the accusation makes the idea common property and removes the necessity for documentation.

One cause of the belief that regulation has broken down lies in the apparent readiness of the utilities to resort to a court appeal of almost every commission order. Of course, this readiness is more apparent than real. The percentage of commission orders contested in the courts is infinitesimal. It is the excessive publicity given to outstanding and exceptional cases that creates this impression. Yet the utilities are not without blame in this connection. It does seem that the larger the utility the more combative it is in this matter of appeal. Officials of the American Telephone and Telegraph Company in the past have appeared to be almost contemptuous toward the commission process. As one former commission counsel has said, they act as if it does not matter what the outcome of the case may be, they intend to appeal as a matter of course. The never ending litigation of the New York Commission and the New York Telephone Company is a case in point. The reaction of the commissioners themselves against this process of appeal is well illustrated by the remark of Clyde Seavey, formerly president of the California Railroad Commission, on the occasion of a request of the Pacific Gas and Electric Company for an injunction against a rate order alleged to yield 6.6 per cent on the commission valuation. He said:[1]

> I wish to give it as my personal opinion that if exorbitantly paid utility executives and high-priced attorneys can delay so just and reasonable an order as this the only adequate protection the consumers of this state have is public ownership. And the sooner they get it the better.

Nothing will so discredit private ownership and regulation as a widespread belief that this experience in California is the usual practice of the utilities.

THE TAX ARGUMENT

We have set out for separate discussion the pros and cons of the effect of public ownership upon the tax burden of property. We do this for two reasons: First, both sides use it as a weapon of attack; and, second, we wish to emphasize the relation between taxation and public ownership.

In almost every debate over public ownership, there is raised the bogey of increased taxes upon property. Of course, whenever a plant has been financed through the sale of general public bonds resting upon taxable property, in the event of the failure of the enterprise or through deliberate choice, these bonds may be retired from tax proceeds. Likewise, part of the operating costs of a plant so financed

[1] *Electrical World*, p. 840, Dec. 30, 1933.

may conceivably be included in the general property tax levy. In these cases, the tax levy upon property within the district of such a plant will be increased. *Of course, if these possibilities are used as arguments against public ownership, their advocates assume either the ultimate failure or constant mismanagement of the enterprise.* Neither of these premises, however, necessarily follows. Many plants have been financed by general bond issues, yet not a dollar of principal retirement, interest payment, or operating expense has been charged against general taxation.

Whenever a municipal plant is built from the moneys of a revenue bond issue, there is scarcely a possibility that its success or failure will affect a general property tax levy. The law of Iowa is typical of the restrictions placed upon this instrument:[1]

> Such contract shall not constitute a general obligation or be payable in any manner by taxation. Such contract shall specify the maximum rate that may be charged the consumers, *including the municipality*, and the city shall not increase or fix any rate beyond such maximum. Under no circumstances shall the city be in any manner liable by reason of the failure of the net earnings being sufficient for the payments provided in the contract.

The possibility of a plant's not earning enough to pay its out-of-pocket expenses of operation is too remote to need consideration. Unquestionably, therefore, when the argument of alleged general tax increases is raised to thwart a proposed public plant to be built from the proceeds of revenue bonds, it is a bogey pure and simple.

The "Taxless Town."—The advocates of the publicly owned plant, on the other hand, make extravagant claims about tax reductions and tax eliminations. They point to a multitude of so-called "taxless" towns as evidence of their claims. A taxless town is one in which the city levy under the general property tax is replaced by profits from the public plant or plants. Let us be clear on the meaning of this phrase. All that it can mean is that the cost of city government is paid from plant profits rather than tax receipts. All other tax levies of all other taxing bodies will remain. To state it another way, a taxless town is one in which the cost of city government is shifted from taxpayers to public utility ratepayers.

Whenever this practice occurs, it should be condemned. In the first place, it is misleading. Its advocates speak of a tax-free town, whereas the tax is simply shifted from a direct to an indirect form. In no sense are citizens, as a group, relieved of the cost of city government. In the next place, one pays taxes presumably in accordance

[1] *Code of Iowa*, §6134.06. (Italics ours.)

to his ability, but he may use utility service in accordance to other criteria. There is no necessary correlation between taxpaying ability and utility service consumption. In the third place, those groups who use little or no utility service would be exempted from the city taxes. Industry, in particular, would be favored, because industrial rates are scarcely more than enough to pay the direct operating costs incurred. Thus the domestic consumer and the regular consumer are discriminated against by the industrial customer and occasional user. As a result, we have a perfect illustration of regressive taxation. The only argument that could be advanced in favor of the taxless town is that it is a less painful method of taxation. Cost of government when paid out of plant profits becomes, in effect, an indirect tax. This is poor defense. If utility rates of a public plant yield such excesses, then, instead of their being used to defray costs of city government, we believe that those rates are excessive and should be reduced.[1]

THE TAX EXEMPTION OF PUBLIC PLANTS

The problem of taxation of publicly owned utility plants is both a problem of taxation and a phase of public ownership. Since taxation has played a large part in the debates on the merits of government ownership, we have chosen to discuss this problem here. So long as both public and private ownership divide the electricity supply business, the question of taxation or exemption will be very significant. As a general rule, public plants are not subject to local, state, and federal taxation. They have often been built from the proceeds of the sale of tax-exempt securities, and they pay no taxes on operations, property, or income. On the other hand, privately owned utilities pay annually as taxes anywhere from 10 to 20 per cent of their gross revenues. Therefore, this raises the question of the merits of the tax exemption of such proprietary activities of government.

This question can best be answered by considering several factors. In the first place, if taxes on a private company are a proper payment for the benefits of government, they are no less proper charges against the public plant. Regardless of ownership, government furnishes to a public utility many kinds of protection that are valuable and thus a proper cost to the users of its service. In the second place, exemption of utilities from taxation reduces the tax base generally and raises

[1] For further analysis, see Thompson, "The Actual Taxpayers in 'Taxless' Towns," *Public Utilities Fortnightly*, **11**:458, Apr. 13, 1933. In the same journal, see King, "Let's Have an End to the 'Taxless Town'," **13**:449, Apr. 12, 1934; Kynaston, "A Boost for the Taxless Town," **14**:787, Dec. 20, 1934; and Cooksey, "Why Municipal Plants Should not Be Taxed," **15**:183, Feb. 14, 1935.

the burden of taxes on the remaining taxable property. Since tax payments and utility service consumption bear no necessary relation, tax exemption of publicly owned plants redistributes the plant's proper tax burden inequitably to taxpayers generally. In the third place, since public and private ownership seem likely to exist side by side in the electrical field, a similarity in their cost conditions will greatly facilitate the drawing of sane conclusion as to their respective merits.

It begs the problem entirely to assert that the profits of the municipal plant can be substituted for the losses in taxes. As we pointed out above, the only part of these tax losses that can be made up through plant profits is the city levy, and that only. In fact, it is quite difficult to find any valid reason for the tax exemption of utilities except as a historical accident. Its continuation has simply been the expedient thing to do. Teachers of public finance condemn the practice; experts in public utility economics sharply criticize it; and in every state legislative session, bills are presented to remedy this unjust situation.

Since 1931, there has been a tendency on the part of legislatures to impose some type of taxation upon the public plant. As a general rule, such taxation takes the form of extending existing taxes applicable to privately owned plants, although occasionally a special and different tax may be invoked. Although the public plant as yet is far from being burdened to the same extent as its competitor the private plant, there is reason to believe that the future will see increased imposition of taxation upon public enterprise. If public ownership grows, the resulting tax loss will become significant, thereby arousing demands for the taxation of the public operator. For instance, when the Tennessee Electric Power Company was sold to the Tennessee Valley Authority, it was estimated that the taxing districts in Tennessee would lose annually not less than $3,500,000. As a result, taxing officials of that state are hopeful that Congress will require the Tennessee Valley Authority to pay annually sums equivalent to this loss. Although managers of municipal plants are unanimously opposed to the taxation of their establishments, we believe that their efforts can do no more than delay what must and should eventually come to pass.

There is a curious conflict in the decisions over the right of a municipal plant to include an item of taxes as a cost of operation. Indiana and Wisconsin represent the conflicting views. The Indiana Supreme Court, although citing the Wisconsin position, refused to follow it, holding that a municipally owned utility was not entitled, in

addition to a fair return, to an amount equivalent to taxes that a similar private plant would pay. It said, "Taxes not being actually levied and paid, they should not be included as a cost of service."[1] Wisconsin, on the other hand, allowed a municipal waterworks rate to cover not only the taxes that a private concern would pay but a "reasonable return on the earning value."[2] The Wisconsin position seems to square better with our position in this matter.

RATE COMPARISONS

The final argument of the advocates of public ownership is to claim substantial savings in rates. In other words, they marshal a host of statistics all pointing to lower rate levels for the publicly owned establishment. There is a stock of standard data. For years, favorite illustrations were the west coast plants and the Ontario Hydro. Comparisons between these public establishments and private companies located in similar-sized American cities were always favorable to the public cause. A second illustration could always be found in the figures of the Census of Electrical Industries. For instance, Table 65 shows that for 1937 the public plant received from residential customers 0.6 cent less per kilowatt-hour. Since 1933, there is always the Tennessee Valley Authority rate level by which to make comparisons. Thus, the clincher argument of public ownership is found in rate comparisons.

The opponent finds himself reduced to the necessity of questioning the comparability of such data, since there can be no denying the figures as they stand. One attack is to question the adequacy of the sample of public plants. Except for the western examples, the plants are generally located in small places and thus not comparable with averages for the privately owned plants. A second line of attack is to question the comparability of costs between public and private establishments. The public plant is accused of being the beneficiary of cost subsidies and cost exemptions. Specifically, it is said to have subsidies in the form of low interest rates and other governmental assistance. Particularly it is charged with tax exemption. Finally, the opponent to public ownership may rearrange and reclassify these data in attempt to show the "true picture" of his side of the argument.

[1] *Logansport v. Public Service Comm.*, 177 N.E. 249, P.U.R. 1931E 179, 191, 192 (1931), and cases there cited. The 1937 law of Indiana permitting the inclusion of an amount in municipal plant costs equal to taxes was probably passed to remedy the effect of this decision.

[2] *South Milwaukee Taxpayers Alliance v. South Milwaukee*, 2 P.U.R. (N.S.) 423, 429.

What have we proved by rate comparisons? We think that nothing significant can be proved, because there simply are not acceptable bases for such comparisons. Each side can marshal the "facts" to suit its convenience, and each side can rebut its opponents. For instance, the Federal Power Commission has not only shown that rates of publicly owned electric plants are generally lower but has "pulled the teeth" of the challenge that it is possible because of tax exemption. According to its figures, taxes and tax equivalents paid by public plants amounted to 17.3 per cent of their gross revenues, compared to 13.2 per cent for private plants.[1] If free services of public plants are added, their contributions amounted to over 25 per cent of their gross revenues. Thus, it would seem that the opponents of public ownership are on shaky grounds in raising the question of tax exemption. Yet we maintain our position that all rate comparisons must be viewed with suspicion. If all other items of dispute in comparisons were settled, there would be the final question of allocation of joint costs. It would appear that private companies have chosen to favor industrial customers in such cost allocations, whereas many public establishments have chosen the opposite theory. Each view has adequate support. What, then, shall we say about rate comparisons, because obviously they will continue to be made so long as battles over public ownership continue? They can certainly serve one useful purpose, namely, to give us clues as to companies charging excessive rates. Further than this we cannot go—we think that the ultimate decision on public ownership must turn on more fundamental considerations.

THE REAL ISSUE OF PUBLIC OWNERSHIP

None of the arguments thus far presented gets to the heart of the problem. Each of them can be supported or rejected by proper sorting and selecting of the evidence. Obviously, they cannot be dismissed as without merit, because they have some weight but only as secondary to the fundamentals of the problem of public ownership. The following are submitted as the basic questions to be answered in the choice of municipal versus private ownership:[2]

1. Risk.
2. Standardization of technology.
3. Duplication of operating conditions.
4. Social attitudes of private interests.

[1] 1939 *Annual Report*, p. 13. See *Rate Series* No. 5, "Comparative Rates of Publicly and Privately Owned Electric Utilities"; and "Rates, Taxes, and Consumer Savings—Publicly and Privately Owned Electric Utilities—1935–1937."

[2] These points were first developed by Thompson in an article entitled "Not Much in Some Names," *Public Utilities Fortnightly*, **14**:207, Aug. 16, 1934.

Risk.—All business carries with it some degree of risk; there is always the possibility that, in the future, new inventions or changes of consumer habits will antiquate and destroy present industries. This hazard can be properly named "social obsolescence," or "antiquation." A rapid review of economic history will disclose the extent of this process. Gone are the sperm-oil and kerosene lamps of a few decades ago. Where is the old-time harness maker or the village blacksmith? With their passing, passed also their capital equipment. Thus, there is a pronounced risk factor in capital investment which every investor knowingly or unknowingly assumes. The same situation holds true in the utility field. Two illustrations will suffice. At the turn of the century, who other than Henry Ford would have dared to predict the present social obsolescence of the urban rail carrier? What is the future of the railroad? Supreme in the transportation field from 1850 to 1920, what is to be its future in the next 70 years? Will there be railroads in 1990? If not, or if greatly reduced in size, many of the present billions in the railroad field will have been wiped out. Therefore, who is better able to assume this risk—the private investor, or the body politic?

It must not be assumed that this factor of risk forbids all forms of public ownership. In many instances, the risk is so small, the necessity for the industry so great, the possibility of a satisfactory substitute so remote, that this risk can be said not to exist for all practical purposes. In those instances, public ownership must be approved. The condition in the waterworks fits this situation exactly. The oldest of the utilities, it is the most essential of them all, and there is no apparent substitute facility likely to destroy the investment in that utility. So long as there are towns and cities, the future of the water industry remains secure. In the case of the gas and the street transportation utilities, the future appears questionable for the former and very doubtful for the latter. Neither is today a prime necessity, because for each there is an acceptable substitute. It is this change in the status of the street car companies which explains the complete disappearance of the agitation for their public ownership.

How about the telephone and electrical utilities? They are prosperous, essential, and with a certain future, it may be argued. If the argument is sound, then they might as well be publicly owned. But there is as yet no assurance that radio in some form may not make obsolete much of the present investment in these industries. Other discoveries, as yet only laboratory playthings, may rise to the rank of destroyer. The point is, there is no assurance of the lack of risk in these two utilities. Their combined investment is over 20 billion dollars. Should this amount of risk be passed to the shoulders of the

public; and if it were, might not the chance of future replacement by more desirable and economical instruments be lessened?

Standardization of Technology.—The previous point deals with the problem of obsolescence of entire industries; this, with obsolescence within industries. Almost every business passes through several successive stages of growth which may be called, for lack of better terminology, "infancy," "childhood," and, finally, "adulthood." During the second of these stages, it undergoes rapid technological changes. A process or machine is no sooner perfected and in operation than a superior process or machine makes its appearance. A plant is built in terms of the best estimates of immediate future needs; then a new use makes this plant inadequate. These rapid changes are costly and make the risk very high. Yet though many lose part or all of their investment during this second stage, society profits by every change. Eventually, however, industry does emerge into adulthood, in which stage new developments are not major in character but minor and easily adapted to the existing plant. Operation becomes reduced to a routine and easy to teach to the newcomer.

Three of the utilities—telephone, electricity, and gas—have passed through periods of startling change. The machinery and equipment obsolescence and inadequacy have been tremendous. Courage and imagination were required in the early days of these utilities. In 1905, the first steam turbine was installed, thereby antiquating all older generating equipment; yet within 5 years, these same turbines were replaced by much improved types. The gas industry has had something of the same experience. One process after another gave way to new and improved ones. Since 1927, most of the manufactured gas equipment has been threatened with extinction by the steady spread of natural gas pipe lines. The history of the telephone industry is similar to that of gas and electricity. Manual switching was replaced by machine switching; the older style of telephone, by the newer handset; and now this instrument, by a still further improved instrument. In all these cases, none of the antiquated equipment was unfit for use; it simply was replaced by better.

Notice that these utilities have passed through the periods of childhood under private ownership. It is a fair question to ask what their history would have been had they been raised under public ownership. Would they be in their present advanced stage? The presumption is that they would not.[1] There is too much of a tendency for managers of public enterprise to be content with the old ways of doing business;

[1] On the other hand, the apparent withholding of new equipment by the Bell System in order to protect its operating subsidiaries in their use of older equipment is another side of this problem.

the rut of a fixed routine is difficult to break in government service. Therefore, we conclude that no business should become a public business until it has clearly emerged into its adulthood.

Have the utilities reached this stage? Only one of them clearly has so arrived—the waterworks. Its processes are standardized, and technological changes, if any, are very gradual. One need not fear that new equipment bought now will be so antiquated 5 years later that it must be then junked in order to hold the plant customers. How about the others? The street car systems are ruled out of the picture because of the uncertainty of their future. If the government does anything relative to this utility, it may be forced to take it over and operate it at a loss. There is no evidence that gas, electricity, and the telephone have passed into stage three. Size alone is no guide. Whenever a number of normal industrial years pass without any appreciable increase in the investment in these utilities or any radical change in equipment and methods, the adulthood is probably at hand. After that time, public ownership would not be faced with the risk of rapid technological change.

Duplication of Operating Conditions.—Three of the utilities—electricity, the telephone, and gas—have developed operating territories far beyond size of their original areas—the city. For two of these, the drive has been economy of operation; for the third—the telephone—the need for more complete service. As a result, this latter utility is now national and international in scope, the universality of its service being shown by its boast that any instrument in the system of the American Telephone and Telegraph Company may be connected with over 90 per cent of the telephones of the world. The waterworks and urban transport utilities have remained largely isolated operating units confined to city limits. This is especially true of the waterworks, the only occasion for going outside corporate limits being to obtain an adequate water supply. The street railway is strictly an urban utility and transcends city limits only in the metropolitan districts.

Public ownership, to be as successful as private ownership, must be able to approximate the operating conditions and system development of the private utilities. So long as it was largely a city-confined movement, it but poorly conformed to the operating setup of the telephone, gas, and electrical utilities. In the past, the municipal electric plant has been an isolated plant; and so long as it continues, it cannot hope to equal the operating performance of the private integrated and interconnected system. In so far as gas is produced by a manufactured process and is not piped in from the natural gas fields, it is an isolated

plant and thus offers no operating obstacle to municipal ownership. The present replacement of manufactured gas by natural gas, however, introduces the same weakness of municipal ownership as exists in the electrical field. So far as the telephone is concerned, municipal ownership is out of the question; national ownership is the only possible substitute for the present private organization.

The essentially isolated, city-confined character of public ownership is not necessarily a permanent condition. As suggested above, many states are permitting the power district, and the federal government is developing the Tennessee Valley on the same basis as it had been developed by private systems. The states and the nation could be divided into operating districts and integrated even better than the present private systems. To do so, however, will require redirection of the present public ownership movement, a change in our laws, and a change in public policies and public attitudes. The problem of duplicating the present operating conditions of the electric and natural gas utilities is not impossible, only difficult.

Social Attitudes of the Private Interests.—The public utility performs a public service, and the manager is a public servant. His first duty is to the public and his customers; if a privately owned plant, his second duty is to the owners. True, the property by which this business is performed is private, and the legal title cannot be divested from its private owners. Yet, from a long-run viewpoint, this second duty will not suffer by the performance of the first. Neither the customers nor the courts will permit this legal right of ownership in property to be substantially impaired. A fair rate of return will be allowed to its owners, which is all that long-run conditions will return in the competitive field. Wherever management of private utilities has this proper viewpoint of its responsibilities, the gains through public ownership are minor and may be more than offset by possible future risks.

There are public utility managers, however, who do not subscribe to this statement of obligation. They regard their business as one to be run as they see fit; they feel that they are within their rights to take full advantage of the public at every point. They make full use of expert talent and the machinery of the courts to maintain their alleged rights. In other words, they fight every inch of the way in matters relating to rates and service. Whenever a situation such as this is found, and although the presence of risk and continuous technological change points to private operation, public ownership is often the only way out of the situation. Better remove the source of public annoyance even at the risk of poorer service and higher rates, if need be.

Résumé.—The purpose of this chapter has not been to take sides in this controversy over public ownership. We have rather tried to state the problem and to present arguments and fundamentals, pointing out at the same time the strength or weakness of each. If it is remembered that the decision on public ownership is essentially one of public policy, many of the usual arguments against as well as for lose most of their weight. The decision should be made in the light of four fundamental factors—the risk of social obsolescence, the standardization of technology within the utility, the possibility of duplication of operating conditions, and the social attitudes of private management. If there is but little risk, if techniques are standardized, if operating conditions can be duplicated, the proper groundwork for successful public ownership is present. In the absence of these facts, but with the presence of unsocial management, the people may be forced to public ownership in self-defense. *It is not too much to say that the future course of ownership lies almost entirely in this fourth fundamental, the social attitudes of private management.*

Whatever may be the present evils in the system of private ownership, municipal ownership is no once-and-for-all cure. To paraphrase Carlyle, it is no Morrison's pill. It may be that many of the present troubles of private ownership are the result of our own carelessness. If so, merely changing the form of ownership will not lock the door to similar ills and evils in the future. There is merit in the argument that those who cannot or will not regulate cannot or will not operate any better than they have regulated. Of course, this is an exaggeration, but its moral is that public ownership must be watched with as critical an attitude as the best of our state commissions watch the public utilities.[1] Anything short of eternal vigilance is not enough. To turn the utilities over to the professional politician will be as disastrous to good service and low rates as the "let-alone" policy toward privately owned utilities has been in some of our states.

Bibliography

The literature on public ownership is most voluminous. In our footnotes, we have attempted to cite representative articles and books. Each side of this controversy has its propaganda material supporting its cause. For the worst type of defense of private ownership, see the *Public Service Magazine*. On the opposite side, one should read materials of the public ownership groups and Carl

[1] Glaeser says, "The second lesson [in the study of the Los Angeles municipal plant] is that an impartial regulating authority is necessary to enable even a municipally owned utility to live up to its public utility obligations." "The Los Angeles Bureau of Power and Light: A Critical Summary," *Journal of Land and Public Utility Economics*, **9**:227, August, 1933.

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CHAPTER XXIX

THE PUBLIC POWER PROJECTS

The previous chapter has been restricted to the traditional problem of public ownership, namely, the ownership and operation of utility facilities by municipal corporations. It is true, of course, that we departed from that pattern in our discussion of the public power district. Yet that departure was logical because those units are also subordinate state agencies and are an obvious extension of the basic principles of municipal ownership. So long as utilities were essentially confined to urban areas, their ownership by cities and towns rather than by the state or other large political unit was a natural consequence. It was inevitable, as the unit of utility operation grew to regional and state size, that public ownership advocates would plan similarly expanded public ownership areas. As we have said, the power district is an illustration of this process in political institutions. Ultimately, however, partly as a result of certain historical accidents, public ownership advocates began to urge utility operations by the national government. Especially since 1933 have they been successful in their plans—so successful, in fact, that we devote this and the next chapter to those regional power projects under direct federal supervision and operation. Because of its pioneering and general importance in the sphere of public operation of hydrofacilities, we have added to this chapter a brief discussion of the Hydro-electric Power Commission of Ontario (Canada), better known to Americans as "Ontario Hydro."

THE RECLAMATION PROJECTS

The spectacular public power projects of the 1930's may lead to the conclusion that development and sale of electricity by the national government is a "New Deal" creation. Although its magnitude and effect may be New Deal-ish, the principle is not, because it had its origin with the Reclamation Act of 1902. To understand the purposes of that act, one must understand the region where the bulk of the reclamation projects have been undertaken. Most of them are located in the area known as the "intermountain plateau section" of the United States, a region lying between the Coast Range of mountains

to the west and the Rocky Mountains to the east and extending north and south the length of the nation. This is an area deficient in moisture, with less than 20 inches of rainfall a year, a region where irrigation is necessary if agriculture is to be carried on extensively. Not only is the total annual rainfall of the area small, but only a minor part of it comes during the growing season; hence the need for irrigation has been imperative.

The purpose, then, of the Reclamation Act was to make possible intensive agriculture in the semiarid West. To do this, water must be supplied, which, in turn, meant that water had to be impounded behind man-made dams. Here was the ideal setting for the development of hydroelectric power. The production of electricity served at least two useful purposes. It gave a source of power for pumping water into irrigation systems, and it provided a source of income to offset in part the costs of irrigation. Excess power production was usually sold to a near-by electric system. Thus, the Bureau of Reclamation was able to say with considerable pride that it made double use of this precious resource of the West: First, it developed electric power; and, second, it irrigated millions of otherwise worthless acres. In short, it could properly add that the presence of the first made economic the second.

Water power is important throughout the eleven states of the Mountain and Pacific group. In 1939, for instance, over 80 per cent of their electric energy came from water as compared to approximately one-third for the country as a whole. Both private and public (state and federal) agencies have participated in this development. In fact, as yet the bulk of western hydropower is produced by private companies. Although the projects of the Bureau of Reclamation are scattered throughout this region, they account for only a small portion of the total.

From this too sketchy picture of the early reclamation projects, two policies in the matter of electricity generation seem clear. In the first place, there could be no question of the primary purpose of these developments. They were designed to be irrigation projects. Electricity production appears to have been definitely secondary, though essential to the realization of the major objective. In the second place, excess electricity (that not needed to operate irrigation works) was marketed through existing channels, usually private electric power companies. These policies, in combination with the minor place of the bureau's facilities in total western power production, simply could not create a national controversy. That had to await the 1930's. When the day came that federal power projects would

TABLE 67.—POWER PLANTS OPERATED ON RECLAMATION PROJECTS DURING FISCAL YEAR, 1937–1938

Project	Name of plant	First cost of plant (all features)	Cost of operation and maintenance without depreciation (all features)	Estimated depreciation	Cost per kw.-h. exclusive of depreciation	Sold to consumers, kw.-h.	Total output, kw.-h.	Gross power sales
Boise	Black Canyon	$ 414,317 21	$ 11,138.98	None	0 00022	26,491,262[a]	50,942,359[b]	[c]
	Boise River	167,095.37	55,439.98	None	0 0023	[d]	[d]	
Boulder Canyon	Boulder	26,563,314.61	[e]	[e]	[e]	1,427,928,442	1,452,285,000	$1,888,132.84
Grand Valley	Grand Valley	210,500.00	[f]	[g]	[f]	[f]	7,226,920	[f]
Minidoka	Minidoka	1,110,195.86	137,192.14	$38,002.00	0 002	21,812,125	68,114,406[h]	200,433.16
	American Falls	76,975 00[i]						
New Lands	Lahontan	324,793.52	19,766.38	7,619.84	0.00046	3,067,458	3,592,270	35,735.80
North Platte	Guernsey	454,244 27	14,578.38	None	0 000871	23,618,759	25,823,770[k]	271,368.97
	Lingle	184,791 74	12,938 93	None	0 001424	[l]	[l]	[l]
Rio Grande	Elephant Butte	8,440.50	2,175 94	None	0 0054	None	400,610	None
Riverton	Pilot Butte	262,809 00	12,611.72	.....	0 006742	1,218,765	1,870,549	26,196.21
Salt River[m]	Roosevelt	1,372,193 73	1,241.21[n]	68,609 69	0 001388	.....	87,351,000	
	Arizona Falls[o]	115,566 47	8,464.46	5.778.32	0 002249	....	3,764.200	
	Chandler	177.410 37	8,680 11	8,870 52	0 002123	.....	4,088,180	
	Cross Cut	663,926 33	25,766 26	33,196 02	0 001688	.....	15,267.000	
	Horse Mesa	982,756 47	63,798 87	49,137 82	0 000524	.....	117,780,000	
	Mormon Flats	472,011 68	15,367.53	23,600.58	0 000664	.....	23,146,000	
	Stewart Mountain	344,070.32	13,039.57	17,203 52	0 000332	.....	39,310,000	
	South Consolidated	176,202 81	8,918 56	8,810.14	0 000785	.....	11,365,600	
	Total	.....	.....	.....	.....	397,886,897[p]	496,413,616[p]	3,748,256.94[p]
Shoshone	Shoshone	883,037.48	24,374.33[q]	None	0 00214	10,051,779	11,361,600	106,092.65
Strawberry Valley	Strawberry Valley	175,900.00[q]	11,300.00[q]	None	0.002157	5,574,636[r]	5,238,286[s]	57,688.13
Yakima:								
Kennewick	Prosser	404,843 88	8,262.28	None	0 00034	24,076,296[s]	24,500,670	
Sunnyside	Rocky Ford	23,000 00	1,546 40	1,056.40	0.0023	....	670,900	
Yuma	Siphon Drop	317,396.00	25,012 32	7,950 00	0 003727	5,423,484	7,131,889[u]	44,056.63

[a] To Idaho Power Co., T. E. Connolly, Inc., Lackey Gravel Plant, and Civilian Conservation Corps Camp B R-26.
[b] Includes Boise River Power Plant. 1,216,952 kilowatt-hours purchased from the Idaho Power Co.
[c] Not reported.
[d] Included with Black Canyon Power Plant.
[e] Not available.
[f] Operated by contractor.
[g] None—constructed with advanced funds.
[h] Includes 14,169,406 kilowatt-hours from Idaho Power Co.
[i] Has not been operated since 1927.
[j] Estimated.
[k] Total of both plants; Guernsey, 9,085,070 kilowatt-hours; Lingle, 16,738,700 kilowatt-hours
[l] Included with Guernsey power-plant data.
[m] Reports are for calendar year of 1937.
[n] Total for system. Includes 194,341,636 kilowatt-hours of purchased power.
[o] Total for system.
[p] Includes cost of Garland substation, amounting to $8,292.72.
[q] Costs for the month of June 1938 are estimated; books for that month were not closed at the time of preparing this statement.
[r] Includes 2,627,360 kilowatt-hours of dump energy.
[s] Exclusive of 550,600 kilowatt-hours purchased.
[t] Includes 4,800,000 kilowatt-hours of winter power delivered to Pacific Power & Light Co. in payment for transmission of power to irrigation districts.
[u] Includes 673,600 kilowatt-hours purchased.
NOTE: Data from Appendix ix 3 (facing p. 42) *National Irrigation Policy, Its Development and Significance, Sen. Doc.* 36, 76th Cong., 1st Sess.

add tremendous quantities of capacity, that electricity generation appeared to be the major purpose, that electricity would be marketed through new channels endangering existing facilities, then a controversial issue would arise. This is precisely what happened with the creation of Boulder, Bonneville, Grand Coulee, and Fort Peck dams and the Tennessee Valley Authority.

Let us, therefore, begin our study with that gigantic development at Boulder (Black) Canyon on the Colorado River.

BOULDER DAM

Boulder Dam, located on the Colorado River where that stream forms the boundary of Nevada and Arizona and approximately 250 miles northeast of Los Angeles, can be best characterized by superlatives. It is the world's highest dam; it has created the world's largest reservoir; it has made possible the world's largest power plant. Interest in this development began in 1904, when the Bureau of Reclamation began studies of possible power sites along the Colorado River. A study of our Chart 33 will show at least one pressing reason for harnessing the river. Its waters were needed by the Imperial Valley farmers and the coastal cities, and the first group needed protection against its infrequent but devastating floods. Preliminary studies disclosed that favorable sites were Black and Boulder Canyons. Finally, the present development was recommended by a committee of experts of the Department of the Interior. The Congress followed these recommendations in the fall of 1928 by passing the Boulder Canyon Project Act (better known as the "Swing-Johnson Act"), designating either site for the location of a dam.[1]

The Boulder Canyon Project Act has several important provisions. It opens with a statement that the construction of the dam and other works shall be

> . . . for the purpose of controlling the floods, improving navigation and regulating the flow of the Colorado River, providing for storage and for the delivery of the stored waters thereof for reclamation of public lands and other beneficial uses exclusively within the United States, and for the generation of electrical energy as a means of making the project . . . a self-supporting and financially solvent undertaking. . . .

This statement suggests the order of preference of objectives, and the act sets them out in no uncertain terms, as follows: first, "river regulation, improvement of navigation, and flood control"; second, "irrigation and domestic uses"; and, third, "power." Because the

[1] The Black Canyon was subsequently chosen.

purpose of the act was related to that of the Colorado River Compact, it was provided that its terms would become effective only after six of the seven contracting states had ratified that pact.[1]

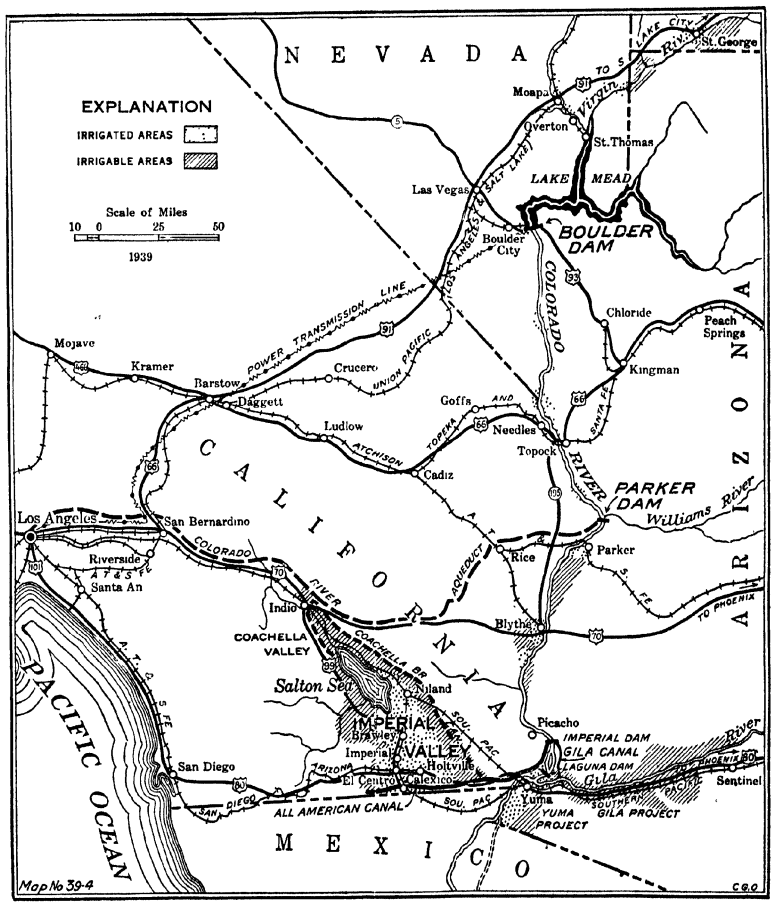

CHART 33.—Colorado River development below Boulder Dam. (*Bureau of Reclamation, Department of the Interior.*)

The original financing and power provisions are especially important. A maximum of 165 million dollars was appropriated for the dam and reservoir, with a provision for the allocation of 25 million dollars

[1] It was stipulated that the state of California must be one of the six accepting states.

of that sum to flood control. The act contemplated that these sums would be returned to the United States with interest at the rate of 4 per cent. The whole project was tied to a requirement that contracts for the sale of electricity "adequate . . . to insure payment of all expenses of operation and maintenance of said works . . . ," with interest, within 50 years, were to be executed before construction could begin. These contracts were reviewable 15 years after execution and every 10 years thereafter. It is thus apparent that the entire Boulder project was made contingent upon power production carrying almost all of the cost burden.

By 1930, the act had been ratified by the required six of the seven states of the Colorado river basin,[1] power contracts had been executed, and therefore plans for construction could go forward. Preparations for the construction of Boulder Dam involved many diversified operations of considerable magnitude. It was necessary to provide transportation for supplies and equipment and to build housing facilities for a population of 5,000 in the middle of a desert. The Union Pacific Railroad built a branch line 23 miles from a point near Las Vegas, Nevada, to the site of Boulder City, and the government extended this line 10 miles to the rim of the canyon. Six Construction Companies, Inc., general contractors for the dam, built 26 miles additional—one line extending to the Arizona gravel deposits at the bottom of Black Canyon, and another to the Nevada side of the gorge at the dam site. Highways were built; a town was constructed; and provisions for electric power and water were made. Many of these facilities are in use in the permanent town of Boulder City; others were removed when the dam was completed in 1936 after only 5 years of actual construction time.[2]

It is estimated that there are approximately 1,900,000 acres of irrigable soil in the United States below Boulder Dam capable of being served by this project. These are the driest acres of the nation, as they receive 3 inches or less of rain a year. With the help of the Imperial Diversion Dam and the All-American Canal,[3] over half of

[1] The Colorado River Compact, drafted in conference in Santa Fe, New Mexico, in 1922, included the states of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming. The six states mentioned above did not include Arizona, which refused to ratify that document.

[2] For a graphic presentation of the problem of construction, see the bulletin of the Bureau of Reclamation of the Department of Interior entitled "Construction of Boulder Dam."

[3] These projects were opened in 1940. Imperial Diversion Dam is located about 15 miles northeast of Yuma, Arizona, and on the All-American Canal which extends from Imperial Dam to a point about 12 miles west of Calexico, California.

these acres are now under irrigation. In addition to its usefulness in irrigation, Boulder Dam is responsible for creating Lake Mead, which is fast becoming a resort and tourist center and by which the beauty of Grand Canyon is made accessible. Furthermore, the dam serves to regulate the flow of the unruly Colorado and to make certain the domestic water supplies of many coastal cities.

Although electrical energy is regarded as a by-product of the project, it was initially expected that the entire 120 million dollar cost of the dam would be repaid with interest at 4 per cent over a 50-year period under the contracts first in force for the sale of power. Firm power, estimated to amount to 4,300,000,000 kilowatt-hours a year, prior to 1940 was sold at the switchyard for 1.63 mills per kilowatt-hour. Dump power (when available) was sold under the same conditions at 0.5 mill per kilowatt-hour. In addition to this charge, the power purchasers were required to pay the additional cost of operating and maintaining the generating facilities. In other words, they paid the stated amount per kilowatt-hour plus their allocated shares of operating and maintenance costs, which for firm power averaged between 2.25 and 2.50 mills per kilowatt-hour.[1]

As we pointed out above, the law authorizing the Boulder development is unique in one respect; namely, prior to its construction, it was necessary to execute sufficient power contracts to ensure the financial success of the venture. By 1930, the Secretary of the Interior completed arrangements with several groups. To the city of Los Angeles he leased 37 per cent of the firm capacity; to the Southern California Edison Company, 27 per cent; and to the Metropolitan Water District of Southern California, 36 per cent. Since each of the states of Arizona and Nevada was to have rights to 18 per cent of this power, when needed, the amounts assigned to the first two lessees include these

Of the 1,000,000 acres that can be served by the canal, approximately one-half are at present irrigated. En route to the coast the canal services Imperial Valley and other agricultural centers. Parker Dam, between Boulder Dam and Imperial Dam on the Colorado, at the point where the Colorado River aqueduct which serves Los Angeles and vicinity connects with the river, is joined by transmission line with Pheonix (115 miles) and Yuma (100 miles).

[1] This information was furnished at the request of the authors by the Bureau of Reclamation. We quote the following paragraph: "Depending upon the capacity required and the cost of the machinery installed for the generation of electrical energy allocated to any allottee the cost of generation will vary between approximately 0.62 and 0.87 mill per kilowatt-hour, making the total cost of firm electrical energy delivered at transmission voltage about 2.25 to 2.5 mills per kilowatt-hour depending upon load factor and cost of the particular generating machinery used to generate the energy. The rate for falling water used to generate secondary energy is 0.5 mill per kilowatt-hour delivered at transmission voltage."

preferences and upon demand must be surrendered. According to estimates in 1930, unless rate schedules are changed, these arrangements will yield between 327 and 361 million dollars.

Disputes over the Boulder Project.— Two disputes merit our attention. The first concerns the refusal of Arizona to sign the Colorado River Compact and subsequent litigation to establish her rights to the river. Under the compact and the Boulder Canyon Project Act, cer-

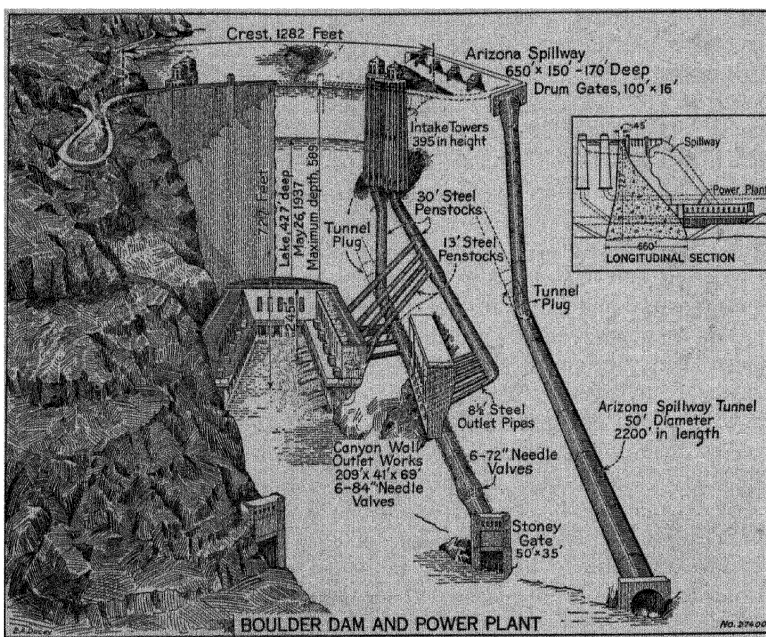

CHART 34.—An illustrative drawing of Boulder Dam and power plant. In place of the Arizona wall, there are shown the penstocks and outlets. (*Bureau of Reclamation, Department of the Interior.*)

tain reservations of energy and waters were made for each of the participating states. Feeling that they had been slighted, the leaders of Arizona refused to ratify the compact and later tried, unsuccessfully, to defeat the operation of the Boulder Canyon Act. In 1939, however, the Arizona legislature passed an act providing for the allocation of water among the states of the lower river (California, Arizona, and Nevada), its provisions being very similar to those of the former rejected legislation. If the other two states and the Congress accept, this 10-year dispute will be closed.

The second dispute turned around the fairness of the original terms of power sales and the shares of the states in the proceeds. Late in 1938, representatives of the seven states of the Colorado River Basin agreed to a plan of amendment of the Boulder Canyon Project Act.[1] The major provisions of their proposal were

1. Annual payment of $500,000 by the power contractors to a separate fund.
2. For three years, these moneys to be used for a comprehensive survey of the entire Colorado River Basin.
3. For the next 12 years, $500,000 a year to be allocated to the upper basin states of Wyoming, Colorado, Utah, and New Mexico.
4. Arizona and Nevada each to receive annual payments of $300,000 for a period of 47 years.
5. Reduction of the interest rate from 4 to 3½ per cent.
6. Abolition of interest on the 25 million dollars allocated to flood control, and deferment of the amortization of that sum.
7. Reduction of power rates at the dam from 1.63 mills to approximately 1 mill.

The Congress of the United States on July 11, 1940, passed an amendment to the Boulder Canyon Project Act. Its provisions are almost identical to those proposed. The interest rate was lowered to 3 per cent, the above-mentioned sums were ordered for the states of the basin, and all interest was waived on the flood control allocation, and its repayment postponed until 1987. In addition, the Los Angeles Bureau of Power and Light and the Southern California Edison Company, Ltd., were designated as the operating agents of the United States. One step remains to make this amendment effective, namely, ratification by each of the legislatures of the compacting states. Such action should be immediately forthcoming.

THE TENNESSEE VALLEY AUTHORITY

Next in sequence as a power development is the program of the Tennessee Valley Authority, although in other phases of its activities its beginnings trace back to the early part of the past century. Since the next chapter is devoted to a detailed presentation of the background to and present program of the Tennessee Valley Authority, we mention it at this point in order to preserve our time sequence. Briefly, the Tennessee Valley had been of spasmodic concern to Congress and War Department officials since 1824. Between that time and the passage of the National Defense Act of 1916, that interest was primarily one of improvement of navigation on the Tennessee River. As a result of the 1916 act, a hydropower plant was established on that

[1] Reported in *Public Utilities Fortnightly*, **23**:111, Jan. 19, 1939.

river at Muscle Shoals. From these beginnings grew what we now know as the "Tennessee Valley Authority."

THE COLUMBIA RIVER PROJECTS

Discussion of the federal projects of the Pacific Northwest probably should follow an analysis of the Tennessee Valley Authority, both because of time sequence and because of the influence of that development upon the national power program generally. The Columbia River development has no doubt been influenced by the example of the early reclamation projects and Boulder Dam, but it has undoubtedly been as much affected by the philosophy and policies of the Tennessee Valley Authority.

The Columbia River rises in the Canadian Rocky Mountains and, after flowing over 460 miles, enters the United States in the northeastern corner of the state of Washington. It formerly flowed almost directly south across the state until its path was blocked by lava flow and glacial action, thereby forcing the stream to bend to the west before continuing its southward journey toward the mouth of its largest tributary, the Snake River. At this point, the Columbia turns west to the Pacific, forming the boundary between Washington and Oregon. The river has a total length of 1,210 miles and drains an area of approximately 259,000 square miles, 750 miles of length and 220,000 square miles of drainage area being within the United States. The total fall of the United States portion is 1,288 feet. The river is tidal to the site of Bonneville Dam, a distance of 140 miles from the coast. The flow at Bonneville formerly varied from one extreme of 40,000 second-feet during the few days of low flow in winter to the other extreme of 500,000 second-feet during the June peak caused by melting snow near the river's headwaters.

As early as 1925, interest in the Columbia was evidenced by the Congress when it authorized a survey for the purpose of investigating the possibilities of development of the river for navigation, irrigation, and power production.[1] As a result of this survey, a plan was proposed for the improvement of the Columbia River above tidewater by the construction of ten dams so located that 92 per cent of the total head of the river below the international boundary could be utilized for power production, with the resulting pools to be used for navigation. Bonneville Dam, Grand Coulee Dam, and Rock Island Dam, the last a private power development, are steps in the ultimate project.[2]

[1] Reported in *House Doc.* 103, 73d. Cong., 1st Sess.

[2] *Improvement of Columbia River at Bonneville, Oregon*, War Department, United States Engineer Office, district engineer, Bonneville, Ore., 1939.

BONNEVILLE DAM

Bonneville was chosen as the site of the first dam of a series to be constructed on the lower section of the river. At this site, the Columbia flows westerly in two channels separated by Bradford Island. The dam is in the north, or main, channel; and the powerhouse and navigation lock on the south channel, called Bradford Slough. An earth levee across the island connects dam and powerhouse. Elaborate provisions in the form of fish ladders and fish locks have been made to protect the river's valuable salmon run.[1]

The Bonneville project was begun in 1933 from appropriations of the National Industrial Recovery Act and continued under the Rivers and Harbors Act of 1935. Two years later (1937), it was made the joint responsibility of the chief of engineers of the War Department and the Bonneville power administrator, appointed by the Secretary of the Interior.[2] By this arrangement the former is responsible for the building and operation of power-generating facilities at Bonneville, and the latter is in charge of the marketing of electricity. To accomplish this the power administrator has many responsibilities, including the construction and maintenance of transmission lines and arrangements for the sale of power.

By the 1937 act, the Bonneville project is exclusively a wholesaler of electric power, selling to such customers as public plants, cooperatives, private utilities, and industries. Characteristic of all federal power acts, the public purchaser has priority in service. In this act, it not only has a preference but until January 1, 1941, it had a preference of exactly 50 per cent of all electricity produced. The administrator is authorized to establish schedules of wholesale electric rates, subject to the confirmation of the Federal Power Commission. Rate schedules shall be devised to permit " . . . recovery . . . of the cost of producing and transmitting such electric energy, including the amortization of the capital investment over a reasonable period of years." To accomplish this mandate, the Power Commission is directed to make allocation of joint costs to power and other purposes upon a fair basis. Yet, in order to keep the commission well within bounds, the allocation provision speaks of " . . . electric energy developed from water power created as an *incident* to and a *byproduct*

[1] One of the most disputed items about this and the other Columbia River dams is their effect upon the annual 10-million-dollar salmon run of the Pacific Northwest. Of course, the next dozen years will settle this dispute; but if they show the destruction of this run, the economy of these developments will be under considerable suspicion.

[2] Public No. 329, 75th Cong. (H.R. 7642).

of the construction of the Bonneville project. . . . " (Italics ours.) The administrator, in turn, is directed to sell electricity under these wholesale rates to eligible buyers. In the event that the purchaser intends to resell to others, the administrator is further directed to see to it that its rates are "reasonable and nondiscriminatory."

The first units of Bonneville were placed in operation in 1937. By January 1, 1941, four generating units with a capacity of 194,400 kilowatts were in use; by July 1, 1944, six more units are expected to be in operation, bringing the capacity to 518,400 kilowatts. As of June 1, 1939, allocated expenditures of $13,672,795 were reported by the U.S. Engineer Office; by 1945, the figure is expected to be $50,293,-885. In allocations of the joint costs in these figures, the Federal Power Commission has assigned 57 per cent to power production.

Rates for Bonneville Power.—The power section of the Bonneville Act provides that rates " . . . shall be fixed and established with a view to encouraging the widest possible diversified use of electric energy. . . . " The act further specifies that rate schedules "may provide for uniform rates or rates uniform throughout prescribed transmission areas in order to extend the benefits of an integrated transmission system and encourage the equitable distribution of the electric energy developed at the Bonneville project."[1] This mandate immediately led to sharp discussion of proper rate theories. The opposing views were the "postage stamp" theory and the cost theory. The advocates of the former wished to have a set of standard rates applicable everywhere in the area; the proponents of the latter insisted on charges graduated according to transmission distances from Bonneville. One important element behind this conflict was the question of the preservation of the scenic beauty of the river in the vicinity of the dam. As we shall see later, the actual rates put in use were a compromise. The site rate applicable within 15 miles of the dam was a restricted expression of the cost theory; and at the same time, the 15-mile limitation removed any incentive for industry to crowd into the immediate vicinity of the dam. The balance of the area served by Bonneville outside the 15-mile zone is blanketed into one region, thereby being to that extent an application of the postage stamp theory.

[1] Sec. 6. It is probable that the activities of the Oregon State Planning Board and others interested in preserving the scenic beauty of the Columbia River gorge were in part responsible for the adoption of this rate policy. As is shown above, the actual rates promulgated remove all incentive to locate industries along the rim of the gorge.

As we have intimated, the Federal Power Commission, in whose hands the act committed the authority to approve Bonneville rates, followed neither theory of rate making but instead considered both of them by setting up two general rate forms, expressed in kilowatt-years.[1] The first were the *site rates* "available to private purchasers for their own use, but not for resale, and to public bodies, cooperatives, and privately owned utilities for distribution within fifteen miles of the Bonneville power plant." The original rate schedule was

For primary power	$14.50 per kw.-year
For secondary power	9.50 per kw.-year

The second class of rates were the *transmission system rates*, which, by provision of the act, were required to be "uniform over the entire transmission system, available to public bodies, cooperatives, and privately owned electric utilities for resale only." That schedule was

For primary power	$17.50 per kw.-year
For secondary power	11.50 per kw.-year

Almost simultaneously with the appointment of the new administrator for Bonneville in September, 1939, the Power Commission released a new and revised schedule of rates. The new one retains the same charges for primary power for the site and transmission rates but discards the charges for secondary power. It adds two new supplemental rates and retains temporary experimental rates. The first new supplemental rate is:

Demand charge	75¢ per kw. of demand
Energy charge	2.5 mills per kw.-h.

The second new supplemental rate provides for the sale of dump power at 2.5 mills per kilowatt-hour.

For its public power customers, the Bonneville administrator has assisted in the design of retail rates. For its first municipal plant customer the following schedule for residential users was agreed to:

First 50 kw.-h.	3¢ per kw.-h.
Next 50 kw.-h.	2 per kw.-h.
Next 200 kw.-h.	1 per kw.-h.
Next 900 kw.-h.	½ per kw.-h.
Excess kw.-h.	¾ per kw.-h.
Minimum monthly bill	75¢

[1] The use of the kilowatt-year is based upon the demand principle of industrial and power rates. It simply means the amount of output of 1 kilowatt of capacity for the period of 1 year. In other words, one who buys a kilowatt-year buys the right to use 1 kilowatt of capacity, or any portion thereof, for as many hours a year as he wishes, to a maximum of 8,760 hours.

The Rate Controversy.—Of course, the Power Commission expects these rates to cover all costs of power generation and transmission to the point of sale, including "the amortization of the allocated investment. . . . " These rates have been attacked on two grounds, namely, that they are too high and they fail to cover all costs. The *Electrical World* has said editorially, "In spite of the arbitrary allocation of investment costs Bonneville power is not cheap power."[1] Another critic has taken the position that the present schedule, be it "cheap" or "dear," is not half high enough to cover all legitimate costs. He cites the experience of the Ontario Hydro which, he says, was obliged to raise its kilowatt-year rate from $13.20 in 1913 to $25.33 at the present time.[2] On the other hand, there is evidence that these rates in themselves are reasonable. An elaborate study of power costs made by the Power Authority of the State of New York included the following estimates for Bonneville. Assuming a 50 per cent load factor and fixed charges of 6½ per cent, it was calculated that electricity could be delivered 50 to 100 miles for approximately 3.5 mills a kilowatt-hour.[3] According to our own calculations, the transmission system rate at Bonneville, on the basis of a 50 per cent load factor, will result in the sale of electricity at 4.00 mills per kilowatt-hour. The new supplemental rate, under similar assumptions, will yield a cost of 4.2 mills. These figures seem comparable to costs of privately owned plants; and if they cover all costs (as defined by the administrator and the Federal Power Commission), there can be little challenge of them.[4]

GRAND COULEE DAM

In addition to the Bonneville dam, there has been constructed on the Columbia River an even more spectacular development popularly known as the "Grand Coulee Dam." Any description of it leads one of necessity to the use of superlatives. It is the largest in volume and the second highest of the masonry dams of the world, second in height

[1] **112**:163, July 15, 1939.

[2] Abrams, "Bonneville Rates and Market," *Public Utilities Fortnightly*, **23**:456, Apr. 13, 1939.

[3] "Government Hydro versus Private Steam Power," *House Doc.* 52, 75th Cong., 2d Sess., pp. 6, 18, 53, 55. This report estimates, under identical conditions the cost of steam-generated electricity in the Bonneville area to be 6.5 mills.

[4] In the *Second Annual Report* of the Administrator of the Bonneville Administration is found the following statement in conclusion to elaborate calculations: "In summary, the feasibility studies indicate that if the present wholesale rates are maintained, the Government would recover within 15 years of the completion of all power-generating units in Bonneville Dam not only the full investment allocated by the Federal Power Commission to power production, but also interest thereon at 3½ per cent." Pp. 40, 1940.

only to Boulder Dam. The base of the dam alone, completed in early 1938, is the largest man-made structure on earth. The dam is located in the Columbia River immediately below the head of the Grand Coulee (the old river bed). It is 94 miles northwest of Spokane, Washington, and approximately 600 miles from the river's mouth. When fully developed, it is expected that the Columbia Basin Reclamation Project, of which Grand Coulee Dam is the principal feature, "will ultimately irrigate 1,200,000 acres of land, regulate the flow of the Columbia River, and develop electrical power for use on the project and elsewhere."

Fundamental to the project has been the construction of two reservoirs. The first is a storage reservoir extending upstream 150

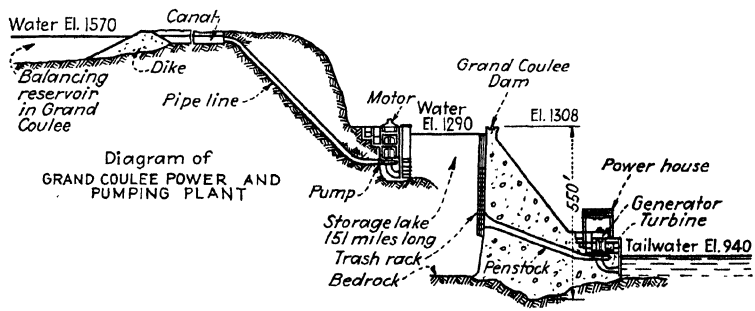

CHART 35.—A cross-section sketch of the Grand Coulee development, prepared by the Bureau of Reclamation. Note the combination of on-channel dam in the Columbia, and balancing reservoir in the Grand Coulee.

miles behind a dam on the Columbia. This dam is approximately 4,000 feet wide at the crest and extends upward 553 feet from bedrock. The upper 80 feet of reservoir capacity, something over 5 million acre-feet, can be used, when necessary, to regulate the river flow for the benefit of downstream power plants and navigation. This feature is the key to the Columbia River power development. It has been estimated that this use of the Grand Coulee Dam will double the firm power of plants between it and the mouth of the Snake River and will increase by 50 per cent the firm power output of plants below that point, including Bonneville.[1] By means of two earth dams, a balancing, or second, reservoir 27 miles long and covering an area of about

[1] Since the high-water and irrigating seasons coincide, stored water will not be required for irrigation or for power in pumping irrigation water. In other words, secondary power can be used for pumping, leaving all primary and some secondary power available for other uses.

27,000 acres has been formed in the upper Grand Coulee (see Chart 35), its high-water level being 280 feet above that of the storage reservoir behind Grand Coulee Dam. A portion of the power developed on the river is used to pump water into this reservoir, from which flows a system of main canals carrying water to irrigation systems.

Since the Grand Coulee project is not yet completed, its total cost can be only approximated. One source estimates that dam and irrigation facilities will ultimately cost in the neighborhood of 400 millions. Between March 1, 1933, and the end of the 1940 fiscal year, there had been advanced by the federal government a total of $117,005,000, as follows:

Source	Amount
Public Works Administration	$ 27,005,000
Emergency funds	20,250,000
General funds	69,750.000
Total	$117,005,000

According to our information, the moneys from emergency funds and the general funds are appropriations, to be repaid at a later date.

The ultimate installed capacity at Grand Coulee has been estimated to be 1,944,000 kilowatts; and as the system of canals is extended, a number of relatively small auxiliary power plants will be developed at "drops" in the canals. In fact, power is an essential rather than an incidental development on the project, because it will be required in the lifting of water into the balancing reservoir. On the other hand, a tremendous quantity of surplus energy will be available, although an engineer in charge of construction has said that all of it can be absorbed by the market in 15 years. He quotes a price of commercial power at Grand Coulee . . . "at 2¼ mills at the plant," which, he says, is ". . . equivalent to 3 mills on the coast." He believes that at these rates, with interest computed at 4 per cent on the investment, the Grand Coulee power development can pay for itself in 50 years and, in addition, accumulate a large surplus to be available for partial liquidation of the irrigation investment.[1] If these calculations are correct (and the project is not far enough advanced to check them), there is unquestioned defense of the Grand Coulee development.

ELECTRIC POWER IN THE NORTHWEST

The student will suspect, after reading this discussion of the Columbia River projects, that the first hurdle is the successful penetration of power markets. Let us look once more at the figures. By

[1] Cited by THOMPSON, "The Biggest Dam on Earth," *Public Utilities Fortnightly*, **23**:153, Feb. 2, 1939.

1945 the combined kilowatt capacity of Bonneville and Grand Coulee will be 833,400 kilowatts. The 1940 capacity of other producers in Washington and Oregon amounted to approximately 1,500,000 kilowatts. If these add nothing before 1945, the new facilities of the Columbia River projects will have increased the generating capacities of these two states by 55 per cent. Thus, the primary problem of the power administrator of Bonneville, acting as agent for Grand Coulee as well, is the securing of new customers.

The experts at Bonneville have studied intensively the probable future market for power.[1] For instance, an analysis of the consumption of the states of Washington and Oregon, and western Idaho and northwestern Montana showed in 1938 a total consumption of 4,686,560,000 kilowatt-hours evenly divided between industrial and railroad sales and all other sales. By 1950, it is expected that consumption in this area will rise to 8,800,000,000 kilowatt-hours. If this be so, by that time there must be built additional capacity amounting to well over 1,500,000 kilowatts. Thus, the building program of the Columbia River projects is justified, since more than their construction will be necessary to meet this difference.

But the Bonneville authorities have done more than estimate future needs. They have actively sought power customers. As of December 31, 1939, the administrator had contracted to supply 1,250 kilowatts of firm power to municipalities, 3,600 kilowatts to public utility districts; 20,000 kilowatts to the Portland General Electric Company, and 32,560 kilowatts to industrial companies. The Portland Electric contract was executed on December 1, 1939, for one year, and it is subject to renewal under a variety of stipulations, the most important of which is a requirement of mutual agreement among the administrator, the company, and the Oregon commission to a schedule of retail rates. In addition to the firm power provision, the company is permitted to buy dump power, if available. Such an arrangement may presage peace in the Pacific Northwest between private and public power producers.

Even more significant are the power contracts with industries. Of the 32,560 kilowatts contracted with industry on December 31, 1939, 32,500 were assigned to the Aluminum Company of America, for the use of its first west-coast plant. Early in 1940 another important customer, the Sierra Iron Company, concluded a contract for 30,000 kilowatts of firm power. Thus has over 60,000 kilowatts of capacity

[1] The Federal Power Commission has been interested in assisting the Pacific Northwest to find power outlets. See its 1938 study entitled *Power Requirements in Electro-chemical, Electro-metallurgical and Allied Industries.*

been assigned to two industries new to the region. Their plants will be located at Vancouver, Washington, directly across the Columbia from Portland. Other industrial possibilities are likely when one considers that " . . . over 50 inquiries have been received from firms or industries interested in utilizing Bonneville power in manufacturing operations in the Pacific Northwest."[1] Of these, the administrator believed that there was a good possibility of finally securing an additional load of 100,000 kilowatts.

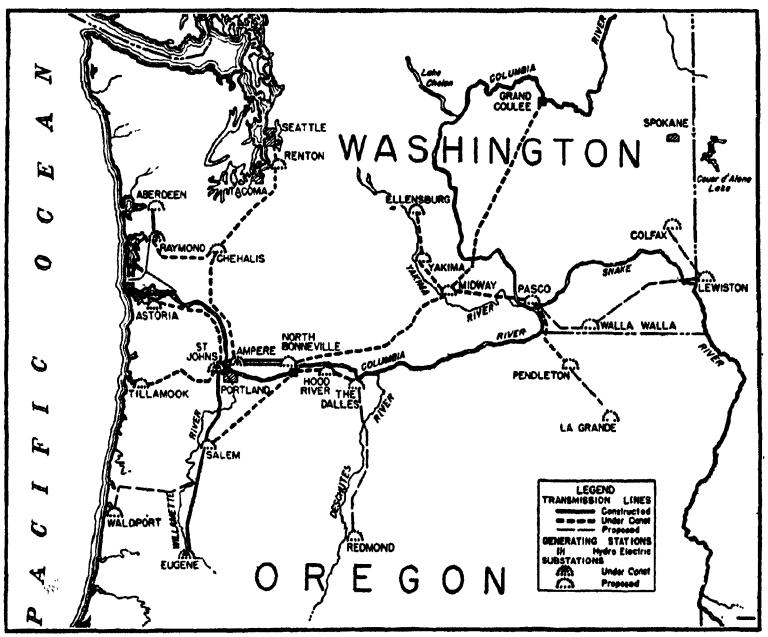

CHART 36.—Interconnections of the Columbia River power projects and adjacent electric-power facilities. With the completion of these lines, the power pool in the Pacific Northwest will become a reality. (*Electrical World* **112**: 1676, *Dec.* 9, 1939.)

It would seem that Bonneville and Grand Coulee power can be economically utilized within the proper vicinity of those projects, and this without destroying any capacity now privately owned. Of course, to carry out this extensive program a network of major and minor high lines must be built interconnecting these dams and the existing facilities to the east and west. This is being done (See Chart 36). It can only be hoped that this program will be carried forward with a

[1] *Second Annual Report* of the Administrator of the Bonneville Administration, p. 16, 1940.

minimum of friction between private and public interests. There ought to be some basis of their harmonious interconnection, spiritual as well as physical.

One more change is certainly needed to complete the organization of the Columbia River projects. Bonneville is the joint responsibility of the War Department and the Department of the Interior (acting through an administrator). Grand Coulee is the responsibility of the Bureau of Reclamation of the Department of Interior. These should be integrated under one head—at least, the power sales should be so administered. The Bonneville act calls the setup for Bonneville "tentative." President Roosevelt took a forward step when, in August, 1940, he designated the administrator of Bonneville as the agent for both projects for the sale of power. This arrangement should be made permanent, if not expanded to include other phases of the program, in order to expedite the development of the Columbia River along the lines of a unified and rational plan.

OTHER FEDERAL PROJECTS

These public power projects described so far do not exhaust by any means the total of such developments (see Table 68). Excluding the Tennessee Valley Authority from consideration, there are at least five other public projects with contemplated ultimate installed capacity in excess of 100,000 kilowatts each. We select two of them for brief description.

Fort Peck.—Under the Corps of Engineers of the United States Army, the world's largest earth-filled dam, Fort Peck, has been constructed in the Missouri River in northeastern Montana at a point 1,878 miles above the river's mouth.[1]

The primary engineering purpose of the dam is the improvement of river navigation from Sioux City, Iowa, to the mouth of the Missouri River, a distance of 764 miles, with incidental purposes of flood control, hydro-electric power and irrigation.

The estimated cost of the project is 123 million dollars, and the ultimate generating capacity will be 105,000 kilowatts. Under the Fort Peck Act, the Federal Power Commission is instructed to provide a cost allocation for this project.[2]

The Central Valley Project of California.—The Central Valley Project in California provides for the construction of two dams. Shasta Dam, on the Sacramento River about 12 miles north of Redding,

[1] *Report on Fort Peck Reservoir Dam*, Corps of Engineers, United States Army, Apr. 16, 1939.

[2] 1938 *Annual Report*, Federal Power Commission, p. 1.

TABLE 68.—FEDERAL POWER PROJECTS*

Project	Estimated cost ($1,000)	Ultimate capacity kw.	Added in 1939, kw.	In operation end of 1939, kw.	Expected to be added in 1940, kw.	Completed end, 1939, approximate per cent
Tennessee Valley Authority:[a]						
Gilbertsville	95,000[b]	160,000				3
Pickwick	31,837[c]	216,000	72,000	72,000		100
Wilson	34,980[d]	444,000		184,000		100
Wheeler	31,586[e]	259,200		64,800		100
Guntersville	33,400[e]	97,200	72,900	72,900		100
Chickamauga	37,000[e]	108,000			81,000	95
Watts Bar	35,000[e]	150,000				3
Norris	30,749[f]	100,000		100,800		100
Hiwassee	20,000[g]	115,200			57,600	74
Corps of Engineers:						
Fort Peck	123,750[h]	105,000				90
Bonneville	78,120[h]	518,400	86,400	86,400	108,000	100
Denison	48,290[h]	125,000				1
Reclamation Bureau:						
Boulder Dam	132,160[i]	1,317,000	165,000	700,000		100
Kendrick	20,000[j]	32,400	32,400	32,400		100
Central Valley	170,000[k]	375,000				35
Colorado Big Thompson	44,000[l]	145,000				30
Grand Coulee	394,500[m]	1,944,000				35
Public Works Administration Projects:						
Platte River	11,226	26,000	26,000	26,000		100
Loup River	12,814	47,000		45,225		95
Central Nebraska	35,516	54,000			54,000	80
Grand River	20,000	86,400			57,600	80
Santee-Cooper	34,300[n]	163,000				20
Lower Colorado River Authority	22,350[o]	98,000	33,750	33,750	53,250	80
Brazos	50,000[p]	75,000			22,500	86
Totals	1,546,587	6,761,600	488,450	1,418,275	438,950	

[a] TVA joint investment, covers navigation, flood control, power.

[b] Estimate with no power. [c] Estimate includes two units.

[d] Reconstruction cost of facilities acquired from War Department, plus additions made by authority to June 30, 1938.

[e] Estimate includes three units. [f] Costs to June 30, 1938. [g] Estimate includes one unit.

[h] Bonneville—navigation $42,600,000, powerhouse and generating facilities $35,520,000. Fort Peck—navigation $117,000,000, power $6,750,000. Denison—allocation as between power and flood control not yet determined.

[i] *Not* including all-American Canal. [j] Includes Alcora Dam and irrigation district.

[k] Includes whole project; Shasta Dam alone will have power development.

[l] Including $26,000,000 for irrigation. [m] For dam and irrigation development.

[n] Total estimated cost exclusive of $6,495,691 WPA for clearing reservoir.

[o] Total exclusive of $18,280,000 allotment to Bureau of Reclamation and direct congressional authorization and $109,850 Works Progress Administration.

[p] Possum Kingdom Dam, key project in the contemplated $50,000,000 development of the Brazos River Conservation and Reclamation District, has received a $4,200,000 Works Progress Administration allotment, a substantial portion of which has been expended. Recently Reconstruction Finance Corporation purchased $4,200,000 of the district's bonds, of which proceeds approximately $2,500,000 will be used to complete Possum Kingdom. An estimated 75,000 kw. will be generated in the proposed seven-dam hydrodevelopment. The Reconstruction Finance Corporation bonds will be retired from sale of power supplemented by a state appropriation of $132,000 per year for 16 years.

* *Electrical World*, **113**:122, Jan. 13, 1940.

California, is to be operated for the purpose of regulating "the flow of the river for navigation improvement, flood control, irrigation, salinity repulsion, industrial use, municipal consumption, and electric-power generation."[1] It is to be a concrete dam second only to Boulder in height and to Grand Coulee in mass. Work was begun under the direction of the Bureau of Reclamation in 1938. A hydroelectric plant of 375,000-kilowatt capacity is included in the project. Friant Dam, in the San Joaquin river to the south, completes the Central Valley Project. Initial construction plans do not include a power plant. The total project cost is estimated at 170 million dollars.

THE ST. LAWRENCE PROPOSAL

Thus far, our interest has centered around those public power projects under federal assistance. All these are at least under construction, and all will be in operation within a few years. Let us next turn our attention to a project which before the second World War existed only in paper stage. This is the St. Lawrence Waterway proposal, a plan to create along the St. Lawrence river a deep waterway from the Atlantic Ocean to the Great Lakes and a series of hydropower plants. In brief, when conceived as a peacetime project it would require the building of river control dams, where power can be developed, and the construction of about 25 miles of canals and eight locks to permit the passage of seagoing vessels between Lake Ontario and Montreal. It would involve, more or less directly, a variation in Great Lakes levels, channel maintenance, winter navigation, power development, Chicago water diversion plans, and preservation of scenic beauty at Niagara Falls. In addition, such a program cannot be considered apart from its probable effects upon established transportation and power production agencies.

According to a proposed treaty (rejected in 1932 by the Senate of the United States), there were to be built two power dams in the international section of the St. Lawrence where the combined fall available at both dams would be about 85 feet in summer and 76 feet in winter. There were to be two powerhouses at each dam, one on each side of the river, thereby making available a total of approximately 2,200,000 horsepower. The half that would belong to the state of New York was estimated to be capable of producing annually about 6,500,000,000 kilowatt-hours of energy—over one-half of all electricity sales in that state by private companies.[2] According to estimates of

[1] "Central Valley Project," *Bulletin* of United States Department of the Interior, Bureau of Reclamation.

[2] WALKER, "Is New York Wasting Money on Its Power Authority?," *Public Utilities Fortnightly*, **24**:217, Aug. 17, 1939.

the Power Authority of the State of New York, this plan could be completed in 7 years at a cost of $257,992,000 to the United States and $142,976,000 to Canada, the difference being accounted for by the investment of the latter in the Welland Canal.[1]

This combination plan for a shipway and power generation will require at least the agreement of Canada and the United States and the cooperation of the provinces of Quebec and Ontario and the state of New York. As yet, the two countries have not been able to arrive at a satisfactory treaty basis, although final agreement may not be too far away. In addition to that hurdle, there is the question of the rights of New York State to power developments on the St. Lawrence. The Power Authority of the state of New York is inclined to claim jurisdiction over that part of the bed of the river within the state. This is disputed by the United States.[2]

Since the outbreak of the second World War, interest in the power portion of the St. Lawrence program has been revived. In the fall of 1940, President Roosevelt allotted 100 million dollars to be spent by the Federal Power Commission and the United States Engineer Office in surveys of the power possibilities of the international rapids section of the river. The defense needs of the United States were the basis of the President's action. It is yet impossible to predict the final outcome of this step. Very likely, however, a hydropower plant will be built upon the river under the joint supervision of Canadian and United States authorities. Since power only is being considered, whatever is constructed on the St. Lawrence during the emergency created by the second World War will not be subjected to the hazard of review by the Senate of the United States. Once the step is taken to develop power, it ought not to be too difficult later to proceed with the remaining features of the program. When that time comes, we shall have in operation upon our northeastern border as spectacular a public power project as those in the South and West.

HYDRO IN CANADA

Any discussion of public power projects would not be complete without mention of the development in the Canadian province of Ontario. Ontario's hydro undertaking is not strictly comparable

[1] For a detailed showing of cost estimates on this proposal, see *Public Utilities Fortnightly*, **23**:46, Jan. 5, 1939.

[2] For further investigation of this proposal, we suggest *Report of the Saint Lawrence Power Development Commission*, State of New York, 1931; 1931 *Annual Report*, the Power Authority of the State of New York, *Legislative Doc.* 111, State of New York; and *Report* of the Joint Board of Engineers appointed by the United States and Canada, *Sen. Doc.* 183, 69th Cong., 2d Sess.

with similar projects in the United States, because it is a cooperative municipal enterprise administered by the Hydro-electric Power Commission of Ontario, a province organization. Its coverage is province-wide, and the commission has, since about 1910, been supplying its customers with electrical energy derived entirely from water power developments, including both power generated in its own plants and that purchased from private sources.

Although the province of Ontario has an area of approximately 400,000 square miles and includes rich forest, mineral, and agricultural sections, the portion south of Lake Nipissing and the Ottawa River, an area of 40,000 square miles, contains the bulk of its population. On the premise that this southern part of Ontario had an industrial future, province officials, as early as the turn of the century, began to search for a means of liberating it from outside sources of fuel and power. As a result, the Hydro Commission was created by special act of the Province Parliament in 1906, and its powers were amplified and extended in 1907. These two basic acts, modified by numerous amending acts which now form a part of the revised statutes of Ontario, make up the authority under which the commission operates.

In 1909, construction of a transmission network was begun; and by 1910, power was being supplied to several municipalities. From that beginning, the Hydro rapidly extended its services in the province until, by the end of 1938, it was serving twenty-six cities, 102 towns, 285 villages and police villages, and 408 townships. All in all, these total 821 municipalities. The commission served these communities by means of forty-six generating stations with a capacity of 1,519,400 horsepower. To this should be added leased facilities of 540,005 horsepower. With these combined facilities, it supplies over 7 billions of kilowatt-hours each year.[1]

According to its statements, the Ontario Commission has followed the principle of service at cost in rate making, such cost to include not only "all operating and maintenance charges, interest on capital investment and reserves for renewals or depreciation, for obsolescence and contingencies and for stabilization of rates, but also a reserve for sinking fund or capital payments on debentures."[2] This principle has resulted in service to customers at very reasonable rates, as the following figures show. Of the domestic customers in 1938, 86.7 per cent paid 1.5 cents or less per kilowatt-hour; 12.7 per cent paid between

[1] See *Hydro in Ontario*, by the Hydro-electric Power Commission of Ontario, p. 2. Much of the material of this section is from this and other official documents released by the commission.

[2] *Ibid.*, p. 4.

1.6 and 2.9 cents; and the balance, 0.6 per cent, paid 3 cents or more per kilowatt-hour. Of the commercial light customers, 91 per cent paid an average of 1.9 cents or less per kilowatt-hour; 53.7 per cent of the municipalities paid less than $20 per horsepower per year; and 46 per cent paid between $20 and $30.[1] The promotional qualities of the commission's rates are seen in the figures of domestic use. In 1938, for instance, the average annual urban residence consumption exceeded that for any other similar area in North America, being 1,980 kilowatt-hours.

According to the commission's statement, the Ontario enterprise "involves two distinct phases of operations."[2] The first phase is the supply of electricity, either by generation in its own plants or by purchase from private producers, and its delivery in wholesale quantities to municipal utilities, large industrial consumers, and rural power districts. This function is performed by the Ontario Hydro Commission "as trustee for the municipalities acting collectively in groups or 'systems.'"[2] The second phase of the commission's operations is concerned with the retail distribution of electricity to consumers within the limits of the areas served by the participating municipal utilities and rural power districts. The former of these groups performs the retail function with only a minimum of commission supervision, whereas, acting in behalf of the townships, it supervises the details of the physical and financial operation of the rural power districts.

The properties of the Ontario Hydro are organized into systems, called "partnership municipalities," and are as follows:

The Niagara System, largest and most important, serves the area between the cities of Hamilton and Toronto on the east and the cities of Windsor and Goderich on the west. Its power supply comes from the commission plants on the Niagara and Ottawa rivers and from purchases from privately owned Quebec companies. It is the development at Niagara Falls, across from New York State, that has occasioned much discussion in the United States. Before 1933, it was almost a tradition that an advocate of public ownership would look to that development for evidence to support his proposals for the United States.[3]

The Georgian Bay System serves that territory at the southern end of Georgian Bay and secures its electricity chiefly from scattered local developments.

[1] Of course these figures are quoted in terms of the Canadian dollar.

[2] *Ibid.*

[3] See chapter bibliography for a note listing some of the "investigations" made by Americans of the merits of Ontario Hydro.

The Eastern Ontario System serves the remaining territory to the east of the province and obtains its power from local developments and purchases from private producers.

The Thunder Bay System serves the cities of Port Arthur and Fort William, their adjacent rural section, the village of Nipigon, and the mining district of Langlac. Two hydrodevelopments on the Nipigon river are the sources of electricity for this system.

The Northern Ontario Properties are the final group. Whereas the other systems are operated in behalf of the "partner utilities," this system is operated in trust for the province. These properties are widely scattered in the northern part and are served by many isolated, scattered hydroplants. This system has played a significant part in the development of mining in northern Ontario.

The commission points with pride not only to its record of low cost of service and efficient operation but also to its engineering achievements. It was a pioneer in "superpower," the high-voltage transmission line. It now has in use products of its research laboratories and has a standing policy of cooperation with outside research bodies.

The capital of the Ontario Hydro has come from two sources. First, during its life (to 1939), the province has advanced to it a total of $207,250,258. These funds were raised by the sale of province bonds, to be retired by the Hydro Commission. As of October 31, 1938, there were outstanding against it province bonds amounting to $148,714,776.[1] The second source of funds has been the direct sale of Hydro debenture bonds. As of the above date, there were outstanding approximately $120,000,000 of them, bearing interest rates ranging from 2½ to 6 per cent. On that date, the commission showed total assets valued in round numbers at $350,000,000.

Much has been written about the economy of the Ontario Hydro. In the 1920's, it was the target of bitter attacks on the part of American opponents to public ownership, who thought that they could find in its operations proof of its lack of good example for us. Occasionally, some act or decision of the commission gets injected into politics, if accounts in the American press are correct. On the whole, regardless of what one may believe about the validity of public ownership, the Ontario Hydro has grown; it has a magnificent record of high domestic consumption; and, according to its own reports, it has been receiving a surplus of revenue over all operating costs. Fundamentally, such a development as this is very difficult to compare with the typical American steam power electric system; and therefore all comparisons, regardless of whether made by friend or foe, are of doubtful merit.

[1] 1938 *Annual Report*, pp. 162, 175, 180.

WHICH IS CHEAPER—STEAM OR HYDRO?

One measure of the economic validity of any power program, private or public, has always been the estimated comparative unit cost of production by means of substitute facilities. Thus, so long as electricity could be factory generated at less per kilowatt-hour than it could be purchased from a central station (steam or hydro), it was so produced.[1] When the reverse became true, independent factory units began to be dismantled. The same comparisons are often made between steam and hydrogenerated electricity, especially between privately owned steam plants and publicly owned hydroplants. If one side or the other of this dispute can be proved to have a kilowatt-hour cost advantage, then we shall at least have settled one point in the controversy over the public power projects.

The problem, however, is a complex one; the evidence is in dispute; and comparable situations are rare. In a real sense, each generating station serves under unique circumstances. Load factors; plant costs; reserve factors; degree of system integration; stand-by, or base-load, function; transmission distances; interest and taxes are all items to be harmonized in any adequate comparison. A final complicating factor is the presence of joint costs in practically every one of the public power projects. As is set out in detail in the discussion of the rates of the Tennessee Valley Authority, no one rule of allocation is accepted by public and private operators alike. Thus, the choice of allocation theory may hinge upon the favorableness of a unit cost comparison.

Yet for all these complex factors, comparisons have been and will continue to be made. The private industry owns twice as much steam capacity as hydro and consistently claims that the former has the edge in unit cost over the latter, whether it be publicly or privately owned. For instance, a leading electrical engineer, F. F. Fowle, has said that under ordinary circumstances steam generation at the power-plant bus results in costs of 4 mills per kilowatt-hour, whereas hydroelectric plant costs average 6.3 mills. These conclusions were later cited in a *Report* of the National Resources Committee on Technological Trends and National Policy.[2]

The general conclusion of those involved in building, operating, or fostering public projects is as uniformly to the contrary. For instance, the Power Authority of the State of New York has made an elaborate

[1] We assume that factory-generated power is as continuous and constant as that supplied by a central station.

[2] See p. 259 of the *Report*.

TABLE 69.—STEAM VERSUS HYDRO*

	Mills per kw.-h.	
	Fowle's estimates	Power authority estimates
Steam (private):		
Mine-mouth generation	4.0	5.2
With $2.50 coal	4.5	5.6
With $4.00 coal	5.4	6.3
With $5.00 coal	6.0	6.7
Hydro (public):		
Generating point	6.3	2.1
Transmitted 50 miles	8.0	2.9
Transmitted 100 miles	8.2	3.0
Transmitted 200 miles	8.7	3.3

* Assumptions: 50 per cent load factor and no market for secondary hydropower. See *Government Hydro Versus Private Steam Power*, p. 3, *House Doc.* 52, 75th Cong., 2d Sess., 1937.

study of this problem.[1] It used as its point of departure figures prepared by the engineer cited above and, after elaborate corrections of his basic assumptions, produced far different results, as the preceding table adapted from the report shows. This study was not content merely to combat private "propaganda" but went into detailed analysis of comparative water and steam costs for major projects. Its findings are set out in Tables 69 and 70.

TABLE 70.—COMPARATIVE COST: STEAM AND HYDRO*
(For selected projects)

	Cost at load centers, mills per kw.-hr.	
	Hydro including transmission	Equivalent modern steam plant
St. Lawrence	4.1	6.3
Bonneville	3.5	6.5
Grand Coulee	3.1	6.5
Boulder	3.4	6.4

* *Government Hydro versus Steam Power*, p. 4, *House Doc.* 52, 75th Cong., 2d Sess., 1937. Notes of the report are: "Assumed basis 50-per cent load factor. The St. Lawrence project is naturally a base load development. At 80-per cent load factor the cost of hydro would be 2.6 mills."

What shall we conclude from this evidence? In the first place, it obviously is in conflict. In the second place, the report of the New

[1] *Government Hydro versus Private Steam Power*, printed as *House Doc.* 52, 75th Cong., 2d Sess., 1937.

York Power Authority, if correct, proves the economic validity of public power projects. On the other hand, this report is open to the same criticisms that its authors leveled against the Fowle estimates. Always there is that illusive thing known as "joint costs" in the background of all estimates of hydro costs. Therefore, we wonder if a power program, a portion of a multipurpose project, should be defended

TABLE 71.—COST PER HORSEPOWER, COMPARABLE HYDROELECTRIC PLANTS*

GOVERNMENT PLANTS

Project	Present or initial cost	Ultimate cost	Capacity, hp.		Present or initial cost per hp.	Ratio of present to ultimate hp., per cent
			Present	Ultimate		
Pickwick	$ 31,800,000	$ 39,900,000	96,400	289,200	$330	33.3
Wilson	46,950,748	57,950,748	246,600	595,100	190	41.4
Wheeler	33,483,559	42,400,000	85,800	343,000	390	25.0
Guntersville	33,400,000	35,200,000	96,300	128,400	347	75.0
Chickamauga	37,010,000	39,200,000	108,600	144,800	341	75.0
Norris	37,257,000	37,257,000	134,000	134,000	278	100 0
Total or average	$219,901,307	$251,907,748	767,700	1,634,500	$286	47.0

PRIVATE PLANTS

Project	Licensee	Cost claimed by licensee	Capacity, hp.		Present or initial cost per hp.	Ratio of present to ultimate hp., per cent
			Present	Ultimate		
Coosa	Alabama Power	$ 10,646,056.76	72,000	93,000	$148	77.4
Ohio River	Louisville Gas & Electric	7,829,738.72	108,000	135,000	72	80.0
Chattahoochee	Columbus Electric & Power	7,688,544.12	66,000	80,000	116	82.5
Safe Harbor	Safe Harbor Water Power	24,995,111.74	255,000	510,000	98	50.0
Conowingo	Susquehanna River Power	55,156,084.98	378,000	594,000	146	63.6
Tallapoosa	Alabama Power	17,868,816.84	135,000	180,000	132	75.0
Total or average		$124,184,353.16	1,014,000	1,592,000	$122	63.7

* KELLOGG, "The Utilities Offer the Facts," *Forbes*, Dec. 15, 1939.

mainly on the basis of its alleged costs per kilowatt-hour of output. Certainly a stronger defense lies in the fact that only a publicly controlled multipurpose program can integrate such diverse objectives as flood control, navigation, power production, and conservation generally. The last objective alone may, in the future, be sufficient justification.

One fact alone suggests the economy of hydropower production. For years, a significant portion of installed capacity and output has been accounted for by such plants. A study of installed generating capacity shows that the percentage of hydro to total capacity rose from 25.9 per cent in 1920 to 28.3 per cent in 1937. The percentage of total production has oscillated from 35.8 per cent of the total in 1920 to a high of 40.1 per cent in 1932 to 32.2 per cent in 1939. This fluctuation is probably to be explained by the use of hydro to carry base loads. Thus, in 1932, the output decline was largely accommodated by reduced use of steam facilities, thereby increasing the percentage relation of the base-load capacity to total capacity in use that year. Finally, note that even before the beginning of the public power program the percentage of total generated by hydro held its own, thereby indicating its permanent place in even the program of private ownership and operation.

Bibliography

For further study of the federal projects, one should consult the publications of the Bureau of Reclamation, Department of the Interior. See especially the annual reports of the chief of engineers, United States Engineer Office, War Department. In connection with Bonneville, there are the *Annual Reports* of the Administrator of the Bonneville Power Administration and studies of the Oregon State Planning Board. Two of them are *A Study of the Wholesale Cost of Bonneville Power* and *Recommended Policies for Sale of Bonneville Power.*

For further reading on the St. Lawrence Proposal, consult our footnote references.

The Ontario Hydro has been the cause of a large amount of writing—pro and con. Its best defenses are the annual reports of the Hydro-electric Power Commission of Ontario and reports of official investigations such as were made in1922. Many popular articles and books have appeared in the United States attempting to "expose" Ontario Hydro. For a list of these, see Federal Trade Commission, *Summary Report on Efforts of Electric and Gas Utilities to Influence Public Opinion,* No. 71A, Utility Corporations, p. 112.

CHAPTER XXX

THE TENNESSEE VALLEY AUTHORITY

In terms of strict time sequence, discussion of the Tennessee Valley Authority should have been presented at the point indicated in the previous chapter. Logic, however, warrants a departure from chronological order. In the first place, the volume of material on this project exceeds that on any other federal power project. More significant, separate treatment is justified by the extraordinary public controversy over its program, the extent of the fulfillment of its objectives, and the settlement of the legal controversies that have swirled around it. Truly, the story of the development of the Tennessee Valley Authority is a case study in itself worthy of special and detailed treatment.

MUSCLE SHOALS: THE PERIOD BEFORE 1933[1]

We begin with a description of the economic geography of the area. The Tennessee River, the focal point of early as well as recent developments, is one of the half-dozen largest streams in the United States. It rises in the Great Smoky Mountains at an elevation of approximately 950 feet above sea level and flows toward the Southwest to a point about 20 miles past Chattanooga, Tennessee, near Guntersville, Alabama. At this point, the river makes a right-angle turn and flows away to the Northwest. In this vicinity in Alabama, it has its most rapid fall, a drop of 134 feet in 34 miles, ending at the foot of Muscle Shoals.[2] After following a winding northerly course through Tennessee and Kentucky, it finally empties into the Ohio at Paducah, 302 feet above sea level. It is thus a stream more than 650 miles long, dropping nearly 650 feet from its source to its mouth!

The watershed of the Tennessee River includes about 40,000 square miles of rugged rocky land and valley bottoms and contains a population of over 2 million people. This area receives slightly more than 50 inches of rainfall a year, and its soil classifies as fair to good for

[1] Every official study of the Tennessee River begins with its history. For a recent summary, see *Report* of the Joint Committee Investigating the Tennessee Valley Authority, *Sen. Doc.* 56, 76th Cong., 1st Sess., 1938.

[2] The present name of these Shoals comes from a "correction" by a clerk in the War Department of a report of a field engineer in which that site was called "Mussel Shoals," after the mussel shells found there.

agricultural purposes. Above the river flats, topography and poor farming techniques have combined to make agriculture an inadequate occupation. Much of the production is for home consumption rather than for market, and many farm families have annual cash incomes not exceeding a hundred dollars. Although the Tennessee basin is rich in minerals and other natural resources, it is definitely a problem area. The people, for the most part, represent a "stranded population," resisting education, progress, and outside influence.

The interest of the federal government in the improvement of the river, especially the Muscle Shoals sector, was evidenced first in the year 1824 when President Monroe, in an annual report to Congress, recommended a survey of the area with a view to improving navigation. From that year until about 1902, considerable investment was made in canals, locks, and open channel works. In general, however, this expenditure resulted in nothing of permanent value. Interest of private groups in the Muscle Shoals site first appeared in 1902 when an application was filed for a permit to construct a power dam at that point. The War Department denied this request on the grounds that such a development would be harmful to navigation. Later, in 1907, the Secretary of War was directed to create a board to formulate a plan for river improvement. When this board made its report, it recommended private development of power resources. As a result, the War Department recommended the acceptance of a bid of the Muscle Shoals Hydro Electric Power Company, a subsidiary of the Alabama Power Company.[1] Thus, when the first World War began, we find this private company in control of the site, on which, according to its claims, it had spent approximately $500,000.

The First World War Developments.—The first significant development on the river came during the first World War. President Wilson, under the National Defense Act of 1916, in order that the United States might have an independent domestic nitrate supply for military purposes, selected Muscle Shoals as "the ideal location" for its production. Although the Alabama Power Company, then in control of the site, asked to be compensated for its investment, the government refused, and undisputed title ultimately passed upon payment of $1 and some additional consideration.[2] The acquisition of the Muscle Shoals site

[1] *Report* 20, Rivers and Harbors Committee, 63d Cong., 2d Sess., May 18, 1914, and *House Doc.* 1262, 64th Cong., 1st Sess., June 28, 1916.

[2] An amusing by-product of this transaction was the arrest and $500 fine of the Alabama Power Company for photographic displays of its $1 check as evidence of its patriotism. The act violated a federal law forbidding the photographing of checks.

for the construction of nitrate plants as authorized by the National Defense Act of 1916 and the appropriation of $20,000,000 for this purpose properly marks the first step in what was later to become the enlarged program of the Tennessee Valley Authority. Previously, the government had been interested only in improving navigation on the Tennessee; following this war experiment, the public eye began to be focused upon the site as a potential source of cheap electric power.[1]

The only construction completed during the war was Nitrate Plant No. 1, which, with a reservation of 1,900 acres, cost $12,888,000. This plant used the modified Haber process, requiring little electric power. A brief period of operation proved it to be unsatisfactory. In the meantime, Nitrate Plant No. 2, a steam power plant, and Wilson Dam (Dam No. 2) were completed during the postwar period. Plant No. 2 was designed to use the cyanamide process which required a relatively large amount of power. This plant and its 2,300-acre reservation cost approximately $67,555,000. It was operated at one-fifth capacity for a 2-weeks' test run and likewise proved to be unsatisfactory. The steam electric power plant built to serve Plant No. 2 cost approximately $12,000,000 and at the time was the largest of its kind in the world, having an installed capacity of 60,000 kilowatts. Wilson Dam, the last of the four original projects, was completed in 1925. It had an initial installed capacity of 240,000 horsepower (180,000 kilowatts), and provision was made whereby subsequent installation of 360,000 horsepower (270,000 kilowatts) of additional capacity could be made. The dam and equipment represented an investment of approximately $47,000,000.

Prior to 1923, the Muscle Shoals project included a transmission line from the Shoals to a 30,000-kilowatt steam unit on the Warrior River in Alabama, a distance of 100 miles. This plant had cost $4,750,000, and both it and its connecting line were on the lands of the Alabama Power Company. Since Wilson Dam was not completed until 1925, such an auxiliary unit had been necessary to ensure an adequate power supply at Muscle Shoals. As a result of an agreement whereby these facilities would be sold to that company when no longer needed, in September, 1923, they were turned over to the Alabama Power Company for $3,400,000.

The Years of Indecision.—The years between the close of the first World War and the passage of the Tennessee Valley Authority Act of

[1] It is true, of course, that power had been developed in certain of the federal reclamation projects and had been proposed as early as 1907 for Muscle Shoals. One difference, however, between these early developments and the Tennessee Valley program is the place of private enterprise in power production and sale.

1933 were marked by inability of the Congress to agree upon a program of disposal of the government holdings at Muscle Shoals. In fact, after the war, the immediate problem was whether or not to execute the plans as set up in the war period. As we have seen, they were completed by 1925. The major question then became the permanent disposition of these holdings. Two courses were open, namely, sale or lease to private operators; or public operation directly by the United States or other public agency.

Several private concerns made proposals to take over and operate either the power plant at Wilson or the combined power and nitrate plants. Since the Muscle Shoals development had sprung out of our war needs for nitrate, most of the offers contemplated attempts to continue nitrogen production, provided it could be placed on a commercial basis. The many bidders for these works from time to time included Henry Ford, the Union Carbide Company, the Farmers Federated Fertilizer Corporation, and the Alabama Power Company.[1] The Alabama Power Company was especially interested in the disposal of the power facilities at Muscle Shoals. Originally the owner of the site, that company was physically connected to the central station at Wilson Dam and until 1933 the only important purchaser of power. Early in 1921, the Secretary of War had circularized electric companies with reference to purchase of the power output of Wilson, when completed, and the Alabama Company was the only interested one. Its reply to the Secretary is significant in that it reflected its expectations (or hopes, maybe) in the matter of the use of publicly generated electricity:[2]

> We do not wish to suggest a course contrary to the expressed purpose of Congress, [namely,] that all of the Muscle Shoals power shall be used in the manufacture of nitrates or other products needed for the munitions of war and useful in the manufacture of fertilizer and other useful products.

Each of these offers occasioned much current discussion, and each was in turn formally drafted into a Senate or House bill. The net result in each case, however, was a quiet death without even a vote by either house of Congress.

During the period of private offers, several bills were introduced to continue public operation of the Muscle Shoals facilities. For instance, before the dam at Muscle Shoals was completed, the Secretary

[1] Our investigations have disclosed at least nine distinct offers by private interests in the years between 1922 and 1929.

[2] Cited in *Hearings* on Muscle Shoals, House Military Affairs Committee, 67th Cong., 2d Sess., p. 789, 1922.

of War proposed a government-owned corporation to operate those facilities. This proposal passed the Senate but failed in the House. On two subsequent occasions, the Congress did pass bills providing for public operation of Muscle Shoals, only to suffer presidential veto.[1] The second vetoed bill, sponsored by Senator Norris, would have created a corporation (similar to the Tennessee Valley Authority) in order to provide for navigation, national defense, flood control, and economic development of the valley. The corporation would have been authorized to produce fertilizers and munitions and to develop and sell electric power. President Hoover's veto was based primarily on the belief that the valley was adequately served by private electric companies at rates lower than those proposed for the public corporation and that the major purpose of the bill was to place the government in competition with private electric companies.

We conclude with the observation that during the years of indecision, although neither side of the public versus private ownership controversy could triumph, the advocates of public ownership were setting the stage for their eventual victory.

THE TENNESSEE VALLEY AUTHORITY

The issue over the disposal of the government's hydropower plant at Muscle Shoals was finally settled in 1933. Under the spur of presidential approval, the special session of Congress in the spring of that year created the Tennessee Valley Authority.[2] To this federal corporation was handed the operation of the facilities at Muscle Shoals as the first unit of a far-flung—indeed, almost revolutionary—program. The act (as amended in 1935) contemplates, first, the integrated control of the Tennessee River and its tributaries and, second, the use of this integrated control to accomplish a number of purposes, such as navigation, flood control, agricultural and industrial development, and national defense.[3] The authority is also directed to make surveys looking toward legislation that would assist in "the proper use, conservation, and development of the natural resources of the Tennessee River drainage basin and . . . adjoining territory. . . . " As incidental to these and "in order to avoid the waste of water power," the act authorizes the development of electrical power and the transmission

[1] The first was vetoed by President Coolidge in 1928 (*House Report* 1095, 70th Cong., 1st Sess.) and the second by President Hoover in 1931 (*Sen. Doc.* 321, 71st Cong., 3d Sess.).

[2] Public No. 17—73 Cong., H.R. 5081; as amended by Public No. 412—74th Cong., H.R. 8632.

[3] *Tennessee Valley Authority*, 1933–1937, p. 1.

and sale of such portion as will not be needed for governmental purposes.[1]

THE PRIMARY OBJECTIVES

As set out in the Tennessee Valley Authority Act (as amended), the primary objectives for which the authority is created are the operation of the government properties at Muscle Shoals "in the interest of national defense and for agricultural and industrial development," the improvement of navigation upon the Tennessee river, and the control of flood waters in the Tennessee and Mississippi River basins. This mandate seems therefore, to create at least three primary objectives —improvement of navigation, control of floods, and agricultural experimentation.

Navigation.—As a primary objective, river navigation can be improved in one of two ways. As a function apart from flood control and power production, one standard process would be to construct a series of low dams in the Tennessee and tributary rivers. One suggestion, for instance, called for thirty-two such structures. The objections to such a plan are: It creates very little, if any, flood protection; it means a series of thirty-two locks and thus makes for slower movement; and since it would permit but scant power development, it would place almost the entire cost burden upon transportation. To carry out its mandate to construct and maintain a 9-foot channel from Paducah to Knoxville, the authority elected to follow a 1929 report of engineers of the War Department by which a series of high dams (including the proposed Fontana Dam on a tributary, there will be eleven) would be built. This plan provides adequate navigation and at the same time serves to better the primary objective of flood control and the "incidental" obligation of power generation. When the authority was created in 1933, three of these—Dam No. 1 below Muscle Shoals, Wilson Dam, and the privately owned Hales Bar Dam—were already in existence. The profile drawing (Chart 38) shows the pools to be created by these dams which mount from 302 feet above sea level at the river's mouth to 810 feet at Knoxville, a rise of 508 feet. Because of the variable flow of the river, a channel cannot be maintained on a year-around basis without some storing of water during rainy seasons for later release in dry seasons. This objective involves not only the main stream but a series of tributary dams as well. Norris Dam on the Clinch River 25 miles northwest of Knoxville (built by

[1] To clarify the original act, the Amendment of 1935 added Section 9a under which the primary obligation of operating in terms of navigation and flood control is made plain.

the War Department and then handed over to the authority) and Hiwassee Dam on the Hiwassee and the proposed Fontana Dam on the Little Tennessee are a part of the tributary program. The close relationship between water control for channel maintenance and flood control is obvious. The project, when completed, including adjustments at Wilson Dam and the Hales Bar Reservoir, is expected to provide a 9-foot channel on the Tennessee for a distance of 530 miles.[1]

Flood Control.—The plan for flood control in the Tennessee Valley provides for the development of flood storage space in tributary reservoirs and behind high dams along the Tennessee itself. For example, Norris Dam provides flood storage capacity of 2,020,000 acre-feet. The Hiwassee Dam increases flood storage space on the tributaries by 2,382,000 acre-feet. These two reservoirs control the runoff from 3,930 square miles, an area equal to 18 per cent of the valley above Chattanooga. On the Tennessee itself, Wheeler and Pickwick Landing Dams provide controlled storage of 856,000 acre-feet. This will be increased to 6,144,000 acre-feet by the Guntersville, Chickamauga, and Gilbertsville projects. Not only flood control on the Tennessee but some measure of control on the Ohio and Mississippi ought to result from the development. It is estimated by the authority that the Gilbertsville project alone will be worth about 115 million dollars to the Mississippi Valley.[2]

Agricultural Aid.—A third primary objective, assistance to agriculture, has its origin in the very purpose for which the Muscle Shoals development was begun. Conceived as a source of nitrates for war

[1] At Wilson Dam, the 3-mile Florence Canal connecting the Pickwick Reservoir with the Wilson navigation locks must be deepened. At Chickamauga Dam, there are at least 5 miles of shallow water between the upper end of Hales Bar Reservoir and the Chickamauga navigation lock. 1938 *Annual Report*, Tennessee Valley Authority, **1**:14.

[2] *Ibid.*, **1**:18. The value of these dams for flood control has been a matter of sharp dispute. The Tennessee Valley Authority freely admits that their proposed ten-dam system will not give complete flood protection—such can be accomplished only by additional works on tributary streams. Claims of partial control are, however, advanced. For instance, in March, 1936, shortly after its completion, Norris Dam was estimated to have reduced a flood crest at Chattanooga 4 feet, a significant amount measured in probable property damage. During the next winter, four separate flood stages were said to have been lowered. For further estimates, see *ibid.*, **1**:5–26. The estimated reduction of the flood crest at Cairo, Illinois, during the 1937 flood on the Ohio River illustrates the problem of accurate computations. At the time, Norris Dam was said to have lowered the Ohio crest there by at least 1 foot. Since the crest was approximately 60 feet, a difference of 1 foot could be significant. Later calculations before the Joint Committee Investigating the Tennessee Valley Authority reduced this estimate to 4 inches at Cairo. See *Report, Sen Doc.* 56, 76th Cong., 1st Sess., p. 141.

purposes, it was hoped that in peacetime these facilities would be an equally good source of supply of nitrates for agricultural fertilizers. Thus, most of the proposals of the 1920's provided for fertilizer experiments. The Tennessee Valley Authority has worked faithfully at this objective, shifting, however, from nitrate to phosphate manufacturing. In addition to this form of agricultural aid, the interest of the authority runs toward the whole problem of conservation, because it touches not only agriculture but flood control. This relationship has been expressed in these words:[1]

> No matter how effectively the water of public streams is controlled with engineering structures, there remains the problem of providing storage for water on the land. Undisturbed nature furnishes an example of remarkable control of water on land. Foliage of trees and smaller vegetation, matted blades of grass, and plant litter lying on the ground break the force of rainfall, decaying vegetation absorbs several times its weight in water, and roots provide channels of penetration into the soil. But where man disturbs nature, as in row-crop farming, he bares the soil to the tremendous force of falling, rushing water. Destructive erosion follows.

The work of the Tennessee Valley Authority in this connection consists of cooperating with state land-grant colleges and universities, the United States Department of Agriculture, and other agencies.[2] Its varied program includes the selection and experimental production of plant foods, their testing under actual farm conditions, and the proper use of forest cover.

POWER PROGRAM

If these activities—flood control, agricultural aid, and improvement of navigation—completed the program of the Tennessee Valley Authority, even though important in themselves and together justifying all that they have cost, they would have no place in a textbook on public utility economics. Their inclusion is justified by their relation to the utility program of the authority, the production of electric power. In fact, from our viewpoint, this power program, regardless of its legal subordination, is as important as any of those described above.[3] Only a sense of modesty keeps us from saying that it is the

[1] *Ibid.*, **1**:27.

[2] For detailed discussion of the status of these activities, see any *Annual Report* of the Tennessee Valley Authority.

[3] The legal subordination of power production is set out in the act (as amended) as follows: "The board is hereby directed in the operation of any dam or reservoir in its possession and control to regulate the stream flow primarily for the purposes of promoting navigation and controlling floods. So far as may be consistent with

most important item in the authority's program. Although the authority has consistently maintained that its major objectives are navigation, flood control, and national defense, the development of the "yardstick" concept and the litigation surrounding the power program have focused public attention upon power production. That activity is of major importance because it is the principal source of income and thus the one activity of the authority immediately in competition with private enterprise. Finally, the power program is important because it has given rise to a serious conflict between the federal government and private business, and it could be the cause of a similar conflict between the federal government and the states.[1]

On the basis of the Tennessee Valley Authority Act and its court interpretation, the authority has assumed three obligations toward its power development.[2]

1. To develop power as rapidly as a market can be found.
2. To use the proceeds of power sales to help pay operating and construction costs.
3. To sell electricity under such conditions and at such rates as will promote widest possible use.

At a relatively early point in its existence, the authority arrived at two conclusions with respect to these obligations. First, if power were sold at the dams, only one or two private utility companies would be in a position to purchase, and hence the authority's ability to carry out the third obligation (encouragement of wide use) would be impaired

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such purposes . . . [the board may produce and sell electric power] in order to avoid the waste of water power. . . . "

[1] For instance, the inability of the state to tax federal properties may create a problem. The Tennessee Taxpayers' Association has estimated that the acquisition by the Authority and Tennessee municipalities of the property of the Tennessee Electric Power Company will cause a loss of over 3 million dollars. What can Tennessee do about this?

[2] *Tennessee Valley Authority*, 1933–1937, p. 27. The act as amended directing the sale of "surplus," that is, power in excess of government and authority needs, reads as follows: "It is hereby declared to be the policy of the Government so far as practical to distribute and sell the surplus power generated at Muscle Shoals equitably among the States, counties, and municipalities within transmission distance. This policy is further declared to be that the projects herein provided for shall be considered primarily as for the benefit of the people of the section as a whole and particularly the domestic and rural consumers to whom the power can economically be made available, and accordingly that sale to and use by industry shall be a secondary purpose, to be utilized principally to secure a sufficiently high load factor and revenue returns which will permit domestic and rural use at the lowest possible rates and in such manner as to encourage increased domestic and rural use of electricity." (Section 11.)

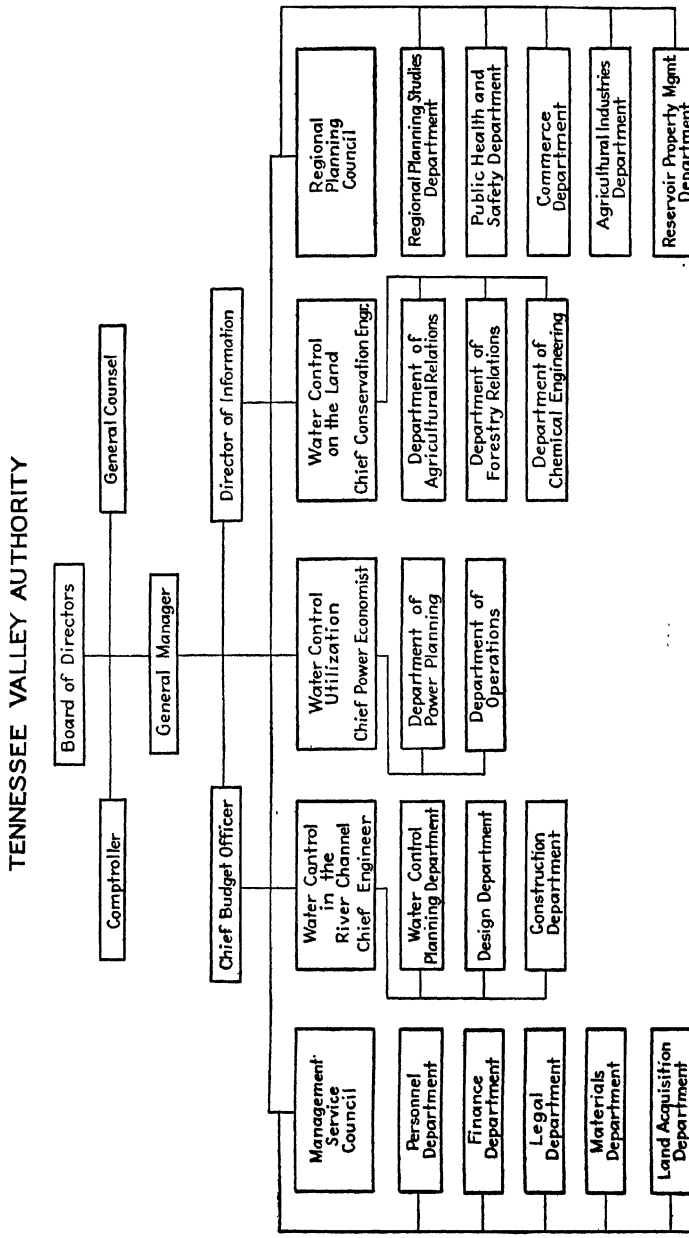

CHART 37.—Organization chart prepared by the Tennessee Valley Authority.

because the contracting utilities would be able more or less to dictate the terms of sale. Secondly, if wide consumption of electricity was to be successfully encouraged, low rates must come as the first step. This could be accomplished only by a "dynamic," or promotional, rate policy which in itself would require a large measure of authority control of the distribution and retail sale of electricity. On the basis of these decisions, the authority embarked upon its program of transmitting power from its dams by means of its own transmission lines to prospective and underdeveloped markets at low rates. It is perhaps still too early to evaluate this experiment in "mass consumption," but it is clear that great increases in residential power sales by the authority and private sources alike have occurred as a result of the program.

Distribution of Power.—Two types of transmission lines have been constructed or acquired by the authority. The first, or intertie, lines serve the purpose of interconnecting the powerhouses at the various dams so that electricity can be shifted back and forth as season and need require. The second, or marketing, type of line runs out to community systems and industries. Table 72 shows the disposition in 1939 of the power generated by the authority's plants. Municipalities and cooperatives are preferred customers under this act, and their purchases, because of the acquisition of new facilities and expanding demand, have been increasing rapidly. Of the total power sold in 1939, 20 per cent went to them. In terms of primary power, they purchased 34 per cent of that amount. Sales to industrial and utility customers continue to be important. In fact, such sales may be expected to increase because they enable the authority to extend serv-

TABLE 72.—ELECTRICITY SALES BY THE TENNESSEE VALLEY AUTHORITY*
(For year ending June 30, 1939)

Purchaser	Total sales, kw.-h.	Total revenue	Average rate, mills per kw.-h.
Municipalities	253,028,353	$1,228,031	4.85
Cooperatives	48,483,420	288,372	5.95
Industrials	901,509,107	2,507,431	2.78
Private electric utilities	192,165,740	561,316	2.92
Temporary rural service	26,910,088	347,243	12.90
Interdepartmental	196,123,111	512,125	2.61
Miscellaneous	66,933	680	10.16
Totals	1,618,286,752	$5,445,198	3.36

* 1939 *Annual Report*, Tennessee Valley Authority, p. 63.

ice to distant preferred customers by providing sufficient load to justify investment in transmission lines to be used jointly by both classes of users. These industrial customers also provide an excellent market for secondary power, since many of their operations can be geared to a certain amount of service interruption. Obviously, such power cannot be used for retail distribution where continuity of service is necessary. Large industrial and power company sales further "take up slack," pending future use of power by preferred customers. The contracts with industrial users are, therefore, for relatively short periods of time, running from 5 to a maximum of 20 years in duration.[1]

Contracts for Sale of Power.—Although the Tennessee Valley Authority Act permits direct sale of electricity especially to farms, the general assumption behind it is that the authority should serve as a wholesale unit but possess close supervisory powers over rates and service of purchasers. Thus, it was necessary in 1933 to devise contracts specifying, among other things, wholesale rate, retail rates, accounting procedures, and general terms and conditions of service and disposal of revenues. Here we shall describe only the rate provisions.[2]

Wholesale Rate.—The standard wholesale rate available to public distributors is patterned after the Hopkinson form and is illustrated as follows:

Demand charge:

90¢ per kw. of demand

Energy charge:

First 100,000 kw.-h.	4 mills per kw.-h.
Next 200,000 kw.-h.	3 mills per kw.-h.
Next 700,000 kw.-h.	2.5 mills per kw.-h.
Excess	2 mills per kw.-h.

According to one estimate, assuming a 40 per cent load factor, this rate would reduce to the following average costs:[3]

Small cooperative	750 kw. peak demand, 6.54 mills per kw.-h.
Small community	2,000 kw. peak demand, 6.01 mills per kw.-h.
Large community	20,000 kw. peak demand, 5.21 mills per kw.-h.

[1] The most important contract is with the Arkansas Power and Light Company whereby large quantities of firm and secondary power are sold at an average of 3.19 and 2.48 mills per kilowatt-hour, respectively. This contract has been severely criticized. For one analysis of it, see *Report* of Joint Committee Investigating the Tennessee Valley Authority, p. 166.

[2] These rates are taken from the authority's contract with the city of Nashville. See 1939 *Annual Report*, pp. 343 *et seq.*

[3] *Report* of the Joint Committee, *op. cit.*, p. 163.

Retail Rates.—Unless special permission has been secured from the authority, each public purchaser of electricity must charge according to a standard schedule of retail rates.[1] We illustrate here two of them:

Residential Rate:[2]

First 50 kw.-h.	3¢ per kw.-h.
Next 150 kw.-h.	2¢ per kw.-h.
Next 200 kw.-h.	1¢ per kw.-h.
Next 1,000 kw.-h.	0.4¢ per kw.-h.
Excess	0.75¢ per kw.-h.
Minimum bill	75¢ a month

Industrial Rate.[3] This rate is available to industrial and other large power customers having a demand in excess of 20 kilowatts.

Demand Charge:

First 1,000 kw. of demand	$1.00 per kw.
Excess	0.90 per kw.

Energy Charge:

First 15,000 kw.-h.	8 mills per kw.-h.
Next 25,000 kw.-h.	6 mills per kw.-h.
Next 60,000 kw.-h.	4 mills per kw.-h.
Next 400,000 kw.-h.	3 mills per kw.-h.
Excess	2.5 mills per kw.-h.

Special Rates.—In addition to these standard rate schedules, the Tennessee Valley Authority has entered into special sale and interchange agreements with industrial and utility companies. Several of the large chemical companies in the valley and the Arkansas Power and Light Company have special purchase agreements.

CRITICISM OF THE PROGRAM

From the very first, the program of the Tennessee Valley Authority has been under constant attack. Utility leaders and conservatives have attacked it as uneconomic; liberals and believers in public ownership have rushed to its defense. During 1938, this controversy came to a head as a result of dissension within the board of directors of the

[1] Certain special charges by cities have been permitted, to allow for amortization of investment, such as 1 cent a kilowatt-hour, but not less than 25 cents or more than 1 dollar a month. See *Hearings*, Pt. 11, p. 4861. In at least one instance, a residential rate lower than this standard has been authorized because of past excess accumulations under the standard rate.

[2] The rate in the final step, 0.75 cent, is the average cost of consumption of all electricity provided in the other blocks.

[3] In addition to this general industrial rate, there is a special schedule available to seasonal users.

authority. Since serious charges were made by the ousted director, a Joint Congressional Committee was appointed to investigate the Tennessee Valley Authority. That body was directed to investigate many things, such as the location of the authority's principal office, the appointment of personnel, the dissension on the board, the controversy over accounting procedures and audits, and finally the adequacy of the general program. The committee, after extensive hearings, brought a majority and minority report. The majority report found but minor faults in the organization and operation of the authority, but the minority was sharp in its condemnation.[1] In this analysis, we must of necessity omit many of the points of criticism considered by both reports. Although it may be significant from a lawmaker's viewpoint to know whether or not the headquarters at Knoxville are permissible in view of the section reading " . . . the Corporation shall maintain its principal office in the immediate vicinity of Muscle Shoals, Alabama," we shall not attempt to say.

Probably the most widely urged criticism has been that the authority is in competition with private business, a competition essentially unfair because of certain fundamental and permanent differences between public and private enterprise. These critics advance the following in support of their contention: First, the authority gets its funds from the federal government rather than from the capital market directly, and hence capital is available at lower rates than those paid by competing private utilities. It is even argued that the authority ignores all interest costs. Notice this from one of its reports:[2]

> Through June 30, 1938, the funds of the Authority have been obtained from Congressional appropriations, requiring no return of interest, and from operating revenues. Accordingly, no interest expense charges have been made in the accounts, and the costs of fixed assets include no interest during construction.

Second, the tax bill paid by the Tennessee Valley Authority is lower per dollar of income than the tax bills of private utilities even when payments in lieu of taxes are taken into consideration.[3] Periodic

[1] *Report* of the Joint Committee on the Investigation of the Tennessee Valley Authority, pursuant to Pub. Res. 83, 75th Cong.; *Sen. Doc.* 56, 76th Cong., 1st Sess. In addition there is Appendix A, *Reports and Exhibits* (*Doc.* 56, Pt. 2); and Appendix B, *Report of Chief Engineer* (*Doc.* 56, Pt. 3). These reports followed *Hearings*, printed in 14 volumes.

[2] 1938 *Annual Report*, Tennessee Valley Authority, 2:20.

[3] Section 13 of the act makes provision for payments in lieu of taxes to the states of Alabama and Tennessee. Briefly, 5 per cent of the power sales at Wilson shall be paid to Alabama, and 5 per cent of the sales at Norris to Tennessee. On income from electricity sales at other developments, 2½ per cent

proposals to increase these "lieu" payments are evidence of this point. Third, the program of the authority is subsidized at many points. In addition to capital and tax advantages, evidence of this is the use of the franking privilege for official business, freight-rate reductions, and Public Works Administration help. Fourth, costs, both construction and operation, are not allocated to the various phases of the program so as to show power costs comparable to those of private utilities.[1]

Allocation of Joint Cost.—Many flaws have been found in the financial and operating policies of the Tennessee Valley Authority, but none has occasioned more controversy than the debate over an adequate theory of allocation of joint costs. Obviously, a solution of this problem is basic to the design of any scientific set of wholesale and retail rates. The presence of joint costs is not peculiar to public utility enterprises. Illustrations abound in every major industry. So long as goods and services produced under such circumstances are sold in competitive markets, there is no particular problem of the allocation of these costs among the joint products. A social problem arises only when the cost-price relationship is reversed, as in the Tennessee Valley program, where the investment in certain facilities must be divided among many purposes without the benefit of competitive pricing. We must ascertain the portion to be allotted to power production before we can begin the design of scientific rate schedules.

It has been said many times that there is no accepted rule of allocation of common costs flowing from joint use, a position eloquently proved by the literature arising around this problem of the authority. That body has been charged with the obligations of maintenance of navigation, control of floods, and generation of power on the Tennessee River, a task that by its very nature results in certain of its facilities being used jointly for two or more functions. For the solution of that problem, at least six allocation theories have been advanced. They are called:[2]

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shall be paid to each of these states. In the fiscal year ending June 30, 1939, there was paid $243,056.14.

[1] This by no means exhausts the list of charges. One who would go further is referred to Marlett, "The T.V.A. Investigation," *Journal of Land and Public Utility Economics*, **15**:212, May, 1939, and the *Report* and *Hearings* of the Joint Committee on the Investigation of the Tennessee Valley Authority.

[2] For the official statement of the Tennessee Valley Authority as to its theory of joint cost allocation, as well as a discussion of allocation theories generally, see "Investment of Tennessee Valley Authority in Wilson, Norris, and Wheeler Projects," *House Doc.* 709, 75th Cong., 3d Sess.

Benefit theory.
Vendibility theory.
Use of facilities theory.
No-allocation theory.
Incremental power investment theory.
Alternative justifiable expenditure theory.

At the outset of this problem, we are met with preliminary difficulties. Shall our allocation be influenced by the fact that the act creating the program gives legal priority to navigation and flood control functions? One member of the staff of the Tennessee Valley Authority, Martin G. Glaeser, has stated this point as follows: " . . . the [TVA] board is not at liberty in the development and operation of these multiple-purpose dams to give priority or even equal consideration to power. . . . The allocation of joint cost must recognize this limitation."[1] We, however, cannot accept this limitation, because we refuse to substitute legal folderol for economic realism. Other problems must be faced. Which are the common costs, and which are directly allocable to a single function? Presumably, locks pertain to navigation, and intakes, turbines, and electrical-producing facilities are direct costs of power production. Shall any of the storage space be considered a direct adjunct to one function, or is the use of all such space joint use? The ousted chairman of the authority Dr. A. E. Morgan, for instance, has testified that all the "dead storage" below the intake level at Norris should be treated as a direct cost of power production, instead of, as is actually the case, as a part of the joint costs.[2] For all its difficulties, however, the first step in most allocation theories must be the separation of direct costs attributable to each function, leaving the remainder as the common cost to be allocated.

Benefit Theory.—The first theory, strongly advocated by conservationists, would allocate joint costs in accordance to the benefits derived from each function. This theory requires a reduction of benefits to a common denominator of value, an impossible task for such diverse functions as flood control, navigation, and power production. A further complication arises from the impossibility of measuring benefits of flood control until years of use have elapsed.[3]

Vendibility Theory.—The second theory of allocation is to share joint costs in such proportions as the intensity of demand of each

[1] "Those Joint T.V.A. Costs," *Public Utilities Fortnightly*, **24**:261, Aug. 31, 1939. Mr. Glaeser has since resumed his professorship at the University of Wisconsin.

[2] *Hearings* before Joint Committee, Pt. 11, pp. 4814 *et seq.*

[3] These first three theories are described in Glaeser, "Those Joint T.V.A. Costs," *supra.*

product permits. Thus, if one of two joint products sells for twice the price of the other, the first should be charged with two-thirds of the joint costs. Of course, this is unavailable to the Tennessee Valley Authority, first, because it assumes a competitive market and, second, because several of the authority's functions have no price measure.

Use of Facilities Theory.—The third theory of allocation of joint costs is to share them in terms of their comparative use. Such a theory also requires a common denominator, some physical unit of measure, such as the ton-mile or passenger-mile available for separating joint costs in rail service. In the multipurpose functions of the Tennessee Valley Authority, the only common unit is the acre-foot of water. This theory was given serious consideration by the authority but discarded in favor of the sixth of our list.

No-allocation Theory.[1]—The fourth theory, called "no-allocation," was advanced by the president of the Edison Electric Institute, C. W. Kellogg, at the hearings of the Joint Committee Investigating the Tennessee Valley Authority. Under this theory, all joint costs of a multipurpose venture would be charged to the power function, since, in the past, such had been forced upon the private owners of hydropower developments. Mr. Kellogg testified that the power developments at Keokuk on the Mississippi, Conowingo on the Susquehanna, and Rock Island on the Columbia had been charged with all costs. He said of the Keokuk plant:[2]

> . . . the company which I had charge of from 1914 to 1919—built the entire navigation improvement, they created a pool 50 miles long on the Mississippi River, they built a lock of the same width as the Panama Canal locks, and an even greater lift, although not as long, they built a large drydock, furnished buildings and equipment, shops, tools, storehouses for the Government, all of that being furnished by the power company as part of its development cost, and had to be carried by it.

This theory was rejected by the Joint Committee for at least two reasons. First, since these developments were initiated, the federal government had begun a policy of assisting private multipurpose projects.[3] Second, the theory flew squarely in the face of the legal subordination of the power portion of the authority program.[4]

[1] See *Report* of Joint Committee, p. 155, and *Hearings*, Pt. 10, pp. 4111 *et seq.*

[2] *Hearings*, Pt. 10, p. 4111. There was no dispute of this evidence upon cross-examination by counsel of the joint committee.

[3] Counsel for the committee cited the Rivers and Harbors Act of 1930 as allowing compensation to private power companies for improvement of navigation as a result of their hydropower dams. *Hearings*, Pt. 10, p. 4142.

[4] Another no-allocation theory has been advanced—one that would charge all joint costs to the noncommercial functions of the authority. See Gray, "Joint

The Incremental Power Investment Theory.[1]—The next theory, called the "incremental power investment theory," was presented to the Joint Committee by Dean Edward L. Moreland of the Massachusetts Institute of Technology.[2] This theory would deduct from total investment the estimated costs of navigation and flood control benefits, as measured by estimates for single-purpose projects. The remainder would then be charged to power. On the basis of an eleven-dam system (this includes the Fontana proposal), Dean Moreland made the following allocations of total investment:[3]

Function	Allocation, Per Cent
Navigation	18.0
Flood control	15.9
Power	65.2
Miscellaneous	0.9
	100.0

This proposed theory was likewise rejected by the Joint Committee because of its excessive portion to power production.

Alternative Justifiable Expenditure Theory.—The final theory has been variously named. Glaeser calls it "alternative cost avoidance," and the Tennessee Valley Authority has named it "alternative justifiable expenditure." This theory was adopted by the authority and

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Costs in Multiple-purpose Projects," *The American Economic Review*, **25**:224, June, 1935. David E. Lilienthal, a director of the Tennessee Valley Authority, has been accused of advocating a by-product theory under which little more than the direct costs of power production would be allocated to that function. See *Hearings*, Pt. 11 pp. 4819 *et seq.*, especially p. 4824, and *Report* of minority, p. 280.

[1] See *Report*, p. 158, and *Hearings*, Pt. 9, pp. 3887 *et seq.*

[2] Dean Moreland, at these hearings, was the witness of the Commonwealth and Southern Corporation, the chief competitor of the authority in the Tennessee Valley. According to the testimony of the president of that company, Wendell L. Willkie, Dean Moreland was engaged to present his evidence before the Joint Congressional Committee as an independent expert, uncoached by the officials of his company. Mr. Willkie said of Mr. Moreland's testimony: "As far as Mr. Moreland was concerned, so that you may be acquainted with that fact, I didn't discuss with him his testimony, I told him to come down here and tell this committee the truth, and I didn't care whether it was in accordance with my ideas or not, so I am not familiar with that. I was glad to have the committee get an impartial witness." *Hearings*, Pt. 10, p. 4240.

[3] *Hearings*, Pt. 9, p. 3887. On that page, the percentage for power is given as 56.2. On several other pages, however, it appears as 65 and 65.2, which apparently is correct (see p. 3899). In the *Report*, the Moreland percentages are given as: navigation, 15.1; flood control, 13.3; and power, 71.6. These differences may be reconcilable on the basis of the complete record and exhibits, but none is given in the *Report*. Therefore, we have chosen to use the testimony.

generally approved by the majority of the Joint Committee.[1] It is based on the fact that river dams and works can be built for a single function, though the aggregate of the estimated costs of such single works would ordinarily exceed the cost of actual multipurpose dams and works. Thus, it is possible "to use the ratio in which these higher expenditures are avoided by joint action as a basis for allocating joint costs."[2] The theory can be illustrated by the authority's calculations for its ten-dam system. First, costs directly allocable to each function are deducted from total investment. The remainder, the joint costs, are then divided among the functions in accordance to the ratio that the estimated cost of providing for each bears to the sum of the estimates of the three single-function developments. These percentages and the general result can best be shown by the following table:[3]

Function	Direct cost	Joint cost	Allocation, per cent	Total direct and joint cost	Per cent of total
Navigation	$ 44,880,800	$ 70,921,048	32.2	$115,801,848	28.4
Flood control	33,763,000	65,386,808	29.7	99,149,808	24.3
Power	108,884,965	83,973,243	38.1	192,858,208	47.3
Total	$187,528,765	$220,281,099	100.0	$407,809,864	100.0

The Joint Committee, after making minor changes and adding transmission costs of $75,500,000, found the estimates shown in the

Function	Committee finding		TVA percentages (10-dam system)
	Amount	Per cent	
Navigation	$121,789,873	24.1	24.0
Flood control	104,061,813	20.6	20.5
Power and transmission	279,488,335	55.3	55.5
Total	$505,340,021	100.0	100.0

[1] See the *Report* to the President on cost allocation, made on June 9, 1938, *House Doc.* 709, 75th Cong. See, also, *Report* of the Joint Committee, p. 157, and Appendix B, *Report* of chief engineer, p. 42. Dr. A. E. Morgan insisted, however, that, in the end, allocations were actually made by "use of judgment." See *Hearings*, Pt. 11, p. 4826. Even the committee's engineer said: " . . . this allocation is subject to the criticism that the final method of determination is not clear, but apparently based on judgment, rather than exact figures." *Report* of chief engineer, p. 11.

[2] Glaeser, *op. cit.*, p. 267.

[3] Adapted from *Report* of the Joint Committee, p. 158.

table on page 684 and percentages to apply. Note that the percentages relate to total investment, not simply to the joint portion.

For immediate use in allocating costs of the three-dam system actually in operation in 1939, the joint costs (not the total investment) and joint expenses were divided 36 per cent to navigation, 24 per cent to flood control, and 40 per cent to power.

The foregoing methods and disputes over cost allocation have been presented not so much to defend any one of them but rather to show both the complexity of the problem and, second, the utter lack of agreement upon it. It seems valid to conclude that any allocation theory involves certain assumptions that are always a matter of opinion and subject to debate. We are almost reduced to the conclusion that a search for a solution of the problem of allocation of joint costs is futile. On the other hand, we recognize that allocations simply must be made. Because of honest differences of opinion that do exist on this problem, any choice among these theories of allocation must be subject to reservation.

We presume that the final economic test of any program is to be found in its profit and loss statements. In other words, will the power program of the valley pay its way? This cannot be answered dogmatically—all estimates involve cost allocations and corrections for subsidies, if any. Let us examine the findings of the experts. For instance, the chief engineer of the Joint Congressional Committee, on the assumption of a 60 per cent load factor, a 50-year period in which to amortize the investment in a 10-dam system, estimated an annual surplus of $3,783,000.[1] One of the experts of the authority, using similar assumptions, estimated an annual profit of over 4½ millions. On the other hand, Dean Moreland, representing the Commonwealth and Southern, found an estimated annual out-of-pocket loss of $4,039,000.[2] Such conflicting testimony leaves one utterly confused, because it would appear that one can find such evidence as his general attitude desires. Unless one is able to make a personal analysis of this problem, it seems wiser to discount most of these findings. Thus, the experiment in the Tennessee Valley has its weakest defense in estimates of profit and loss.

"YARDSTICK" RATES

The power program in the Tennessee Valley has contributed a new word in the public utility vocabulary—"yardstick." In short, one of

[1] *Report* of chief engineer, Appendix B, p. 14.

[2] *Hearings*, Pt. 9, p. 3909. Moreland estimates normal annual revenues of $24,136,000 and expenses of $34,488,000, or a total annual loss of $10,352,000 (p. 3894).

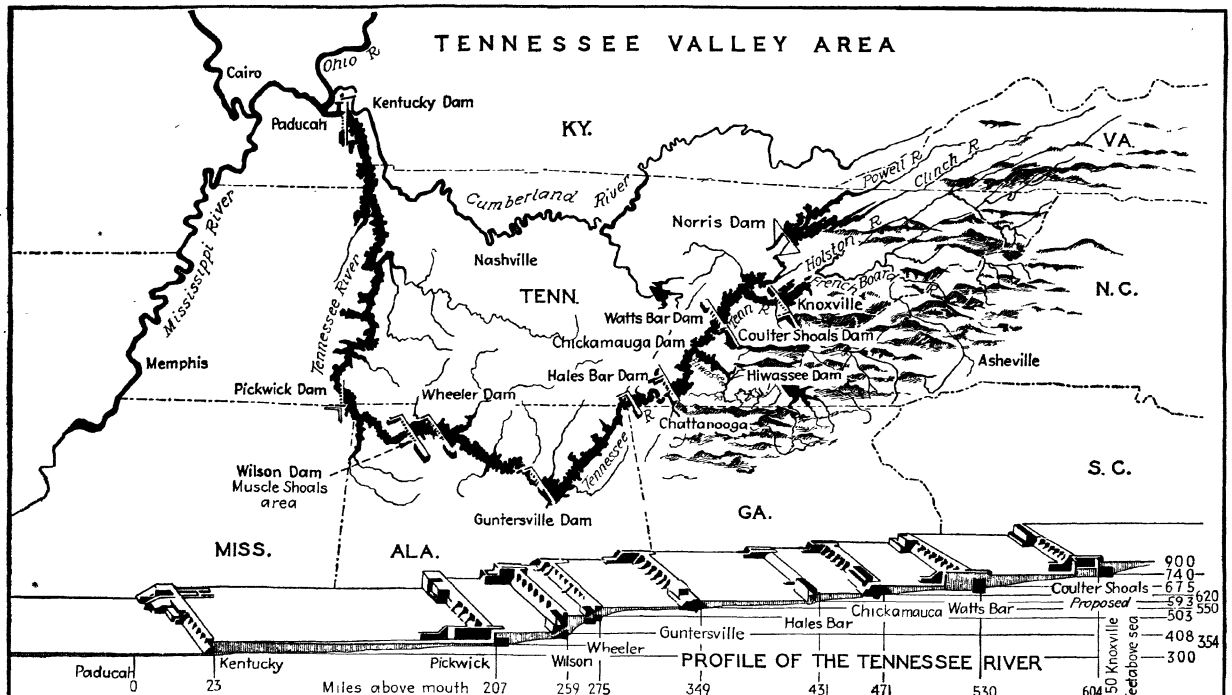

CHART 38.—Pictorial illustration of the dams of the Tennessee Valley Authority and profile of the river. The profile drawing shows graphically the series of lakes that eventually will replace the former turbulent river. (*Adapted from the frontispiece, 1939 Annual Report, Tennessee Valley Authority.*)

the stoutest claims for the Tennessee Valley Authority is that its rates can serve as a yardstick by which to measure the reasonableness of rates of private companies. One searches in vain the laws under which the authority operates to find authorization of this purpose—it is not there. The yardstick concept was simply a creation of its directors.[1] For many years, it had been argued that state commission regulation was ineffective, must be supplemented by public competition. The Tennessee Valley Authority was the one agency that could do that task.

Which of the several Tennessee Valley Authority rates is the yardstick rate? Since it is freely admitted that factory power rates are fixed in a large measure by the competition of substitute private facilities, industrial consumers need no protection. Therefore, the yardstick must be the retail residential rate of the co-ops and municipal distribution systems. The first step in defending the authority-imposed retail rate as a yardstick must be to defend the wholesale rate behind it. Since this latter rate is itself under fire as not covering full costs (interest, taxes, hidden subsidies, and joint cost allocations), any retail rate based upon it is likewise vulnerable. The minority of the Congressional Joint Committee took this position.[2] The majority, although believing the wholesale rate to cover all proper costs, took the position that the similarity of the authority's average wholesale price and those of private companies made any challenge of that rate immaterial to a defense of the retail residential rate as a yardstick. As was said, "Taking all the available evidence into consideration, it appears that the Authority is not underselling the [wholesale] market for privately generated power by more than a mill or two, if at all."[3] Although a "mill or two" may mean but little at times, here it means a 20 to 40 per cent differential advantage. If all alleged subsidies and improper cost allocations are corrected, might not the advantage run the other way? It would appear, then, that even if the co-ops and municipal distributors added all proper costs to the wholesale rate, the resulting yardstick could be still subjected to considerable challenge.[4]

[1] For example, Mr. Lilienthal told the Rotary Club of Chattanooga, in September, 1933, that "it is pretty well recognized that regulation has not been entirely adequate to protect the public interest, and so to supplement regulation Congress has provided for a measure of public operation on a limited scale. This public operation is to serve as a yardstick by which to measure the fairness of electric rates." *Hearings*, Pt. 11, p. 4842.

[2] Speaking of the allocations made by the authority, the minority said, "*The allocation is valueless for yardstick purposes and its very existence is incompatible with a fair yardstick.*" *Report*, p. 285.

[3] *Report*, p. 193.

[4] Considerable testimony was presented to the Joint Committee to show that the municipal distribution systems were subsidized in many ways by the authority,

Closer examination of the yardstick concept shows it to be most fallacious, except under a rigid set of assumptions. There are significant cost differences among public utilities, the product of varying load and diversity factors, geographical peculiarities, population densities, and expense differentials. For the retail rate of the authority to be a valid yardstick, there must, of necessity, be an identity of load factors, comparable industrial and residential use, a similarity in tax and interest charges, an absence of hidden subsidies, and agreement on allocation of joint cost. Therefore, if the yardstick is to be a valid substitute for commission regulation, it must be done through single-purpose projects, not multipurpose ventures such as the Tennessee Valley experiment.

Finally, when the actual events leading to the establishment of the initial retail rates are revealed, much of the subsequent defense of the yardstick principle takes on the appearance of rationalization. In the first place, the Tennessee Valley Authority rates were not based on a cost-of-service theory but on a "social-basis theory." In a report, this was described as follows:[1]

> The social basis would disregard cost entirely. It would follow the value of the service where necessary to get the business but go below the additional cost of service where the margin is available from other classes of business in order to spread the use of electricity as much as possible among the small and particularly rural users. It is outright discrimination based upon social values, and therefore might be rationalized as reasonable. . . . The social basis would be the one most open to attack by private industries and utilities particularly, as well as by many municipalities who may not be in the subsidized class. It would charge small villages and hamlets far removed from the source of power the same average rate per kilowatt hour as large cities and industrial customers located near the plant. It would spread rural transmission lines into thin, poor, rural territory where the farmer might be barely able to afford to wire his home for lights only and pay a small nominal cost for the service used. This policy is recommended to the Authority as the one leading to the final results believed to be desired.

In the second place, and even more significant, is the fact that in the summer of 1933, a schedule of wholesale and retail rates was announced and that this same basic schedule is still in use. Were these rates

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the Electric Farm and Home Authority, and the Public Works Administration. Since we feel that the dispute over the validity of the wholesale rate casts doubt on the yardstick concept, we have not discussed these alleged subsidies to the retail units.

[1] *Report* by Zinder to David F. Lilienthal, on rate policies and structure, dated Sept. 7, 1933. Exhibited in *Report* of Joint Committee, p. 289.

based on estimates of costs, a vital step if they were to be valid yardsticks? The minority of the Joint Committee thought not.[1] At that time, only Wilson Dam was in operation, so costs of a complete program not then formulated could hardly have been known. The actual method behind these rates was apparently to follow the examples of the larger public plants—Seattle, Los Angeles, and the Ontario Hydro. If these rates based on such data in 1933 were actually covering all costs in 1941, it is a sheer coincidence. Therefore, elaborate calculations in later years to demonstrate the soundness of a prior hunch are quite unnecessary, because the thing being defended has lost all meaning as a yardstick.[2]

IN DEFENSE OF THE PROGRAM

The real defense of the power program and rate structure of the authority lies in other channels. Some of the witnesses testifying before the Joint Committee struck the real chord when they emphasized the "dynamic" concept of Tennessee Valley Authority rates. Instead of accepting the conventional quantity sold and gross revenue relationship of the private companies as expressed in the fair-value formula, the authority set out to demonstrate the elasticity of demand for electric service. In other words, it established a 3-cent top residential rate on the theory that the quantity sold would respond sufficiently to prevent at least significant losses. The record since 1933 both for the authority and for the near-by private companies has demonstrated the wisdom of this dynamic, or promotional, rate theory. The authority has been able to sell electricity for home use at an average level of 2 cents per kilowatt-hour, whereas the country as a whole has paid an average in excess of 4 cents. The table on page 690 shows these effects graphically. To summarize at this point: The great public utility contribution of the authority lies in its promotional rate experiment, in its demonstration of the characteristics of the demand for electricity, in its pioneering in the field of mass consumption of electric service. The private companies had generally refused to plunge into such experiments, pleading financial inability. This was but an excuse to conceal the inertia that too often develops in the

[1] "The T.V.A. rates ignore cost factors, having been prepared with no data or estimates of such costs except for Wilson Dam." *Ibid.*, p. 289.

[2] Professor Glaeser, who has been quite sympathetic to the objectives of the Tennessee Valley Authority and who is inclined to argue that the act implies the "yardstick" concept, nevertheless has said, "Long ago I had concluded that the yardstick idea is a will-o'-the-wisp which lends itself admirably to propaganda purposes. . . . " "The Yardstick Once More," *Public Utilities Fortnightly*, **24**:737, Dec. 7, 1939.

management of a sheltered enterprise. The Commonwealth and Southern properties in and near the valley had no option but to join this experiment, if indeed they had not already begun it, and their financial reports have shown no ill effects.[1]

TABLE 73.—ANNUAL DOMESTIC CONSUMPTION AND AVERAGE RATE PER KILOWATT-HOUR FOR THE UNITED STATES, COMMONWEALTH AND SOUTHERN CORPORATION SUBSIDIARIES, AND TENNESSEE VALLEY AUTHORITY*

Year	United States		Commonwealth and Southern operating subsidiaries						Tennessee Valley Authority	
			Alabama Power Company		Georgia Power Company		Tennessee Electric power Company			
	Average rate, cents	Average kw.-h. per year	Average rate, cents	Average kw.-h. per year	Average rate, cents	Average kw.-h. per year	Average rate, cents	Average kw.-h. per year	Average rate, cents	Average kw.-h. per year
1929	6.30	499	5.56	571	6.18	592	6.65	503		
1931	5.74	578	5.00	778	5.42	766	6.20	576		
1933	5.49	595	4.76	808	5.16	805	5.77	612		
1935	4.99	672	3.65	988	3.63	1,039	3.63	967		
1937	4.39	793	3.16	1,205	3.04	1,313	2.86	1,353	2.00	1,465
1939	4.03	890	3 01	1,284	2 87	1,430	2.70	1,498		

* Data for Commonwealth and Southern companies supplied at the request of the authors. Figures for 1939 for these companies are for the 12 months ending September 30, 1939. In August, 1939, the properties of the Tennessee Electric Power Company were sold to the Tennessee Valley Authority and associated public purchasers.

Many more things can be said in favor of the Tennessee Valley experiment. In order not to be misunderstood, let us repeat that the foregoing sharp condemnation of the yardstick principle does not mean a general condemnation of the whole program. Although we doubt that one phase—navigation—is economic, we see great benefits in the

[1] As an example, we cite the story in the *Electrical World*, **112**:737, Sept. 9, 1939, entitled "Appliance Sales Soar in Mississippi Drive." Briefly, it outlines the features of an intensive appliance sales campaign by the Mississippi Power & Light Company, inaugurated as a consequence of the settlement of the "T.V.A. War" against its sister subsidiary the Tennessee Electric Power Company. As a result of a purchase agreement with the authority, the Mississippi Company cut rates to a 3¾ cent top, with a low of 1 cent for water heating, and then instituted a real appliance sales campaign. The results of such drives in Mississippi leave no doubt of the desirability of tapping new markets by every privately owned electric power company.

unified plan as announced by the authority. Such a policy provides the technical advantage of coordination in both construction and operation. Centralized control should assure the careful weighing of objectives and their harmonious integration. Thus can be blended what are otherwise incompatible objectives. In short, the Tennessee Valley Authority program, involving as it does sponsorship of agricultural improvement and industrial development, is an attempt to solve the economic difficulties of a region that has long been properly designated as a "problem area" of the United States.[1]

Finally, the unified plan may be advantageous from a long-run point of view, because it retains control of important water power resources by the government to be administered as a public trust. In the light of our experience with private exploitation of resources, this is perhaps a commendable effort to protect the public interest. This is not to say, however, that generation, transmission, and sale of electric power is solely a public function, because it is equally possible to accomplish this conservation function by a combination of governmental ownership of the power rights and private development and operation of power facilities and sale of electricity.

To depart in conclusion from the strictly economic phases of our analysis, the Tennessee Valley Authority can be defended as an invaluable experiment in public enterprise, a development by means of which the nation may observe first-hand both the merits and demerits of government in business. The experiment is, then, apart from its specific objectives, a social experiment which should add much to our store of experience and information on the public ownership question.

THE LEGAL HURDLES

Ashwander v. Tennessee Valley Authority.—A program as revolutionary as the Tennessee Valley experiment was, of course, bound to be challenged in the courts of the United States. One of the first acts of the authority was to contract to purchase from the Alabama Power Company certain of the latter's distribution facilities in order to begin its program of serving the broadest possible market. This contract, made early in 1934, called for the sale to the authority of certain transmission lines and substations in seven counties in northern Alabama. Its validity became the basis of the first significant litigation, *Ashwander v. the Tennessee Valley Authority*.[2] The case involved an

[1] In fact, a research monograph published by the Federal Emergency Relief Administration in 1935, *Six Rural Problem Areas*, indicates that two of these areas with high relief ratios, the Appalachian-Ozark area and the eastern cotton belt, are within or near this Valley.

[2] 297 U.S. 288 (1936).

attempt on the part of certain preferred stockholders of the Alabama Company to have this contract declared illegal on the ground that the action of the company was *ultra vires*. In other words, the claim was made that the Tennessee Valley Authority had lacked lawful authorization to make such a purchase, that the act in question was unconstitutional.

The case ran the usual gamut of trial in a district court, a review in the Circuit Court of Appeals, and a review by the Supreme Court of the United States. In the district court, the judge enjoined the Tennessee Valley Authority and all other participants from carrying out the provisions of the contract, holding, in effect, that the Tennessee Valley Authority Act was unconstitutional.[1] As a basis of this decision, the judge cited freely the many statements and speeches of the directors of the authority. The case was immediately appealed to the Circuit Court of Appeals, and there the issue was narrowed sharply to the validity of the government's ownership and operation of Wilson Dam and the sale of power therefrom. In short, that court was more interested in what was about to be done than in what the leaders said they were going to do. The Circuit Court, in view of this restriction, found no difficulty in sustaining the Tennessee Valley Authority, and thereupon it reversed the lower court.[2]

Since this was a very important case, it was carried to the Supreme Court, where the Circuit Court opinion was sustained by a divided court. Chief Justice Hughes and three associate Justices (Butler, Sutherland, and Van Devanter) approved the action of the lower court; Mr. Justice Brandeis and three other judges (Stone, Roberts, and Cardozo), although appearing favorable to the decision, thought that there was no "justiciable controversy." Mr. Justice McReynolds dissented. In this analysis, we follow the decision as written by the Chief Justice. He thought that the suit was properly brought, that a preferred stockholder did have a right in this case to challenge the actions of his board of directors. Secondly, he accepted the issue as narrowed by the Circuit Court. On the basis of these points, he found the constitutional authority for the construction of Wilson Dam to be a combination of the war and commerce powers. "The Wilson Dam and its power plant must be taken to have been constructed in the exercise of the constitutional powers of the Federal Government."[3]

The remaining question dealt with the right of the federal government to dispose of electric energy generated at the Wilson Dam. It

[1] *Ashwander v. T.V.A.*, 8 F. Supp. 893 (1934) and 9 F. Supp. 965 (1935).
[2] *Ashwander v. T.V.A.*, 78 F. (2d) 578 (1935).
[3] 297 U.S. at 330.

was on this point that the Chief Justice and Mr. Justice McReynolds sharply divided. The former held, "The government acquired full title to the dam site, with all riparian rights. The power of falling water was an inevitable incident of the construction of the dam. That water power came into the exclusive control of the Federal Government." With the many examples before him of federal operation of other public properties and the disposal of saleable products therefrom, the Chief Justice found no reason to differentiate between those acts and the sale of all electrical energy available at Wilson Dam. Furthermore, he found no reason to forbid the authority's choice of the best possible market in which to make such sales. Therefore, he approved in its entirety the right of the authority to acquire the disputed transmission facilities of the Alabama Power Company. Mr. Justice McReynolds, on the other hand, believed that the maximum surplus power legally available for sale by the authority could be only that incidental and accidental amount generated over and above the minimum needs for satisfying the government's demands in the valley.

The court disclaimed any judgment on the validity of the other phases of the program, but this was a signal victory and, as we show below, a first step in its ultimate validation.

Tennessee Electric Power Co. v. Tennessee Valley Authority.— Following this decision, a second question remained to be settled, namely, the validity of the other dams built and to be built on the Tennessee. These new developments would lack the protection of authorization during wartimes and consequently might be more difficult to sanction. Justice Florence Allen, at that time the only woman justice on the federal bench, found an easy escape when the developments upstream from Wilson were challenged. Her logic was as follows: Since upstream developments made more constant the water flow at Wilson, validated by the Ashwander case, they were by that fact themselves valid.[1] When this problem reached the Supreme Court of the United States in *Tennessee Electric Power Co. v. Tennessee Valley Authority*, that body handled the problem in a less direct fashion.[2] There the Court, speaking through Mr. Justice Roberts, dwelt mainly on the right of power companies to be protected from injurious governmental competition. After careful examination of the franchises

[1] 21 F. Supp. 947, 24 P.U.R. (N.S.) 497 (1938). "It is uncontradicted that the release [of water] from Norris and Wheeler, and from Hiwassee, Guntersville, and Chickamauga, as planned, create and will create extra head for continuous water power at Wilson, and thus aid in the national defense." 24 P.U.R. (N.S.) at 505.

[2] 306 U.S. 118, 27 P.U.R. (N.S.) 1 (1939).

of the appellants, it found none of them to possess exclusive grants and therefore ruled that they had no standing to be protected from such competition. Such damage, to use the words of the court, was lawful, was "damnum absque injuria," and "will not support a cause of action or a right to sue."[1] The Court was quite sweeping on this point. While citing the laws of the states in question to the effect that public competition was not there forbidden, that body made this observation: "The Authority's action [competition] in these states is consonant with the state law, but, as has been shown, *if the facts were otherwise the appellants would have no standing to restrain its continuance.*"[2] The only other point left for consideration was the charge of coercion and intimidation by the administrator of the Public Works Administration of the municipalities to be served by the Tennessee Valley Authority. Specifically, the charge was that he was forcing the recipients of his aid to purchase solely from the authority. This charge the Court declined to accept. Thus, Mr. Justice Roberts was able to conclude as follows: "In no aspect of the case have the appellants standing to maintain the suit. . . . "[3]

It seems fair to conclude that the Supreme Court in this case actually avoids the merit of the issue, preferring instead to meet it on a technicality. Nevertheless, the effect is the same. The possibility of effective challenge of the constitutionality of the power program of the Tennessee Valley Authority is now remote.[4] This same view was expressed by one of the critics of public ownership, as follows: "This far reaching decision of the Supreme Court also throws a protecting cloak of judicial immunity around other Federal power projects and, for that matter, around any other public enterprise which the Federal Government may now or here after decide to undertake."[5]

[1] 27 P.U.R. (N.S.) at 6.

[2] *Ibid.* at 8. (Italics ours.) This passage in the decision certainly suggests that had the state policy been one of protection from public competition, such a policy could not affect the right of federal competition with private utility companies.

[3] *Ibid.* at 11.

[4] Since the outbreak of the second World War, the facilities of the Tennessee Valley Authority once more have assumed an important relation to national defense. See the discussion at p. 698. As is said there, for all practical purposes, the legal validity of the program because of its defense implications is no longer open to challenge.

[5] *Public Utilities Fortnightly*, **24**:220, Aug. 17, 1939. For a very caustic pair of articles analyzing the Tennessee Electric Power case, see Wherry, "Federal Competition May Be Unconstitutional—but?" *supra.*, **24**:3, 84. July 6 and 20, 1939.

THE AUTHORITY MOVES FORWARD

As a result of these decisions, the way was cleared for a complete development of the unified plan in the valley. Certain steps, however, had been taken even before this second decision. For instance, the authority and the city of Knoxville jointly acquired certain properties of the Tennessee Public Service Company, a subsidiary of Electric Bond and Share Company. This purchase cost approximately $8,274,000. In addition, there were acquired certain properties of the National Power and Light Company and the Kentucky-Tennessee Light and Power Company.

The most significant acquisitions have occurred since the decision in the Tennessee Electric Power case. Two major properties in particular have been acquired. In June of 1939, the city of Memphis completed negotiations for the purchase of the Memphis Power and Light Company's gas and electric properties.[1] In this purchase, the Tennessee Valley Authority paid $2,110,000 for the transmission facilities of the company, and the city paid $15,250,000 for the gas and electric properties within its limits.[2] In the fall of 1939, the city of Memphis reduced its retail electric rates to the basic level prescribed by the authority, thus making an estimated annual saving of approximately $2,400,000. The electric property has been connected with the generation facilities of the authority and will be served from the dam at Pickwick Landing.

The second major property acquisition was completed in August of 1939, when the Tennessee Electric Power Company was acquired from the Commonwealth and Southern Corporation. This company had been the particular opponent to the expansion of the Tennessee Valley Authority; but with the decision in the second case, the hopelessness of continued warfare became obvious, and therefore the company entered into negotiations for the sale of its properties. After many weeks of discussion, the purchase price for the entire electric properties of the company in Tennessee was set at $78,425,095. For this purchase, the Tennessee Valley Authority, under a special authorization of Congress, paid approximately 45 million dollars for those facilities outside corporate limits, the balance being contributed by participating muni-

[1] This company was a subsidiary of Electric Bond and Share Company.

[2] Thus does Memphis become the first large American city to own three public utilities. These are electricity with 60,000 customers, water with 50,000, and natural gas with 40,000. These three systems have an estimated value of 35 million dollars.

TABLE 74.—ELECTRIC PROPERTY ACQUISITIONS BY THE TENNESSEE VALLEY AUTHORITY AND RELATED PUBLIC BODIES*

Acquired from	Date	Number of customers	Purchased by	Purchase price
Alabama Power Co.	April, 1936	1,020	Authority	$ 1,180,974
	July, 1936	2,340	Florence, Ala.	220,000
	April, 1937	960	Tuscumbia, Ala.	107,000
Bruce Power Co.	February, 1936	110	Pontotoc EPA†	4,000
Bruceton Light & Power Co.	April, 1939	300	Carroll County, Tenn.	8,000
Etowah Light & Water Co.	July, 1939	1,080	Etowah, Tenn.	237,500
Georgia Power Co.	February, 1939	1,190	North Georgia EMC‡	158,750
Gibson Power & Light Co.	December, 1936	80	Gibson County EMC	3,618
Grainger County Electric Co.	November, 1938	190	Authority	7,500
Holston River Electric Co.	September, 1938	1,070	Authority	87,500
Hornbeck Electric Co.	December, 1936	110	Gibson County EMC	3,000
Kentucky-Tennessee Light & Power Co.	November, 1938	2,500	Clarksville, Tenn.	260,000
	February, 1939	1,370	Gallatin, Tenn.	150,000
	December, 1938	7,800	Paris, Tenn.	502,000
			Weakley County, Tenn.	215,000
			Carroll County, Tenn.	145,000
			Gibson County EMC	225,000
			Ridgely, Tenn.	10,000
			McKenzie, Tenn.	75,000
			Huntingdon, Tenn.	25,000
			Authority	125,000
Memphis Power & Light Co.	May, 1939	57,000	Memphis, Tenn.	15,250,000
			Authority	2,110,000
Mississippi Power Co.	June, 1934	4,500	Authority	850,000
Mississippi Power & Light Co.	May, 1939	120	Tallahatchie Valley EPA	4,015
Ripley Utilities Co.	April, 1938	700	Tippah EPA	70,000
Smithville Light & Power Co.	February, 1936	60	Monroe County EPA	11,500
Southern States Power Co.	June, 1939	640	Murphy, N.C.	67,000
Tennessee Electric Co.	March, 1939	350	Gibson County EMC	23,000
Tennessee Electric Power Co.	August, 1939	142,110	22 municipalities	30,958,500
			11 cooperatives	2,692,100
			Authority	44,994,400
Tennessee Light & Power Co.	April, 1939	80	Carroll County, Tenn.	15,000
Tennessee Public Service Co.	September, 1938	34,280	Knoxville, Tenn.	5,443,656
			Authority	2,549,488
West Tennessee Power & Light Co.	November, 1938	10,700	Ripley, Tenn.	171,000
			Brownsville, Tenn.	120,000
			Humboldt, Tenn.	50,000
			Jackson, Tenn.	750,000
			Southwest Tennessee EMC	221,760
			Gibson County, EMC	37,240
			Authority	250,000
Total		270,660		$110,343,501

* 1939 *Annual Report*, Tennessee Valley Authority, p. 51.

† Electric Power Association.

‡ Electric Membership Cooperative.

cipalities and cooperatives. Of course, the purchase price can be challenged as unfair. The president of the Commonwealth and Southern Corporation, in his statement following the closing of negotiations, said:[1]

> With the purchase of these properties, the Government acquires, at about 80 per cent of its real value, one of the best electrical sevices in the world. . . . We sell these properties with regret. We have been forced to do so because we could not stay in business against this subsidized Government competition.

Valuation, whether for rate making or for public purchase, is always a difficult question, and therefore we pass no judgment on the fairness of this purchase price. It should be noted, however, that it more than covered the outstanding bonded indebtedness and preferred stock issues. One thing in the favor of this acquisition is the statement of the officials of the Tennessee Valley Authority that this completed their utility purchasing program.[2] If this is so, anything bringing peace to the valley is probably justified. The Commonwealth and Southern Corporation may now operate its remaining properties in the South undisturbed by the immediate threat of competition by the Tennessee Valley Authority and may devote its energies to the fulfillment of its program.[3] In a full-page article in the Nashville and Cattanooga newspapers following this sale, Wendell L. Willkie, president of Commonwealth and Southern Corporation, after commenting on the disposal of this property and its annual $2,800,000 tax obligation, made a plea for the recognition of what he chose to call two principles:[4]

[1] *United States News*, Aug. 21, 1939.

[2] When the Congress authorized the Tennessee Valley Authority to issue $61,500,000 of bonds to buy the Tennessee Electric Power Company and other facilities, it earmarked the purposes for which the proceeds could be spent. In addition, prior to the passage of this special act, the authority had agreed, for the fiscal year ending June 30, 1940, to confine its work to its generally accepted area of development. In conformance with that limitation, there were acquired in 1940 in eleven counties of northern Alabama the properties of the Alabama Power Company. The purchase price was $4,600,000, $1,989,000 of which was paid by the authority. After this purchase was announced, it was said that it was the "final step in carrying out the plan for long-term adjustment of relations between the authority and privately owned utilities in the region." *Electrical World*, **113**:1818, June 8, 1940.

[3] Evidence of a truce is the 10-year contract, signed August 16, 1939, by which the authority will sell 400 million kilowatt-hours a year to the Alabama, Mississippi, and Georgia companies of the Commonwealth and Southern Corporation.

[4] *Electrical World*, **112**:528, Aug. 19, 1939. The advertisement referred to above was also printed in *United States News*, Aug. 21, 1939.

I ask first, as I have asked many times before, that the government discontinue its competition with private business outside the Tennessee Valley. It now has its yardstick area. It should be content with that, so that in the other areas of this nation the utility industry may make its vital contribution to American business recovery.

Second, I ask that these government agencies should keep their books on a completely honest basis so as not to mislead the American people, from whom [they] get their power. Not only should these agencies observe the rules laid down by the government for the utilities themselves, but they should make due allowance for such things as the tax income loss to the federal and local governments whenever a private enterprise is destroyed.

Subsidized government competition not only wipes out tax revenues but destroys that confidence in private enterprise which is essential to economic recovery.

NATIONAL DEFENSE BECOMES IMPORTANT

With the quickened tempo of the second World War, the people of the United States began in the summer of 1940 an almost frantic rush to rearm. Since that war had demonstrated the importance of mechanized forces, it was a logical step to turn first to American industry and munitions plants for accelerated production. Thus, among the first acts were an analysis of power resources and new plans for the establishment of munitions plants in the less exposed parts of the country. The Tennessee Valley Authority immediately felt the results of this new program. Upon the recommendation of the National Advisory Commission to the Defense Council, the authority has been selected to operate a publicly owned fixed-nitrogen plant to be located at Muscle Shoals. Some of the facilities remaining from the experiment of the first World War will be used, although the present processes will not require the enormous quantities of power necessary for the older methods. Since the Tennessee Valley Authority has for several years been in the production of commercial fertilizer, this new activity will be incorporated with those facilities, thereby creating no particular problem of eventual peacetime readjustment.

As a result of this renewed interest in the Tennessee Valley as a proper location for defense industries, Congress in July, 1940, appropriated $25,000,000 as a first step for the erection of generating facilities to cost eventually $65,800,000. With this the Authority will be able to build a new power dam, to be known as "Cherokee dam," build a steam power plant near Watts Bar, and install additional facilities at Wilson and Pickwick Landing dams. The ultimate new capacity will be 300,000 kilowatts. Not only will these new facilities be available to existing defense industries in the valley, such as the aluminum com-

panies, but they will enable the serving of new establishments. Who knows but that the legal fiction upon which the legality of these developments has been hung since 1933—national defense—may become a stark reality? At least, whatever doubts may have existed in 1939 about the validity of the multipurpose program of the authority have disappeared into thin air forever.

FUTURE OF THE FEDERAL POWER PROGRAM

Unless the second World War brings unforeseen changes, there is reason for believing that the federal power program has reached at least a temporary stopping point. As we showed above, representatives of the Tennessee Valley Authority have indicated that, with the conclusion of purchases made in 1939, they will concentrate upon the integration, operation, and expansion of their present facilities. Also, there seems to be a growing feeling that the federal program, given its way in the Tennessee Valley, will be content in future developments to operate on an interconnected relation with private producers. This was suggested by an officer of the Electric Bond and Share Company when he said:[1]

> The objectives of both Government and the utilities must be with the widest possible use of electric service at the lowest possible cost. . . . The achievement of this end and the solution of the existing problems of competition lie in . . . the coordinated use of the existing generating and transmission facilities of both.

It seems possible, then, that the severe conflict between government and private utilities may be at an end. In return for compliance with the provisions of the Holding Company Act of 1935 and the sale of private power facilities in the Tennessee Valley, the private electrical utilities may find the federal government now willing to develop with them a coordinated program.

On the other hand, it is equally possible that, with the legality of the Tennessee Valley Authority firmly established and its operations expanded by the national defense program, federal power development will proceed at an accelerated pace along the lines of the proposed "Seven Sisters of the Tennessee Valley Authority," a plan for a nation-wide federal program of power generation and distribution. Such a proposal had been suggested by the National Resources Committee and by President Roosevelt in his message to Congress on June 3, 1937, in which he recommended the establishment of regional authorities charged with the conservation of the nation's water resources. Follow-

[1] "Utilities," *Time*, p. 57, July 24, 1939.

ing this suggestion, Senator Norris introduced the so-called "Seven Sisters" bill, or Conservation Authorities Act, by which would be created seven corporate conservation authorities to be named Atlantic Seaboard, Great Lakes, Ohio Valley, Tennessee Valley, Missouri Valley, Arkansas Valley, Southwestern, and Columbia Valley.[1] Its provisions for electric power are patterned after the Tennessee Valley Act. Should this bill be enacted, it is difficult to comprehend the magnitude of the program that would result.

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Because the ultimate disposal of the investment of the United States at Muscle Shoals has been a point in controversy since 1920, the literature is voluminous. With the creation of the Tennessee Valley Authority in 1933, the controversy became sharper, and the flow of materials pro and con reached flood stage. We shall refer to these in general terms only. The utility organization releases and trade journals should be consulted for the opposition viewpoint. Especially violent in its opposition has been the National Coal Association. For attempts to present scientific analyses, see the volumes of the *Journal of Land and Public Utility Economics*. Specific defense of the Tennessee Valley Authority can be found in its many special publications and annual reports. The most exhaustive study of this problem was made by a Joint Committee of the Congress, pursuant to Pub. Res. 83, 75th Cong. See the *Hearings*, 14 volumes; and *Report* of the Joint Committee, Appendix A—*Reports and Exhibits*, and Appendix B—*Engineering Report*. These reports and two appendices are printed as *Sen. Doc.* 56, 76th Cong., 1st Sess. For financial statements, see 1938 *Annual Report* of the Tennessee Valley Authority, vol. 2, and 1939 *Annual Report*, pp. 127–160. Finally, and for the last time, we suggest our footnote references as a basis for further reading.

[1] The Seven Sisters proposal also included a special provision for a Mississippi Valley Authority, which had already been suggested in 1936 by Senator Norris. See S. 3524, 74th Cong., 2d Sess. The Seven Sisters proposals were incorporated in H. R. 7365 and S. 2555, 75th Cong., 1st Sess.

CHAPTER XXXI

PUBLIC UTILITY ECONOMICS: A RÉSUMÉ

The preceding thirty chapters make no pretense of covering either intensively or extensively the subject of public utility economics. We have not exhausted the topics with which we have dealt, nor have we covered all topics. Obviously, one tries to limit his presentation to what appear to be problems of general and national importance. In this respect, his perspective is unquestionably affected by his own physical and cultural landscape. Therefore, to us, there was no place for discussion of the many secondary (though important) duties of some of the state commissions. The New York Commission, for instance, has the very important duty of supervising grade-crossing elimination. Some of the midwestern commissions still have the responsibility of control of rates and service of public warehouses. These, as we said, we have chosen to omit from our discussion.

One topic in particular might have properly been included, namely, the labor bargain. One important item of cost in utility operation is the wage bill. For that reason, a discussion of wages and labor could have been justified. For that matter, the labor relationship runs far deeper than simply the wage paid. A complete study of the labor bargain would include a discussion of the special obligations of utility labor; the various labor representation and benefit plans in use; and, finally, the place of the labor organization in the public utility field. Why, then, have we omitted this subject? The explanation is simply this: With the exception of a few trades, utility employees were generally unorganized before 1933. In a sense, there was no "labor problem" before that time. It is true that there were occasional strikes and other labor disturbances, but they were rare and exceptional. Since 1933, the place of the labor organization in public utilities has been undergoing rapid change. Under the aegis of federal legislation, the American Federation of Labor and the Congress of Industrial Organizations are making continuous advances in organization of utility labor. Thus, until stability in this new day has been reached, we have chosen to omit discussion of the labor bargain. Eventually (and probably soon), it will assume its place in the textbooks.

We have observed one other limitation. We have consciously, except for statistical purposes, restricted our analysis to the period before the outbreak of the second World War in the late summer of 1939. To speak more accurately, our presentation ignores such effects as war may bring to public utilities. It goes without saying, nevertheless, that war can have grave consequences on these businesses. It can bring their enforced expansion and interconnection, even their direction by government. When war is the thing, then the ordinary peacetime rules of the game are forgotten. Who cares about fair value, reasonable rates, "death sentences," when hysteria bred of war stalks the land?

Yet the threat of war has taught at least one lesson, namely, the need for an interconnected and expanded electrical industry. According to the figures of the Federal Power Commission, the 1940 construction expenditures of that utility will be almost 600 million dollars. This will help, especially if these moneys are spent in areas where reserve ratios are approaching perilously near zero. At the same time, plans are going forward to cover the manufacturing belt of the United States with a transmission grid, thereby giving a maximum insurance of ample uninterrupted power to American industry. In brief, a proposal of the Federal Power Commission is to construct two power loops. One would connect Cleveland, Buffalo, Syracuse, Binghamton (New York), New York, Philadelphia, and Pittsburgh. The second would connect Cincinnati, Indianapolis, Chicago, and Toledo. These loops would be tied together; and from them would run spurs to Milwaukee, St. Louis, Boston, and Washington. As we write, this is but a proposal. How it will be financed and the exact relationship of private utilities and government cannot be known. It is suggestive, however, of what the future holds for the electrical utility.[1]

The years since 1930 have been very important for their significant changes both in the regulation of utilities and in their ownership. Looking first to regulatory changes, the major gap in control has been closed by the creation of the several federal utility commissions. Whereas in 1930 all interstate commerce in utility service and the holding company were quite beyond all effective control, today both areas are under adequate supervision. In fact, unless the Supreme Court of the United States interferes, the one threat to regulation in the 1930's—the holding company—has been brought under control and before many more years pass will be properly tamed. Even the

[1] For a further story of this proposal, see *Electrical World*, **113**: 971, Mar. 30, 1940.

state commissions have undergone renovations and improvements. Their powers have been enlarged and their budgets increased through special assessments and other new means of finance.

As the fourth decade of the twentieth century closed, the Supreme Court of the United States may have set the stage for almost unlimited expansion of federal authority over public utilities.[1] The specific

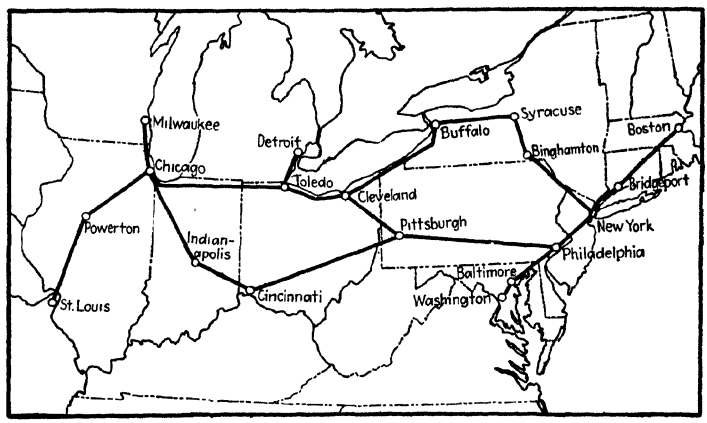

CHART 39.—Power loops proposed by the Federal Power Commission in order to make more certain for the defense program electric power in the manufacturing belt. (*Adapted from illustration in Electrical World*, **113**:971, *Mar.* 30, 1940.)

situation was its decision ending a 15-year controversy over the authority of the Federal Power Commission to impose a major license on the Appalachian Electric Power Company for its hydroelectric plant on the New River, near Radford, Virginia.[2]

Through the years of dispute, the chief point at issue was the navigability of the New River. If the river were navigable, no power development could be built without the permission of the Power Commission. As the circuit court had pointed out in 1939, this river at the

[1] *United States v. Appalachian Electric Power Co.*, 61 *Sup.* Ct. 291 (Dec. 16, 1940); summarized in *Time*, pp. 8, 9, Dec. 30, 1940. We have intentionally qualified our analysis of this case because standing on the threshold of a startling decision one has no clear landmarks to guide his thinking. Let us remember that after every revolutionary decision of the Supreme Court, dire prophecies have always been made.

[2] Why was the company so opposed to accepting a major license for this development? First, as a condition precedent to its issue, the government must be given the privilege of acquisition at the end of 50 years. Second, other limitations such as the rule of legitimate investment for rate making and public purchase, and recapture of excess earnings were unavoidably accepted by the licensee. See *ante*, pp. 217, 218.

point of the dam and for many miles below was navigable neither in law nor in fact. Furthermore, the dam near Radford, Virginia, could have no possible effect upon the water of the navigable portions of its downstream host, the Kanawha River. True, in the Civil War days and during the 1890's attempts had been made to improve portions of the New River, but for almost 50 years it had been abandoned for navigation purposes.

First in a district court and then in a circuit court the Federal Power Commission had been thwarted in its efforts to assert jurisdiction over the hydroplant of the Appalachian Electric Power Company. Such jurisdiction had to be based upon a finding of navigability or adverse effects upon downstream navigability, and both courts could discover neither in the facts of the case.[1] In the meantime, the company began construction in 1934 of its dam, a structure 1,140 feet wide with nine spillways. "Thirtieth largest hydroelectric plant in the U.S., it backed up 206,000 acres of water into a lake reaching 21 miles upriver."[2] In the powerhouse have been installed four 2,600-horsepower generators. Total expenditures have been 11 million dollars.

This is the brief setting for the epoch-making decision of the Supreme Court. Overruling the circuit court, and in the face of the intervention of forty-one states on the side of the company, that body in a 6–2 decision[3] held that power developments on the New River by the Appalachian company were subject to the licensing provisions of the Federal Water Power Act. In the words of *Time*, the Court restated the concept of navigation as follows:[4]

> . . . 1) any stream navigable by boats drawing two feet or more is "navigable"; 2) any stream that can be improved into navigability by expenditure of any "reasonable" amount of money is "navigable."

Thus did the Court extend the concept of navigability far beyond its historic limitations, although in so doing it inferentially borrowed a principle of the great Chief Justice Marshall when it said that the authority of Congress over navigable streams "is as broad as the needs of commerce. . . . " It is yet too soon to know whether or not

[1] For the decision of the Circuit Court of Appeals, see *United States v. Appalachian Electric Power Co.*, 107 F. (2d) 769, 31 P.U.R. (N.S.) 65 (1939).

[2] *Time, supra*, p. 8. *Time* apparently means "acre-feet."

[3] The Chief Justice did not participate; Justices Roberts and McReynolds dissented.

[4] *Supra*, p. 9.

this decision will be the death warrant to states' rights.[1] This was the charge of the dissent, although denied by the spokesman for the majority, Mr. Justice Reed. It may be, nevertheless, that the decision has "put power in federal hands to declare anything more than a heavy rainfall navigable, therefore licensable, therefore regulatable."[2] If so, those in the early 1930's who opposed the creation of the federal utility commissions on the ground that they would soon invade the jurisdiction of the states were almost prophetic. For ourselves, we withhold judgment, although it does appear certain that the boundaries of federal authority have been significantly widened. Only time, however, can show their exact location.

The public ownership movement has undergone significant change since 1930. In 1930, except for Boulder Dam, interest in public ownership was quiescent; since then it has definitely become alive. Now we have, besides many smaller developments by the Public Works Administration and the Bureau of Reclamation, the Tennessee Valley Authority and the Columbia River projects. In addition to these, and apart from them, we have seen hundreds of communities launch into the public ownership of electric plants. These changes since 1930 can be demonstrated statistically. Measured in terms of actual installed capacity in the United States in 1940, the estimated ultimate capacity of federal power projects amounts to almost one-fifth of that figure.

To summarize, it would appear that the fourth decade of the twentieth century closed with three trends. First, there are the attempts to shore up the foundations of regulation. Second, the stage has been set for expansion of the jurisdiction of the federal utility commissions. If state authority becomes seriously threatened, the fifth decade may see a repetition of the battle of the 1910's when the states resisted the expansion of another federal agency—the Interstate Commerce Commission. Third, there is the much revived public ownership movement.

What the future holds for these movements we hesitate to say. From the point of view of logic, we suggest that either regulation or public ownership should be chosen. At least, if we must have a mixture of regulated private ownership and public ownership, each should dominate its area of service. Direct competition between these types

[1] See the discussion of states' rights, *ante*, pp. 228 *ff.* There are discussed this problem, and the so-called "Shreveport principle." In the light of the decision in the New River case, how should that section be modified?

[2] *Time*, *supra*.

of control is uneconomic, and even the measure of the results of one by the results of the other is of questionable value.

We venture the hope that, under the general supervision of a liberal judicial system, we shall yet continue to prefer the regulation of public utilities, except water supply, instead of their public ownership. We take this position not because of a fear of public ownership as such but because of our premise of internal and external risk in these businesses. One thing only stands in the way of this hope—the attitudes of management. If public utility operators cooperate with, not sabotage, the regulatory process, then we are certain of the desirability of this choice.

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