UNIVERSAL
LIBRARY

OU_150155

UNIVERSAL
LIBRARY

FOUNDATIONS OF SOCIOLOGY



THE MACMILLAN COMPANY
NEW YORK · BOSTON · CHICAGO · DALLAS
ATLANTA · SAN FRANCISCO

MACMILLAN AND CO., LIMITED
LONDON · BOMBAY · CALCUTTA · MADRAS
MELBOURNE

THE MACMILLAN COMPANY
OF CANADA, LIMITED
TORONTO

FOUNDATIONS OF SOCIOLOGY

By
George A. Lundberg
BENNINGTON COLLEGE

New York
THE MACMILLAN COMPANY
1939

COPYRIGHT, 1939
BY THE MACMILLAN COMPANY

All rights reserved—no part of this book may be reproduced in any form without permission in writing from the publisher, except by a reviewer who wishes to quote brief passages in connection with a review written for inclusion in magazine or newspaper

PUBLISHED DECEMBER, 1939

PRINTED IN THE UNITED STATES OF AMERICA

Set up and electrotyped by T. Morey & Son

¶ *"The outstanding problem of our civilization is set by the fact that common sense in its content, its 'world' and methods, is a house divided against itself. It consists in part, and that part the most vital, of regulative meanings and procedures that antedate the rise of experimental science in its conclusions and methods. In another part, it is what it is because of application of science. This cleavage marks every phase and aspect of modern life: religious, economic, political, legal and even artistic.*

"The existence of this split is put in evidence by those who condemn the 'modern' and who hold that the only solution of the chaos in civilization is to revert to the intellectual beliefs and methods that were authoritative in past ages, as well as by radicals and 'revolutionaries.' Between the two stand the multitude that is confused and insecure. It is for this reason that it is here affirmed that the basic problem of present culture and associated living is that of effecting integration where division now exists. The problem cannot be solved apart from a unified logical method of attack and procedure." —*John Dewey*, Logic. The Theory of Inquiry. (*Holt, 1938, pp. 78–79.*)

PREFACE

The relatively undeveloped state of the social as compared with the physical sciences and the resulting problems are subjects at present much in the foreground of public discussion. The nature of the remedy for this state of affairs is the general theme of the present work. The proposed remedy, however, is not in terms of a ready-made solution purporting to "discover" the "ultimate" laws of societal phenomena or a final "just" type of social organization. This volume merely expounds an approach designed to provide the instruments for any desired solution. It is my thesis that if we follow this method as faithfully in the social sciences as we have followed it in physics it may yield us a corresponding reward in our powers of control.

The more specific considerations which have urged the preparation of the present volume are set forth at some length in Part I, and particularly in Chapter III (Sec. E, pp. 100–102). The reasons for adopting the particular viewpoint here represented may be found in Chapters I and II. Those who do not find these considerations of importance, will probably find little of interest in the book.

Briefly, these considerations are the following: There exists at present no explicit statement of the postulates from which contemporary social science proceeds or of the logic by which generalizations in these sciences are derived. Consequently there is endless confusion, contradiction, and argument regarding the permissible and effective methods of research and the validity of the conclusions reached in those fields. Comte sensed this dilemma a century ago, and it still oppresses the social sciences. "Now the existing disorder," he said, "is abundantly accounted for by the existence, all at once, of three incompatible philosophies—the theological, the metaphysical, and the positive. *Any one of these might alone secure some sort of social order;* but while the three co-exist, it is impossible for us to understand one another upon any essential point whatever." [Italics mine.] The trend in the direction of a unified positivistic science has, of course,

been conspicuous since Comte wrote. The new developments in this trend have, in fact, rendered nearly all of Comte's work obsolete. But the handicap mentioned still persists to a large degree. The reason assigned for the reluctance to adopt a completely "positivistic" position in the social sciences is the alleged inapplicability of this approach to the phenomena with which these sciences deal. The contrary view, with its general implications, is presented in the present volume.

It should be observed that in adopting this view I am not assuming that this or any other approach is dictated by the data, that it is inherent in nature apart from man in a certain stage of development, or that it otherwise partakes of elemental or eternal "truth." An indefinite number of different approaches are possible. All of them, including theology and voodooism, yield certain types of results. I confine myself here to a presentation of *one* viewpoint. My main object is to expound that viewpoint as clearly, completely, and consistently as possible. Its usefulness as a way of achieving the generally recognized aims of science will be determined by the results it has yielded and will yield when applied to concrete problems. I am content to await those results at the hands of those who have to choose between various approaches in the development of the social sciences in the future. I do point out the compatibility of the viewpoint and methods I propose with the framework of the other sciences, and the compulsions which the dominating influence of the latter in contemporary life are likely to exert also on thinking about societal phenomena. Beyond this I make no claim for the "truth," or infallibility of the viewpoint here adopted.

In view of the nature of the undertaking as outlined above, I have not attempted, of course, to give an adequate treatment of other and possibly conflicting viewpoints and approaches, however useful these may be. (See Chapter III, note 11.) I have no objection to anyone undertaking a survey of all possible theories and attempting to relate or reconcile them. I merely devote myself in the present work to a *different* task. If anyone finds this book lacking in the former respect, therefore, they will merely have discovered that I failed in a task which I did not undertake. It may be observed, too, that when I appear to have cast aspersions upon other viewpoints, *it is the attempt to introduce these*

viewpoints into systems with which they are logically incompatible, rather than the viewpoints themselves, which I have deplored.

No one should seek in this volume, furthermore, for empirical demonstration of the numerous hypotheses which constitute the viewpoint adopted. I have made numerous references to research which suggests and supports the hypotheses advanced. The further verification or refutation of these hypotheses depends in many cases upon the research of future generations. I have repeatedly emphasized throughout the book that this research in turn depends upon techniques not yet invented. I make in this connection an assumption which is quite fundamental but which seems to me justifiable: I assume that the social sciences are not immune to that development of symbolic and mechanical technology upon which all other sciences have been and are so largely dependent. I have made numerous references to recent developments of this kind. The improvement of the technology of social research I take to be a primary condition of the advancement of the social sciences.

The present volume has been contemplated for many years. The manuscript was begun ten years ago. Some other parts have appeared in the sociological journals during the past five years. I am indebted to the *American Sociological Review, The American Journal of Sociology, Sociometry,* and *Philosophy of Science* for permission to reproduce and paraphrase portions of previously published papers. The volume first took definite shape in 1934 when Professor S. C. Dodd expressed an interest in undertaking the pioneering task of elaborating the methodological implications of a theoretical position which I had previously outlined in my *Social Research.* The result was a singularly happy and profitable collaboration which has resulted in the present work and in Dodd's companion volume, *Dimensions of Society.*

A word should be said regarding the relationship of the two volumes. The position adopted in the present work undoubtedly contemplates a development *in the general direction* and *of the general type* exhibited in Professor Dodd's volume. The latter in turn undoubtedly proceeds upon the postulates and according to the general reasoning maintained in the present volume. The position here advanced, however, is also compatible with an indefinite number of other possible specific systems of classification

and notation. The validity of the approach and the central theses of the present volume are not contingent, therefore, on the ultimate usefulness of the *particular* system so ingeniously expounded in Dodd's work. At the same time the latter affords, as will be seen from my numerous references to it, elaboration and illustration of general theoretical principles with which the present volume is chiefly concerned.

In fact, for those who are not interested in Dodd's technical analysis, his volume is still a most impressive casebook of concrete sociological materials. Instead of the customary anecdotes regarding the quaint ways of primitive tribes, or current newspaper reports, however, Dodd has assembled a representative collection of *sociological studies* summarizing thousands of such "cases" of individual observations presented in a form which either explicitly states or implies hypotheses for sociological investigation. Dodd's work is undoubtedly the most rigorous and comprehensive attempt ever made *to classify systematically in terms of generalized scientific concepts* the results of the bewildering chaos of sociological "studies" that have accumulated with such rapidity in recent years. He has thus also relieved the present text from the necessity of constant digression from its theoretical task in order to introduce the detailed material which it is designed to encompass. While each volume is, then, independent and complete in itself, they supplement each other in a vital way.

It should be unnecessary to add that in a work of this kind, I have made no attempt to assemble the latest data on social and political conditions in the world or in any particular country, to moralize about them, or to advise students what to think about current events. I refer to such data, if at all, only for illustrative purposes. I have been interested principally in general societal processes that appear to be operative in human society in all times and places. Especially have I been interested in the theoretical considerations involved in the development of reliable methods of studying these processes and systematically formulating and verifying hypotheses regarding them. When systematic classification and definition of sociological concepts as illustrated by Dodd's work have been developed on this foundation, a more comprehensive and mature system of scientific theory in terms of specific formal postulates and theorems subject to rigorous test will be possible.

The text will reflect in large measure the extent of my obligation to other writers. The notes appended to each chapter acknowledge my more specific obligations. I have made no attempt to cite all authors who have ever written on the various subjects I touch. Let my position rest on its own merits rather than on the number, prestige, or antiquity of its sponsors. I am especially grateful to those authors and publishers from whose work I have been allowed to quote at some length. The works of F. S. Chapin and A. F. Bentley have been of especial value to me in this respect. The influence of G. H. Mead and John Dewey upon my philosophical orientation will be readily apparent. I recall with gratitude in this connection Professor Dewey's critical comments upon some of my earlier papers and the privilege of many conversations with him regarding difficult theoretical questions. There is little danger that any of these men will be blamed for the shortcomings of my work.

First among those who have taken an interest in the preparation of the work is Stuart C. Dodd. The prolonged discussions and voluminous correspondence with him over a period of five years have been a rare pleasure. I recall especially the summer spent with him in the Lebanon mountains in strenuous days of intellectual adventure. I have profited much from his penetrating comments upon my manuscript, and the inspiration of his bold and original attack upon a task of staggering proportions as reflected in his companion volume.

I have also been much encouraged and stimulated in the preparation of the work by a considerable number of graduate students in the Universities of Washington, Minnesota, Pittsburgh, Stanford, and Columbia where I have had opportunity to present the basic ideas. Of great value to me also have been the discussions by a group of students of Bennington College where I have used the manuscript as a text for a course in sociology. The continued interest of all of these students in the approach, as evidenced by discussion and a considerable correspondence over a period of years, has convinced me that whatever the limitations of the viewpoint may turn out to be, it does have the power of invoking the sustained interest of the rising generation. At their hands I trust this work will soon be supplanted by a more adequate formulation.

For critical reading and invaluable criticisms of the entire manuscript I am greatly indebted to Professor Read Bain of Miami University, Dr. Harry Alpert of the College of the City of New York, Professor Margaret Patterson of Bennington College, Miss Ruth Inglis, formerly of Bryn Mawr College, Mr. P. E. Keller, formerly of Stanford University, Mr. Robert Bierstedt of Columbia University, and Mr. Afif Tannus of Cornell University. All of them are absolved from responsibility for the faults that remain. Finally, I am indebted to the faculty and administration of Bennington College for time, stimulation, and intellectual hospitality.

GEORGE A. LUNDBERG

North Bennington, Vermont
November, 1939

TABLE OF CONTENTS

PART I. LANGUAGE, MEASUREMENT, AND SCIENCE

PAGE

INTRODUCTION TO PART I 3

CHAPTER

I. THE POSTULATES OF SCIENCE AND THEIR IMPLICATIONS FOR SOCIOLOGY 5

A. Science as a Technic of Adjustment 5
B. The Postulates of Science 8
C. Corollaries and Implications for Sociology 9
1. The Inferential Nature of Knowledge and "Reality" 9
2. Words as Objective Phenomena 10
3. The Relativity of "Existence" and "Reality" . . 14
4. The Visibility and Objectivity of Societal Phenomena 17
5. Meaning as a Type of Classification 22
6. Categories as Generalized Habits 23
7. The Utilitarian Test of All Thought-Systems . . . 27
8. The Non-Ethical Nature of Science 29
D. Conclusion 31
E. Notes 34

II. SYMBOLIC BEHAVIOR AND THE PROBLEM OF QUANTIFICATION 45

A. The Role of Symbols and Symbolic Systems in Society and in Science 45
B. Quantitative Symbols and Methods 50
C. "Understanding," "Insight," and Other Mystical "Methods" 51
D. The Importance of Informal Quantitative Methods . . 53
E. The Quantitative Nature of All Scientific Generalization 54
F. Definition and Measurement 58
G. "What" Do Scales Measure? 61
H. Some Theoretical Problems in the Measurement of Societal Phenomena 65
I. Summary of Fallacious Assumptions Regarding Measurement 68
J. Conclusion 74
K. Notes 77

III. FRAMES OF REFERENCE IN SOCIOLOGY 89

A. The Nature of Selective Responses 89
B. Frames of Reference 90

CHAPTER PAGE

C. Classifications of the Science 92
D. The Sources of Frames of Reference 98
E. The Need and Requirements of Scientific Sociological Theory 100
F. A Natural Science Theory of Human Society . . . 103
1. The Field-Concept in Science 103
2. Symbolic Representation of Dynamic Relationships 109
3. Requirements of a Natural Science Theory . . . 115
G. The Components of Dodd's S-Theory 117
H. Conclusion 120
I. Notes 126

IV. SOCIOLOGICAL LAWS 133
A. The Meaning of Law in Science 133
B. Types of Laws 133
C. Obstacles to the Development of Sociological Laws . . 137
D. Present Status and Prospects of Sociological Laws . . 142
E. The Instability of Societal Phenomena 144
F. Conclusion 148
G. Notes 151

PART II. SOCIETAL DYNAMICS

INTRODUCTION TO PART II 155
V. MECHANISMS OF BEHAVIOR 159
A. The Meaning of Mechanism 159
B. Is There a "Group Fallacy"? 163
C. The Mechanisms of Action, Interaction, Group Formation, and Other Behavior 173
1. Tropisms 175
2. Reflexes 176
✓3. Habits 177
✓4. Folkways 181
✓5. Customs 181
✓6. Traditions 182
✓7. Mores 182
✓8. Institutions 182
D. Public Opinion as a General Factor in Group Behavior Mechanisms 185
1. Vagueness in Definition of the Term "Public" . . 186
2. Must Public Opinion Be Unanimous? 187
3. Sudden Changes in Public Opinion 189
4. The "Superiority" of Public Opinion 191
E. Conclusion 192
F. Notes 196

CHAPTER PAGE

VI. DYNAMICS OF BEHAVIOR—GENERAL 203

A. Fundamental Concepts 203
B. The Transformation of Energy 206
C. Equilibrium, Cycles, Normality 207
1. Equilibrium 207
2. Cycles 211
3. Normality 213
D. Interaction 217
1. The Constructs "Organism-Environment" and "Stimulus-Response" 217
2. The Construct "Heredity-Environment" . . . 223
E. The Environments of Human Groups 226
F. Conclusion 231
G. Notes 235

VII. DYNAMICS OF BEHAVIOR—SOCIETAL PROCESSES . . 244

A. Introduction 244
B. Some Classifications of Societal Processes 246
C. Communication 252
D. Association and Dissociation 256
E. Cooperation, Competition, Conflict 268
F. Conclusion 277
G. Notes 280

VIII. SOCIETAL INTEGRATION AND STATUS 290

A. Introduction 290
B. Integration of Human Groups 290
1. Socialization 291
2. Sympathy, Altruism, Selfishness 296
3. Summary of Socialization 297
4. Primary Group Attitudes and Their Expansion . 299
C. Social Distance and Status 311
D. Conclusion 323
E. Notes 325

PART III. THE PRINCIPAL SECTORS OF SOCIETY

INTRODUCTION TO PART III 337

IX. TYPES OF GROUPS: (POPULATIONS—P) 339

A. A Classification of Human Plurels 339
B. Types of Organic Plurels 343
C. The Problem of Classification of Groups 345
D. Types of Groups 346

CHAPTER PAGE

E. Technic of Scientific Definition of Groups 359
F. Conclusion 365
G. Notes 367

X. CHARACTERISTICS OF POPULATIONS (INDICATORS—I): INSTITUTIONAL ASPECTS 375

A. The Meaning of "Institution" 375
B. Latent and Manifest Behavior Patterns 379
C. Familial, Sexual, and Kinship Patterns 384
D. Economic Patterns 386
1. The Assumed Priority of Economic Factors . . 386
2. The State of Economic Science 387
3. Major Aspects of Economic Patterns 389
4. The Relativity of Economic Standards . . . 390
5. The Preconception of an Expanding Economy . 393
6. Preconceptions Regarding Money and Prices . . 396
E. Political Patterns—The State 400
F. Religious and Recreational Patterns 406
G. Conclusion 410
H. Notes 415

XI. CHARACTERISTICS OF POPULATIONS (INDICATORS—I): DEMOGRAPHIC ASPECTS 421

A. Introduction 421
B. Generalizations Regarding Rates of Human Reproduction 423
C. Conditions Influencing Rates of Reproduction . . 429
1. Space Effects 429
2. Wealth 430
3. Opportunities for Other Activities . . . 431
4. Demographic Constitution of the Population . . 432
a. Sex Ratio 432
b. Age Distribution 435
c. Mortality 440
d. Morbidity 441
e. Marital Status 444
5. Religion and Other Ideological Factors 446
D. "Qualitative" Gradations of Populations 446
E. Conclusion 458
F. Notes 463

XII. SPATIAL ASPECTS OF SOCIETY (I): HUMAN ECOLOGY . 469

A. Introduction 469
B. The Interrelationship of the Dimensions of Society . 470

CHAPTER PAGE

C. Types of Regions 475
D. Distribution 479
E. Conclusion 492
F. Notes 494

XIII. TEMPORAL ASPECTS OF SOCIETY (T): SOCIETAL CHANGE 503

A. The Time Concept 503
B. Technology and Change 504
C. Invention as a Societal Phenomenon 507
D. Theories Regarding Societal Change 511
E. Social *versus* Astronomic Time 518
F. The Concept of "Cultural Lag" 521
G. Conclusion 526
H. Notes 529

AUTHOR INDEX 537

SUBJECT INDEX 542

FIGURES

PAGE

1. The field of the sciences 93
2. An arrangement of the sciences 94
3. The field of sociology in relation to other fields. . . . 95
4. Diagram of interaction. 218
5. The possible relationships between two people, three attitudes being specified 352
6. Plurality patterns of four persons. 355
7. How plurality patterns form the basic element in the four type parts of the configuration of a social institution . . 356
8. Overlapping of groups through common membership . . . 357
9. Group setting of an individual 357
10. The growth of the indigenous native population of Algeria . 424
11. Age distribution in a stationary population 436
12. The structure of population by age-groups 438
13. The declining birthrate in Europe 439
14. The principal causes of death and their relative importance in the United States 442
15. Community boundaries defined by communication facilities . 482
16. Rates of various crimes according to distance from the Detroit Metropolitan District 483
17. Rate of school truancy according to distance from the Chicago loop 484
18. Geographic distribution of public relief in Long Beach, California, 1930–32 486
19. Correlation of national-index in Europe with language, religion, race, rainfall, health, and illiteracy 487
20. Equilibrium polygon for the human species and some of the species on which it depends for its food supply 497
21. Dates of enactment of compulsory school laws by Northern and Western States. 514
22. Dates of enactment of compulsory school laws by Southern States 514
23. Diagrams of processes defined by statistical moments . . 515

TABLES

1. Levels in the Process of Symbolic Substitution 180
2. Types of "Minimality" 215–216
3. Correspondence between Action-Relationship and Status-Relationship. 264

PAGE
4. Classification of Dyadic Group 348
5. Group Types as Differentiated by Nature of Social Contact . 364
6. Simplified Schematic Arrangement of Types of Plurels . . 370
7. Nucleated Social Institutions 378
8. Forms of Social Organization 412
9. A Sample of the Data Tabulated for the Kwakiutl . . . 413
10. Pattern Analysis of the City Family 417

PART I

LANGUAGE, MEASUREMENT, AND SCIENCE

¶"*Most words are like small vessels with constantly changing contents. Life does not wait for adjustments in language, but seeks to give an immediate solution to its most imperative needs and interests. . . . Consequently, there comes every once in a while a moment when traditional meanings become so overgrown with the moss of ages that they stand as a handicap for clear thinking. Then it is advisable not to continue studies along customary lines, but rather to make a determined effort toward an analysis of basic concepts in the Cartesian fashion—by purging our minds of all the accumulated presuppositions, by undertaking a re-examination of meanings, by unlearning and re-learning.*"—*R. B. Winn, "Is Nature Rational?"* Philosophy of Science, *VI, July, 1939, p. 285.*

INTRODUCTION TO PART I

All writing is an adventure in human communication. Scientific writing especially aims at precision and clearness. Intercommunication is, as we shall see later, the special concern of sociology. The principles that govern the uses of language symbols are basic to all science. Part I, therefore, is devoted to certain problems of language, logic, and meaning.

Systematic discourse finds it desirable to state explicitly at the outset the general propositions in terms of which the discussion is to be carried on. These propositions are called assumptions, postulates, or axioms. They have sometimes been regarded in philosophy as self-evident, self-verifying, and self-contained products of a "faculty" called reason, which intuitively apprehends *a priori* "ultimate first principles." Modern science and mathematics, on the other hand, regard axioms merely as convenient instruments of inquiry. As John Dewey has said, "Axioms are now held to be postulates, neither true nor false in themselves, and to have their meaning determined by the consequences that follow because of their implicatory relations to one another." * As instruments of inquiry, postulates may be formulated freely and are appraised purely on the basis of the results which they yield. Those postulates and those systems of reasoning which are found on the whole and in the long run to be most nearly compatible with man's experience are regarded as relatively true. Changing conditions and changing experiences may therefore require changes in postulates or reasoning, or both.

It follows that the phenomena of the universe can be fitted into a variety of frameworks, or organized into a variety of patterns depending upon our initial assumptions. We can assume, for example, that phenomena move as they do because postulated gods, devils, or minds pull strings; because phenomena have instincts predisposing or determining them to act that way; or because assumed forces in the surrounding field move them that way.

* *Logic. The Theory of Inquiry.* Holt, 1938, p. 10. Elsewhere the same author says: "Postulates are not arbitrary or merely linguistic conventions. They must be such as control the determination and arrangement of subject-matter with respect to achieving enduringly stable beliefs." (P. 18.)

Very different descriptions are obtained when different assumptions are made. All such accounts may be useful in ordering our experience. Some results are, however, more useful than others. In any case, if the writer makes clear at the outset what he purposes to take for granted, i.e., what postulates he intends to adopt, it should enable the reader to understand the subsequent discussion based on these assumptions, regardless of whether he believes the particular postulates and rules adopted are the most desirable.

Accordingly, we shall set forth in the first chapter some of the assumptions we are making in this volume about man, society, and knowledge. In the second chapter, we shall examine more closely the nature of language and the superiority of some types of language as a means of communication and as a technic of social and personal adjustment. In the third chapter, the nature and importance of language *systems* as frames of reference for the correlation of human experience will be elaborated. A brief introduction to the system proposed in the present volume and more fully presented in Professor Dodd's *Dimensions of Society* will be set forth in this connection. Finally, Part I concludes with a consideration of the nature of scientific laws and the possibility of developing such laws governing societal * phenomena.

We hope that it will be clear from these introductory chapters that we do not regard the system proposed as anything more than a man-made framework within which societal phenomena can be meaningfully arranged, verified, and predicted with economy and objectivity. We claim no revelation in its inception, no absolute or intrinsic "truth" in its propositions, and no finality in its structure. We are content merely to set forth the theory and the grounds which seem to us to justify and necessitate it. The rest of the volume sets forth the implications of this approach to the problems of sociology. From this exposition it is hoped that the reader will be in a position to decide for himself to what extent the approach, if adequately carried into effect, promises that understanding and control of the societal universe which is the aim of the social sciences.

* In common with many other writers, I use the adjective "societal" rather than "social" because of the large number of meanings attached to the latter in common speech. For a good review of the considerations which motivate the adoption of the word "societal" for sociological purposes, see E. E. Eubank, *The Concepts of Sociology* (Heath, 1931), pp. 22–24.

Chapter I

THE POSTULATES OF SCIENCE AND THEIR IMPLICATIONS FOR SOCIOLOGY

A. SCIENCE AS A TECHNIC OF ADJUSTMENT

Human sociology deals with the communicable adjustment technics which human groups have developed in their long struggle to come to terms with each other and with the rest of their environment. Science is, in the fields where it has been tried, the most conspicuously successful of these technics. As a human adjustment technic, science is primarily a *sociological* subject. Hence, if we start out with a brief consideration of this technic, we are not going outside our subject, but into a very vital aspect of it. Furthermore, since we wish to attempt to use this technic in the study of human group-behavior itself, it is not only permissible but necessary to consider first the implications of that approach.

All inquiry begins with an experienced tension or imbalance of some sort in the inquiring organism. "Tension" and "imbalance" are words used to describe the result of an imperfect adjustment. "Adjustment" is in turn a word used to describe the situation under which the activities of an organism come to rest or equilibrium.[1] The latter we define, as in physics, as the state of maximum probability in any organism or other system. We shall also refer to this state of maximum probability as the "normal" in any societal situation.

When certain tensions are formulated verbally they tend to take the form of a question. The tentative, experimental answer to this question is called a hunch, a guess, a hypothesis, or a postulate. A tentative answer of this kind serves as a basis for the orderly assembling of data which will establish more firmly, modify, or refute the hypothesis. A hypothesis which is corroborated by repeated observations made by all qualified observers is thereupon called a principle or a law. Hunches, hypotheses, and guesses are produced, of course, by the responses of the or-

ganism to some situation, i.e., through data of experience, just as are the more adequately supported generalizations called principles or laws. "Hunches" differ from "principles" only in that the former rest upon more subjective (i.e., private, unverified), transitory, and quantitatively inadequate data. These characteristics frequently have misled men to believe that "hunches" are somehow generated spontaneously in the "mind"—a view which is here repudiated in favor of the position stated above.[2]

In its maturest form the content of science consists of a body of verified propositions so related that under given rules (logic) the system is self-consistent and compatible with empirical observation. The more universally applicable these propositions are, i.e., the greater the variety of phenomena covered by the propositions, the more adequate is our knowledge of the field which they cover. Thus, nearly all empirically observed behavior of bodies from the point of view of their movement in space and time are "covered" by the general "principles" of physics. That is, events as "different" (from some points of view) as a man falling from a twentieth story window, a bullet fired into the air from a rifle, or drops of water in a rain storm, are all "explained" by the same basic principle.

No two cases of any of these events are ever identical in all respects nor are the natural conditions under which they occur ever the same. Yet by a process of ignoring all this variety and concentrating our attention on some single characteristic or aspect of the event (abstracting), we can make general statements that are equally true for all falling men, all rain drops, and all projectiles. This standardization of widely different events is achieved either through actual laboratory controls or through symbolic, usually statistical, devices. Thus are myriads of unique events of the most heterogeneous nature described, classified, summarized, and "explained" by showing that they are only special cases of a general rule or law already "understood" and in terms of which we have become accustomed to make adjustments to these events. We say that anything is "explained" or "understood" when we have reduced a situation to elements and correlations with which we are so familiar that we accept them as a matter of course so that our curiosity rests. By "element" we

mean any component which we do not consider it necessary or possible further to analyze. Understanding a situation means, from the operational point of view, discovering familiar elements and correlations between them.[3]

As a result of his familiarity with the principles which govern (describe, explain) most of the events in the so-called "physical" [4] universe, man adjusts today to these events with relative emotional equanimity. That is, his curiosity and other adjustments come to rest relatively easily and without the fears, doubts, angers, and magical practices which accompanied his adjustment to these events in prescientific times. The absence of reliable principles brings forth a vast amount of trial-and-error blundering and emotional squirmings in social adjustments as compared to our relatively systematic adjustments to the "physical" world. Scientific knowledge operates, therefore, as a sort of mental hygiene in the fields where it is applied. If the morning paper reports an earthquake, an eclipse, a storm, or a flood, these events are immediately referred to their proper place in the framework of science, in which their explanation, i.e., their relationship to other events, has already been worked out. Hence each new event of this character calls for very little, if any, "mental" or "emotional" strain upon the organism so far as our intellectual adjustment to it as an event is concerned.

Political and social upheavals, on the other hand, such as wars, revolutions, and crime are to most people a matter of shock and much personal recrimination and other emotionalism. Yet these societal events are "natural" in the same sense that "physical" events are "natural." "Natural" and "physical" are of course merely words by which we describe a relatively objective (corroborated) type of adjustment to the phenomena so designated. Unfortunately, it is at present very generally assumed that these terms represent not merely a type of adjustment technic on our part, but that such terms as "physical" and "natural" are inherent characterizations of *some* phenomena in the universe but not of others. The other type or types of data are variously and vaguely designated as "social," "cultural," "mental," and "spiritual." These terms, instead of being regarded as describing those situations to which we make at present a relatively subjective and emotional type of adjustment, are likewise

attributed to data as inherent characteristics. The result of this semantic confusion has been a most mischievous separation of fields of knowledge into the "natural" and "physical" on the one hand as against the "social" and "cultural" (mental, non-material, spiritual) on the other. As a consequence, it has been assumed that the methods of studying the former field are not applicable to the latter. The generally admitted lag in the progress of the "social" as contrasted with the "physical" sciences has been a further result.

The history of science consists largely of the account of the gradual expansion of realms of the "natural" and the "physical" at the expense of the "mental" and the "spiritual." One by one "spiritual" phenomena have become "physical." This is not the place to review that history. It is readily available elsewhere and its implications for the point here under discussion are reasonably clear. The evolution of the concept of the "soul" is especially relevant, because its final stage of transition or translation by way of the "mind" into purely "physical" concepts is still under way. The resistance which this transition is encountering in some quarters is especially instructive because it illustrates the widespread linguistic confusion as to the nature of verbal symbols.

B. THE POSTULATES OF SCIENCE

To prevent constant digression and misunderstandings from arising, it is necessary in this connection to call attention explicitly to the postulates and their corollaries upon which this volume proceeds. This will seem to some to be a needless repetition and elaboration of the obvious. To others the postulates will seem unjustified. The implications of these assumptions will be set forth in this and subsequent chapters. Only as much of the reasoning will be given here as is necessary to make clear the assumptions themselves. The ultimate justification for the point of view adopted must wait upon the results it yields in clarifying thinking, in stimulating cumulatively productive research, and finally in providing that groundwork of knowledge on which alone effective practical adjustments can be made.

The basic postulates regarding the nature of "reality" and

"knowledge" upon which all science proceeds may be briefly stated as follows:

1. All data or experience with which man can become concerned consist of *the responses of the organisms-in-environment.* This includes the postulate of an external world and variations both in it and the responders to it.[5]

2. Symbols, usually verbal, are invented to represent these responses.

3. These symbols are the immediate data of all communicable knowledge and therefore of all science.

4. All propositions or postulates regarding the more ultimate "realities" must always consist of inference, generalizations, or abstractions from these symbols and the responses which they represent.

5. These extrapolations are in turn represented symbolically, and we respond to them as we respond to other phenomena which evoke behavior.

C. COROLLARIES AND IMPLICATIONS FOR SOCIOLOGY

Some of the corollaries and implications of these postulates, especially as they affect present methods in the social sciences, need to be emphasized and elaborated briefly.

1. The Inferential Nature of Knowledge and "Reality"

In the first place according to these postulates, all statements about the nature of the universe or any part of it are necessarily a verbalization of somebody's responses to *that which* evoked these responses. The nature of that which evoked them must always be an inference from the immediate datum, namely, our symbolized sensory experience.[6] All assertions about the *ultimate* "reality," "nature," "essence," or "being" of "things," or "objects" are therefore unverifiable hypotheses, and hence outside the sphere of science. Conversely, we assume that man and culture are definitely part of the cosmos. The *cosmos* is a word by which we designate the sum total of all the influences that precipitate responses in man. We assume further, that all phenomena of man and culture, in common with all nonhuman phenomena, are entirely contained within the cosmos and entirely dependent

upon the energy transformations within that cosmos. We start with symbolized human responses as the immediate datum. As a metaphysical necessity we grant *that which* in the universe outside of the responding mechanism precipitates the response. After this is done, science is not concerned with the particular metaphysical hypotheses anyone may prefer to hold about the more ultimate nature of *that which* arouses responses.

2. Words as Objective Phenomena

It follows from the above that for scientific purposes all attempted distinctions, hypotheses, or assumptions regarding differences in the *ultimate* "nature" of so-called "physical" as contrasted with "social" data, between "material" and "immaterial," "mental," "spiritual," or "cultural" phenomena are ruled out. No relevant data (e.g., behavior designated by such words as "spiritual," etc.) are ruled out if they are manifest in human behavior of *any observable kind.* At present we shall attempt to deal only with the more objective of these behaviors. But since objectivity is here regarded *not as a characteristic of things but as those ways of responding which can be corroborated by others,*[7] it follows that the framework of science affords place for all known or knowable data. Of course, the less developed our objectifying technics are for certain experiences (i.e., the "subjective" and "spiritual") the greater is the task of communicating them so that they can be verified (the test of objectivity). Indeed, this process of objectifying them may involve analysis, reclassification, and designation by new and strange symbols. Many terms at present employed probably will be abandoned entirely as devoid of content when the behavior phenomena to which they once referred has been more adequately described by other terms. As science has advanced, this has been true of all prescientific terms and categories. In this connection we encounter one of the chief obstacles to the translation of subjective experience into objective data, i.e., communicating the former and rendering them verifiable. Let us take only one illustration.

In the opinion of the best chemists as recently as 150 years ago, *phlogiston* was a necessary element in the explanation of combustion. The theory was that in all materials that burn there is present phlogiston, a substance without color, odor, taste, or

weight. Even Priestley, to whom the discovery of oxygen is usually credited, continued to maintain during his lifetime the existence of phlogiston and the part it was supposed to play in combustion. By experiments involving much careful and accurate weighing, Lavoisier was able to demonstrate finally the unnecessary character of the hypothetical entity, phlogiston. Nevertheless, the older chemists of the day, thoroughly habituated to thinking about fire in terms of phlogiston continued to "feel" that the new explanation "left something out." It did leave something out, namely, a *word* to which the chemists of the day had become thoroughly habituated, and which was therefore as "real" to them as the word "wood" or whatever other words are used to symbolize the factors assumed to be present in a given fire. However, we do not contend that by abandoning phlogiston, modern chemists refuse to recognize a vital or relevant element in the explanation of fire.

Today, however, a considerable number of students of societal phenomena are still firmly convinced that the phenomena with which they have to deal cannot be adequately described or explained without, for example, a category called "mind," which carries with it a whole vocabulary of subsidiary terms (thought, experience, feeling, judgment, choice, will, value, emotion, etc., etc.). "We forget that these nouns are merely substitutes for verbs and go hunting for the things denoted by the nouns; but there are no such things; there are only the activities that we started with." [8] By this oversight, also, we avoid the necessity of defining operationally the behavior-units into which the phenomena of any field must be divided for scientific purposes. Any attempt to deal in other words with the behavior which these words are used to represent meets with the most determined resistance on the ground that "*something* has been left out." And what has been left out? Why, "will," "feeling," "ends," "motives," "values," etc. These are the phlogiston of the social sciences. Argument or demonstration that the behavior represented by these words is accorded full recognition within the present framework of the "physical" sciences are to some apparently as futile as were the arguments against phlogiston to Priestley. He *just knew* that any system which left out the word phlogiston was *ipso facto* fallacious. I have no doubt that a considerable part

of the present content of the social sciences will turn out to be pure phlogiston. That fact will be discovered as soon as someone attempts operational definitions of the vocabulary which at present confounds these sciences. Yet, it is on the basis of such words that we undertake to set up a separate universe [9] to which the methods of inquiry recognized in the other ("physical") universe is held not to apply. The Germans properly designate this former field as that of the "Geisteswissenschaften." The distinction between "science" and "social science" is, in fact, quite generally accepted as a matter of course. The present work continues, as a matter of necessity, to use the terminology here criticized because it is our purpose to communicate with the present generation. Also it is necessary to bring about the desired transition through the substitution of a new content for some of the old terms rather than abandoning them outright. Useless or undesirable words should be allowed to die as their content is taken over by new and more adequate terms. But while adopting this practice here, we contemplate a gradual transition to the type of terminology proposed in Professor Dodd's volume.

The following illustration from contemporary sociological literature further illustrates the tendency to regard familiar words as essential components of situations: "There is an essential difference, from the standpoint of causation, between a paper flying before the wind and a man flying from a pursuing crowd. The paper knows no fear and the wind no hate, but without fear and hate the man would not fly nor the crowd pursue. If we try to reduce fear to its bodily concomitants we merely substitute the concomitants for the reality experienced as fear. *We denude the world of meanings for the sake of a theory itself a false meaning which deprives us of all of the rest.*" [10] [Italics mine.]

Note the essential nature of the words *hate* and *fear* in this analysis. Even their translation into terms of their behavior-referents is alleged to "denude the world of meanings." Now if anyone wishes to interpret the flying of a paper before the wind in terms of hate and fear, as has doubtless frequently been done in ages past, I know of no way of refuting the analysis for it is determined by the terms, the framework, and the meanings adopted. *These categories* are not given in the phenomenon. Neither are the categories I should use in scientific description so given. In

fact, I have no objection to the words "fear" and "hate" if they are defined in terms of physico-chemical, biolinguistic, or sociological behavior subject to objective verification. I have no doubt, either, that descriptions in these terms would vary widely in different cases of flying objects. For this reason, I do not declare MacIver's analysis of the man and the crowd as *false*. I merely point out that possibly I could analyze the situation in a frame of reference not involving the words "fear" or "hate" but in operationally defined terms of such character that all qualified observers would independently make the same analysis and predict the behavior under the given circumstances. Such a demonstration would not, of course, constitute an adequate substitute explanation to some people any more than Lavoisier's interpretation of fire was satisfactory to Priestley. Indeed, that interpretation is still meaningless to those not familiar with the framework and terminology of chemistry and physics. On the other hand, the principle of parsimony requires that we seek to bring into the same framework the explanation of all flying objects. In an animistic culture the imputation of fear to all flying objects (under the above circumstances) fulfills this requirement. Gradually, however, this explanation was abandoned for all inorganic phenomena, and more recently for the lower animals. The fear-hate categories are not generally used in describing or "explaining" the approach of the amoeba to its food although even the amoeba approaches food that can move away in a different way than it approaches food which has no power of locomotion.

The idea that the same general laws may be applicable to both "physical" and societal behavior may seem fantastic and inconceivable to many people. It is literally inconceivable to those who do not possess the symbolic technology in terms of which alone it can be conceived. For this reason, it may be that the next great developments in the social sciences will come not from professed social scientists but from people trained in other fields. The contributions of men like Comte, Ward, and Pareto, all of them technically trained in other sciences and in mathematics, is significant in this connection. In present day psychology, likewise, the major contributions are being made by men trained in engineering, physiology, and other "physical" sciences. This does not mean the contribution of social scientists will be worthless. They

have performed and will perform valuable services in pointing out data, problems, and difficulties in their field. With much data already available, scientists with more adequate technical equipment will probably make the most important contributions to systematic sociology for some time to come. In the meantime, the general scientific and technical equipment of social scientists is, of course, rapidly improving.

The doctrine that man is the one unique object in the universe whose behavior cannot be explained within the framework found adequate for all others is, of course, a very ancient and respectable one. We merely make the contrary assumption in this work. From the latter point of view a paper flying before the wind is interpreted as the behavior of an object of *specified characteristics* reacting to a stimulus of *specified characteristics* within a specified field of force. Within this framework we describe the man and the crowd, the paper and the wind. The characteristics of these elements (and they may be specified to any degree desired) would never be the same in any two cases of wind and paper or of men and crowds. But it is the faith of science that sufficiently general principles can be found to cover all these situations, and that through these principles reliable predictions can be made of the probability of specific events.

3. The Relativity of "Existence" and "Reality"

It will be observed that the above position regards "existence" and "reality" as always relative to some responding organism and that these words designate nothing absolute or final of the type usually implied by such words as "truth" and "fact." The only metaphysical position necessary and compatible with science is a postulate conceding the existence of *whatever* precipitates our responses, but making no further statements whatever about the absolute nature, characteristics, or temporal-spatial qualities of these postulated entities. Phenomena exist for those organisms which respond to the stimuli in question but do not exist for organisms which do not so respond. If "wall" is defined as that which obstructs the movement of a person toward a given place, the existence of the wall is predicated upon that observed behavior of the person. To a micro-organism whose movement is in no way hindered by that which obstructs the person, the wall

does not exist under the definition we have adopted. "Existence," "reality," the verb "is" as a mystical general designation, and a large number of similar words, and rules of logic constructed from them, are merely words designating behavior and behavior relationships. Apart from this behavior, the words are without content for science.

The deepseated nature of these language habits and the rules of logic couched in these terms cause many people to feel that the bottom drops out of all "sensible" discourse unless *certain* things (as contrasted with the mere postulate of *something*) can be declared to *exist* quite irrespective of anybody's responses to them. If this position is assumed, it follows that *someone must declare what things do so exist.* In spite of the mischief and obscurantism which has resulted from this position throughout history, contemporary scientists, and especially social scientists, are still inclined to cling to some "eternal verities" specified or implicitly taken for granted by themselves. They still undertake to discard new theories precisely on the same ground as did certain contemporaries of Galileo, namely, the conflict of these theories with "ultimate realities."[11] The latter are assumed to be given in nature and self-evident to all decent and competent persons. We are usually so thoroughly habituated to the "ultimate realities" as to be unaware of the origin of these word-habits and impatient of any inquiry into that subject. The most vigorous critics of *past* obscurantists are likely to be also the most passionate defenders of the current faith. Did not their present beliefs triumph over "Falsehood," "Error," "Superstition," etc. and does not this sufficiently establish the former as "Truth" now finally "discovered"? Because of their mistaken notion that these words are absolute *entities* of some sort instead of an organism's designation of certain types of responses entirely relative to itself, they follow precisely in the footsteps of the popes and the priests for whom they profess such contempt.

Scientists had better confine themselves to a modest postulate of "x" which precipitates our responses and the nature of which we tentatively infer from these responses. The justification of even the postulate of the "x" had better be its demonstrable efficiency in helping us comprehend our world rather than in vociferous declarations about its "existence" and its "truth." Then

if, for example, the time ever comes when the data of experience are more adequately comprehended by the assumption of a round rather than an elliptical orbit of the earth or any other modification in even the most widely accepted viewpoints, we can with full freedom and consistency adopt such a view.

Informed scientists in other fields have, of course, accepted this view of even their most stable formulations. Einstein and Infeld have expressed the viewpoint with admirable clarity in the following passage:

"In our endeavor to understand reality we are somewhat like a man trying to understand the mechanism of a closed watch. He sees the face and the moving hands, even hears its ticking, but he has no way of opening the case. If he is ingenious he may form some picture of a mechanism which could be responsible for all the things he observes, but he may never be quite sure his picture is the only one which could explain his observations. *He will never be able to compare his picture with the real mechanism and he cannot even imagine the possibility or the meaning of such a comparison.* But he certainly believes that, as his knowledge increases, his picture of reality will become simpler and simpler and will explain a wider and wider range of his sensuous impressions. He may also believe in the existence of the ideal limit of knowledge and that it is approached by the human mind. He may call this ideal limit the objective truth."[12] [Italics mine.]

The same authors have also recognized a point too frequently overlooked by those who believe that past theories were merely a morass of error serving no purpose but to obscure the truth now so happily finally attained. Say Einstein and Infeld: "The new theory shows the merits as well as the limitations of the old theory and allows us to regain our old concepts from a higher level. This is true not only for the theories of electric fluids and field, but for all changes in physical theories, however revolutionary they may seem. . . . To use a comparison, we could say that creating a new theory is not like destroying an old barn and erecting a skyscraper in its place. It is rather like climbing a mountain, gaining new and wider views, discovering unexpected connections between our starting point and its rich environment. But the point from which we started out still exists and can be seen, although it appears smaller and forms a tiny part of our broad view

gained by the mastery of the obstacles on our adventurous way up."[13]

The above reasoning applies with equal validity to our most firmly established orientations and to our more transient theories. It is not likely that we shall have to revise our notion of the earth's shape. But it is highly likely that we shall have to abandon or thoroughly revise some of our most profoundly held notions about man and human society. The resistance which behaviorism encountered some years ago in psychology and sociology even in some scientific circles suggests that science had better make no absolute and final declarations about "existence," "reality," and "truth," in any field. Sociology especially had better keep clear of such declarations. It is quite common for researchers in sociology to be told that however rigorous has been their devotion to all the requirements of scientific method, their results unfortunately do not square with "the very nature of the thing" studied; its "true or real content" has been missed, and so forth.[14] The mere objectivity of findings in the sense of corroboration by other workers is not enough from the point of view I am attacking. The findings must also, and primarily, square with some "objective reality" (*represented only by certain words*) which is declared to "exist" independently of anybody's observations or corroboration.

Fortunately, scientists are likely to go about their business without too much attention to these strictures. They record their observations, analyze and synthesize them according to rules that experience has shown yield a certain kind of result. If, when they are through, it seems more sensible to say the earth is round rather than flat, they say so, suffer persecutions, but go on their way. They have done it in the past, and will doubtless do it in the future, even when it does to "the very nature" of man and society what Darwinism did. I have taken here an epistemological position compatible with such developments.

4. The Visibility and Objectivity of Societal Phenomena

Within our universe of discourse, then, all data are known to us only through human responses and we infer both the existence and the characteristics of any phenomena from these responses. A taboo, a custom, an "idea," or a belief is, therefore, as a datum, as "tangible," "real," observable, measurable, and otherwise sus-

ceptible of scientific study as is a stone, a table, or a horse. The contrary assumption flows from the fact that the responses aroused through certain senses, notably of touch and sight, being responses for which the most highly developed objective symbols have been invented, are therefore assumed to possess a "tangibility" which events that have not yet been thus symbolized do not have. Now the words "tangibility," "reality," etc., may be used profitably to describe a degree of objectification of our responses to some data while such terms as "intangible," "spiritual," "nonmaterial," describe a lesser degree of objectivity of responses. But these terms cannot be used to indicate intrinsic characteristics of data in the present frame of reference. The alleged greater "tangibility" of certain "physical" events resides not in the events, but in our more highly objectified methods of responding to them. *That response* which we call custom, affection, pain, anger, the welfare of our grandchildren, the Future Life, or what not, consists of reactions of sense receptors to stimuli from outside or inside the organism as truly as our experience of a stone or a tree.

This point is fundamental and must be taken quite literally if we really contemplate bringing societary phenomena within the framework of natural science. We must be able to show that symbols such as honor, duty, loyalty, etc., and the behavior which they represent are as observable and objective data as are baseball, the seasonal flight of birds, or the jump of an electric spark. "Baseball," "flight," and "spark" are words by which one person communicates to another certain of his responses to whatever phenomena precipitate these responses. Honor, duty, and loyalty are another group of such words designating people's responses to other phenomena. The capacity of a word or any other stimulus to evoke a given response depends upon our conditioning, at some time in our existence as an organism, to respond in a given way in a given stimulus-response situation. All of these words stand for behavior of some sort. To the extent that numbers of individuals use the same word to designate similar behavior phenomena (i.e., to the extent that numbers of individuals behave in a given way in a given situation) it is conventional to designate the phenomena to which they respond as objective. Phenomena are objective in science to the extent that this criterion of agreement, corroboration, or verifiability is satisfied.

Failure to grasp this relativistic meaning of objectivity is perhaps the basic reason for fundamental misunderstandings in the social sciences. The common objection to the position advanced in this book, usually designated as behavioristic or positivistic, is that it cannot, it is said, take account of what men feel or think.[15] In elaboration of this statement Cooley's "bold statement that the solid facts of social life are the facts of the imagination" is quoted.[16] "My friend is best defined," it is said, "as what I imagine he will do and say to me on occasion"—a surprisingly behavioristic statement. The point is further illustrated by the statement that "when John and Tom meet there are six persons present. There is John's real self (known only to his Maker) [*sic*], John's idea of himself, and John's idea of Tom, and, of course, three corresponding Toms. Cooley goes on to say that there are really twelve or more, including John's idea of Tom's idea of John's idea of Tom. In these 'echoes of echoes of echoes' of personality we have an *a fortiori* consideration of the importance of *the subjective aspect of conduct*."[17] [Italics mine.]

If it is assumed that any social scientist, behaviorist or other, proposes to ignore any or all of the above data, it is not surprising that the thought has caused considerable agitation. No supporter of such a view is ever cited by the critics, and I have never in the course of a considerable survey of the literature encountered an exponent of the position. The better known authorities, including the most extreme behaviorists, have specifically disavowed any such view.[18] Not only have the behaviorists apparently failed to communicate what their position is, but they have succeeded in arousing in their critics nightmares of vast proportions. The obvious fact is that communication has broken down on this subject. Whether the fault lies at the sending or the receiving end is not immediately relevant. The important thing is to clarify the position if possible, since the possibility of objective study of phenomena of the kind illustrated above is obviously basic to a science of sociology.

I hold that "echoes" and "shadows" are just as truly physical phenomena subject to objective scientific study as are the phenomena which shadows and echoes reflect. The charge that we propose to ignore the phenomena of "imagination," "thought," or "consciousness" is as unwarranted as would be a similar charge

that physicists deny the phenomena of shadows and echoes. The physicist demands verifiable sensory evidence of echoes and shadows exactly as he does of original noises that echo or of objects that cast shadows. The sociologist must similarly demand sensory evidences of the imaginings, thoughts, and other phenomena of "consciousness." When he has such evidences he is as much interested in the phenomena of what men think and feel as in any other data. Imaginings, thoughts, and feelings manifest themselves if at all through symbolic or other neuro-muscular behavior. As such they are as proper subject for scientific study as are all other phenomena. This holds for all so-called introspective phenomena as well as for phenomena assumed to originate outside of the observer. (Actually, of course, all *responses* are "subjective" or "introspective" in the sense that the response occurs before it is communicated.)

The assumed inaccessibility of the data of consciousness to objective study arises from the undeveloped state of the technic for such study.[19] No behaviorist questions the scientific validity of a physician taking his own temperature, pulse count, or recording by any method subject to verification, his observation of the behavior of any part of his organism in relation to stimuli of whatever kind, societal or "physical." It is a problem of developing an objective terminology and instruments with which to observe and describe experience which is now very inadequately communicable or subject to verification. "The possibility of one man's observing another's mental processes, like the possibility of observing another's digestion becomes a question of developing laboratory technique."[20] This technic need not contemplate substituting our experience for his directly. Like all other knowledge it is usually inferred from objective signs. In short, it is only a matter of what degree of objectivity we shall require before we can use them as a basis for scientific generalizations. Of course, we are using and should continue in the meantime to use these data for all they are worth in their present form.

The same reasoning holds for the common assumption that a strictly behavioristic description of societal behavior denies "the relevance of anticipated social ends as a partial determinant of social action."[21] Anticipated ends, in the sense of "conscious" prevision, whenever they become stimuli to action, exist as words

or other symbols to which the organism responds as it does to other stimuli. The same is true of memories, "values," "meanings," "ideals," "ideas," and all the rest of the phenomena which are alleged to be unapproachable by the accepted methods of science. Again, the error lies in assuming that the telic character or purposiveness which we like to attribute to societal behavior is an intrinsic character of the behavior rather than our way of describing it. All phenomena *may* be described in teleological, theological, or magical terms. We have merely abandoned the practice of ascribing "malice" to the tree which falls "in order to" block our path, or of attributing "planning" to the amoeba in approaching its food.

Physicists have likewise lost interest in the question of whether an echo or a shadow is "objective," "real," or "exists." The investigation and description of an "echo of an echo of an echo" proceeds according to the same principles as the investigation and description of any other noise. When we adopt this attitude toward the "intangibles" which so bedevil and frustrate contemporary sociological theory, we shall presently find that certain metaphysical questions of "existence," "reality," "subjectivity," and "tangibility" can take their place with the question of how many angels can stand on the point of a needle and other profound issues that agitated learned men of other ages.

Full inquiry into the conditions affecting the observed behavior is required in any case. If it is desired to designate a certain type of conditions common among human beings by the term "malice," there is no objection to doing so. It is the use of the word as a substitute for the investigation of the conditions that is here under criticism. As convenient classifications of types of data there is, likewise, no objection to designating some as "physical" and "material" and others as "cultural," "social," or even "spiritual," provided we do not make assumptions that these classifications effect the method by which we know the phenomena in question, i.e., through sensory responses of some kind. It is true that both an iron fence and a taboo will keep men from touching an object or going to a certain place. It is also true that the taboo will have this effect only upon the behavior of men conditioned to a certain culture, while the fence may have the same effect on all men. Therefore, by men in general, greater objectivity is ascribed

properly to the fence. But *to the men conditioned by the given culture*, the taboo has the same degree of objectivity, the test of objectivity in either case being the observed behavior of the men. From this behavior of the men, the existence, meaning, objectivity, and other characteristics of both fence and taboo is inferred. Obviously, the fact that we ascribe equal degrees of objectivity to two things for given groups of men does not mean that we claim they are the "same," "alike," or "similar" in any or all *other* respects. The fact to keep in mind is that all existence, data, reality, or being is relative to some observer and, of course, to his frame of reference. Obviously, to some of the lower animals with different sensory apparatus and background of experiences, many data sensed by all men do not exist and *vice versa*. Likewise, different men sense different things. Things which all or nearly all men respond to in very much the same way, i.e., an iron fence, we call relatively objective, physical, material, tangible, etc. Things to which only relatively few, or only one, respond in the same way without special cultural conditioning are termed subjective, intangible, spiritual, etc. We are not contending that the data called intangible and spiritual today may not be properly so described. We merely point out wherein their intangibility resides, so that, if we develop response technics which permit the checking and corroboration of the responses to things today called intangible, they would then be tangible. Whether this can ever be done to some "subjective" data remains to be seen. In any case we are more likely to make progress in this quest if we assume as a working hypothesis that it can be done. We have no choice but to proceed on that hypothesis if we wish to bring these data within the domain of science.

5. Meaning as a Type of Classification

Much of the difficulty which the above position seems to involve is the result of a failure to recognize that within the framework here advanced, words themselves, spoken or written, are just as truly entities to which we respond as all other objects are. Under other orientations, words are frequently unique and mysterious, not to say magical, entities, because it is alleged, we respond to their *meanings* rather than to the words as objects or as "physical" stimuli. This is a confusion flowing from the assump-

tions dealt with under our first postulate. Our response to a stone is also to its meaning to us, i.e., the conditioning we have undergone to the word "stone." Prior to such conditioning it has no "meaning" to us (in the sense of knowledge) and calls for no response as a symbol. All words (stone as well as taboo) are symbolic designations of some behavior phenomenon to which we respond. It is our response which gives it "meaning." [22] The meaning of anything we respond to at all is implicit in the response and part of it. We do not respond symbolically to that which has *no* meaning to us. Meaningless things, words, or symbols are a contradiction in terms; the very fact that we call them meaningless proves that they have *that* meaning, i.e., we so classify them. We use the expression to designate, of course, phenomena that do not fit in consistently with the frame of reference in which we try to place them. A "nonsense" syllable, for example, has meaning *as such*. What we mean when we call it meaningless is that it does not have *a certain kind* of meaning that other syllables in a given language have.

To say that a statement is meaningless is obviously as meaningful a statement as any other. Only *words* or *statements* (symbols) about the world (not objects *per se* which are only inferences from responses) can have meaning. We encounter here, the old question as to whether we can "think" without symbols. This question can be resolved only by an arbitrary definition of "thinking." Since all responses that have any scientific import involve symbolic systems, we take the generally accepted view that all thinking involves symbols and that only when symbolized do "objects" or behavior have meaning.

6. Categories as Generalized Habits

What has been said above about words in general also applies to categories and classifications of phenomena. The limitations of man's sense organs permit him to respond only to certain aspects of the whole universe (i.e., everything that might be responded to) at any one time. We mean by an "aspect," "segment," "field," or "part," any situation to which our neural organization allows us to respond as a unit while responding in a secondary way to the relation of this situation to a larger situation in which the former is considered as encompassed. The

problems that confront us at a given time define and evoke selective responses. We designate them as parts or wholes according to their individual sufficiency for the adjustment-needs of the occasion. On this basis, we designate some situations as "wholes" and others as "parts." It follows, of course, that what is regarded as a "whole" with reference to one situation may be regarded as a "part" with reference to another, and *vice versa*. Thus a cell may be a whole and the solar system a part, according to the frame of reference adopted. The words are therefore merely designations of types of response, not intrinsic qualities or characteristics of objects or situations as is implied by some writers on "Gestalt" psychology.[23] In other words, all aspects, segments, parts, or other categories or classifications, including the classification of the sciences, are defined by whatever behavior the organism finds relevant to its adjustment needs (including the intellectual needs of a given organism at a given time) to restore that balance the disturbance of which we postulate as the occasion for any or all behavior. The lines of classification which we impose upon phenomena "are not walls of separation, but more like the parallels and meridians of the globe, which in no way mar its continuity but make our sphere intelligible and comprehensible from our various points of view." [24]

The number of different aspects of the universe to which it is possible for the human organism to respond probably are practically unlimited. The permutations and combinations possible among such a multiplicity of factors as those to which the human senses are sensitive, as well as the constantly appearing new aspects resulting from the phenomena of evolution or change in man himself, his technology, and his environment make the social universe alone a field within which an almost unlimited number of classifications of phenomena (selective responses) are possible.

The broadest and most general classification of aspects of the universe which any species will make consists of those aspects which involve the adjustment needs of all or nearly all individuals. The broad divisions of the universe introduced by some of the ancients such as earth, air, fire, water; man, as distinct from other animals; distinctions between body, soul, and mind, etc., represent designations of aspects of the universe calling for special types of responses to which practically all people were called

upon to make common-sense adjustments of certain fairly uniform kinds. For example, it is found that changing one's position from point to point by walking is under given conditions always possible on land but not on water. Air, likewise, is an aspect of the universe to which all are compelled to make specific responses different from those adapted to locomotion on land and water. The constant verification of these responses by everyone, permits universal assent to the imputation of certain characteristics to each of these aspects of man's environment. This is how *all* phenomena come to have attributed to them their generally recognized characteristics. That is, we assign to *that which* arouses *certain responses, words designating the qualities or characteristics which differentiate these responses from other responses.* Earth is that which supports us when we walk, water is that which does not support us if we try to walk on it but which is definable in terms of our *other* responses to it, etc., etc.

We delimit the total universe, therefore, into aspects, categories, and classifications on the basis of the differential responses with which we are compelled to adjust. These adjustments consist, of course, of observably different behaviors. In the human species, these different behaviors are represented by different words. To these aspects of the universe to which nearly all men respond in nearly the same way we attribute high objectivity, "reality," "existence," "being," etc. This is the basis of "common sense," the experiential precursor of science. There are other aspects with reference to which the uniformity of response is not so easily observable or verifiable and for which the descriptive symbols are not as yet so easily checkable against the behavior for which they are alleged to stand. To these aspects we therefore attribute lesser objectivity, lesser "reality," etc. The point to be observed is that the *divisions, categories, classifications,* and *groupings* of the phenomena of the universe are *words representing* differential *responses of man.* The objectivity of any aspect of the universe (situation) as contrasted with another, therefore, depends upon its capacity to evoke uniform responses from large numbers of people.[25] Since the overwhelming majority of these responses in the human species become known to others only through verbal behavior, the objectivity of phenomena depend largely upon the possibility of communicating accurately the meaning of words so as

to insure that a given person uses a given word to represent the same kind of experience that other people use the word to represent. This we achieve chiefly through specifying in terms already highly objectified, and ultimately in overt behavior of some sort, such as pointing to an object, or going through the *operations* which we use the new term to designate.

It is quite essential to remember this basic nature of all categories in order to avoid becoming involved in insoluble metaphysical questions of ultimate reality, as we have pointed out above, and in order not to create the impression that the various classifications of human groupings to be reviewed in the later chapters represent anything more ultimate than ways of responding to aspects of the universe to which adjustment of some sort is made. On the scientific level that adjustment consists chiefly of the need of scientists to relieve the intellectual tension which comes of inability to fit certain phenomena into a coherent framework so that their curiosity can come to rest.

The postulates, axioms, and assumptions, and the corollaries we draw from them, constitute a symbolic frame of reference or universe of discourse, the origin and properties of which will be further discussed in Chapter III. No orderly discussion is possible without such a framework for it is only by reference to some such framework that individual statements about phenomena have meaning. Since the elementary rules of grammar of any language constitute the most general of such frameworks, we usually take the reference for granted and do not state postulates explicitly. As a result we assume too lightly that the knowledge regarding which we have developed familiar verifying technics has an inherency in the universe, instead of being only a more uniform way of responding. In short, frames of reference and universes of discourse are themselves merely comprehensive ways of responding to large configurations of data. ". . . Both mathematics and scientific theories," says Bell, "are nothing more immortal than convenient man-made maps for the correlation of human experiences." [26] We here make the same statement about any and all theories and generalizations whatsoever. Their "truth" or validity will rest on the same practical test upon which we estimate the adequacy of any other response, namely, whether it achieves the adjustment sought.

7. The Utilitarian Test of All Thought-Systems

The above orientation calls for no theoretical argument, therefore, as to the "truth" of our system as against theological and philosophical terms and postulates *within their own system.* Many theologies are quite as logical, comprehensive, and self-sufficient theoretical systems as is science. Thus the postulate of an omnipresent, omniscient, and just God, or of a devil directing the affairs of the universe provides a frame into which events may be fitted according to certain general rules of logic, i.e., of verbal syntax. The postulate of the earth as a flat body around which the sun and the other planets move is another frame of reference into which common-sense observations may be fitted logically. The postulate of a round earth moving around the sun is an alternative frame of reference. The only legitimate criterion for judging frames of reference, as such, is the degree to which they are consistent with themselves. From the standpoint of the use of a given frame as a chart or compass for practical adjustments, the criterion becomes, of course, its practical adequacy, i.e., its usefulness in securing the desired adjustment. By the first criterion several widely disparate systems may be equally defensible. By the second criterion, one system will, under given circumstances, tend to be superior (on the ground noted) to others. These two criteria must not be confused. Under the first criterion the postulates of the present work should be judged by their self-consistency, the possibility of logically deducing from them theorems capable of emperical verification, and their compatibility with the general framework of science. Under the second criterion they must be judged by their simplicity, their generality, and by their capacity to provide a basis for practical adjustments.

The futile scholastic discussion of many subjects especially affecting man and the social order owe their futility to the failure to designate explicitly the frame of reference, the postulates, and the rules upon which the discussion proceeds. This failure is in turn due to the common assumption that frames of reference are in some way inherent in the universe instead of being pure constructions for our convenience—"ways of looking at things."

The conditions under which men live, including their cultural

heritage determines, of course, in a broad way what frames of reference will be invented at any given time. The point of view here presented, for example, is the result of the tension which comes of trying to live in an intellectual world which is half scientific and half something else. Although the thought pattern of science is bearing down on us from every side, we nevertheless try to avoid its full implications in the sociological realm on the ground that the latter involve "mental" or "spiritual" factors. Out of these factors it is attempted to erect a separate order of being or of knowledge called "Geisteswissenschaft." In the meantime, the incompatibility of the assumptions behind such a view in the light of increasing psychological knowledge about the nature of the "mental" categories, are destroying the basis for the distinction.

Since failure to recognize the essential nature of propositions, postulates, and frames of reference as discussed above results in the most widespread and fundamental misunderstandings and futile arguments, these essential points cannot be too strongly emphasized. It must be admitted too that scientists as well as their opponents frequently overlook these considerations. The tirades against religion, theology, and other systems of thought by erstwhile adherents to these faiths who have recently discovered "science" are often evidence of a mistaken notion regarding the nature of both science and the faiths of the fathers. *All* of these systems are merely adjustment technics which have been found more or less satisfactory to their adherents *under given conditions* at different times. As times and conditions change, all of these frames of reference, including present science, may be expected to prove inadequate, and be abandoned for radically different postulates, and may proceed perhaps, according to different technics and systems of logic.

The tests of the adequacy ("truth") of any system at any given time will in any event be determined by certain empirical tests, notably whether the system affords a rationale of the adjustments that have to be made and whether it aids in planning those adjustments. The vogue of "physical" science today springs from just such demonstrable relevance in an industrial, mechanical age in which adjustments to remote environments have become necessary through highly developed means of com-

munication. The same conditions have, of course, forced the "social" sciences in the same direction and will ultimately, I think, compel them to align themselves completely with the "physical." But it is impossible to show that the orientations of science have any greater (or as great) relevance to the practical adjustments of life in a convent or a monastery (and some of the present academic counterparts of these societies) than theology. Different ways of life demand different ways of thought. In abandoning here a traditional distinction between the "physical" and the "social," "mental," and "spiritual" we are not doing so under the delusion of having "discovered" "new," "absolute" truth. Neither do we deny, ignore, or abolish any phenomena whatsoever. Philosophies may themselves be considered sociologically as systems of verbal behavior, but their declared objectives and objects (entities allegedly represented by the words employed) need not be considered in a scientific framework unless the phenomena designated by the words used can be verified. We aim merely to discuss from a certain explicit point of view the *same* behavior phenomena with which all other sociological systems (including all the theologies and social philosophies) deal, and to organize them as far as possible according to the general pattern of science. The "truth," the merits, or the advantages of this point of view will have to be determined by the same practical usefulness which has given modern science in other fields its prestige and its following as against the thought-ways it has supplanted.

8. The Nonethical Nature of Science

It should be clear from the above that it is the primary function of all science to formulate the sequences that are observable in *any* phenomena in order to be able to predict their recurrence. I shall specify in a later chapter what I consider to be the particular field of sociology. In the meantime, it is desirable to point out, as another corollary of the position stated above, that questions of ethics or of what "ought to be" must not in science be confused with what observations indicate. Nor must sociological problems be confused with "social" problems in the sense of adjustments deemed desirable by anyone in any time, place, or circumstance. The prevention of crime is a social problem. The

relationship between criminality and population density or any other social condition is a sociological problem. Sociological and all other scientific questions have to do with the formulation of verifiable relationships. Social questions have to do with other and more general readjustments of social conditions with reference to any goals toward which man may aspire.

The fact that there is a relationship between these fields is no reason for confusing them. It is entirely permissible for society to maintain educational institutions and courses to transmit to the young a knowledge of past and current social events from the viewpoint of the dominant ethical and social system that prevails or which is idealized at any given time. Orientation courses, courses in reform, ethics, idealism, religion, current events, and social work are doubtless a useful and necessary part of the educational program of contemporary society. If it is found administratively convenient or otherwise advisable to give this instruction in departments of sociology and by "sociologists" that is again a practical question of educational administration. To confuse such subject matter with scientific problems, however, is mere confusion and cannot lead to the solution of scientific problems. If we give little attention to traditional "social" problems in the present work it is not because we are not personally interested in these problems as all members of human society are likely to be, but because we do not wish to confuse them with certain *other* problems with which we wish to concern ourselves.

As we shall see in later chapters, the approach to societal phenomena here proposed provides a place for all societal data whatsoever including those conventionally designated as ethical, idealistic, spiritual, or esthetic. It does not follow that we must adopt the conventional categories in terms of which these phenomena are treated in other systems. Only *the behavior designated by these conventional categories* are entitled to recognition. Much confusion results from overlooking the fact that no theory legitimately can be required to adopt the *categories* of another theory. Take, for example, the constant demand upon thoroughgoing social scientists as to how they propose within their frame of reference to deal with "spiritual" data—what about "values," "ideals," "ethics," the good, the true, and the beautiful? Frightened by the prestige of the source from which these inquiries frequently come,

the sociologist, himself often a bit worried over his own heterodoxy, makes ludicrous attempts to provide within a scientific framework place for *categories* which have no place in that framework any more than scientific categories have a place in a theological framework. It is not necessary for a priest to give an account of the cellular structure of the Holy Ghost. The only answer which a scientist needs to give to the question as to how "spiritual" data are to be handled within the scientific framework is to point out that all the *observable behavior* covered by this category is readily and fully provided for in the scientific framework. The *category itself* clearly does not have to be, and should not be, incorporated, any more than the categories of science can or need be incorporated into theology.

The root of this difficulty lies, of course, in the naive conceit of man which induces him to believe that any word which he may invent inevitably has a necessary counterpart in nature or in supernatural regions. A slight sophistication in the nature and functions of language would render obsolete the major controversies of the day in sociological theory, as hundreds of similar time-honored discussions of other philosophical subjects have been rendered obsolete by the advancement of science.

D. CONCLUSION

We have enumerated above the major postulates of science and their corollaries which have special significance for sociology. Many of these points will be further elaborated in the next two chapters.

Our principal concern in the present chapter has been to emphasize that the apparent difference between the data of the "physical" and the social sciences springs chiefly from a failure to recognize that the immediate data of *all* sciences are human responses to whatever arouses those responses. Much of scientific development depends, as we shall see, upon the type of symbols we develop to represent the phenomena to which we respond. We need only suggest in this connection what would be the state of any of our sciences if arabic numerals, the zero, and the calculus had never been invented. With these symbols and the rules governing their use, any fourth-grade child can solve problems—

relevant, important problems—which staggered the most brilliant intellect of ancient Greece. Clearly it makes a difference with what symbolic equipment we approach our scientific tasks. It would be strange indeed if this lesson from the other sciences should be entirely inapplicable to the study of sociological problems.

This point has been emphasized not so much to minimize the uniqueness and intricacy of societal phenomena as to suggest the type of approach to which these difficulties are most likely to yield. It is not necessary to argue that societal and "physical" data are the "same," or "similar." No phenomena in the universe are identical and to admit that societal phenomena are "different" from "physical" is a highly irrelevant concession in the present context unless we further specify *in what respect* we allege they are different. *All* phenomena are different in some respects. *All* of them are similar in one highly vital respect, namely, in that they are all known, if at all, through sense experience conceptualized and organized into the patterns determined by the nature of the human organism as conditioned by all its environments. This is the only similarity relevant to the present discussion because we are concerned at present only with the means by which valid knowledge of *any* phenomena is achieved. Are the means by which we know societary phenomena fundamentally different from the means by which we know physical phenomena? If they are not, then it is as irrelevant for our present purpose to enumerate "differences" between "physical" and societal phenomena as it would be to claim that the differences between ants, spiders, and grasshoppers preclude a science of biology. Indeed, all discussion of similarities and differences of phenomena without specifying explicitly or through the context with respect to what aspect of the phenomena we are concerned may be said to be quite meaningless. Such discussion is not uncommon in sociological treatises on differences between societal and "physical" phenomena.

Much has been said in this connection about the ability of "physical" scientists to bring their "subject-matters" (i.e., the referents of their symbolized responses) into the laboratory and otherwise manipulate them. This possibility varies considerably with different sciences. The solar system has never been brought

into any laboratory. Astronomical laboratories do contain very ingenious symbolic and mechanical representations of the astronomical aspects of that system and remarkable instruments for observing it. These every science must unquestionably develop. Beyond this, the question of laboratory conditions becomes one of convenience and technical and mechanical ingenuity. Already it is possible to observe illuminating sociological situations in the laboratory through sound and motion pictures not to mention the extensive sociological experiments involving laboratory observations of children and college students.

In short, most of us have been brought up in a world in which we are taught that the physical sciences deal with metals, fluids, gases, and such "matter" which we like to describe with such reassuring sounds as "tangible," "visible," "actual," "real." The phenomena of the social sciences, on the other hand, we have been taught to consider "intangible," and "invisible" entities described by words like customs, mores, competition, sovereignty, justice, etc., etc. Yet these words if they mean anything at all, certainly refer to *behavior—events* impinging on our senses. The aspects of the universe with which chemists and physicists deal, and which folk-language designates by such broad categories as metals, fluids, and gases refer just as certainly to *other* behavior events. Yet such is the tendency for us to project upon nature the structure of our language that we develop a superstitious reverence for the categories which, as we shall see in the next chapter, are merely constructs which man somewhere, sometime, found a convenient framework within which to assort his experiences.[27]

To those who still find that these traditional frameworks serve their purposes, the present volume has nothing to offer. There are doubtless also those who still find the pre-Copernican astronomy, pre-Newtonian physics, and pre-Darwinian biology quite adequate to their needs. But they will perhaps find themselves increasingly disturbed by the intrusions and by-products of the scientific quest as represented by our technological age. Frequently the findings of that quest will, as Veblen said, "go beyond the breaking-point of their jungle-fed spiritual sensibilities." At such times they will "furtively or by an overt breach of consistency . . . seek comfort in marvelous articles of savage-born lore."[28] Take, for example, the following honest confession of a

distinguished president of Columbia University in 1873. President Barnard had himself specialized in the natural sciences, served as president of the American Association for the Advancement of Science, and was noted for his liberal views. With reference to the doctrine of evolution he said:

"Much as I love truth in the abstract I love my sense of immortality still more; and if the final outcome of all the boasted discoveries of modern science is to disclose to men that they are more evanescent than the shadow of the swallow's wing upon the lake . . . if this, after all is the best that science can give me, give me then, I pray, no more science. I will live on in my simple ignorance, as my fathers did before me; and when I shall at length be sent to my final repose, let me . . . lie down to pleasant, even though they may be deceitful dreams." [29]

To those who find themselves in this unhappy predicament I can only say with Bentley: [30]

"I can deeply sympathize with anyone who objects to being tossed into such a floating cosmology. Much as I have stressed its substantiality, I can hardly expect everyone to feel it. The firm land of 'matter' or even of 'sense' or 'self' is pleasanter, if only it stands firm. To anyone whose tasks can be performed on such ground, I have not the slightest thought of bringing disturbance. But for many of us tasks are pressing, in the course of which our firmest spots of conventional departure themselves dissolve in function. When they have so dissolved, and when we are so involved, there is no hope of finding refuge in some chance island of 'fact' which may appear. The continents go, and the islands. The pang may be like that felt by a confirmed landsman at his first venture on the ocean, but the ocean in time becomes familiar and secure. Or, if I may change the figure, the fledgling will vastly prefer his firm nest to falling with untried wings. But the parent sciences are pushing; the nest, even, is disintegrating; and there is air for flight, even though it is not so vividly felt and seen as the sticks and straws of the nest."

E. NOTES

1. The meaning of "equilibrium" in science will be discussed at greater length in Chapters VI and XII. It is still conventional in sociology to refer to adjustment in terms of an organism's "striving" or "need" for "certain ends." For many

purposes this anthropomorphic terminology is useful. But for the sake of consistency with the terminology of other sciences, we propose to deal with the phenomena in question in a framework in which the terms "needs" and "ends" are unnecessary. It is possible to interpret the event of a stone rolling down a hill into a brook as a striving or a need of the stone for the brook, and in many other terms and frameworks of which ethnology furnishes various examples. But in the scientific frame of reference we have adopted and defined operationally such terms as "mass," "gravity," and "field of force," as more suitable for our purpose. That purpose in science is to explain as much as possible by as few terms or symbols as possible—the principle of parsimony. We adopt here the viewpoint of modern psychology that the behavior of nervous tissue and of organisms is explicable in the same basic terms as the behavior of other matter. In this orientation, "needs" become merely biophysical or biochemical imbalances in an organism or between it and its environment. Cf. John Dewey, *Logic. The Theory of Inquiry*, Holt, 1939, p. 27: "The state of disturbed equilibration constitutes *need*." That organisms behave with reference to the anticipated results of the behavior is, of course, admitted, as is all other observed behavior. In our frame of reference such "ends" whenever they figure in a behavior situation exist in the form of symbols of some kind and organisms respond to these symbols just as they respond to other stimuli. These symbols and whatever they stand for are from our point of view merely part of the data of the situation, and have the same power of influencing conduct as any other phenomena that precipitate responses. The present treatment assumes an elementary knowledge of modern psychology and physiology.

The above position should dispel the curious notion that behavioristic or positivistic theory denies or ignores the problems of ends, values, etc., in behavior. For example R. K. Merton ("Durkheim's Division of Labor in Society," *Amer. Journ. of Sociology*, XL, Nov., 1934, p. 321) says: "For, if, as positivism would have us believe, logic and science can deal only with empirical facts, with sensa, then a science of social phenomena, on that score alone becomes impossible, since this attitude relegates to the limbo all ends [*sic*] i.e., subjective anticipations of *future* occurrences without a consideration of which human behavior becomes inexplicable." The symbols by and through which man anticipates the future or in terms of which he reacts to any "ends" are as tangible and objective phenomena as any other that precipitate behavior. If any positivist or behaviorist actually held such views as those attributed to them above, there would, of course, be ample ground for agitation on the part of the critics. But even J. B. Watson, whose more popular works are usually relied upon to furnish unguarded statements susceptible of such interpretation, was quite explicit and emphatic on the above point. "Let me make this fundamental point at once: that *saying* is doing—that is *behaving*. Speaking overtly or to ourselves (thinking) is just as objective a type of behavior as baseball." (*Behaviorism*, Norton, 1924, p. 6.) See also my paper "Is Sociology Too Scientific," *Sociologus*, IX, Sept., 1933, pp. 311–312. Also C. L. Hull "Goal Attraction and Directing Ideas Conceived as Habit Phenomena," *Psychological Review*, XXXVIII, p. 505. Also note 19 below.

2. It may be well to indicate briefly at this point my general position regarding the allegedly "mental" character of societal phenomena. For illustrative purposes I refer to some statements in the otherwise unobjectionable discussion by L. von Wiese and H. Becker, *Systematic Sociology*, Wiley, 1932, Ch. II, p. 33. E.g., "To be sure, our senses can perceive only *concrete objects*, in the form of discrete human bodies, and between them only the atmosphere, other organisms, and inorganic matter. *Plurality patterns themselves cannot be thus perceived* and can be made corporeally apparent only by symbols. Nevertheless, many of them are recognizable in our *internal world* of presentations, concepts and images. They live in the minds of tangible human beings, men, in the neuro-psychic patterns of human beings." [Italics mine.] (See also the section heading of the same page which reads: "Plurality patterns are not perceivable, but nevertheless are real." (!)) If we investigate wherein resides the "concreteness" of the "objects" which our senses perceive, we would probably be forced to agree with Bentley (*Behavior Knowledge Fact*, Principia Press, pp. 209–210), who in a brilliant chapter on "The Visibility of the Social," remarks: "Not that the words 'concrete' and 'abstract' have significance in modern scientific application; they are nebulous wraiths surviving from primitive man's attempts at description, serving today merely for the crudest contrasts and reports." When our senses perceive "concrete objects" we respond to behavior of some sort (i.e., light rays from an object strike the optic nerve). If this reaction ever becomes knowledge to us at all, i.e., if we symbolize it, we do so because the response (usually symbolized) fits into a system of past responses (also usually symbolized) as a frame of reference which gives the response meaning. If we say that certain social structures exist it is likewise because our senses react to some behavior. We symbolize this response into "presentations," "images," and "concepts." Then *these* (in common with our images of "concrete" objects) "live" in our "minds" and the minds of those to whom we may be able to communicate. In short, Wiese and Becker overlook in the above case the "concrete objects" (behavior) from which they derive their symbolic "image" of social structures, and in the other case overlook the *symbolic process* by which they derive the "images" of the "concrete objects"—in both cases because traditional philosophy and logic (symbolic systems) have thoroughly habituated us to (in fact require) such dichotomies between the "social" (human) and the "physical." The dichotomy is in the nature of a primary postulate taken over perhaps from theology. There is no support whatever for the postulate in modern science. Wiese and Becker come very near to my position later in the same section when they say: "Strictly speaking, a social structure never consists of human beings but of images, presentations and concepts which may be traced back to relationships. . . . *Relationship-structures exist only in and through human ideas.*" [Italics mine.] If they would say the same for *all* knowledge we would be agreed. I would say that our knowledge of "social" *and* "physical" structure-relationships consists of images, etc., which may be traced back to *that which* evoked them.

I am in full accord with the following estimate of Wiese's position by Bentley ("Sociology and Mathematics," *Sociological Review*, XXIII, 1931): "Turning to recent German sociology, the development of L. von Wiese is the one most fully

in accord with what is here attempted. Taking his initiative from Simmel's presentation of forms of socialization as do all of the more important recent German sociologists, Wiese stresses as fundamental the immediate and direct observation of a realm of social fact. This is his 'sozial Optik' vital to his entire work. Differing from the present approach, however, he coordinates the social realm with the physical and psychical realms: accepting these latter as he finds them in their respective lines of scientific investigation: and demanding only for the social its full right to its own independent investigation, on a par with the others. In this social realm he finds possibilities of measuring and counting: and these are not mere borrowings from other sciences, but are peculiarly social techniques." (P. 160.) Because of this he asserts the existence of a peculiarly social space, "without, however, proceeding to a fully functional analysis of it in system with physical space presentations." The physical space therefore appears as an outlying or indirect "cause" of happenings in social space, and not as an intimately involved region of the full sociological investigation. (P. 161.)

Significant in this connection is Wiese's attempt to derive "sociologically usable materials through intensive analysis of words denoting relations, etc." He reports (Wiese-Becker, *Systematic Sociology*, p. 129) that a seminar at the University of Cologne devoted itself to lexicographic research over a period of years with the object of listing all words with "definite sociological meaning." "It soon became evident," he says, "that the plan covered too much territory, for in spite of relatively minute divisions of labor a full year was consumed in working through the letter A." While lists of such words may be of historical interest and while they may be suggestive of behavior phenomena to be looked for, the words thus found are unfortunately too frequently accorded quite other significance. It is assumed that since the word exists, it must have a counterpart in nature, and any system which leaves out the *word* is therefore defective. To include all words *as data* in sociology is obviously entirely different from including all the vague allusions of folklore-words in the vocabulary of scientific sociology. It is the latter tendency which is here under criticism.

In this connection I am also in agreement with the following criticism of a position which has been put forward by K. Lewin (*Principles of Topological Psychology*, McGraw-Hill, 1936) and J. F. Brown (*Psychology and the Social Order*, McGraw-Hill, 1936): "Although efforts have recently been made to distinguish two types of empirical statement, 'the language of data' and the 'language of constructs,' it appears evident to the psychologist that the dichotomy is artificial. A statement about a datum is a statement about a construct. The simple statement, 'I see red,' is a complex response conditional upon previous training and present circumstances of an organism and differs only in complexity from a statement such as, 'The oscillograph shows that the discharge takes place at a potential of 80 volts.' The notion of a language of Data is reminiscent of the concept of an absolute 'given' and since it can be shown that the immediately given experience is defined operationally as consisting of relatively elementary differential responses, we had best dispense with the distinction between data and constructs." (Pp. 99–100, S. S. Stevens "Psychology: The Propaedeutic Science," *Philosophy of Science*, IV, Jan., 1936, pp. 90–103.) See also note 6 below.

3. Cf. P. W. Bridgman, *The Logic of Modern Physics*, Macmillan, 1932, p. 37. Failure to recognize this point has been the basis of much futile controversy such for example as the contention that statistics may *describe* but can never *explain* a situation. This position usually assumes that true "explanation" must always be in terms of lower levels, e.g., psychology in terms of physiology, physiology in terms of chemistry, etc., J. F. Brown (*op. cit.*), and K. Lewin (*A Dynamic Theory of Personality*, McGraw-Hill, 1935), also seem to repudiate on other but equally fallacious grounds, the value of classification as a predictive devise. If it has been established statistically that children lose their teeth at a certain age, then the classification of a child as of that age explains, in the sense defined above, the loss of his teeth and enables us to predict the event. Curiosity about the biological sequences leading up to that event is *also* desirable and the satisfaction of such curiosity (i.e., reducing the phenomenon to elements with which we are so familiar that we accept them as a matter of course) is a type of explanation on another level. Such explanation consists of classifying this particular phenomenon under some general and already established generalization of biology. That generalization is in the last analysis based on precisely the same kind of repeated observation as is the generalization that children of certain age group lose their teeth. Such reduction is, of course, desirable in the pursuit of relatively comprehensive and unified knowledge and the suggestion by Brown and Lewin that we need *further* explanation of social phenomena in terms of the field structure within which they operate is quite true. It is an overstatement, however, to claim that classification is without explanatory or predictive value.

4. I use the word "physical" in quotation marks in order to emphasize that I do not recognize this word as denoting, for scientific purposes, any unique character of the phenomena to which this word is usually used to refer as contrasted with the phenomena designated "social," "cultural," etc. Since all phenomena are "physical" from my point of view, I retain the word only to designate a conventional distinction which must be defined, if at all, only in terms of the degree of universality and uniformity of responses of human beings to some phenomena as contrasted with others.

5. "Through the frosted windows of our senses we may say, if we please, that we receive impressions of what we call the 'external universe' or 'reality.' But it is not necessary to say anything so mystical—at least for the present. It is sufficient to recall that certain scientific philosophers are content to start from the sense impressions themselves as 'reality' without seeking for anything less familiar and more disputable. Einstein for one, in his paper of 1936, appears to be satisfied to identify reality provisionally with the sense impressions which others refer to a yet more recondite reality." (E. T. Bell, *The Handmaiden of the Sciences*, Williams & Wilkins, 1937, pp. 17, 18. See also note 13 below.)

6. This statement should not be understood to mean that I consider sensory experience as an absolute datum or starting point in the sense that Hume and Hobbes (to mention no others before and since) seem to have held. I take rather the position of E. C. Singer (*Mind as Behavior*, R. G. Adams and Co., Columbus, 1924) which regards the immediate datum as an *ideal terminus* of abstraction. What we have to work with as immediate data are our *knowledge* of sensory ex-

perience, i.e., inferences (symbolic representations), from sensation. "The purely objective world and the purely subjective datum of consciousness are two ideals toward which we can endlessly strive, modifying our notions of each as we change our understanding of the other. . . . It is only in this process of reconstruction that the concepts of 'consciousness' and 'object of consciousness' fall out—*they fall out together*, and together they grow apace. To follow the adventures of this pair is, I suspect, to be led deep into the heart of things." (P. 30.) For elaboration of the point see Singer, *op. cit.*, Ch. 9 on "Sensation and the Datum of Science." See also William James, *Principles of Psychology*, I, p. 508. See also John Dewey, *op. cit.*, p. 38: "In a proper conception of experience, inference, reasoning and conceptual structures are as experiential as is observation, and . . . the fixed separation between the former and the latter has no warrant beyond an episode in the history of culture." Also W. V. Metcalf, "The Reality of the Atom," *Philosophy of Science*, VI, July, 1939, pp. 368, 370: "And just what is this fundamental philosophical distinction between 'percept' and 'concept'?—the 'percept' of the 'real' table and of the 'real' meteor, and the 'concept' of the atom? . . . Are they not both mental constructs of what we have come to believe exists in the external world? . . . The view that seems to me worth emphasizing is that *all* our beliefs in external reality are the result of inference from our subjective sense-data."

7. Under this definition, objectivity is always a matter of degree and is always relative to the sensory equipment and general response capacities of responding organisms. The phenomena corroborated by everyone are thus considered the most objective. Corroboration by all or most "qualified observers" is frequently substituted for mere preponderance of general opinion in cases where the prestige of the "qualified" is such that we accept their responses as more valid than our own. This viewpoint is further elaborated later in this chapter. (See points 3 and 4.) Cf. Aristotle: "Whatever appears true to everybody must be accepted as such; and he who denies the validity of universal opinion can hardly produce any more valid criterion of his own." (*Aristotle, from Natural Science, Psychology, and The Nicomachean Ethics*, Translated by P. H. Wheelwright, Doubleday, 1935, p. 212.)

8. James Harvey Robinson in *The Story of Human Error*, Appleton-Century, 1936, p. 276, edited by Joseph Jastrow. The quotation is attributed to Professor Woodworth.

9. E.g., Morris Cohen's categorical statement "Psychic forces are not physical forces." *Reason and Nature*, Harcourt, 1931, p. 360.

10. R. M. MacIver, *op. cit.*, pp. 476–477. [Italics mine.]

11. See A. Einstein and L. Infeld, *The Evolution of Physics*, Simon and Schuster, 1938, p. 33.

12. *Ibid.* It is interesting to note that this, on the whole, excellent statement runs afoul of itself on account of the speech habits which even these authors are unable to avoid when they attempt popular exposition. Note the contradiction in the sentence in italics in the text. My criticism in the text is directed at precisely this linguistic habit of talking about "*real* mechanisms" of which we "cannot *even imagine* the possibility or meaning" as compared to our conception of them!

13. *Ibid.*, pp. 158, 159. Cf. also the following passages from these authors:

"The [electromagnetic] field *did not exist* for the physicist of the early years of the nineteenth century." (P. 157.)

"There would be no place in our new physics, for both field and matter, *field being the only reality*," . . . But we have not yet succeeded in formulating a pure field physics. For the present we must still assume the existence of both: field and matter." (Pp. 258, 260.) [Italics mine.]

"The reality created by modern physics is, indeed, far removed from the reality of the early days. But the aim of every physical theory still remains the same. . . . Quantum physics formulates laws governing crowds and not individuals. Not properties but probabilities are described, not laws disclosing the future of systems are formulated, but laws governing the changes in time of the probabilities and relating to great congregations of individuals." (Pp. 312–313.)

"But what I am trying to do is to push the analysis so far back that we are asking ourselves what it means to say that a world really 'exists' independently of ourselves and our sensations. I am trying to point out that any meaning I find in making such a statement is found in things *which I do* and experience, of which I am aware." (P. W. Bridgman, *The Intelligent Individual and Society*, Macmillan, 1938, pp. 152–153.) [Italics mine.]

The following statement by A. P. Weiss has, I think, never been improved upon:

"Metaphysics, for the behaviorist, is merely a name for special types of linguistic habits that have been acquired by reading other books on metaphysics, rhetoric, grammar, etc. A metaphysical analysis is essentially an analysis of a verbal statement of some sort into other verbal statements that are historically related. . . . One of the problems of science is that of determining the antecedent conditions which precede the appearance of some experimental or technical result. Next the antecedents of the antecedents are isolated, and so the investigations are continued backward until a stage is reached beyond which experimental analysis or observation has not gone. The usefulness of any guess as to the nature of unobserved antecedents depends upon how well the guess is verified when the experimental technique will have been refined to the point at which a testing of the validity of the guess or prediction is possible. Thus, until recently by following this method, the chemist regarded the atom, of which he postulated about ninety different kinds, as the ultimate unit or element in the structure of matter. As experimentation became more refined, the guess of ninety different kinds of elements was not verified. A new guess was proposed by the physicists, —the electron-proton hypothesis, in which the number of units was reduced to two. For the physicist, then, the electron-proton hypothesis is a guess as to what would be observed visually with a microscope of sufficient magnifying power. On the whole it is to be expected that the physicist who *uses* the microscope, *performs* the laboratory analysis and then *reports* the results, should be better qualified to guess the nature of the antecedents of what he observes than the professional metaphysician who has available only the verbal report of the physicist.

"The metaphysical problem as it presents itself for analysis, can only be a study of the biosocial antecedents of the language responses (metaphysical discussions) recorded in the literature as the verbo-motor responses of individuals who, for the time being, are classified as metaphysicians. The *scientific* solution is thus narrowed down to an investigation of the metaphysician's heredity and training. All metaphysical discussions, no matter how profound and involved they may be, are in the *last* analysis nothing but language responses and linguistic habits derived from other language responses. In science, observation and the analysis of experiential conditions play a much larger part. When the metaphysical problem is stated in the form of the question, What are the essentials of reality? the term *reality* for the behaviorist is merely a word stimulus which individuals of a given social status use to designate the fact that the responses occurring at any one moment might be more complex and varied than they actually are if the bodily response mechanism were more complex than it really is.

"Thus I may affirm that the clock in my room has an existence or reality aside from my reactions to it because of the following behavior conditions. Suppose one of my responses is that of counting the ticks. The number of ticks that can be counted seems to be unlimited, but the manner of counting may be continuous or intermittent. The alternative responses of counting or not counting are not determined by the nature of the clock. That is, if I had installed an automatic counter for the ticks, the visual readings of this counter would be correlative with *continuous* auditory counting, but not with *intermittent* auditory counting. In terms of behavior this only means that some responses (oral counting) and other responses (visual counting) are sometimes correlated, sometimes not, and that the cause of this correlation is some condition (clock) that is independent of my own body.

"Reality is merely the term that designates this type of relationship between responses. It is the basis of the fiction of an external world of stimuli. This particular fiction, as a form of behavior, has persisted. Another fiction, characterized as solipsism, has never been generally adopted. According to this fiction my own responses are the only responses that ever occur. Certainly I have never found myself doing anything else. When I am not reacting (as in dreamless sleep) there is only oblivion. For the behaviorist, then, the problem of the nature of reality is a biosocial problem of tracing out the type of behavior which corresponds to the assumption that there is an external reality of which man is only a part and that this assumption has survived longer (produced better co-operation between individuals) than any other." (A. P. Weiss, *A Theoretical Basis of Human Behavior*, R. G. Adams, 1929, pp. 44–47.)

14. See, for example, Ch. II, note 41.

15. Ellsworth Faris, "The Primary Group: Essence and Accident." *Amer. Journ. of Soc.*, XXXVIII, July, 1932, p. 44.

16. *Ibid.*, p. 45.

17. *Ibid.*

18. See J. B. Watson, *op. cit.* (See note 1 above.)

19. The relatively undeveloped state of the methods of study of symbolic behavior has, of course, given rise to the usual conclusion that these phenomena

are, as T. Parsons has said, "outside the range of scientific observation and analysis." (*The Structure of Social Action*, McGraw-Hill, 1937, p. 421.) In this work, the author says: "It will be maintained and the attempt made in considerable detail to prove that *in this sense* [as a general framework for understanding human behavior] *all of the versions of positivistic social thought constitute untenable positions*, for both empirical and methodological reasons." [P. 125. Italics in the original.] In so far as a single statement may be selected as illustrative of the type of consideration which the author has in mind, the following is suggestive with respect to the matter here under discussion: "If a stone is at the same time a religious symbol, there is a double symbolic reference when the word 'stone,' or a particular of that class, is spoken or thought: first, a reference of the word to the object; second, that of the object, in turn, to that which it symbolizes. In the case of an imaginary entity, the situation is *in essentials* the same, except that the immediate reference of the original linguistic symbol is not mediated through sense data *in the same way*. Zeus is not experienced *in the same sense* as a stone." [P. 423. Italics mine.] I assume that the author means by imaginary entities precisely the type of "imaginings" and "echoes" I have discussed in the main text and, if so, that discussion also applies to this illustration. To me, the significant admission is that the imaginary situation is "*in essentials* the same," for I consider the essential similarity in this context to be the observability and the possibility of objectively designating the phenomenon. If so, it is, as I have noted in the main text, entirely unnecessary that there should be any other "sameness" in the situations. In short, echoes and shadows may be "mediated" in a vast variety of ways, but we do not therefore contend that they are not experienced "in the same sense."

20. M. A. Copeland, "Desire, Choice and Purpose from a Natural-Evolutionary Viewpoint," *Psychological Review*, XXXIII, p. 145, 1926.

21. See R. K. Merton, *op. cit.*, p. 321. See note 1 above.

22. See J. F. Markey, *The Symbolic Process and Its Integration in Children*, Harcourt, 1928, pp. 141, 142, 146, 147. Also John Dewey *Experience and Nature*, Norton, 1925, pp. 322 ff. G. H. Mead, "The Genesis of Self and Social Control," *International Journal of Ethics*, XXXV, 1924–25, pp. 251–277.

23. See W. Köhler, *Gestalt Psychology*, Liveright, 1929. Also K. Kofka, *Principles of Gestalt Psychology*, Harcourt, 1935.

I am unable to see that there is anything in the approach of these and other authors of the so-called "Gestalt school" which justifies its designation as a unique "school." Their experimental work is frequently excellent, but I find no difficulty in interpreting their findings in the behavioristic terms of A. P. Weiss or other competent behavioristic writers. Much of the "Gestalt" attack seems to me to be directed at a bogey usually called the "atomistic-mechanistic" approach, the alleged sponsors of which are usually not cited, and I have been unable to find anyone who supports the position referred to. In so far as the Gestalt position can be identified with the field theory as advanced by J. F. Brown (*Psychology and the Social Order*), I find myself largely in agreement with it. But the whole-part relationship to which Gestalt psychology is supposed to have made special contributions does not seem to me to have been at all clarified

by the turgid treatment of Gestalt writers. Fine literary phrases such as "the whole is more than the sum of its parts," derive their impressiveness chiefly from their obscurity. The problem when objectively examined is quite simple. Consider the much quoted illustration of hydrogen and oxygen considered separately and in the compound H_2O. Is the latter "more than the sum of" the former? The question has no sensible operational meaning. All that needs to be pointed out is that hydrogen and oxygen act upon *different sense organs* (or act differently upon the same sense organs) when combined into H_2O than when uncombined. That they should give us a *different* sensation in combination than in separation is, therefore, no mystery requiring weird philosophical conjuring about the whole-part relationship. One is neither more nor less than the other. They produce different sensations, each of which is equally "real," "whole," and otherwise a legitimate phenomenon for study. This is perhaps generally recognized with respect to such phenomena as are used in the above illustration. But when the same problem rises as between "man" and "society" it sometimes gives rise to protracted futile discussion.

24. J. A. Thomson and P. Geddes, *Life: Outlines of General Biology*, Harper, 1932, II, p. 1413.

25. See L. L. Bernard "The Evolution of Social Consciousness and of the Social Sciences," *Psy. Rev.*, XXXIX, March, 1932, pp. 147–164, for a discussion of the reasons for the earlier development of some sciences.

26. E. T. Bell, *op. cit.*, pp. 104, 105.

27. It is unfortunately not possible here to give an adequate account of the full extent to which linguistic and semantic difficulties at present handicap the social sciences. The reader is urged to supplement the present chapter by readings from the following sources. The first two sources are popular and elementary treatises. Stuart Chase, *The Tyranny of Words*, Harcourt, 1938. Thurman W. Arnold, *The Folklore of Capitalism*, Yale University Press, 1937. P. W. Bridgman, *The Logic of Modern Physics*, Macmillan, 1932. C. K. Ogden and A. I. Richards, *The Meaning of Meaning*, Rev. Ed., Harcourt, 1936. Alfred Korzybski, *Science and Sanity*, Science Press, 1933. J. F. Markey, *The Symbolic Process and Its Integration in Children*, Harcourt, 1928. By far the best brief source is C. W. Morris, "Foundations of the Theory of Signs," *International Encyclopedia of Unified Science*, I, Univ. of Chicago Press, 1938. Consider, for example, the following extracts:

"No contradiction arises in saying that every sign has a designatum but not every sign refers to an actual existent. Where what is referred to actually exists as referred to, the object of reference is a *denotatum*. It thus becomes clear that, while every sign has a designatum, not every sign has a denotatum. A designatum is not a thing, but a kind of object or class of objects—and a class may have many members, or one member, or no members. The denotata are the members of the class. This distinction makes explicable the fact that one may reach in the icebox for an apple that is not there and make preparations for living on an island that may never have existed or has long since disappeared beneath the sea." (P. 5.)

By "actual existent" Morris here apparently means those stimuli-phenomena

which evoke universal or at least very general confirmatory responses in all or large numbers of men. The explanation of the behavior of reaching for the apple which "is there" and the apple which "is not there" lies in the description of the sequence or combination of events leading up to the reaching. This set of events will be different in the two cases, but subject to description within the same framework. Morris continues:

"The interpreter of a sign is an organism; the interpretant is the habit of the organism to respond, because of the sign vehicle, to absent objects which are relevant to a present problematic situation as if they were present. In virtue of semiosis an organism takes account of relevant properties of absent objects, or unobserved properties of objects which are present, and in this lies the general instrumental significance of ideas. Given the sign vehicle as an object of response, the organism expects a situation of such and such a kind and, on the basis of this expectation, can partially prepare itself in advance for what may develop. The response to things through the intermediacy of signs is thus biologically a continuation of the same process in which the distance senses have taken precedence over the contact senses in the control of conduct in higher animal forms; such animals through sight, hearing, and smell are already responding to distant parts of the environment through certain properties of objects functioning as signs of other properties. This process of taking account of a constantly more remote environment is simply continued in the complex processes of semiosis made possible by language, the object taken account of no longer needing to be perceptually present. (Pp. 31–32.)

. . . "If, following the lead of the pragmatist, mental phenomena be equated with sign responses, consciousness with reference by signs, and rational (or "free") behavior with the control of conduct in terms of foreseen consequences made available by signs, then psychology and the social sciences may recognize what is distinctive in their tasks and at the same time see their place within a unified science. Indeed, it does not seem fantastic to believe that the concept of sign may prove as fundamental to the sciences of man as the concept of cell for the biological sciences." (P. 42.)

28. T. Veblen, *The Place of Science in Modern Civilization*, Viking, 1932, pp. 26, 27.

29. Quoted by Sidney Ratner, "Evolution and the Rise of the Scientific Spirit in America," *Phil. of Sci.*, III, Jan., 1936, p. 115. For a good summary of the present scientific status of "materialism" see William Seifriz, "A Materialistic Interpretation of Life," *Phil. of Sci.*, VI, July, 1939, pp. 266–284.

30. A. F. Bentley, *Behavior Knowledge Fact*, Principia Press, 1935, p. 183.

Chapter II

SYMBOLIC BEHAVIOR AND THE PROBLEM OF QUANTIFICATION

A. THE ROLE OF SYMBOLS AND SYMBOLIC SYSTEMS IN SOCIETY AND IN SCIENCE

Nothing is so likely to give offense as an inquiry into the meaning of the eloquent phrases in which social scientists today for the most part attempt to communicate. The linguistic noises to which we have become emotionally conditioned seem a peculiarly personal and private possession upon which we rely to a great extent for the projection of our personalities. To submit a person's language to ruthless analysis is quite generally regarded as a personal attack through the medium of sympathetic magic or otherwise. "Hair splitting," "garbling," "distortion" are favorite epithets for those who meddle with other people's language. Still more general is the feeling that "fine" points in linguistic tools do not matter, and are merely a way by which "smart alecks" call attention to themselves. This may be the case, of course. Nevertheless, we shall here take the view that a careful scrutiny of the fitness of our linguistic tools is perhaps of greater importance than a loquacious use of them.

The vocabulary, grammar, and literary style of the more fluent and eloquent talkers and writers represent in a very real sense a vested interest. Words are, furthermore, frequently the smoke screen which protect more tangible interests. This is not to imply that the defenders of such vested interests recognize them as such any more than do the defenders of vested interests in other fields. We all tend to have a deep feeling of the essential fitness of the words to which we have become accustomed. There are unquestionably thousands who feel that "pigs are rightly so-called because they are such dirty animals." They are at one with the traveler who, after recounting the strange words which are used in various lands to describe H_2O, concluded: "Now in English, as you know, we call it water, which is, of course, *what it really is.*"

We are not here primarily concerned with the vast amount of misunderstanding among people in daily conversation on account of the inadequacy of their language as a means of communication. Neither shall we elaborate upon the ambiguities, obscurities, and nonsense which professors, preachers, statesmen, politicians, and journalists frequently regurgitate to their publics.[1] We are concerned here mainly with the same problem as it affects the social sciences. As an illustration of the type of impasse into which an inadequate symbolic system is likely to force us, we may refer to Zeno's well-known paradox of Achilles and the tortoise. If Achilles allowed the tortoise a head start in a race, it was suggested, the former could never overtake the latter. Whatever common sense and an actual trial might show, the language and the logic in terms of which the paradox was set up left no escape from the strange conclusion. The tortoise is allowed 100 yards start. Although Achilles runs ten times as fast as the tortoise, the latter will obviously have gone an additional ten yards by the time Achilles has run the first hundred yards. When Achilles has run this additional ten yards, the tortoise will still be one yard ahead. By this process of verbalization about the race it is obvious that while Achilles is constantly getting nearer to the tortoise he can never quite overtake it.

If instead of the above method of symbolizing this event we resort to a simple algebraic or geometric statement [2] of a type unknown to the Greeks, we come to very different conclusions. We find by the latter methods (under given assumptions) that Achilles definitely overtakes the tortoise at the end of 111.11 seconds. What is more important, this result also corresponds to what happens in an actual experiment. This verifiable result of the latter method suggests that perhaps it is preferable as a symbolic device for such mundane matters as, for example, planning the dispatch of trains. The former method may be more advantageous in "creating" thrilling situations in imaginative literature, just as the trips of rocket-ships to the moon in current cartoons and movies have unquestioned recreational value. They may be regarded as quite harmless unless someone actually attempts to take off, with present equipment, on such a journey. We are interested here in symbolic systems which will be reliable charts to adjustments beyond the universe of the symbols themselves.

When applied to simple and familiar events of everyday observation, paradoxes such as that recounted above do little harm. This is because, fortunately, people promptly set aside in an actual adjustment situation the reasoning and the conclusions of some piously accepted verbal systems. They act instead in a way which experience has shown to produce the desired results. Perhaps nobody, if pursued by a mad dog, would allow the logic of Zeno's paradox to govern his behavior. In an expanding secondary group society, however, men are expected to react with equal intelligence to situations of which they can have no first hand experience and regarding which, therefore, they must adjust on the basis of symbols alone. In such situations it is clearly of vast importance that our symbols and rules of logic should correspond closely to the actual events.

We shall mention later in this chapter examples of how verbal dichotomies and other conventions block scientific inquiry in the contemporary world. But the importance of a correspondence between actual events and our symbolic system is not confined to the field of science. Personal, community, and international relations constantly reflect the tensions resulting from an inadequate symbolic system of communication. Whole nations frequently fall upon each other with great ferocity because of word-systems or ideologies through which they attribute to each other characteristics, "motives," and behaviors entirely fantastic and demonstrably devoid of foundation in fact. Untold nervous energy, time, and natural resources are wasted in warfare upon or protection against entirely imaginary monsters conjured up by words. Widespread mental disorders result from constantly finding the world different from the word-maps upon which we rely for guidance to adjustments. Social problems cannot be solved as long as they are stated in terms as primitive and unrealistic as those which attributed diseases to demons and witches.

The survival in sociology of an approach which has long since been discarded in other sciences is due largely to the type of symbolic equipment today prevalent among social scientists. They are correspondingly inadequately equipped with the type of vocabulary and rules of symbolic manipulation which would permit analysis of the current social situation in other terms than the

personalities of Dictators, Capitalism, Fascism, Democracy, Communism, Labor, and other such categories. As long as "statesmen" and leaders, not to mention scholars, waste their time tilting at these windmill-symbols, we can expect no better results than blood-letting yielded as a cure for disease. This approach yields nothing toward the understanding of that moving equilibrium of forces which constitute the maximum possible adjustment in either the biosphere or of other aspects of the cosmos.

We have emphasized in the first chapter that the immediate data of all science are symbols which represent the relationships and behavior of that aspect of the universe which we have undertaken to study. These symbols correspond to neuro-muscular sets or covert neural behavior of some kind in the human organism. The sets have been formed as a result of responses to situations. The symbols subsequently serve as substitute stimuli for these situations. When these sets, namely our verbal mechanisms and symbols, correspond closely to the conditions to which we must adjust, they greatly facilitate our adjustments. For example, a map is a highly valuable symbolic representation provided its pattern, order, and sequences correspond to the actual terrain [3] over which we must travel. It is a corresponding handicap, if it fails to indicate where the rivers and the mountains are, if it confuses the order in which they occur, or otherwise fails to correspond to the conditions to which we must adjust. Sometimes a local map which may be adequate for most kinds of travel within its own borders turns out to be very misleading for traveling beyond its borders. In the same way the verbal systems and orientations of a primitive primary group society may turn out to be, as we shall see in a later chapter (Chapter VIII), grossly inadequate in a national or world society of secondary group relationships.

In addition to symbols representing situations, rules for the manipulation of these symbols, namely logic, are obviously necessary. The dominating system of both symbols and logic according to which Western man has attempted to orient himself in the social world is the Aristotelian laws of thought laid down some 2300 years ago.[4] Physical science has gradually abandoned these rules of mental procedure but the social sciences still hold to them.

One of the reasons for their popularity is the clean-cut dichotomies which they set up.[5] Propositions are either true or false, things are either right or wrong, and so forth in all matters. This principle resulted in dichotomizing nicely the facts of experience into mutually exclusive compartments, which have for centuries handicapped thinking by setting up categories assumed to be inherent in the universe and holding to them regardless of how badly they served the solution of the problems at hand.[6] The absence of a mathematical technic, such as the calculus, for dealing with gradations, modes, and rates of change was undoubtedly largely responsible for the static and rigid symbolic system which the Greeks devised, and which it has been necessary to abandon in the physical sciences.

Illustrations of the prominent but mischievous role which these dichotomies have played in the history of human thought are too well-known to require more than mention. For example: (1) The induction-deduction controversy is, in the light of modern psychology, simply obsolete. (2) The heredity-environment controversy is another case in point.[7] (3) Further illustrations are found in many of the arguments regarding structure *versus* function, organization *versus* process, form *versus* activity, etc. What is overlooked is that a structure is merely a persistent function while a function is merely a series of changing structures.[8] (4) The arguments about case studies *versus* statistical method, likewise disappear upon the reflection that all statistics necessarily consist of cases and that therefore there can be no antithesis or mutual exclusiveness between the two methods. The scientific import of the most thorough genetic or case or configuration analysis, on the other hand, lies in the demonstrability of its generality. The attempt to contrast quantitative technics with theory is likewise fallacious, because quantitative approaches may be as theoretical as any others.

The best general illustration of the phenomenon here under consideration, namely, the necessity of developing new symbolic technics to deal with expanding experience and new situations, is, of course, furnished by the history of the successive intellectual revolutions that mark the epochs of science. The milestones marked by Galileo, Newton, Lobatchewsky, and Einstein are common knowledge. More recently the idea has taken hold that,

whereas logic is usually assumed to be the science concerned with the phenomenon of thought in general, actually this is the province of psychology.[9] Logic from this point of view becomes merely the rules by which we deal with the data of logic, namely, words. This in turn means that the postulates and rules constituting a system of logic may be indefinitely varied so as to be compatible with our observations. In short, any system of logic is justifiable or true if it provides a set of postulates which are internally consistent, that is, from which propositions can be deduced without contradiction. It is precisely this practice which has marked the great epochs of science. The Euclidian geometry set it down as an axiom that *only one* straight line can be drawn through a given point parallel to a given straight line. Lobatchewsky chose to postulate that *more than one* such line can be drawn,[10] and on this axiom proceeded to evolve what has come down to us as non-Euclidian geometry. Riemann in turn chose to postulate that *no* parallel line at all can be drawn parallel to a given line—a procedure which to the conventionally minded is simply false. Yet it was by proceeding on the Riemannian postulate that Einstein evolved the relativity theory. Each of these developments resulted from the difficulty of forcing increasingly adequate observations into the then existing verbal schemes. The new orientations provided a more adequate intellectual chart according to which mental operations could proceed without contradicting the concrete observations of life. I recite these facts not to prove that similar departures *must* be undertaken in the social sciences, but to suggest that it is one legitimate way out of an impasse, if, and only if, it serves to speed us toward the generally accepted goal.

B. QUANTITATIVE SYMBOLS AND METHODS

The symbols man uses at first to represent the world are oral, and very little scientific development is possible as long as this is true. Many of the things that scientists wish to communicate simply cannot be adequately transmitted through oral language. The structure of the idea which scientists must communicate is so complex that it cannot be matched in a succession of acoustic stimuli. Consequently, the language of science must increasingly consist of written graphic symbols, which provide an enduring

instead of an immediately vanishing stimulus, and offer possibilities of arrangement (tabulation, etc.) that cannot be communicated in oral language.[11] In devising written symbols, the tendency in science is to develop, as soon as possible, special symbols representing highly abstract, standardized, and ordered responses called quantitative terms instead of the highly emotionally charged words employed in everyday common-sense communication. The indefiniteness of meaning of such symbols as "many," "much," "more," "few," "less," "least" as well as avowedly "qualitative" terms such as "good," "bad," "symmetrical," "level," "heavy," "light," etc., etc., led to the invention of number systems and the symbolic division of various subject-matters into *units* and scales, which are highly standardized and readily verifiable response categories.

The growing incompatibility of the symbolic system referred to above has already, as previously noted, led to its abandonment in the more advanced physical sciences and the substitution of another set of symbols and manipulatory systems. In the social sciences this transition remains largely to be accomplished. Its first steps are (a) the selection of significant categories[12] representing aspects of behavior and (b) their clear definition in terms that lend themselves to operational representations of relationships. Only if one leaves a record of the operations which one goes through in registering an observation can others verify the report.

C. "UNDERSTANDING," "INSIGHT," AND OTHER MYSTICAL "METHODS"

In this connection a common misapprehension should be corrected. I refer to the attempt, still more or less current in the social sciences, to contrast statistical, quantitative, and mathematical methods on the one hand and a method called the method of "intuition," "understanding," and "insight" on the other. The error lies in overlooking that insight and understanding are the ends at which all methods aim, rather than methods in themselves. Quantitative technics are merely the more refined, easily-used tools by which we gain insight and understanding.[13] No one has to my knowledge ever questioned the importance of the latter in all scientific endeavor. Eloquent defenses of insight

and understanding, therefore, merely draw a red herring across the trail of the real question, namely: What are the methods of attaining understanding and insight? [14] We want an objective description of the *technic*. The answer to this demand in some quarters is to wear one's collar backwards, to gaze into crystals or tea cups, or to go into a trance. While being duly impressed with the remarkable results of these technics, the hardier minds in every field have always demanded a more detailed description of the steps in the procedure. Some of the abler magicians, such as Houdini, have acceded to this demand by describing their technics in verifiable terms. Since verification by other qualified minds is the essence of scientific knowledge, the progress of science has been characterized by increasingly searching demands that the author of a generalization specify the steps by which he reached it.

Take, for example, the phenomenon of prediction. In prescientific terminology it is called prevision and is generally conceded to represent the highest measure of insight. Is there any *scientifically accredited* way of predicting, except in terms of probability based on past observations? The whole argument is a confusion of language. Statisticians themselves fall into the confusion when they point out that the technic of correlation must be used with understanding, logic, reason, etc. They overlook that the understanding, reason, and logic which they properly advocate is itself a method, a technic, of some kind. In fact, the insight and the understanding which we seek is to be achieved only by further correlation—formal or informal. Correlation is not merely the name of a certain statistical operation invented by Karl Pearson. It is, as the dictionary says, "the act of bringing under relations of union, correspondence or interaction; also, the conceiving of two or more things as related." [15] As such, it is a method used as frequently by other people as by statisticians. Misuse of certain specific correlation technics for purposes for which they are not adapted is, of course, common, and nobody defends such errors, least of all the statisticians. At the same time, formal correlation is no more frequently erroneous than the informal correlations which everyone practices. To attack correlation and quantitative technics in general, because of numerous faulty examples of their application, is a flagrant case of throwing out the baby with the bath.

D. THE IMPORTANCE OF INFORMAL QUANTITATIVE METHODS

At this point my analysis will be challenged on the ground that I interpret the meaning of statistics and quantitative methods too broadly. The current idea seems to be that if one uses pencil and paper, especially squared paper, and if one uses numerical symbols, especially Arabic notation, one is using quantitative methods. If, however, one discusses masses of data with concepts of "more" or "less" instead of formal numbers, and if one indulges in the most complicated correlations but without algebraic symbols, then one is *not* using quantitative methods.

A striking illustration from a recent book by a prominent sociologist will make the point clear. After a discussion of the lamentable limitations of statistical methods, the author appends this remarkable footnote: "Wherever the statistical method definitely gains the ascendency, the number of students of a high intellectual level who are attracted to sociology tends to fall off considerably."[16]

In short, this author finally reverts to a statistical proof of the deplorable effects of statistics. It must be clear that the only operations as a result of which one could make the statement that, as statistical methods gain ascendency, high-caliber students decrease in numbers, would be (1) to measure the degrees of relative intelligence of students; (2) to measure the quantitative variations in registrations of the better students in different sociology departments; (3) to measure the degree to which quantitative methods dominate the departments; and (4) to correlate the last two factors. The statement is an excellent example of so-called nonquantitative technics and suggests the reason for their popularity. The measurement of the factors here involved is a serious and difficult business. The generalization as quoted above was the result of a few strokes of the pen. In short, what the critics of the better quantitative methods seem to prefer is informal, impressionistic, and imaginary statistics supporting their prejudices.

The surprising implication by other sociologists that Darwin did not use quantitative methods seems to rest on a somewhat similar misunderstanding.[17] The assumption seems to be that

because the *Origin of Species* contains no tables, therefore Darwin did not use quantitative methods. The patient accumulation of thousands of cases, the painstaking classification of them, the recording of the proportion of cases supporting an hypothesis and the proportion contradicting it—all this apparently does not come within the definition of quantitative methods as understood by these writers. I am not here interested in entering into a dispute about the correctness of this definition or of my own, which is much broader. I am interested only in making the point that, if such limitations exist in the definition of quantitative methods on the part of those who find the methods of little value, I am not surprised at their conclusion. But it must be clear that, if the distinction between quantitative and nonquantitative technics is to have any significance, we must take the position that a procedure is none the less quantitative or statistical if the operation is carried on without algebraic symbols or with concepts of *more* and *less* instead of with formal or exact numbers.[18] It may be alleged that this is an attempt to break down the distinction between the quantitative and the nonquantitative. That is precisely what I am interested in doing, especially in so far as it is attempted to distinguish them solely on the basis of the formality with which they are carried out.

Objectification of the technic of generalization invariably involves quantification.

E. THE QUANTITATIVE NATURE OF ALL SCIENTIFIC GENERALIZATION

The above conclusion directly raises the question as to whether scientific generalization is always and necessarily quantitative. I contend that it is. Those who find otherwise must mean something different by the term *generalization*, and they have failed to explain in operational terms what they do mean by it. I mean by the verb *generalize* the process of determining from less than all the relevant data the probable prevalence in a universe of a given datum or configuration of data. I mean by the noun *generalization* a statement arrived at by the above process. That is, I define the concept in terms of the operations by which I arrive at it, in conformity with the accepted requirements of science.[19] Is

this or is it not what every scientist today means by generalization? If this definition is accepted, the question as to whether all scientific generalization is necessarily quantitative at once disappears, for quantification is implicit in the definition. If this definition is not accepted, let us have some other definition. But let us have it in operational terms, i.e., in terms of the steps involved in arriving at it. If it cannot be so defined, all argument as to its nature again disappears, as anything said by an individual regarding his private mental operations must necessarily be accepted as final and not subject to check, and therefore outside the pale of science.

As a matter of fact, I think the definition of generalization I have given above is what everyone means by the term. Those who fail to recognize it as such are simply misled by the informality with which the process is carried out, as I have illustrated above. The delusion that a scientific generalization may be drawn from a single case seems to be due to the fact that sometimes a single case happens to illustrate, typify, or coincide with the facts as stated in a generalization. This is apparently at the root of such a statement as the following: "If one perceives a single case correctly, he can generalize from that instance." [20] We are left without any operational clue as to how to perceive correctly or how to determine the correctness of a perception. Actually, of course, we say a perception is "correct" when other qualified observers confirm our report on an observation. But even when this agreement of perceptions of a single case has been established, on what possible logical grounds may one postulate that the datum or configuration of data is present more generally in the universe? There are no grounds whatever for such an assumption in the absence of further observations of additional instances.

The use of the word "correctly" above is a striking illustration of how terms of this kind frustrate thinking in the social sciences. The author clearly uses it to *mean* an observation which (1) *has been* confirmed by other qualified observers and (2) *would be* found to hold for the whole universe under consideration. In short, he jumps over the operational steps implied in the words "perceiving correctly" and thus reaches the conclusion that there are no such describable steps, but that the conclusion is "directly" revealed through the alchemy of the mind. It is this kind of verbal

necromancy which has compelled science to insist on the operational definition of its concepts. Of course, I distinguish between what I have defined as a scientific generalization and an hypothesis, although they differ only with respect to the adequacy of the data on which they rest. Thus, the statement criticized above and such contentions as Brown's that laws precede their demonstration confuse hypothesis with scientific law.[21]

While the author quoted above avoids giving any instructions as to how to perceive with that "correctness" which will permit us to generalize from a single case, he does essay directions as to how "we may proceed to obtain insight," and Karl Pearson himself could not improve upon them. For here it is set down categorically that "*in order to perceive with insight,*" we must engage in (1) "direct study of human and interhuman behavior," (2) study of symbols supposed to stand for such behavior, and (3) "sympathetic penetration." [22] In short, insight is not itself the method or even the beginning of the process but the result of some very mundane procedures many of the details of which in their more refined and systematic form may be found in any good text on statistics. This is what I mean by an operational definition of insight as compared with such exhortations as "try to see how data arrange themselves"; "experience phenomena with insight"; "we must look at events until they become luminous." [23] For commentary on these verbal gyrations, it would be impossible to improve on the same author's own remarks two pages later on some other matter. "An unfortunate circumstance," he says, "is that communication often breaks down, so that one acquires names without their attendant perceptual patterns. There is abundant evidence in sociological literature that many of our colleagues have learned words without perceiving processes, so that they literally do not know what they are talking about." [24]

I conclude that the notion that a scientific generalization can be drawn from a single case arises from a failure to define concepts in operational terms. Further illustration of the same confusion is found in certain current discussions of causation. Thus Köhler says: "Once more I must point out that our feeling of something naturally dependent upon something else does not refer to a correlation, or a highly constant togetherness *as such*, stated in terms of the external observations of a great many cases. It re-

fers rather to an evident dynamical dependence as experienced *hic et nunc*, in one actual case." [25] The "*feeling* of something *naturally* dependent" and the "*evident* dynamic dependence" of two things as "felt" by an individual in "one actual case" is precisely what has led to some of the most preposterous generalizations in history. The fact that at other times such "feelings" from a single case have later been confirmed and found to hold generally in no way justifies us in confusing the hypothesis with the verified generalization The latter is exactly what distinguishes science from other types of knowledge. Nor is this distinction any less clear or important because hypotheses are a proper part of the scientific method.

The above quotation from Köhler is an example of one of his postulates of Gestalt psychology. It seems to be the dismal destiny of sociology to fight the battles of psychology over again a decade or so after the issue has been settled or abandoned in the latter science. Thus, some of the questions regarding behaviorism which had their inning twenty years ago in psychology are still in the foreground of sociological discussion. It is not surprising, therefore, that some sociologists have now discovered Gestaltism and with it they are hoping to stave off both behaviorism and quantitative methods. In the meantime, alas, the Gestalters in psychology (especially the younger workers in the field) declare Gestaltism to be a form of behaviorism and frankly avow their adherence to quantitative and mathematical technics.[26] Thus Koffka says in his recent book: "In my opinion this famous antithesis of quantity and quality is not a true antithesis at all. It owes its popularity largely to a regrettable ignorance of the essence of quantity as used in physical science (p. 13) . . . the quantitative, mathematical description of physical science, far from being opposed to quality, is but a particularly accurate way of representing quality (p. 14). . . . It (psychology) may be perfectly quantitative without losing its character as a qualitative science, and on the other hand . . . it may be unblushingly qualitative, knowing that *if its qualitative descriptions are correct*, it will sometime be possible to translate them into quantitative terms (p. 15)." [27] [Italics mine.] This concedes, of course, the point I have made above as to the quantitative test of the correctness of a generalization.

Even more striking is the declaration of J. F. Brown. "It may well be," he says, "in fact I think it very likely, that at best psychological analysis may only be statistical." [28]

Yet in the face of these declarations by accredited Gestaltists a recent article in the *American Journal of Sociology* purporting to be "some methodological implications of the *Gestalt* principle of insight" has this passage: "The relationship of cause and effect usually assumes the form of a configuration in time. This theory enables us to avoid the ultimate nonsense of Pearsonian methodology, the doctrine that a statement of a causal relation is really only a statement of relative probabilities." [29] As to whether *cause, as science understands it,* is an "elementary datum of experience" which has nothing to do with relative probabilities I shall only refer to a bibliography on the subject including such names as Bohr,[30] Bertalanffy,[31] Bridgman,[32] Heisenberg,[33] Hecht,[34] and Schroedinger [35] in science, and others of equal repute in philosophy.[36] There is no question whatsoever as to what living and working scientists today mean by the word "cause," in so far as they concern themselves with it.[37] They have defined it in terms of the operations by which they arrive at it.[38]

F. DEFINITION AND MEASUREMENT

I have repeatedly referred to the importance in science of a clear definition of terms. This does not mean mere agreement on present terms, although even this is helpful. It means more especially (a) the selection of significant behavior-segments and (b) their representation by symbols which lend themselves to operational representation of relationships. That sociologists exhibit only slight agreement even in the use of the most common terms is a matter of common knowledge.[39] The same sociologist frequently uses the same term in various senses in the same article. This state of affairs is not surprising, because the only way of defining anything objectively is in terms of the operations involved. The individual sociologist seldom defines his terms in this manner, even to himself. Most of the current terms cannot be defined operationally because they are mere verbalisms derived from metaphysical postulates incapable of operational definition. In other cases, the operational definition is deliberately avoided because it

would definitely circumscribe the meaning of words which are now used to express not relations, but feelings, usually vague in meaning but very strong in emotional significance. Rigid definition would therefore interfere with rhetorical diction and block the release which the latter affords. Many of the present terms are highly valued because of their familiar and reassuring sound, and are therefore not infrequently mistaken for data, "fact" and "truth."

Failure to recognize the nature and functions of language results in widespread misunderstandings about the applications of scientific method to new fields. We have already illustrated the point with reference to the phenomena of "mind," "fear" and "hate." (Chapter I.) Everywhere in the literature of sociology there is confusion between words and the things words stand for.[40] Take, for example, the voluminous arguments over the "correct" or "true" meaning of a word. Thus, Thurstone records his observation of certain behavior. This behavior, explicitly defined operationally, he calls an attitude. Whereupon his critics vigorously proclaim that this is not an attitude at all.[41] *Attitude* is something else—and they proceed to define it not by other operations than Thurstone's but by another series of noises, which have an expressive function comparable to exclamations of joy or sadness, laughter, or lyric poetry, but which have no objective representative function at all. The metaphysician fails to recognize this, and hence he wants to argue about the truth or falsity of his expressions and definitions, whereas the poet or the musician contents himself with calling his opponent's work, not true or false, but merely bad.[42] Since the language in which such arguments are couched refers to no behavior which can be operationally defined, they are, of course, incapable of solution.

Perhaps the best known illustration of futile quarreling over the meaning of words instead of arbitrarily agreeing on them (which is how they got their meaning in the first place) is the voluminous controversy over intelligence testing or more specifically whether what the tests tested really was intelligence. Indeed, it was regarded as a *reductio ad absurdum* some years ago to accuse the testers of defining intelligence as *that which* the tests tested[43]—a theoretically entirely defensible definition. Logically, and particularly in the logic of natural science, this is perhaps the

best definition that can be given. No platitude is more common in sociology than the remark that in order to measure, we must first define, describe, or "know" what we are measuring. The statement usually passes as a self-evident fact which needs no examination.[44] That measurement *is* a way of defining, describing, and "knowing" seems to have been overlooked. If one confuses words with the things they signify and regards the process of definition as a mysterious intuitive revelation, instead of an ordered and selective way of responding to a situation, the idea of measuring anything without first defining it (in words supposed to possess some final essence), seems the height of absurdity. In the meantime, however, it happens that physical scientists have proceeded in just this manner. Since Einstein, at least, they have blatantly declared that space *is* that which is measured with a ruler; time *is* that which is measured by a clock; force *is* that which makes pointers move across dials, etc. For a couple of thousand years before Einstein, physicists too, were of the impression that they must first "define" these "entities" before measuring them. Let the history of science bear witness to the barrenness of the quest, and to the enslavement of intelligence for some two thousand years by the persistence of this thought-pattern. Today the *definition* of force and its *measurement* turn out to be the same *operation*. Contrast the liberation and the forward strides of physics through the acceptance of the latter doctrine, namely, that things ARE *that which* evokes a certain type of human response, represented by measurement symbols.

The present futile disputation over societal measurement will undoubtedly be solved in the same way. It is granted, of course, that the concepts thus arbitrarily defined by the operations which register our responses will usually not mean the same as they did before, assuming that we retain many of the old words stripped of their vague, folklore connotations. Thus the term *attitude* would under an operational definition have a very much narrower but a more definite meaning than at present. This does not mean that all the other meanings which it now has would be denied or ignored, as seems to be assumed by the critics of this type of measurement. The *other* meanings in so far as they are scientifically relevant would be similarly defined operationally by *other* words or symbolic devices. Each shade of meaning would be des-

ignated by adjectives or other symbols distinguishing them with whatever rigidity is regarded as desirable. It may be true that "in stating a concept statistically, changes are made in it" by which it "is so simplified as to be almost unrecognizable."[45] In the same way the physicists' definition of the concept "horsepower" is quite unrecognizable in terms of its folk-meaning. This "degradation" (?) of concepts is, I fear, a necessary cost of scientific progress. Not only will some existing sociological concepts have to be redefined or abandoned, but others will have to be invented because there may be at present no words for some social behavior-segments of basic importance.[46]

G. "WHAT" DO SCALES MEASURE?

With the invention of each new measuring instrument the question always arises as to "what" it measures. The same question could, of course, be asked with respect to the meaning of any of the words used to designate a phenomenon prior to the development of quantitative ways of responding to it. But in the case of folk-language symbols and in the case of well-established measuring-devices this question is less likely to arise because familiar words and units tend to be reified into self-sufficient entities, and we do not feel that we need to account for "what" they refer to except possibly by pointing, gesticulating, or engaging in some other very overt and elementary form of behavior. It is interesting to note, for example, that the term "socio-economic status" passes readily from mouth to mouth among sociologists and social workers on the assumption that it means the same to all. Only when a formal and rigorously defined scale for measuring socio-economic status is invented does the question arise as to "what" it measures. It is doubtless true that such a scale includes some components and neglects others which each individual includes in that complex response to which he attaches the words socio-economic status. The scale makes us aware of this fact.

Our preference for the "qualitative" or pre-scalar use of the phrase socio-economic status is perhaps attributable to the fact that no one is compelled to break it up into components or to consider the relative weights he gives to each factor. The whole

is a deliciously private and subjective reaction for which we are not consciously accountable to anyone. Consequently, we feel strongly that the meaning which we attach to such words, with which we designate certain stimuli, has some intrinsic validity or fitness, as when children (and others) are impressed with the peculiar fitness of the word "cold" to designate a certain degree of temperature. For people reared in the same culture and hence receiving their language-values from a fairly uniform source, there will be a certain uniformity in the use of such terms, usually sufficient to serve most primary group purposes. When we come in contact with people of different culture backgrounds and therefore with different word-meanings, we marvel at their gross misjudgment of such matters as socio-economic status, living wage, decency, and so forth, and bring to bear against them emotions reserved for the stupid and the vulgar.

As science advances we find less and less interest in such questions, for example, as "what" electricity *is*. Except for certain types of philosophers, children, and other more or less semantically deranged persons (from the scientific point of view), most people find it sufficient to define what electricity is in terms of what it does. It is *that which* under certain circumstances kills people, makes trains go, flashes in the clouds, illuminates lamps, makes the hand of the voltmeter move to a certain score, etc., etc. As social science advances we shall doubtless also find this type of answer adequate for the question as to what socio-economic status *is*. We shall be content to say that it is *that which* under certain circumstances makes people beg on streets, cringe before the local banker, behave arrogantly to the janitor, *that* status which is associated with certain kinds of houses, food, clothing, education, occupation; more specifically, we shall probably say that a person will be accorded status, i.e., people will behave toward him *according to their estimate of the probability that he will achieve* the maximum goals of socio-economic striving.[47] That is what we have meant by the term in prequantitative days; it is likely to continue to be what we mean by it under a quantitative terminology except that we shall state it in terms of a number of units on a scale. Each person will then know exactly what others who use the term mean.

In short, it is only when we have a quantitative scale for measuring socio-economic status that we can give an explicit account

of what we are measuring. We can enumerate or point to the items which enter into the construction of the scale and the proportional weight which each item is allowed in the total score. This is not possible when the general dictionary definition or folk-usage is allowed to determine its meaning. We can never know whether another person means quite the same by the phrase as we do. When we try to determine this, we find ourself constructing, formally or informally, a quantitative scale.

It is not necessary to argue that such a scale as the Chapin scale, for example, takes into consideration the same items to the same degree as does a subjective rating of the socio-economic status of the inhabitants of a village by one or a dozen citizens or "participant observers" living in the village. Doubtless different observers will use a great variety of different criteria and their findings will vary accordingly. None of them can be declared either right or wrong as among themselves or as against the Chapin score. All of them are right according to their own criteria and wrong according to others. On the other hand, it is possible that a wide variety of different criteria would yield virtually the same results. If so, it is because these criteria are so highly intercorrelated among themselves that any one or a few of them can be used with equal reliability. In that case the criterion or criteria most easily observed, although itself apparently trivial and irrelevant, can be utilized as a reliable index of an intricate complex all the details of which are extremely difficult to secure. If study should reveal that a certain religious group of a certain income level always paint their houses blue, the latter would be at once an adequate index of economic status and religous belief. One of the most important problems in the construction of quantitative scales or scientific instruments in general is to discover such simple and obvious criteria which can be used as indices to the complex attitudes or behaviors we wish to measure. Such criteria can be discovered, of course, only by patient correlation of all factors which by suspicion, hunch, or guess we have any reason to believe may be significantly associated. Only by this process can we finally arrive at simple and useful instruments like the mercury thermometer or the various specific tests for certain diseases.

We must guard, then, in taking for granted or assuming a necessarily greater validity of conclusions reached through im-

pressionistic or "participant-observer" technics as against the conclusions shown by more formal methods and instruments. Disagreement between the two merely indicates the desirability of *further investigation*, not that because the scale disagrees with our impressions the former is *ipso facto* wrong or less useful. In the end, one result and one method will be declared preferable on the basis of certain practical results it yields. But it is interesting to note that in our adjustments to "physical" phenomena we have become reconciled to set aside the judgment of our unaided senses in favor of the conclusions of instruments; while in our societal adjustments the presumption is still strongly in favor of the greater validity of uncorrected intuitive impressions. This *may* merely indicate that instruments for societal observation are as yet actually inferior to "common sense." At the same time, the knowledge of the limitations of our unaided senses which the other sciences have revealed suggest that the subtleties of societal phenomena call for even more refined instruments and technics of observation, thought, and analysis.

The problems of more objective symbols and of measurement are not, therefore, academic questions of preference or mere attempts to imitate the relatively highly developed sciences. These problems will thrust themselves upon our attention as soon as we attempt to improve upon the accuracy of our adjustments to a changing world. There exists today a large body of common-sense generalizations about alleged uniformities in societal behavior. This body of knowledge forms the basis of our present adjustments and they are useful not only as guides to conduct but as hypotheses for further study. To point out the limitations of these generalizations and the necessary approach to their improvement is in no sense a denial of their usefulness or of the contributions of those who have developed this knowledge to its present stage. The adages and proverbs of folklore and the pronouncements of present day journalists and sociologists, ranging from local beliefs to generalizations of cosmic scope, are probably far more numerous, varied, and generally useful than common-sense generalizations in any other field. But they are especially defective in two very important respects: They do not indicate (1) under *what conditions* these generalizations are true, and (2) to *what degree* they are true under these conditions. Until we can

answer these two questions with greater accuracy than is now possible, the "principles" of sociology cannot be said to be either scientific or generally useful.

It is here that the insistent and important problem of measurement arises. The degree to which a generalization is true must always be especially important in sociology because of our inability to achieve (for the present, at least) the more perfect laboratory controls. This problem implies its own answer, namely, measurement. We are *compelled* to deal with measurement in sociology because it is implicit in that testing and verification of hypotheses which everyone admits is the *sine qua non* of natural science. Furthermore, the chief source of enlightening new theories in sociology as in other fields is likely to be the by-product of just such testing of present hypotheses. The main stimulus to the creation of a new theory is the demonstration of the inadequacy of the old. The bulk of scientific research must always consist of the testing of the currently accepted "principles" and their modification in the light of that more adequate determination of fact, which is measurement.

Acceptance of the above reasoning does not, of course, constitute any solution of the concrete problems of measurement in the social sciences. The serious and difficult task of developing useful and valid measuring scales still remains. We only remove by the above reasoning the logical prohibition which declares their development to be impossible. The protracted work by which measuring instruments have been invented and perfected in the physical sciences remains to be done in sociology. How long did it take, for example, to develop the modern microscope? Such work must be performed as a condition of progress. In the meantime, the theoretical rationale here presented is demanded both as an hypothesis on which to work and as a justification for devoting ourselves to the slow and undramatic labor upon technology which always has been and always will be the principal condition of scientific progress in all fields.

H. SOME THEORETICAL PROBLEMS IN THE MEASUREMENT OF SOCIETAL PHENOMENA

While there is at present considerable disagreement as to the proper province of measurement in sociology, everyone probably

admits that one of the most essential requirements for further advance is a more objective selection and definition of the behavior-segments that we regard as basic or at least important in this field. I have argued above that the problem of definition is inseparable from the problem of measurement, and, further, that social measurements can and do fulfill the same logical requirements as measurements in the other sciences. Since the point is a basic one and since some highly qualified people who have themselves made noteworthy contributions to the development of sociological and psychological measuring devices find theoretical difficulties in the position I have taken, it is desirable to consider here some of the objections that have been raised.

Perhaps the subtlest is that which finds certain things intrinsically measurable while others are regarded as measurable only in a secondary or less fundamental sense. It is contended, for example, that whereas weight, distance, time, or force are phenomena fundamentally and truly measurable, temperature, hardness, and density are measurable only in an ordinal or secondary sense, and that attitudes, aptitudes, ability, or intelligence are not measurable in either sense, if at all.[48]

For purposes of this discussion we shall adopt the most restricted definition of measurement, namely, that which requires scalar units, which are additive and interchangeable as units. In short, we shall accept the definition which everyone admits characterizes the measurement of such phenomena as weight, distance, and time. On this basis, Nagel finds density not in the same sense measurable as weight. Many others find that such devices as Thurstone's attitude scales are not of the same logical class as measuring scales of weight, time, space, etc. Since the argument is basically the same in each case, let us first examine Nagel's contention that "there is no clear sense in which two liquids equally dense could be added to produce a liquid twice as dense."[49] This is not a question of sociological measurement at all, but it illustrates the basic fallacy involved in most objections to sociological measurement. It is significant to note also that the concept of density and its measurement is a much more recent and, therefore, unfamiliar development than the measurement of weight.

We pointed out in Chapter I that the immediate data of science are symbols. It follows that we never actually measure or weigh

either liquids or bricks in all their aspects, i.e., in all the respects in which they are capable of evoking responses. We respond selectively to some one aspect, property, or quality at a time. It may be weight, mass, color, density, hardness, sweetness, malodorousness, radicalism, or what not. This response, symbolized, is the immediate datum for science. We devise various means of *ordering* successive or numerous responses of the same kind. As between two of them we say that one is better, pleasanter, greater, harder, sweeter, or brighter than the other. Among larger numbers we arrange them in series according to the pressure sensations they evoke in us, the tactile resistance they offer, the visual space they occupy, or their behavior manifested to us through any other of our senses.

The next step in formalizing the process is to interject a mechanical device between our elementary original responses and *that which* evokes the response. For example, instead of gauging verbally ("heavier," "lighter,") the relative weights of two bricks by the directly experienced pressure sensations felt by balancing one in each hand, we may construct a balance (according to principles established previously by similar processes) and draw our conclusions about the weight of the two objects from visual instead of tactile stimuli, i.e., the balancing of a beam or the position of a pointer on a calibrated dial.

Now all the steps (operations) in the construction and calibration of this device are essential considerations in interpreting its behavior as a measurement of weight.[50] But to all who are familiar with and accept the validity of these steps, the beam is accepted as a device for *standardizing responses* and securing more perfect agreement among a number of observers. The units, whether of mass, weight, color, density, hardness, or anything else, are not "parts" or "fractions" of any two bricks or of bricks in general.[51] They are abstractions,[52] *symbols of magnitude. Magnitude* is the name of a selective response. *Units* of magnitude are symbols invented to represent various kinds (gradations) of magnitude responses. As such, units of a given scale are *per se* interchangeable and may be subjected to any mathematical manipulation considered meaningful, regardless of what phenomena in a given case they may refer to. Thus, we may not add bricks and hogs; but *pounds*, i.e., abstractions called *weight magnitudes, of bricks*

and hogs may be added. Likewise, it is perfectly true that "there is no clear sense in which two *liquids* equally dense could be added to produce a liquid twice as dense."[53] Only *magnitudes* (abstractions) are ever added (mathematically).[54] Two equal units of density-magnitude can assuredly be added and a new density-magnitude twice as great can be secured. The familiarity of the operations with which we carry out some measurements has caused us to believe that others, less familiar and formal, involve other logical (or "fundamental") principles. The same reasoning will hold for the alleged differences in "direct" measurability of such phenomena as hardness and temperature as compared to weight.

I. SUMMARY OF FALLACIOUS ASSUMPTIONS REGARDING MEASUREMENT

Let me now summarize my criticism of the four principal thoughtways regarding the measurability of different types of phenomena, and the resulting impasse in social research.

1. The main reason for asserting that some things are measurable while others are not is the implicit assumption that measurement is not a way of defining things, but is a process which can be carried out only after the "thing" to be measured has been defined. This, of course, implies in turn some kind of "existences" of phenomena as "common essences." As has been repeatedly pointed out above, natural science cannot deal with these hypothetical "entities" but must confine itself to the data of human responses, however evoked.

2. Under this restriction the postulation of some units as "natural" and others as "artificial" must also be abandoned. Thus, one able writer says that "a person is a natural unit in measuring population"; whereas, degrees, calories, and ergs, not to mention the units of attitude scales, are artificial.[55] By what postulate can this distinction be made? To distinguish "natural" from "artificial" units we must postulate that some units have inherent existence as "common essences" in the universe, whereas others are the constructs of man's convenience—a way of responding to a situation symbolically represented. It is my contention that *all* units are of the latter character. The former

postulate is implicit or explicit in nearly all social sciences today. The social sciences are hopelessly entangled in the notion that some phenomena are "directly" known and are "material," as contrasted with "mental" and "immaterial" phenomena. Such postulates are not only incompatible with modern science; they completely block further systematic advancement of knowledge in the social field. These assumptions lead to endless, wearisome, and completely futile discussions of the relative "realities" of the individual, of society, of culture, and of "physical" things. The only escape from the impasse is to do what physics has done with respect to its units, namely, recognize that they are all linguistic constructs ("artificial") symbolizing human responses to aspects of the universe relevant to particular problems which man faces.

Closely related to the above misconception of the nature of scientific units is that which holds "man" to be the "natural" unit of sociology. This is analogous to saying that earth, air, fire, or water are the "natural" units of physics. But physics no longer attempts to operate with such units. The units of physics are abstractions—symbols standing for *our responses* to certain situations or phenomena. The "nature" of these phenomena we infer from our responses. All questions of naturalness, artificiality, or "existence" of the units are completely obsolete because units are *defined* as symbols of our responses to *that which* evokes them.[56] The assumption of the naturalness or "existence" of some units as against the artificiality and abstractness (non-existence) of others is a clear Aristotelian survival incompatible with modern natural science and is being rapidly abandoned. All that can be said is that "man" is a convenient unit for certain crude purposes just as certain commonplace physical adjustments are made by regarding tables, chairs, and stones as units. But what was the state of the physical sciences while these natural, convenient, and obvious units, or even earth, air, fire, and water, were regarded as the "units"?

3. A third important reason for the apparent difference between social and physical units and measurements is the implicit or explicit assumption that we measure the *behavior* of some things, but the *being*, *quality*, or *quantity* of others. The latter set of words have, of course, been reified into things, although they actually stand only for human responses. Take, for example,

the statement that degrees, calories, and ergs are "artificial" units because here "*effects produced* constitute units in the indices of the *thing to be measured.*"[57] [Italics mine.] The *unit* "man" is *likewise* an "*effect produced*"—upon the sense organs of the perceiver. It is only when there is relative stability and uniformity in the sensory responses of numerous competent observers that we can postulate either his existence or his unitary nature with reference to the attendant situation to which we also respond. Degrees, calories, ergs, are words *symbolizing sensory responses.* "Man" is just another such a word, but a very crude one because it leaves to the context the task of determining what aspect of "man" (always implicit) is meant, instead of denoting it specifically. The character of the stimuli that evoked any of these responses is postulated from inferences from these responses. Our alleged "knowledge" of the phenomena that evoke our reponses consist of just such inferences.

4. Finally, there is the problem of the alleged physical "counterparts" of some scales or measures as compared with others. This is the question of the "objective existence" and "meaning" of the units of sociological scales and is probably adequately covered by the preceding discussion. Thus, Kirkpatrick says that when a scale value of 5.7 is assigned to a certain statement on a Thurstone scale "the number 5.7 is not a multiple of any objective unit." (P. 83.) This seems to contradict his own earlier concessions to the position advanced in the present volume and to confuse the meaning of his own terms. He has previously admitted that "all units are perceptually and conceptually defined by human beings and have only relative interchangeability." (P. 82.) He would presumably further admit that "objectivity" is a postulate resting solely on the confirmatory response of numerous qualified observers. If so, a unit (i.e., a spatial marking) on a Thurstone scale is "physical," "observable," manipulable, and "objective" in precisely the same sense that a gram is. With respect to interchangeability he says: "Let it be assumed that a score on a Thurstone scale is five. The question arises 'five what?' The answer is five intervals on an eleven point scale which were supposedly equal appearing to judges reared in a particular culture." (P. 84.) This is precisely the only legitimate answer that can be made to a corresponding inquiry as to the meaning of the

following question: "Let it be assumed that a 'score' on the beam or dial of a druggists' scale is 5. Five what? Five intervals on (say) a hundred point scale, supposedly equal in the judgment of those who calibrated the scale.[58] Kirkpatrick goes on to say: "The equal appearing unit [in the Thurstone scale] had no direct physical counterpart in the sense that a brass gram weight corresponds to the idea of a gram as a unit rather than as a symbol like the word 'gram.'" (P. 84.) This is a clear case of postulating "existence" of brass *gram weights* as "common essences" and therefore finding them "different" from the "existence" (behavior) which must by the same logic be postulated (by inference) for the behavior-in-environment *represented by* the statements originally sorted by Thurstone's judges.

Brass gram weights or the "idea of a gram as a unit" do not exist for science or knowledge prior to man's ordered reactions to kinesthetic pressure sensations. When he *has* such sensations he symbolizes them, perhaps first by sounds (words), perhaps then by pebbles, or other objects arranged in order of size, since volume in this case has been observed to correlate highly with intensity of pressure sensations. He may then, on account of the high observed correlation between volume and weight in certain material, proceed to divide metals into equal volumes and by combining them represent mathematical interchangeability and other convenient manipulatory effects. He may further represent all these operations graphically.

Now the raw material of a Thurstone scale on (say) economic radicalism is certain behaviors-in-environment of human beings which are observed by themselves or by others. In attitude scales, certain behavior ("the physical counterpart") has been observed and has been symbolized by words and statements which, in writing, have been collected. Judges whose sensory apparatus and reaction tendencies are similar to those of the original reagents (i.e., those whose behavior is described by the original statements), arrange these statements (*they* are now the physical counterparts) into a series, of more and less, of a quality (radicalism) which they indicate. A scale with arbitrary divisions representing an average of the reactions (serial placements) of the judges is then arranged. These divisions or units are then represented spatially on paper, or could be constructed of brass

and be arranged in any order desired. When arranged they are always numbered successively by agreement, from left to right, as are other scales, dials, etc.

If, by the procedure described, one person scores 5 and another 10,[59] one may be called "twice" as radical as the other with precisely the same logic which declares that one stone is twice as heavy as another. The latter statement means that we have abstracted weight-quality out of a total complex of some kind and represented the abstraction by symbols of some kind, in this case, units-on-a-scale. In terms *of this scale*, one stone is twice as heavy as another and in no other "inherent," "fundamental" sense. In either case, it is a meaningful statement only to people who accept the symbolic operation involved. Note that in the above illustration, I have first defined radicalism in terms of the scores-on-a-scale, just as weight must be so defined in terms of its scale.[60] It is unnecessary to argue whether what is tested is "really" an attitude, because attitude is defined as *that behavior* evoked by this test. It is likewise futile to argue whether a certain behavior considered in a test is "really" radical. For the constructors of the test and the scale agree to *call* it radical. It is therefore, also unnecessary to argue whether the statement that one individual is twice as radical as another is "comparable," "similar," and as logically defensible as the statement that one stone is twice as heavy as another, because in terms of the units of the two scales (both of which assume an arbitrary, rational origin) one is obviously twice the other in both cases. Controversy over such matters illustrates the hopeless current confusion of linguistic and logical constructs with metaphysical postulates of existences, essences, beings, etc. The great contribution of relativity theory was to expose this confusion. Hence its vast significance for the social as well as the physical sciences.

It has been my main interest in this section to emphasize and illustrate the tendency to overlook the basic nature of language units, knowledge, and logic. I have confined myself to illustrations of only a few of the fallacious thoughtways in sociology. But most of them derive from the same basic considerations. We assume too lightly that the knowledge more familiar to us has an inherency in the universe instead of being only well-established and therefore more uniform ways of responding. We *overlook* the

postulates of well-established thought-patterns, and either assume there are none or at least that they are self-evident, eternal, and inherent in the universe, just as the postulates of Euclidian geometry, Aristotelian physics and logic, and every basic postulate of folk-belief has been taken for granted. Now all postulates must and should be taken for granted. But we must remember that we do *take* them for granted and that they are not divinely imposed on us. Otherwise, we handicap ourselves fatally in the development of new advances in science which frequently require new postulates. If sociologists were compelled to make *explicit* the postulates which are *implicit* in their present orientation, they would speak with less condescension about the thoughtways of their primitive ancestors.

If the above diagnosis is in the main a correct characterization of the present situation in sociology (and in the other social sciences as well) the following general approach is indicated.[61]

1. A survey of the present body of sociological theory and "principles" (a) to sift out the matter which seems most relevant to basic problems, and (b) to scrutinize and render explicit the postulates upon which present theory and principles are based.

2. A survey of the terms at present in common use and by fairly common agreement admitted to represent the phenomena of special interest to sociology.

3. Agreement on the definition of these terms in operational language.[62]

4. The formulation, on the basis of the above work, of a comprehensive theory fulfilling as nearly as possible the generally accepted requirements of a scientific theory. Professor Dodd's companion volume *Dimensions of Society* is a preliminary attempt in this direction.

This program does not contemplate, it should be noted, any wholesale abandonment of any existing sociological theory, principles or empirical research without the most careful consideration of its possible value in whole or in part. A new scheme or system spun out of thin idealistic air, the aura of other sciences, or the pronouncements of Aristotle, Marx, Aquinas, and Einstein is not contemplated. All of these, and others, will, however, be considered as legitimate sources of suggestions as to the meaningful arrangements of the considerable body of empirical

and other research upon which present sociology rests. Necessarily, the principal source of any new formulation will be the existing body of sociological theory and fact. The amorphous mass of tangible results of research must be assembled around the generalizations upon which these researches may conceivably be supposed to bear. The more specific generalizations must then be arranged under the broader principles which they seem to support. This procedure will doubtless reveal vast gaps in sociological knowledge. But the first step in filling a gap is locating it as definitely as possible. Further research can then be centered upon the crucial sectors—those problems the solution of which is a prerequisite for further advance. Such research will also serve as a constant check on the postulates and the theory upon which we proceed. "If the deductions involve conditions of observation which are now impossible of attainment, the theory is metaphysical rather than scientific; and if the deduced phenomenon is not observed when the conditions are fulfilled, the theory is false."[63] From the cumulative results of research based upon a coherent set of postulates and directed at clearly stated hypotheses there should emerge an increasingly adequate set of postulates, concepts (words), and verifiable theorems to form the basic framework of sociology.

J. CONCLUSION

The principal theme of this chapter was well stated by Francis Bacon several centuries ago. "There are," he said, "also idols formed by the intercourse and association of men with each other, which I call Idols of the Marketplace, on account of the commerce and consort of men there. For it is by discourse that men associate; and words are imposed according to the apprehension of the vulgar. And therefore the ill and unfit choice of words wonderfully obstructs the understanding. . . . But words plainly force and overrule the understanding, and throw all into confusion, and lead men away into numberless empty controversies and idle fancies."[64]

A great many thinkers and writers on the social sciences have been agitated over the same problem. But thus far little has been done about it. The basic vocabulary of science, for political

example, remains today largely what it was when Thomas Aquinas wrote his *Rule of Princes* in the thirteenth century, or when Aristotle wrote his *Politics*. In the meantime the other sciences have abandoned practically all of the words and symbolic systems of Aquinas's time. Mechanical calculating machines perform with Arabic numerals operations far beyond the imagination of the most brilliant intellect working with Roman numerals. The instruments of the physics laboratory have practically nothing in common with those of the alchemist's cellar.

We have examined in this chapter some of the reasons for this backwardness in the development of adequate symbols in the social sciences. The most commonly assigned reason is that the subtleties, complexities, and dynamic character of societary phenomena preclude the development of the more rigorously defined symbols and methods of other sciences. We have tried to show that these are the very considerations which dictate the development of precisely the kind of symbols which are declared to be inapplicable to societal phenomena. This suspicion of new symbols springs from a survival of the mystical belief in the intrinsic character and properties of words, which is so common among primitive peoples. We have here taken the view that words are, like other instruments of man, constructs of his convenience and to be judged solely by their effectiveness.

It is in this connection that we have pointed out that the technics of symbolic logic and mathematics were invented in order to remedy the hopeless inadequacy of the language of folklore as a vehicle for the description of situations at all subtle, complex, or dynamic. Measurement is merely an objectification of a procedure which has always been practiced with greater or lesser accuracy. Without quantitative units, the vocabulary required to describe the tremendously varied gradations in societal phenomena would be of such staggering proportions as to be a hopeless handicap to intellectual activity, communication, and other adjustments. The Arabic language contains about 6000 names for "camel" [65] a separate symbol for each kind and condition of camels. Imagine the situation if every size of house in a large city could be described only by a separate, noninterchangeable symbol instead of in terms of a certain *number* of stories, cubic contents, height, width, etc. Everyone complains about the vari-

ety and complexity of societal phenomena. Yet we try to describe them by using a separate word for each gradation, or at most resorting to vague qualifications of "more," "less," "some," etc. In our struggle to make increasingly fine distinctions we are constantly multiplying our words on the ground that each has its "shade of meaning." Unfortunately, the shades are frequently more apparent than the meanings.

We need instead to develop quantitative units and forms of expression so that we may utilize in the description of societal phenomena the tremendously powerful technics of mathematics which are already available. By regarding all qualitative gradations as *degrees* or *amounts* of that quality,[66] already existing numerical units and manipulating technics can be utilized in accurate and objective description of qualities and relationships. The practical task of developing scales for the quantitative expression of qualitative differences remains a major concern of the social scientist. Dodd has suggested methods by which such social "processes," as for example, those traditionally called "conflict," "accommodation," and "cooperation" may be reduced to a continuum in terms of degrees of societal tension.[67] Through such an approach, endless discussion of the definition of these and other similar terms and disagreements as to which term applies to a given situation, might be resolved.

Finally we have stressed the fundamentally quantitative nature of all scientific generalization. Whatever view one may take regarding the practical possibility of inventing valid instruments for the quantitative description of the varied gradations and relationships of societary phenomena, the quantitative requirements of scientific generalization cannot be escaped. This applies with equal validity to "case studies," "qualitative analysis," and all other supposedly nonquantitative technics. If it is desired to generalize from the most intuitional, artistic, or qualitative experience, the requirement of *other corroborative instances* of the alleged phenomenon is in science unescapable.

A coherent and consistent system of symbols corresponding closely to the world to which we have to adjust is important not only to science but also from the standpoint of mental health and practical social administration. A very large part of the environment to which men respond consists of words -spoken or writ-

ten, assembled into sentences and ideologies. These word-systems are variously incorporated into so-called "material" forms such as totem poles, monuments, tablets, books, buildings, and institutional paraphernalia and behavior generally. Once language is acquired it is possible to experience just as actual and severe organic tensions on a purely linguistic ("intellectual") level as one experiences on being caught in some "physical" predicament. That is, the tensions which many people experienced under the conflicting impact of the theories of evolution and theology is from the point of view here adopted comparable and amenable to analysis within the same framework as the tensions experienced by a person finding his escape from a dangerous animal cut off by a precipice. The adjustment-behaviors in which the organism engages under the two situations may involve quite different parts and sequences of the organism, but the behavior may be described and explained within the same system of logic (rules of verbal manipulation).

A very large proportion of the population of many countries are today carrying on a major part of their lives in an impersonal machine culture to which they adjust according to the assumptions and rules (word-systems) of science. Another important part of their lives (linguistic and otherwise), having to do with their social adjustments, is carried on according to vitalistic, animistic, primary-group assumptions and doctrines of a bygone age. The resulting tensions, confusions, and maladjustments will be further elaborated in the chapters that follow. (See especially Chapter VIII, Sec. B, 4.) Our schitzoid societal behavior resides largely, we shall see, in the inadequate and inconsistent symbolic systems according to which we attempt to steer our course.[68]

K. NOTES

1. For illustrations see Stuart Chase, *The Tyranny of Words*, Harcourt, 1938; T. W. Arnold, *The Folklore of Capitalism*, Yale University Press, 1937.

2. See the geometric demonstration in L. Hogben, *Mathematics for the Million*, Norton, 1937, p. 89. See also S. Chase, *op. cit.*, pp. 153, 154, who gives the following algebraic solution: "With the same assumptions [the tortoise runs a yard per second, Achilles ten times as fast], let us translate the problem into simple algebra. Let r be the rate of the tortoise. Then Achilles' rate will be $10r$. Let x be the time in seconds taken by the tortoise before they meet. We know that the distance traveled by the tortoise equals the distance traveled by Achilles.

The distance a body travels is its rate of travel multiplied by the time traveled. Using this formula:

$$\begin{aligned} \text{Tortoise's distance} &= r \times x \\ \text{Achilles' distance} &= 10r \times (x - 100) \\ \text{or} \qquad rx &= 10rx - 1000r \\ \text{or} \qquad 9x &= 1000 \\ \text{Therefore} \qquad x &= 111.11 \text{ seconds}" \end{aligned}$$

3. The nature of the "actual terrain" is, for adjustment purposes, relative to the organism making the adjustment. For example, any given terrain is different for man than it is for microbes which pass readily through the walls of houses or through other barriers which impede man's movements. By the same reasoning a given terrain is different for primitive and for modern man.

4. It is not necessary to become involved here in the question of whether these departures are contradictions of Aristotelian logic or merely extensions of it. (For a discussion of the subject, with references to Aristotle's works, see O. L. Reiser "Non-Aristotelian Logics," *The Monist*, XLV, Jan., 1935, pp. 100–117.) The fact seems to be that these later developments consist essentially of showing that the older systems are merely special cases of, and therefore included in, the broader postulates of Lobatchewsky, Riemann, and Einstein. I am using the term non-Aristotelian purely as a term generally (and perhaps erroneously) employed to designate these later developments. The reasoning on this subject is, therefore, in no way concerned with or dependent upon what Aristotle actually said or what is a legitimate interpretation of his remarks. A considerable number of qualified scholars, however, regard the more recent dynamic and functional viewpoints of science as so basically at variance with the thought-patterns which preceded them that the former must be regarded as really *non*-Aristotelian. (See E. T. Bell, *The Search for Truth*, Williams and Wilkins, 1934, Ch. VII; K. Lewin, *A Dynamic Theory of Personality*, McGraw-Hill, 1935, Ch. I; A. Korzybski, *Science and Sanity*, Science Press, 1933; A. F. Bentley, *Linguistic Analysis of Mathematics*, Principia Press, 1932, p. 304.)

5. The arbitrariness of this system has been exposed in the epoch-making work of Lucasiewicz and Tarski; see C. I. Lewis and C. H. Langford, *Symbolic Logic*, Century, 1932; also A. F. Bentley, *op. cit.*

6. Curiously enough, quantitative technics are by some suspected of being guilty of just this shortcoming, though the history of mathematics and statistics clearly demonstrates the opposite.

7. For elaboration of this point see G. A. Lundberg, "The Biology of Population Cycles," *Social Forces*, IX, March, 1931, pp. 405–408. Also Ch. VI of the present work.

8. L. K. Frank, "Structure, Function and Growth," *Philosophy of Science*, April, 1935, p. 213; also Alexis Carrel, "The New Cytology," *Science*, LXIII, March 20, 1931, p. 298; also G. E. Coghill, "The Neuro-Embryologic Study of Behavior: Principles, Perspective, and Aim," *Science*, LXXVIII, Aug. 18, 1933, p. 137.

9. R. Carnap, *Philosophy and Logical Syntax*, Kegan Paul, 1935, p. 34.

10. E. T. Bell, *op. cit.*, p. 216.

11. Cf., Leonard Bloomfield, "Linguistic Aspects of Science," *Philosophy of Science*, II, Oct., 1935, pp. 499–517.

12. *Categories* may be made arbitrarily mutually exclusive without imputing any discontinuity to the phenomena referred to. "Conceptual analysis permits the parts to be conceived as they are when the parts of the living whole, and not as they would be if physically isolated. . . . An analysis is a veritable construct of the person who makes it. The parts are not logically given in the whole. In constructing an analysis, a person builds up a new—and perhaps better—way of responding to a thing—a new way of dealing with it 'mentally.' . . . The merits or demerits of a physical or any other type of analysis are for a scientist questions of the success they yield in predicting or controlling. (M. A. Copeland, "An Instrumental View of the Part-Whole Relation," *Journal of Philosophy*, XXIV, pp. 96–104, 1927.) (See also Ch. I, Section C, 6 of the present volume.) This point seems to be involved in the following passage from R. M. MacIver, *Society, A Textbook of Sociology*, Farrar and Rinehart, 1937, p. 476. "Social phenomena are not, like certain physical phenomena, isolable components of a situation. Social phenomena are aspects of a total nonmechanical, consciously upheld system of relationships." Later on the same page he admits however, and I think correctly, that the kind of isolability he has in mind is impossible also in "physical" situations. "We can say that land, labor, capital, and organization—to take the old categories—are all necessary to produce a steel rail, but the question how much does each produce remains not only unanswerable, but meaningless. If a number of factors are alike *necessary* to the production of a result, there can be no quantitative evaluation of their respective contributions. [How about H_2O? G. L.] And if this is true of material categories, themselves measurable, and their material products, themselves also measurable, it is *a fortiori* true of the more subtle interactions of personalities," etc. (P. 476). If the components present in any situation are reduced to units of some kind then the *number or amount of these units* present can certainly be stated. If we can say that land, labor, and capital are the components that enter into a steel rail, then we can also say how much of each of the components enter into the production of the rail, after we have reduced the components to countable units. We perceive quantitative aspects of things just as truly as we perceive other aspects of them. MacIver uses the illustration to demonstrate the shortcomings of quantitative methods in "explaining" "causation" because these "quantitative indices are merely evidences of an interaction which they do not explain." (P. 476.) I do not find that the illustration has any such implication as MacIver suggests. The "explanation" which he has in mind remains to be performed after he has named his components in any case. The statement of the quantity or degree to which each component is present greatly facilitates that description of the relationships and interaction of the components without which his explanation is in either case not forthcoming. I accept completely MacIver's point (as I understand it) that the description of the *interaction of all the necessary factors* involved in an end result constitutes its explanation. I merely hold that mathematical formulas in quantitative terms are the most accurate way yet devised for describ-

ing just such interaction. The argument over the applicability of quantitative methods is clearly due to different conceptions of the nature of these methods.

This is further indicated, I think, by such a statement as the following: "To understand social causation, therefore, it is not enough to enumerate factors, to set them side by side, to attribute to them different weights as determinants of change. The first and essential thing is to discover the way in which the various factors are *related* to one another, the logical order within which each fall, the respective modes in which they enter into the causal process." (R. M. MacIver, *op. cit.*, p. 478.) Statistical and mathematical procedures were invented to achieve precisely these purposes and they remain the most perfect instruments thus far devised to achieve all of the above objectives. When we weight a factor we do exactly what the above quotation insists must be done; i.e., we assign it a weight on the basis of its *relevance*, its *relative influence*, and its mode of operation in an observed event. In short, the quotation seems to assume that statistics pretend somehow to be a substitute for, rather than an instrument of, analysis.

The above statement that "social phenomena are not, like certain physical phenomena, isolable components of a situation" is also a good illustration of the widespread tendency to confuse words with what they symbolize. Factoring a situation or determining its components consists of responding selectively to various aspects of a situation. It may or may not be possible to dissect the situation "physically." But by symbolizing each aspect, these symbols may be so arranged as to represent in a revealing way the interaction of the parts. (See reference to Copeland above.) Elsewhere MacIver seems to agree with this view, e.g., p. viii (*op. cit.*).

13. Even crude and inadequate quantitative technics sometimes reveal relationships which are not otherwise perceptible. (Cf. L. L. Thurstone, *The Vectors of Mind*, University of Chicago Press, 1935, p. 206.) I am here accepting the conventional usage of such words as "insight" and "understanding" as describing an adjustment achieved, namely, when our curiosity for some reason comes to rest. Later I shall show that from the operational viewpoint *understanding* and *insight* must themselves be regarded as technics. (See notes 19 and 32.)

14. "The gestalters have made much of the notion of insight, but, unfortunately, this idea has become enveloped with a kind of mysticism. It appears to me that *insight* is only another name for a process which has long been familiar to us." (O. L. Reiser, "The Logic of Gestalt Psychology," *Psych Rev.*, XXXVIII, July, 1931, p. 360.)

15. Funk and Wagnall's *New Standard Dictionary*, 1931.

16. Florian Znaniecki, *The Method of Sociology*, Farrar and Rinehart, 1934, p. 235.

17. E.g., Herbert Blumer, *Amer. Jour. Sociol.*, XXXV, p. 1102.

18. "There can be no doubt," says Professor Morris R. Cohen, "that it is of the essence of scientific method that vague terms like *large* and *small*, *far* and *near*, *hot* and *cold*, etc., shall be replaced by terms made definite by measurement." (M. R. Cohen, *Reason and Nature*, Harcourt, 1931, p. 89. See also L. L. Bernard, "The Evolution of Social Consciousness and of the Social Sciences," *Psychological Review*, XXXIX, March, 1932, pp. 147–164; "The Development of

Methods in Sociology," *The Monist*, XXXVIII, Apr., 1928, pp. 292–320.) The fact that a branch of chemistry is called "Qualitative Analysis" is sometimes advanced as proof that not all science is quantitative. Further investigation of this matter will soon convince the investigator of the important quantitative aspects also of this division of chemistry. See note 27 below.

19. "Let anyone examine in operational terms any popular present-day discussion of religious or moral questions to realize the magnitude of the reformation awaiting us [p. 32]. . . . I believe that many of the questions asked about social and philosophical subjects will be found to be meaningless when examined from the point of view of operations. It would doubtless conduce greatly to clarity of thought if the operational mode of thinking were adopted in all fields of inquiry as well as in the physical." (P. W. Bridgman, *The Logic of Modern Physics*, Macmillan, 1932, p. 30.)

For a consideration of the possible limitations of operationalism, see R. B. Lindsay, "A Critique of Operationalism in Physics," *Phil. of Sci.*, IV, Oct., 1937, pp. 456–470. This article does not deny the superiority of operational methods but merely raises the question as to whether science should rely *solely* upon such methods. I have no objection to the use of nonoperational concepts, if they are found useful, until the more desirable operationally defined concepts are developed in any field. The latter are, however, the goal to be sought. (See also H. Alpert, "Operational Definitions in Sociology," *Amer. Sociol. Rev.*, III, Dec., 1938, pp. 855–861.)

"The only justification for our concepts is that they serve to represent the complex of our experiences; beyond this they have no legitimacy. I am convinced that philosophers have had a harmful effect upon the progress of scientific thinking in removing certain fundamental concepts from the domain of empiricism, where they are under our control, to the intangible heights of the *a priori*." (A. Einstein, *The Meaning of Relativity*, Princeton University Press, 1923, p. 2.)

The statement "no virtuosity of technique can compensate for want of understanding" [Waller (cited below), p. 290] uses the word "understanding" in precisely the way attacked by Einstein. Understanding *is* a "virtuosity of technique," from the operational point of view.

"The older elementalistic linguistic problems of 'matter,' 'space,' and 'time' were in such a mess, due to the objectification of verbal structures, that it was useless to talk any more in the old way. He [Einstein] decided to describe what a physicist *does* when he measures 'space' and 'time' and to abandon, perhaps unconsciously, the 'is' of identity." (Korzybski, *op. cit.*, p. 648.)

My restricted use of the term *science* in this section has been made the object of attack on the ground that "all science is a search for truth." The implied *non sequitur* is that therefore all search for truth is science. I have elsewhere fully recognized the value of prescientific, nonscientific, and nonquantitative technics. (See G. A. Lundberg, "Is Sociology too Scientific?" *Sociologus*, IX, Sept., 1933, pp. 301, 302, 316–317. Also Ch. 3, note 11 below.) I use the term *science* to describe a method and its results, not to exalt that method or depreciate others. Also, I am dealing here only with the type of response known as generalization, i.e., the assumption of the general validity of propositions drawn from less than

all the relevant data. Such assumptions may be made from single cases, but if so, there is no basis upon which to estimate the probable validity of assumption.

20. W. Waller, "Insight and Scientific Method," *Amer. Jour. of Sociol.*, XL, Nov., 1934, p. 287. I refer to this article chiefly because it furnishes illustrations from recent literature of the points I wish to make. It should not be inferred, therefore, that this author is especially hostile to quantitative methods. Since much of the controversial literature in sociology consists of heroic demolitions of positions nobody holds or defends, I cite in each case proponents of the views I attack. (For other illustrations see: A. Goldenweiser, "The Concept of Causality in the Physical and Social Sciences," *Amer. Sociol. Rev.*, III, Oct., 1938, pp. 626 ff.; J. F. Brown, "Towards a Theory of Social Dynamics," *Jour. Soc. Psych.*, VI, 1935, pp. 188–189; and K. Lewin, *A Dynamic Theory of Personality*, McGraw-Hill, 1935, pp. 12, 14, 31.)

21. J. F. Brown, "A Methodological Consideration of the Problem of Psychometrics," *Erkenntnis*, IV, 1934, pp. 46–61. Also his *Psychology and the Social Order*, McGraw-Hill, 1936, p. 32.

22. W. Waller, *op. cit.*, p. 288.

23. *Ibid.*, pp. 287, 288. My criticism of the use of "insight" and "understanding" as mysterious "methods" not subject of further analysis also applies to "creativeness," "genius," and "inspiration" as used for example in the following passage:

"The decadent periods, whether in art or science or religion, have *often been marked by this substitution of technique for genius; of specific training in technical skill rather* than real creativeness or inspiration. *In such periods, technique usually dominates the field;* scientists talk mainly of scientific technique with which they usually do not produce anything but mediocrity." (P. A. Sorokin, *Social and Cultural Dynamics*, I, American Book Co., 1937, p. 584.)

Exactly the opposite seems to me to be the fact. The close relationship between new technical departures and inventions on the one hand and epochs of scientific advance on the other seems to me to be about the most obvious fact which the history of science demonstrates. Indeed, how could it be otherwise if we regard science itself as a technic of achieving reliable knowledge? The close interdependence of the development of mathematics and other technical innovations and the most "creative" and "inspired" products of "genius" since the time of Newton, at least, is surely too well known to require even mention. One may disapprove, if one chooses, of the uses to which the technics that constitute science have been put. But these technics are none the less the *sine qua non* of scientific advance of every kind including that mysteriously called "inspirational creativeness." (See any history of science. For special aspects see William Harkness, "The Progress of Science as Exemplified in the Art of Weighing and Measuring," Annual Report of the Board of Regents of the Smithsonian Institution 1888, Government Printing Office, pp. 597–633. H. D. Hubbard, "The Romance of Measurement," *Scientific Monthly*, XXXIII, Oct., 1931, pp. 556–558.)

24. Waller, *op. cit.*, p. 290.

25. W. Köhler, *Gestalt Psychology*, Liveright, 1929, p. 361. Waller takes a simi-

lar position, *op. cit.*, pp. 285–290. Regarding the notion of "immediate experience" see E. C. Tolman, "Psychology versus Immediate Experience," *Philosophy of Science*, II, July, 1935, pp. 356–380.

26. See J. F. Brown, *The Mathematical Conceptions Underlying the Theory of Psychological and Social Fields*, Ann Arbor, Edwards Bros., Inc., 1935.

27. K. Koffka, *Principles of Gestalt Psychology*, Harcourt, 1935. In a footnote Koffka attributes a similar idea to Wertheimer. This is, of course, also the position of the present volume and of Dodd's companion volume (see Dodd, Ch. 2.) We regard quantitative statements as merely *stated amounts* of qualitative attributes. That is, we regard all qualities as subject to distribution on a continuum in terms of the relative *amounts* of such quality. Under this interpretation, qualitative as well as quantitative aspects may be symbolically represented and manipulated mathematically.

28. Brown, *op. cit.*, p. 4.

29. Waller, *op. cit.*, p. 287.

30. N. Bohr, *Atomic Theory and the Description of Nature*, Macmillan, 1934, Ch. 4, pp. 106, 109, 110.

31. L. Bertalanffy, "Über die Bedeutungen der Umwälzungen in der Physik für die Biologie," *Biologisches Zentralblatt*, XLVII, 1927, pp. 653-662. See also on this subject Hans Müller, *et al.*, *Cold Spring Harbor Symposia on Quantitative Biology*, II, Biological Laboratory, Cold Spring Harbor, N. Y., 1934.

32. P. W. Bridgman, *The Logic of Modern Physics*, Macmillan, 1932, p. 37. "I believe that examination will show that the essence of an explanation consists in reducing a situation to elements with which we are so familiar that we accept them as a matter of course so that our curiosity rests. Reducing a situation to elements means, from the operational point of view, discovering familiar correlations between them."

33. W. Heisenberg, *The Physical Principles of the Quantum Theory*, University of Chicago Press, 1930, Ch. 4, pp. 58–59, 63.

34. S. Hecht, "The Uncertainty Principle and Human Behavior," *Harper's Magazine*, CLXX, Jan., 1935, pp. 237–249.

35. E. Schroedinger, *Science and the Human Temperament*, Norton, 1935, Chs. 2, 3, and 5, especially pp. 59, 64, 66, 131–132.

36. B. Russell, *The Analysis of Matter*, Harcourt, 1927, Chs. 16, 20, 30, 31, 35, 38. J. Dewey, *The Quest for Certainty*, Allen and Unwin, 1930, pp. 28, 191–192, 194, 198, 276. Also his *Logic. The Theory of Inquiry*, Holt, 1938, Ch. 22.

37. See L. K. Frank, "Causation: An Episode in the History of Thought," *The Journal of Philosophy*, XXXI, Aug. 2, 1934, pp. 421–428.

38. Operationally speaking, cause is imputed to the independent variable or combination of variables when it shows a high probability-expectation in its concomitant variations with other factors or combinations of factors, still other supposedly relevant conditions held constant.

39. See E. E. Eubank, *The Concepts of Sociology*, Heath, 1931.

40. See A. Korzybski, *Science and Sanity*, Science Press, 1933. This difficulty has been attributed to the survival of the first of Aristotle's three laws of thought, namely, the law of identity.

41. E.g., R. M. MacIver, *Society: Its Structure and Changes*, Long and Smith, 1931, p. 45. "They seek to apply mechanical methods of measurement to *things whose very nature* they fail to understand." [Italics mine.]

42. Cf. Carnap, *op. cit.*, pp. 29 ff.

43. See the articles by Walter Lippmann in the *New Republic*, XXXII, 1922, pp. 246–248, 275–277; XXXIII, 1923, pp. 145-146.

44. For recent illustration from two separate authors, see *Amer. Sociol. Rev.*, I, Feb., 1936, pp. 55, 75, 78. We have here another illustration of the tendency which I have discussed earlier in the present chapter to mistake the degree of formality of a process for fundamental difference in kind. Thus, the process of defining, especially when numbers are not employed, is not considered a form of measurement. Now, of course, for some purposes it may be useful to distinguish processes purely on the basis of the formality with which they are carried out. But in the present case where the issue involved is whether measurability is a trait, property, or characteristic inherent in phenomena or merely a rather formal and standardized way of responding, the essential operational identification of definition and measurement is of basic theoretic importance. Consider the following concession by Nagel: "Measurement has been defined as the correlation with numbers of entities which are not numbers. . . . But in a larger sense, in a sense to include most of those acts of identification, delineation, comparison, present in everyday thought and practice, numerical measurement is only infrequently used. . . . From this larger point of view, measurement can be regarded as the delimitation and fixation of our ideas of things so that the determination of what is to be a man or a circle is a case of measurement. The problems of measurement merge at one end with the problems of predication." (Ernest Nagel, "Measurement," *Erkenntnis*, II, 1931, p. 313.) Cf. John Dewey, *op. cit.*, p. 202: "What is here significant is that all comparison is of the nature of *measurement*. . . . The only difficulty standing in the way of recognition of the equipollence of comparison and measurement is the fact that the results of many measurements are stated qualitatively, not in numerical terms."

45. W. Waller, *Amer. Sociol. Rev.*, I, Feb., 1936, p. 59.

46. For some suggestions of this character, see A. F. Bentley, *Behavior Knowledge Fact*, Principia Press, 1935, Pt. III.

47. Cf. H. Alpert, "Operational Definitions in Sociology," *Amer. Sociol. Rev.*, III, Dec., 1938, pp. 855–861.

48. Attention should here be called to the present connotations of such words as "attitude," "aptitude," and "skill." As generally used today throughout sociology and psychology they denote hidden, mysterious, and intangible entities rather than observable behavior. This is, of course, another illustration of the tendency to reify words and confuse them with the entities for which they are supposed to stand. Thus behavior of a certain kind is spoken of as *evidence of* intelligence of a certain kind or degree, the implication being that the behavior is merely a *sign* of the article itself. The thing itself turns out to be not further definable. It is a Kantian *ding an sich* or a Platonic "essence." It represents a metaphysical position which is incompatible with the metaphysics of modern science.

49. Nagel, *op. cit.*, p. 320. The basic issue involved in this position is the philosophical dichotomy between intensive and extensive qualities. It may be said at the outset that if one chooses to postulate such a dichotomy as inherent in phenomena, the reasoning leading to the conclusion here under attack regarding the immeasurability, or different logical nature of measurement, in the cases of certain phenomena doubtless follows. But I reject this postulate and accept instead the position of Bertrand Russell (*Principles of Mathematics*, Chs. 6, 69, pp. 164 ff.) and others which regards the extension-intension controversy as a purely conventional dichotomy like all other linguistic and logical constructs and, therefore, subject to modification whenever a modification promises a more adequate approach to the problems involved. Carnap's position regarding the proper function of logic is also relevant in this connection. (The above reference to Russell should not be taken to mean that my position on other matters is necessarily in accord with this work.)

50. Nagel (*op. cit.*, pp. 316–317) makes the excellent point that "it is important to remember, however, that the experimenter, working with marked or calibrated instruments, assumes that the calibrations indicate various qualitative continuities not *explicitly* present. The process of measurement has not been fully exhibited until all those operations of calibration have been noted. When a weight is attached to a spring balance, and the position of a marker on the scale read, only a very small fraction of the process actually necessary to estimate the weight as five pounds has been observed; the operations entering into the construction and *correlation* of scale and spring must be included. It is of the essence of an experiment that it be repeatable. Therefore it is not the particular instrument used any more than it is the unique experiment which has such overwhelming importance in science; it is rather the repeatable process capable of producing the markings on the instrument which is. Every marked instrument implies the construction and existence of some standard series of *magnitudes* [italics mine], correlation with which constitutes the calibration. A wholehearted recognition of this reference of instruments to something beyond themselves, is a recognition that other characters of existence besides the spatial are capable of, and are involved in, the process of measurement."

51. For example, C. Kirkpatrick (*Amer. Sociol. Rev.*, I, Feb., 1936, p. 80) says: "Counting people is measuring population directly by deriving multiples of units which are themselves part of the thing measured." *Units* are *never* part of the "thing" measured. Units are symbols of human response What is counted are symbolized responses to population. To count cells, families, weights, intelligence units, degrees of radicalism, etc., etc., is to make different types of responses to population. But populations can be "measured" in all these respects by counting units appropriate to the type of response involved.

52. For a brilliant chapter on the meaning of "abstraction" and related subjects see A. F. Bentley, *op. cit.*, Ch. 21, "The Visibility of the Social," especially pp. 209–210. See also his Ch. 14 on "Isolationality."

53. In a more recent publication, "The Logic of Reduction in the Sciences," *Erkenntnis*, V, Aug.–Sept., 1935, pp. 46–51, Nagel takes a position quite compatible with that of the present paper, although it does not deal with the specific

problems here at issue. His emphasis upon the selectivity (abstractness) of all responses and, by implication, of all units and terms, may be a necessary elaboration, if not a contradiction, of his earlier view.

54. I am unconvinced by Nagel's criticism of Russell's position with respect to magnitude, namely, that the latter holds magnitude to be not "the ordered relations of and between existences, but as a domain of immaterial entities having no necessary reference to existence." (Nagel, *op. cit.*, p. 323.) Whatever may be the position of Russell in the work cited, I hold that the so-called "immaterial entities," namely, magnitudes, are *responses to something*. It is these responses, symbolically represented, which are subject to the manipulations constituting measurement. We may extrapolate these responses into the "external" world and infer objects, qualities, or other "material" or "real" "things." All the so-called "concrete" actualities are inferred in this way. The mysterious words that lend a certain plausibility to Nagel's criticism above are "existence" and "common essences." Magnitudes, he apparently feels, are not "common essences" whereas pounds (?) are. These terms imply a postulate going beyond that to which science must confine itself, namely, that the only immediate subject matter with which science can deal is human responses.

I find Russell's position, even as set forth briefly by Nagel, correspondingly tenable: actual foot rules are *quantity*, their lengths are *magnitude*. It is only by an ellipsis that two quantities can be said to be equal; they are equal because they possess the same magnitude; and it is improper to say that one of two quantities is greater than the other; what is meant is that the magnitude which the first quantity possesses is greater than that of the second. (*Principles of Mathematics*, pp. 164 ff. Cited by Nagel, *op. cit.*, p. 324.)

Cf. also John Dewey, *op. cit.*, Ch. 11, especially p. 215: "When we apply the word *measure* to pounds, gallons, yards, etc., 'measure' is an elliptic expression for *means of measuring*." For a recent illustration of the confusion here under discussion see Mark May, "Ten Tests of Measurement," (*Educational Record*, April, 1939, pp. 200–220). "If two equal units of water, each having a density of 1, are poured together the density of the resulting body is still 1." (P. 214.) Obviously, two *quantities* of water, the units of *volume* (magnitude) of which are added, cannot be expected to yield an additive result in units of *density*. Only the addition of *density* units could possibly yield such a result. See also Ch. VIII, note 30.

55. C. Kirkpatrick, *op. cit.*, p. 80.

56. See Bentley's revealing analysis of the persistence of the assumption of the "basic," "natural" "existence" of the "individual person," "each assumed to have definite independent 'existence' and isolation, each in his own *locus* apart from every other. Here is direct descent in the mind-language from ancient 'souls,' each alone, face to face with its God." (*Op. cit.*, p. 29.) (See also his Ch. 14 on "Isolationality.") Bentley has also made concrete suggestions as to the type of units that may be basic to sociology. (*Op. cit.*, Chs. 23–25.) I believe that Michael and Adler (*Crime, Law, and Social Science*, Harcourt, 1932, pp. 82, 83) had a somewhat similar idea in mind when they declared that the social environment of man, *not* human behavior, is the proper subject matter of so-

ciology. If so, I think their position is sound but badly stated and subject to misinterpretation. *Environment* cannot be either defined or studied except in terms of *behavior* with reference to some constant. The behavior of the constant is an implicit part of the situation. This is recognized in the illustrations subsequently used by these authors. (*Ibid.*, pp. 84, 85.)

57. Kirkpatrick, *op. cit.*, p. 80. As for the contention that some measures are only indexes of that which is to be measured, this is merely to point out that in cases where we have previously established a correlation between two variables we sometimes find it more convenient to measure the one indirectly through the other. But this process is as practicable with reference to one type of units or phenomena as with another. Any measure of anything can be used as an index of any other measure of any other phenomenon, if the correlation between the two (which has to be first determined in any case) is reasonably constant.

58. It is even questionable whether cultural influences were less important in influencing this calibration than they are in calibrating societal measuring scales. The units of the metric system have nothing in common with units of the English measure. It is probable that present reactions to social phenomena vary from culture to culture more than do reactions to physical phenomena. The reason, however, is that physical science is already in international culture. In prescientific days the physical orientations of different tribes were perhaps no more uniform than their social.

59. For the full details of how scale values are assigned to different statements, see L. L. Thurstone, "Attitudes Can Be Measured," *Amer. Journ. of Sociology*, XXXIII, Jan., 1928, pp. 529–554.

60. In using this illustration I am not here expressing any opinion as to the sociological value of attitude measurement, the validity or relative value of different types of scales, or other methods now employed or any of the other technical points involved. I have confined myself here solely to the *logical validity* of such measurement as a means of describing societal behavior and its logical comparability with other recognized measurement technics.

61. From the technological viewpoint, the most promising beginning along the line here indicated is in my opinion to be found in the work of S. C. Dodd, *A Controlled Experiment in Rural Hygiene in Syria*, Beirut University, and The Oxford Press, 1934, Pt. IV. Also his "A Theory for the Measurement of Some Social Forces," *Scientific Monthly*, XLIII, July, 1936. See also Read Bain, "Die Behavioristische Einstellung in der Sociologie," *Sociologus*, IX, March, 1933, pp. 28–44. For the most comprehensive theoretical outline on a mathematical level, see N. Rashevsky, "Outline of a Mathematical Theory of Human Relations," *Phil. of Sci.*, II, Oct., 1935. An able attempt at systematic sociological theory is L. von Wiese, *System der Allgemeine Soziologie*, 2nd ed., or L. von Wiese and H. Becker, *Systematic Sociology*, Wiley, 1932. For valuable suggestions see also A. F. Bentley, *op. cit.*, and "Sociology and Mathematics," *Sociol. Rev.*, XXXIII, Oct., 1931; F. S. Chapin, *Contemporary American Institutions*, Harper, 1935, Pt. 5; J. F. Brown, "Towards a Theory of Social Dynamics," *Journ. Soc. Psych.*, VI, 1935, pp. 182–213; R. Mukerjee, "The Regional Balance

of Man," *Amer. Journ. of Sociology*, XXXVI, Nov., 1930, pp. 455–460. The ecological approach is especially promising.

62. A recognition of the need of this step is found in the work of a special committee of the Social Science Research Council to define the term "acculturation" and to suggest more systematic research regarding the phenomenon. (See *Amer. Journ. of Sociology*, XLI, Nov., 1935, pp. 366–370. See also D. Young, *Amer. Journ. of Sociology*, XLII, July, 1936, pp. 95–99. See also C. W. Morris "Foundation of the Theory of Signs," *International Encyclopedia of Unified Science*, I, University of Chicago Press, 1938.) "But even without detailed documentation it has become clear to many persons today that man—including scientific man—must free himself from the web of words which he has spun and that language—including scientific language—is greatly in need of purification, simplification, and systematization. The theory of signs is a useful instrument for such debabelization." C. W. Morris, *op. cit.*, p. 3.

63. C. L. Hull, "The Conflicting Psychologies of Learning—A Way Out," *Psychological Review*, XLII, Nov., 1935, pp. 512–513.

64. F. Bacon, *Novum Organum* (tr. by J. Spedding), *The Works of Francis Bacon*, VIII, Taggart and Thompson, Boston, 1863, p. 78.

65. W. I. Thomas, *Primitive Behavior*, McGraw-Hill, 1937, p. 68.

66. See S. C. Dodd, *Dimensions of Society*, Macmillan, 1940.

67. *Ibid.*

68. See Read Bain, "Our Schizoid Culture," *Sociol. and Soc. Res.*, XIX, Jan.–Feb., 1935, pp. 266–276.

Chapter III

FRAMES OF REFERENCE IN SOCIOLOGY

A. THE NATURE OF SELECTIVE RESPONSES

Man's sensory equipment does not permit him to study the whole universe in all its aspects at once. Hence his method of attack has always been to abstract out a segment or an aspect of the known universe in order to facilitate his study of it. The basis of abstracting a given field, or segmenting a total universe is, as we have seen, the nature of the problem or interest that actuates us. We respond to a tree, a forest, or to a whole landscape including both the tree and the forest according to the relationship in which we happen to find ourselves with respect to these objects. That is, our focus of attention is determined by the adjustment which the situation requires. This selective response we call our definition of the situation.

This definition, itself determined by the tensions (adjustment needs) of the organism, in turn determines the categories in terms of which we report our experience. The focus of a camera will likewise determine whether a tree, a forest, or a landscape is photographed. The fact that the last term includes the other two makes it neither a more nor a less useful "real," "existent," or "whole" category than the other two. We pointed out in the preceding chapters that all classifications, categories, or other terms designating objects or behaviors are of this character. The verbal delimitations of the universe which we make to correspond to these selective responses should be thought of, therefore, not as walls of separation, but rather as convenient ways of dealing with the situations that confront us.[1]

We may select aspects of a universe on geographic, historical, biological, or psychological, or any other basis which serves to frame our problems. Thus, naturalists find it convenient to define some universes geographically, both horizontally and vertically, into *regions* and to regard each as a field within which all of the interrelationships relevant to given problems are depicted.

The ecologists' accounts of interdependence of life within each of these areas, horizontally defined, i.e., between geographic regions, are perhaps the best known. Vertically, naturalists also find it convenient to describe distinct strata from the ocean floor or under, to the stratosphere and beyond.[2] Biologists, psychologists, and sociologists frequently abstract fields on the basis of racial-cultural characteristics of the population—language, occupation, technological development—with or without reference to geographic location. The segregation of a field is always with reference to a problem on the part of the investigator rather than on the basis of assumed "natural" fields of data given in the universe itself.

Fields of study cannot be delimitated in terms of *kinds of matter* as is sometimes absurdly attempted. For example, it is sometimes carelessly stated that man is the "social unit" or the special concern of the social sciences, while metals and gases are the special concern of physics and chemistry. But obviously man may be just as legitimate a study for physics and chemistry as for sociology, depending on what aspect of his behavior, i.e., what problem we are interested in. Metals and gases may just as truly come within the purview of sociology for the same reasons, as a glance at monetary treatises or discussions of modern warfare will readily show. Every sample of interhuman behavior may be analyzed physically, chemically, biologically, physiologically, and sociologically.[3] In the same way a field of force as a frame of reference in science is *an abstraction of relevant behavior phenomena, symbolically represented,* which enables us to deal with one problem or set of problems at a time.[1]

B. FRAMES OF REFERENCE

Having selected for study a problem or a set of related problems—an aspect of the universe—we seek to associate these data with what we already know, i.e., incorporate them into our already established habit-systems of response. When the new data or systems are so incorporated our intellectual tensions are released, our curiosity comes temporarily to rest, and we consider the new phenomenon "explained." When new observations are thus related to established associations and habits of thought, these new observations are declared to have "meaning," to be "under-

stood," etc. Our already established habit-systems constitute what is usually called our frames of reference. We come by them as we come by any habits or habit-systems, namely, from the conditionings of all our environments, mainly, the social environment in the case of man. Usually man has a variety of these habit-systems, as a result of the necessarily selective nature of his responses, discussed above. Thus, he will have one habit-system of behavior (including thought) for members of his own tribe, another for all outside groups; one habit-system or frame of reference to which all *human* behavior is referred, another for all other animal behavior, as, for example, in pre-Darwinian days and to a large extent in present-day sociology. With widening experience, it frequently happens that two or more frames of reference which seemed originally mutually exclusive are found to overlap to a considerable degree. That is, it becomes doubtful as to which frame, or system, most adequately fits the phenomenon.[5] This means that the phenomenon may be associated with either habit-system in a way that is felt to be meaningful. On the other hand, the two interpretations may be conflicting and contradictory and, therefore, disturbing and destructive of that integrity, consistency, and balance toward which the organism tends.

The resolution of this tension or imbalance usually consists of the adoption of the framework which encompasses with the least resistance the largest variety of phenomena. This continuous integration of habits and habit-systems constitutes the growth and integration of personality. From this basic tendency of the organism toward equilibrium (i.e., toward its most probable state) is derived the principle of parsimony in science, as well as the search for simple unifying principles, gods, or demons, in all thought-systems. Accordingly, the tendency toward equilibrium involves the development of increasingly comprehensive frames of reference for the accommodation of increasing varieties of stimulations if, as is usually the case, the experiences of the organism throughout life continue to expand.

Categories, words, and symbols of every kind are, as we pointed out in the preceding chapter, designations of selective responses. Frames of reference (ideologies, theories, etc.) are systems of such words representing habits of responding with relative consistency

to varieties of individual stimuli. As Thomas has pointed out, these responses must be interpreted in terms of the organism's definition of the situation.[6] This interpretation will in turn be determined by the situation and the preexisting habit-systems. Every person necessarily functions according to *some* such habit-system or frame of reference unless he has a completely unintegrated or disorganized personality. These habit-systems are in folk language variously called "beliefs," "principles," or "philosophy of life."

C. CLASSIFICATIONS OF THE SCIENCES

If it is agreed that all categories and classifications consist of symbolized selective responses determined by the nature of the problems (tensions) of the organism in a given situation, then the conventional classification of the sciences is also of this character. Delimitation of fields of knowledge has, of course, the same history and practical justification as selective responses of any other kind. That is, man's sensory equipment does not permit him to respond to the whole universe at once. Classifications being of the nature noted above, it follows that they may be expected to change—disintegrate or grow—from time to time. This has, of course, been true of classifications of the sciences. Since Comte first included sociology in a hierarchy of sciences about a hundred years ago, numerous other classifications have been made, and considerable argument has ensued as to the "correctness" of various classifications. Many of these discussions have been mainly a battle for prestige, the older and more conventionally recognized fields, taking a patronizing attitude towards more recent branches of their own traditional domain, which break off and attain an independent status. Frequently, this independent status consists of little more than a separate administrative organization in the universities. Actually, of course, the only significant basis for the classification of the sciences is the problems to which each devotes itself. Since some problems are much more closely related than others in respect to the subject matter involved, degree of development, and equipment needed for their study, groupings of the sciences on this basis will doubtless always be a convenience. It must always be kept in mind, however, that, as we have repeatedly emphasized

above, these divisions should not be regarded as walls of separation in any way indicating a discontinuity of the universe, but merely as convenient devices for orderly division of labor.

From the above viewpoint as to the nature of classification it follows that an unlimited number of different classifications of the sciences might be made, each equally legitimate for any particular purpose that might interest the classifier. For the same reason, we must reject all attempts to make out that any given classification is inherent in nature or is intrinsically determined by the inherent "nature" of the subject matter. We take, on the contrary, the position that classifications of any kind are determined by the reactions of particular organisms, including all their conditionings, to those aspects of their situation which call for adjustment.

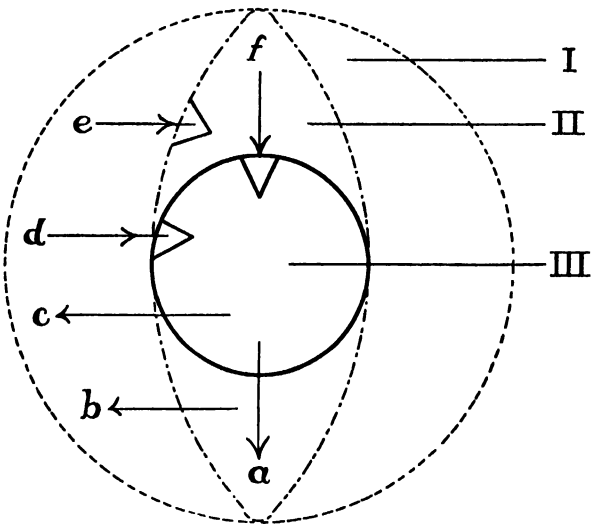


FIG. 1. The Field of the Sciences. I, the domain of Things, the Cosmosphere. II, the realm of Organisms, the Biosphere. III, the kingdom of Man, the Sociosphere. The arrows indicate influences: (a) from III on II; (b) from II on I; (c) from III on I; (d) from I on III; (e) from I on II; (f) from II on III. (From Thomson and Geddes.)

Accordingly, Comte's classification of the sciences in a hierarchy of mathematics, astronomy, physics, chemistry, biology, and sociology was doubtless suited to his own purposes and *as such* we have no objection to it. But his claim that each succeeding stage in the hierarchy depended upon those preceding it for its positive content, and his assumption that this hierarchy neces-

sarily represents a trend of decreasing generality and increasing complexity is, of course, quite incompatible with the point of view here adopted.[7] A more tenable and useful view is to regard the sciences as having developed simultaneously and through interaction with each other, rather than serially in a one-way dependence. As for generality and complexity, the first chapter has already pointed out at some length that these are not inherent characteristics of phenomena but words describing man's response attitudes or manners, and as such entirely relative to the conditionings of the responder.

Much more suitable from our point of view is the preceding diagrammatic representation of the general field of the sciences by Thomson and Geddes [8] (Fig. 1, page 93).

A more detailed outline of the field of the sciences and one which is in every way compatible with our viewpoint is that represented in the accompanying chart from Malisoff. It not

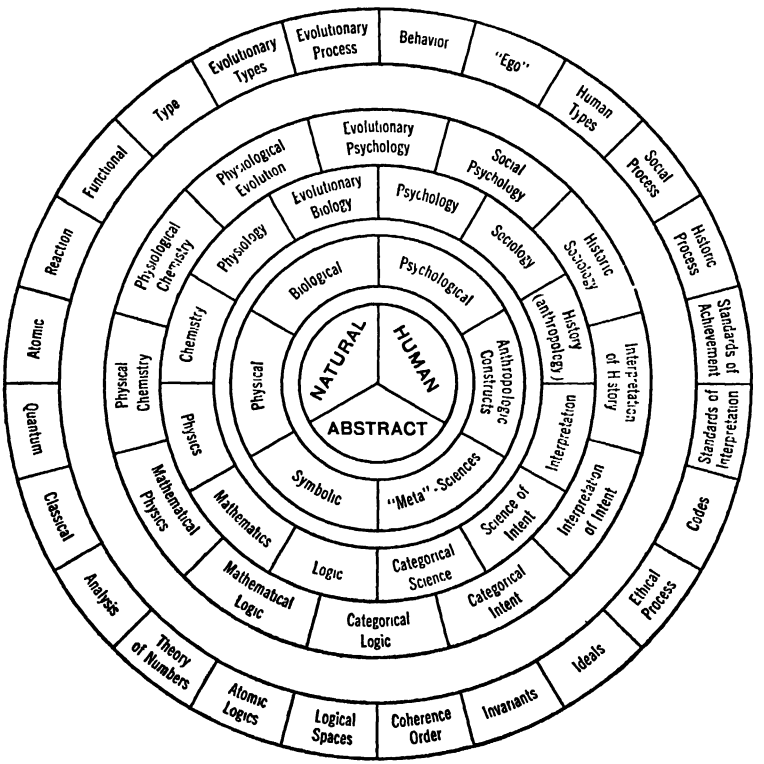


FIG. 2. An Arrangement of the Sciences. (From Malisoff.)

only shows the interrelationship and overlapping of the well-established sciences of today but includes the important feature of indicating probable future developments. This chart is an admirable summary of a subject which has received a great deal of incoherent discussion.[9]

Turning now to the more specific delimitation of the field of sociology, the accompanying chart from Sorokin is a good representation of our view. I am in full accord with the following extract from Sorokin's text accompanying this diagram:

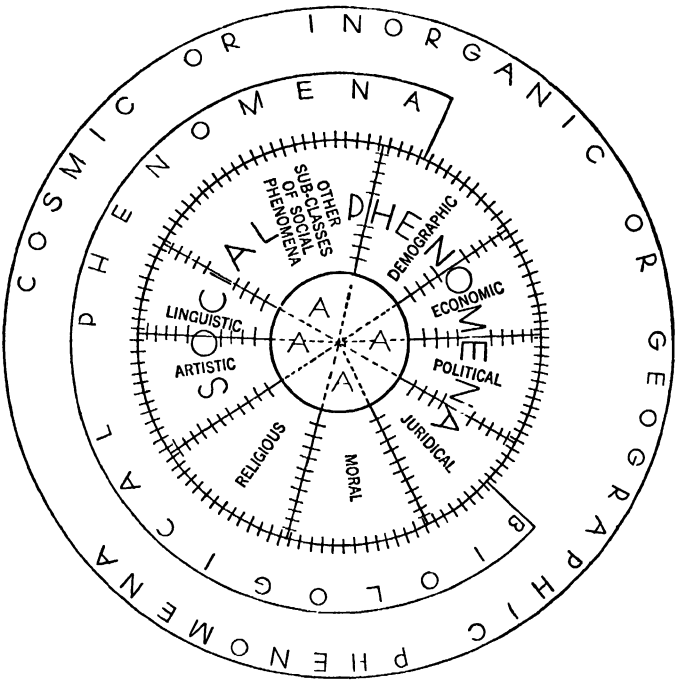


FIG. 3. The Relationship of the Sciences. (A) is the field of general sociology. The areas indicated by cross-hatched lines show the "interstitial" fields of special sociologies. N.B. The division of the whole field of social phenomena into a number of fields of social sciences is only illustrative. (From Sorokin.)

"*Sociology is interested only in those aspects of social phenomena and their relationships which are repeated either in time or in space or in both; which consequently exhibit some uniformity or constancy or typicality.* Historical sciences paint the individual picture of the unique phenomenon studied (a certain person, institution, social object, social constellation of certain conditions); sociology gives either an abstract formula (law) which describes (quantitatively or otherwise) a repeated uniform-

ity (or the degree of variability) in the relationship between two or more societal variables or a *type* as a composite photography of the repeated social phenomena of a certain kind. This difference sharply differentiates sociology from all historical disciplines.

"When this cardinal point is well understood, the nature of general as well as special sociologies becomes easily comprehensible. Under these conditions the task of *general* sociology may consist evidently in nothing but a study of those traits and relationships which are *common to all social phenomena.* To be common to all social phenomena means to be given in any social phenomenon wherever and whenever it exists or to be repeated any time and anywhere where any social phenomenon is given. *Through this subject-matter general sociology radically differs from all the other social sciences.* None of them studies this problem and none is competent to study it, as long as it remains a special social science. Each of these other social disciplines studies only its special variety of social phenomena: economics, the economic variety; political science, the political variety, and so on. But insofar as all these varieties are sub-classes of the same general class of social phenomena, they all must have, side by side with their specific characteristics and relationships, some traits and relationships common to all of them; otherwise they cannot belong to the general class of social phenomena and cannot be styled by a common name of the social sciences. Schematically this can be expressed in the following way. Let the following varieties of social phenomena consist of the following elements and relationships:

economic:	a,b,c,n,m,f,e
political:	a,b,c,h,d,j,p
religious:	a,b,c,g,i,q,r
and so on	

Granting that all the other varieties of social phenomena have the same common elements and relationships: *a,b,c,* these *a,b,c,* would compose the field of general sociology. *An isolation, description, analysis, and classification of these common elements and relationships is the subject-matter of general sociology.* This field is not studied by the other social sciences. . . . If the traits belonging only to one variety are ascribed to the whole class of phenomena (for instance, specific traits of plants to all organisms) the theory will be inadequate or fallacious. If, on the other hand, each special discipline dealing with a special variety of the given class of phenomena would repeat all the traits common to the whole class, the theory would also be inadequate and immensely wasteful from the standpoint of the economy of effort. . . .

"One more remark before I pass to special sociologies. Many people seem to mix the above concept of general sociology with a vague synthetic philosophizing. They think that such a concept of sociology does not make out of it a special science but makes out of it a kind of a 'syn-

thetic hodge-podge' or encyclopedia of all social sciences. I emphatically stress that such a conclusion is utterly wrong." [10]

The characteristics and relationships common to all societal phenomena or social situations are, then, the proper concern of the field of general sociology. It still remains to designate more concretely all the varieties of such phenomena. After further consideration of this subject in a later chapter we shall conclude that interhuman activity (including intrahuman or "inner" behavior which has other people as a point of reference) constitutes the common element of all social situations and is, therefore, the principal general subject of our study. So far, this is merely a formal and tautological definition, for we have said that interhuman behavior is the common element in all social situations, and have then defined social situations as those in which interhuman behavior is present. This is, as we shall show in the next chapter, analogous to the procedure involved in the formal statement of the law of inertia in physics. The statement that if no force acts on a body in motion, it continues to move uniformly in a straight line, is logically and inevitably true if we define force as that which deflects a moving body from its uniform motion in a straight line. The *practical* and operational definition and significance of this law depends upon our ability to construct instruments for the reliable measurement of "force," "motion," and "straight line," in terms of which we can estimate the probability of a certain kind of motion in concrete, observable instances. In the same way, the above definition of social behavior as that in which interhuman activity is present gains practical scientific significance only when this activity is reduced to units in terms of which we can predict the probability of designated types of observable behavior *in concrete cases*. To call attention to this subject matter and to indicate the method by which such prediction can be made will be our principal concern in the rest of the volume. *To work out such predictions for all important types of social behavior* must be the main task of practical sociologists' research as long as man has problems of social adjustment to solve.

If we have succeeded in making clear that the symbols and symbolic systems (including science) with which man designates his reactions to phenomena are of the above nature, that is,

merely convenient man-made maps or coordinates for the correlation of human experiences, an important object will have been achieved. For one thing, it will then be possible to avoid all arguments involving the absolutes of "truth," "falsity," or other metaphysical characterizations of the framework to be proposed. Also, it will be unnecessary to discuss all problems of whether the entities designated by our terms "exist" or not, for we have at the outset postulated the "existence" of that which precipitates the responses designated by the categories and symbols we have adopted. By the same reasoning it becomes unnecessary for us either to deny or to provide a place in our system for all the *words* that have ever been used by other students in other frameworks designating societal phenomena. We do obligate ourselves to provide a place in our system for all communicable observations of societal behavior. In short, we wish to change the level of sociological discussion, as has already been done in the other sciences, from its traditional plane of metaphysical name-calling to the plane of systematic determination of utility.

Do the coordinates (the meridians, parallels, pigeon-holes, map, or verbal framework) of our system provide a convenient set of reference points for the correlation of societal knowledge? Is it a framework which serves to a superior degree the requirements of comprehensiveness, parsimony, objectivity, and verifiability? Does the system offer opportunity for and the means of the extension, refinement, and verification of knowledge through systematic research? Does it promise the induction of laws from which reliable predictions of societal behavior may be made? These are the questions which have interested us in developing the viewpoint and the framework outlined below and developed in Dodd's volume. These are the questions with which our theory should be approached and the points upon which it should be judged.

D. THE SOURCES OF FRAMES OF REFERENCE

We have elaborated above on the thesis that frames of reference, philosophies, or any other such systems whatsoever consist of symbolic behaviors representing the behaver's interpretation of the world in which he lives. As such, frames of reference have the same source as any other societal phenomena, namely, the

more or less formally selected residue of the accumulated experience of the group. In a large society in which a high degree of division of labor exists various groups are likely to be exposed to differing environments and consequently develop differing frameworks to suit their differing experiences. A multitude of barriers, lack of communication, the phenomena of prestige, authority, vested interests, the inertia of habit, and institutionalization usually operate to inhibit the facile adjustments of symbolic frameworks to changing experiences. We shall deal with these phenomena later. At present we are interested only in pointing out that since frameworks of reference are not given in nature but are constructs of man's convenience, man will in the long run select or construct them from the sources and by the methods which his experience has shown to be most useful in the past.

If we survey the various frames of reference which have throughout history been invented and employed by man to order the phenomena of his world, we find a large and conglomerate variety, namely, all the philosophies and ideologies of all peoples and ages. It happens that out of this variety there has emerged by a series of successive changes the framework of modern natural science, the nature of which we have elaborated in the first chapter. The growing dominance of this frame of reference, its viewpoint and method, may be deplored but it can hardly be denied. New problems and new fields will, whether we realize it or not, inevitably be approached by some method that has been found useful in other, however remotely similar, situations. We are, in fact, totally helpless in a new situation unless we can define it in terms of situations with which we are already familiar. Our method of approach must in any case, as already noted, be drawn from the accumulated experience of the ages. That is, if we do not "imitate" the framework and methods of natural science in seeking to further our knowledge of the societal universe, we shall (unless we rely on direct revelation) assuredly imitate the methods of theology, astrology, or some other system or combination of systems that has enjoyed great vogue in the history of mankind.

Under these circumstances it would be strange indeed if social scientists were not increasingly influenced by the theories and

methods of modern science. In fact, the scientific explanation of any phenomenon usually consists of treating a new and hitherto unexplained phenomenon as a special illustration of an older or more familiar process, or law of behavior. If, therefore, we draw upon the present structure of natural science for suggestions for a framework within which sociological phenomena can be most conveniently comprehended, such action should hardly need either explanation or defense.

Nor should it be necessary to explain that this does not mean that we intend to "force" any sociological data into the units of any other science unless the latter serve the purposes of sociology. Every science adopts the categories and the units which best serve its own purposes, but no one has any difficulty in recognizing the common framework, the common rules of logic, and the common tests of validity of all the sciences. Neither does the use of the same mathematical symbols and operations in different sciences constitute "forcing" the data of one into the other any more than the use of the same nouns and verbs in physics and in poetry make these fields the same. No one proposes to put a specimen of society in a test tube for analysis or to measure sociological phenomena with the instruments of the physics laboratory. If we attempt to construct for the measurement of sociological phenomena instruments based on the same logical foundations as those of physics, that is an entirely different matter. This will become sufficiently clear as we proceed.

Having considered at some length the nature of a frame of reference in human adjustments and the process by which these frameworks grow and are formulated, we turn now to an outline of the system we propose for a comprehensive, parsimonious, objective, and verifiable correlation of societal phenomena.

E. THE NEED AND REQUIREMENTS OF SCIENTIFIC SOCIOLOGICAL THEORY

Everyone probably agrees that the backbone of any science is a series of relevant, verifiable, consistent generalizations called principles, or laws. It will probably be further agreed that to attain such a set of principles it is necessary first to formulate a set of hypotheses and second to test them empirically. Does so-

ciology today have a frame of observation, description, and interpretation which can be employed by the great body of investigators in a concerted attack upon sociological problems?

For some years I have examined the annual grist of sociological researches as they are reported. In addition to my interest in the details of method I have had in mind such questions as the following: What hypothesis or theory does this research formulate or proceed upon? What generalization or principle of sociology is more firmly established or is rendered more dubious by the results of this research project? If all these studies had succeeded in achieving their alleged objective, would the verifiable sum total of scientific societal knowledge be increased noticeably? If ten thousand similar studies were made, would our framework of scientific principles be measurably stronger? I am forced to the conclusion that for most of the researches I have seen, the answer to each question would be of a negative character.

This does not mean that these researches have been useless. Frequently they have provided valuable material for public agitation, propaganda, and desirable social reforms. Many have definitely contributed to more intelligent administration of public affairs. All the studies have provided for the most part harmless employment and sometimes desirable training for the people engaged in them. Thus they have been instrumental in redistributing the wealth, which is generally regarded as desirable. The studies have frequently contributed to the entertainment and societal knowledge of the reading public. All of these results are entirely desirable or at least defensible, and so long as they do not demand to be taken more seriously, they should not be criticized for contributing little or nothing to the science of sociology. Nor is it my purpose to make derogatory comparisons between such types of research[11] and that directed avowedly at the advancement of science. But since the latter is generally conceded to be basic in the long run, it is permissible to inquire why so small and doubtful a portion of sociological research is fundamentally scientific.

The main reason appears to be that there exists for sociology no coherent body of scientific theory with reference to which research can be undertaken or evaluated. There is no workable set of postulates to guide and organize research. There is a vast

amount of common-sense generalizations about alleged uniformities in social behavior. In the absence of anything more reliable, even these are useful. But they hardly conform to the requirements of scientific theory. In the first place, if the implicit assumptions underlying this lore are examined, it will be found to consist almost entirely of animistic, anthropomorphic, and theological postulates. This is to be expected since most of this folklore has come down to us from a time when these orientations dominated nearly all thinking. In the second place, both the theories and the generalizations of contemporary sociology are couched in terms which have never been objectively or operationally defined. They are, on the contrary, for the most part of a metaphysical character and not susceptible of empirical test. Finally, the existing theories and generalizations have never been satisfactorily systematized in terms and assumptions compatible with modern science as set forth above.

The need for such systematization has been recognized by all the leading thinkers and all of them have made brilliant attempts in this direction. The works of A. Comte, H. C. Carey, F. Le Play, H. Spencer, L. F. Ward, V. Pareto, and L. von Wiese are important illustrations of man's struggle toward more and more comprehensive frameworks for the correlation of his experiences. The development of new and more delicate instruments and technology of observation, notably in the "physical" sciences, has, it is true, rendered the systems of these men largely obsolete. Consider, for example, the effect upon these systems of the developments in physiological knowledge which forced the abandonment of the instinct hypothesis and the whole attendant super-structure of prebehavioristic psychology. One of the most important by-products of the latter for sociology has been, as pointed out in preceding chapters, a new orientation regarding symbolic behavior and the nature of the processes conventionally included under terms like "mind" and "knowledge." The result has been a desperate attempt to piece together fragments of old sociological systems with the framework of modern science, the dominance of which can no longer be denied, ignored, or kept within a reservation mysteriously labeled "physical." The present system has been formulated largely as a result of this situation.

F. A NATURAL SCIENCE THEORY OF HUMAN SOCIETY

1. The Field-Concept in Science

In the present system we shall regard all societal phenomena from the dynamic point of view as interhuman behavior (including intrahuman behavior which has other people as a point of reference). Following chapters will specify more concretely the content of what we consider societal behavior. This behavior we shall consider as subject to interpretation within the same framework as any other kind of behavior. That is, we shall regard it as *movement within a field of force in time.* Observable manifestations of behavior will be regarded as functions of *energy,* defined here as in other sciences, in terms of measurable amounts of change. The field [12] of force is here, as in other sciences, defined as that segment of the universe which for given purposes of study, with the sensory and symbolic apparatus we command at present, we find it convenient or relevant to define as the situation. The situation always consists of the responding entity and its total environment regarded as a closed system not influenced from the outside. Now the ultimate objective of science, *as science,* is to discover predictable sequences and correlations between the phenomena of the selected field. Accordingly, *the objectives of the present study are (1) to review the field of sociology in order (a) to summarize the better established sequences and correlations in interhuman behavior as far as they have been formulated at present and (b) to suggest hypotheses for further study within the framework here proposed; (2) to develop a framework within which such formulations could be comprehensively established and correlated.* The present volume deals chiefly with the first of these points. Dodd's volume is more comprehensively devoted to the second. Accordingly, only a brief outline of the general theory will be presented here.

The explanation of social groupings and their behavior as groups is generally regarded as the basic problem of sociology. Accordingly, any comprehensive social theory must provide a logically consistent description of this phenomenon. All systematic thinkers on the subject have recognized this need and they have, therefore, usually advanced some generalized principle,

such as gregarious instincts, consciousness of kind, class consciousness, etc. The main difficulty with these theories has been that they have posited within the individual or the group some mechanism, itself unexplained or only implicitly accounted for, by which the observed behavior was to be explained. This approach is in striking contrast to that which physical science has found so useful, namely, that the behavior of any particle or aggregate is to be explained mainly in terms of the structure of the field within which it operates. The swing toward this position in sociology is evidenced by the increasing emphasis upon the situation (of which the individual or the group under consideration is always a part) rather than upon the individual characteristics of the behaving entity.[13]

Geographers and ecologists have given one type of recognition to the situational or field interpretation of social behavior. In fact, the ecologists' concept of a region is a special case of what is here meant by a field. *Region*, as the ecologists use the term, always involves geographic space.[14] The concept of *field* which is of such vast importance in physics also has this implication of geographic space. So thorough is our habituation to this use of the word "space" that we have reified it into an entity which, it is frequently assumed, can be legitimately used only in reference to certain geographic situations and that the use of spatial terms in discussing societal and psychological phenomena is merely figurative. We shall here take the position that all relational thinking tends to structure itself in spatial terms and that the notion of social and psychological space is as valid as the notion of geographic space. Space in mathematics (and in sociology) merely means a manifold (a number of entities related under one system) in which *positional relationships* of any kind may be expressed. The use of spatial constructs in sociological description is, of course, very common as, for example, when we speak of high and low status, social mobility, social boundaries, distance, and barriers.[15] This is as legitimate and useful employment of spatial concepts as is their use in geography, ecology, or physics. Let us review briefly the history of the gradual expansion of the use of spatial or field constructs in the description of societal relationships.

The geographers and ecologists at first emphasized the purely

geographic, structural, and spatial relationships of the community. The mapping and charting of these features admittedly provided a useful framework within which to interpret many aspects of community behavior. Fortunately, the technic of symbolizing on paper such facts as area, direction, topography, channels of communication, land utilization, economic areas, etc., by maps and airplane photographs is widely accepted and understood. There are several reasons for the general understanding of this kind of symbolic representation. In the first place, in its most elementary forms it is a kind of picture-writing. Secondly, the cartographic and photographic types of representation have thus far been applied chiefly to those aspects of the community which are conspicuously incorporated in the so-called material culture, for the objective study of which our technics have always been more highly developed. As a result, we ascribe to those aspects of the community which can be depicted or represented by the simpler cartographic methods a "tangibility," "concreteness," and "reality" which we withhold from aspects for which we have not yet developed objective symbolic technics.[16]

The next step after mere mapping in the process of describing the community was to convert behavior itself into symbolic indexes which can in turn be represented in geometric, isometric, isotypical, or gradient terms.[17] Thus birth, death, disease, and delinquency rates or any other behavior phenomena can be computed for local areas and the relationship of such phenomena to these regions can be shown by lines representing gradients or other geometric devices. A line on the same map representing the declining delinquency rate from the center of the city toward the periphery, denotes a phenomenon just as actual, observable, and meaningful as a line representing the main street. Yet such is the degree of our unfamiliarity with such abstractions as rates, that we feel the line representing the street has a certain "reality," legitimacy, and relevance to the "true" representation of a community which it is felt the delinquency gradient has not. Both types of lines represent both a structural and a functional phenomenon. At present, many of these behavior phenomena have not yet been metricized. Until they are reduced to metric units we may deal with them by topological constructs, or in terms of

symbolic logic, which may be an intermediate step toward metrical statement.[18] The correlation [19] of these various indexes when worked out for *all* the relevant aspects of community behavior would represent all the description and explanation of the life of a community which science can attain. For this description, multiplied and generalized, would say in a more precise and verifiable fashion all that is factually valid in all the wordy and obscure treatises we now have on the community.

The aspect of the community which this approach seems to neglect is the so-called "human" psychological factors of social interaction itself. Hence the next step is to invent objective devices for the representation of these processes which are at present dealt with largely in the language of literature and philosophy.

The transition in the technic of representation from an ecological spot or rate map of delinquency to the organization or functional chart represents merely a transition (a) from geographic to social space representation and (b) from the relatively pictorial technic of the delinquency map to a perhaps more abstract form of symbolic representation of the behavior depicted by the functional chart. That is, the lines in an organization chart do not correspond to roads, railways, etc., in geographic space but represent relationships in social space,[20] such as the relation of the major to subordinate officials, just as a political boundary or a delinquency gradient represents a behavior phenomenon relating two areas of a city in geographic space. In both cases the lines stand fundamentally for behavior phenomena, which are the concern of science. In the same way, purely topological representations or the characters of symbolic logic are merely other literary methods of representing relations. These points are made for the benefit of those who feel that any other language than the customary philosophical terminology of discussing the subtler community relations is "artificial," "cold," "rigid," and lacking in color. All symbolic representation of behavior is "artificial" in exactly the same way. The coldness, rigidity, and lack of color of the topological and mathematical symbolism may be the best reason for its superiority as scientific language. It is, in fact, because philosophical vocabulary is so suffused with subtle and varied emotional tones and meanings that it turns out to be largely useless in scientific discourse and tends to be supplanted

by geometric and other mathematical symbols.[21] It is significant to note how well other sciences get along in explaining the most intricate phenomena without any of the type of language alleged to be so essential in sociology.

The basic assumption of ecologists and others who have attempted to chart the community is that the structures which they depict represent the channels of societal energy (the time-rate of societal change), or the static aspect of the type of behavior we call societal. This assumption also meets the common objection to the ecologists' technic, that it does not portray the dynamic interactions which are the essence of social activity. Just as the trend of development has been from mapping geographic features to the spatial representation of group behaviors of the more obvious (i.e., formally recorded) type, so the next step is to develop technics of representing in their significant relationships the subtler (i.e., as yet imperfectly understood) energy currents or forces that animate and define a community. These patterns are here regarded as existing in social space as well as in geographic space. It has become highly conventional and useful to represent the latter by charts, maps, and other geometric and mathematical devices. The adequate representation of relationships in social space may likewise be greatly facilitated by a kind of sociography, or sociological or cultural ecology.

In short, we use the term "field" in this book as equivalent to W. I. Thomas' "situation," because we want to emphasize that the methods of "field" analysis developed in other sciences are also applicable to "situations." We frequently find it convenient to represent and talk about societal situations in spatial terms. The ecologist defines a *region* as any convenient geographic area within which interaction of its components, organic and inorganic, takes place. Our "field" is a more general construct in that it includes not only such geographic areas or regions but also purely sociological regions which may or may not have definite geographic boundaries. For example, the phenomena which constitute Catholicism and Communism (i.e., the behavior of Catholics and Communists) cannot be adequately bounded geographically but may be meaningfully discussed in social-spatial terms as mutually exclusive fields, at a maximum distance from each other, with mutually impermeable boundaries, and so on. Or the

field may be defined as religion, which might include both of the above, the purpose being to study the relationship of the two. After the field has been selected the problem is to *structure* it somehow so that the relationship of the elements in the field can be most accurately shown. The method of doing this with which we are most familiar is, of course, to name with words certain elements or factors in the situation and then by use of the adjectives and verbs of ordinary language we attempt to give an accurate statement of the relationships within the field. If the field happens to be a simple organism, a picture of its anatomy may be referred to as a frame within which discussion of the relationship of various parts can conveniently be carried on. Frequently however, the teacher finds that a schematic drawing of the anatomy or the nervous system is a more convenient device for throwing certain relationships into bold relief than is an actual anima or a picture of the animal. That is, an abstraction, leaving out al the details except those to which it is desired to call attention communicates the idea more readily. The more elementary diagrams confine themselves to showing relationships of position, symmetry, and size in nonmetrical terms. More refined analysis leads to gradients, potentials, and functional equations, the highest development of which involves metric units. Thus fields may be structured in varying degrees, from mere discussion in folk-terms, or simple diagrams showing, for example, one factor completely inclosed in another to a multi-dimensional system o mathematical coordinates.

Nearly everyone is accustomed to the simpler examples of the above method of analysis and takes its validity for granted. Ye a diagram of the anatomy of a starfish is a symbolic representation or abstraction of a behavior-complex—a situation, a field—just as truly as is a diagrammatic representation of the mutua exclusiveness or other relationships of the two behavior-complexes called Communism and Catholicism. Again, this degree of abstraction is fairly conventional and creates no great objection a a device for the representation of sociological phenomena. Bu if a grid representing mathematical coordinates is substituted fo one of these schematic drawings (e.g., to represent quantitatively gradients or functional interdependence), many people whose symbolic equipment does not extend to this level, begin to fee

worried. They feel that this is getting away from "reality," "leaving something out," "taking the life out of the situation," etc., etc. Doubtless they are right if they mean by reality individual cases and concrete instances in *all* their relationships. Science aims at quite other goals, namely, *certain specified relationships* which are *generally true, within rigidly specified conditions.* The more advanced science becomes, the more abstract it becomes, and yet – the more powerful are the abstractions it evolves. As Einstein and Infield have said: "The simpler and more fundamental our assumptions become, the more intricate is our mathematical tool of reasoning; the way from theory to observation becomes longer, more subtle, and more complicated. Although it sounds paradoxical, we could say: Modern physics is simpler than the old physics and seems, therefore, more difficult and intricate." [22] Although this process consists from one point of view of learning more and more about less and less, yet such is the general validity of the scientist's abstraction that the "less and less" which he abstracts is found practically applicable to more and more.[23]

Familiarity with the symbolism of mathematics and symbolic logic is, of course, growing rapidly and their more elementary applications to sociological phenomena are already common. For example, where *two* types of phenomena vary concurrently, it is quite customary, if they have been reduced to metric units, to plot them on a two-dimensional graph. Such a simple line graph is felt to be a more adequate representation of the co-variation of the two types of phenomena than a "literary" paragraph attempting to describe the fluctuations. Indeed, if the fluctuations are at all intricate they cannot be represented with any degree of adequacy except by the graphic technic. The relationship of the two phenomena may, of course, be further generalized and summarized in the form of a coefficient of correlation or a mathematical equation, which is the goal at which all scientific generalizations aim.

2. Symbolic Representation of Dynamic Relationships

Now the two-dimensional system of coordinates upon which relationships are represented is already so conventional that even the report cards of elementary school children employ graphs to communicate to parents the quality of a child's work in differ-

ent subjects in relation to the norm for different ages. But the limitations of a frame of reference which allows only two variables is apparent to everyone and this limitation has doubtless contributed to the feeling that the method described above has little or no applicability to really involved sociological situations in which the number of factors reacting on each other may be very numerous. More elaborate technics of representation are unquestionably required for such situations and the future of sociology as a science depends on their development. The technics of multidimensional coordinates, matrix and factor analysis have been developed in response to precisely this need.[24] They and others yet to be invented promise to provide these more adequate structures of sociological fields which will make possible a more systematic and refined analysis of the relationships among the components of societal situations.

While these more refined types of analysis contemplate a greater quantification of sociological data than now exists or is likely to exist for a long time, it should not be assumed that the approach is useless as a method of analysis until or unless such quantification has taken place. A great many sociologists, including some who definitely do not share my views on quantification, have resorted to brief symbolic formulas in order to express more concisely alleged societal relationships. Thus Ellwood introduces the formula $C=f(I)$ to indicate that culture is a function of intercommunication.[25] The test of this proposition would presumably involve the correlation of degrees or amounts of culture with degrees of intercommunication and indeed Ellwood submits such data in support of the generalization. But even in the absence of formal units, for the measurement of "culture" and "intercommunication" the statement stands as a generalization to which a good deal of common-sense assent could doubtless be secured. Fairchild finds it convenient to summarize the relationship between land, economic culture, population, and standard of living as follows:[26]

$$\frac{L \times EC}{P} = SL \quad \text{or} \quad \frac{L \times EC}{SL} = P$$

At least two of the factors of the above formulas have not yet been reduced to very definite units, although perhaps most soci-

ologists would admit them to be "measurable." The formulation given by Wiese and Becker is perhaps better suited to illustrate the use of formal symbolization to indicate sociological relationships entirely unquantified as yet. These authors submit the following:[27]

$$P = A \times S$$
$$A = N \times E$$
$$S = B \times A_1$$

in which P = process; A = personal attitude; S = situation; N = native equipment; E = previous experiences; B = physical basis; and A_1 = the attitudes of other participants in the process.

I am not here interested in the validity or usefulness of the above formulas, but only in illustrating that sociologists with a wide diversity of viewpoint on quantification, have nevertheless found it convenient to structure sociological situations or fields in terms of symbols and mathematical constructs involving phenomena as yet entirely unmetricized. To persons entirely unacquainted with even the simple mathematical conventions involved in the above illustrations, these examples would doubtless seem obscure, "dehumanized," and unwarranted. There will doubtless be the same kind of resistance to the unfamiliar in the case of some of the more elaborate but rigorously consistent and systematic formulations contained in Dodd's volume, a brief exposition of which is given below. To select one of his statements at random:

$$\frac{PD}{V} = E$$

in which

P = number of people desiring a specific value;
D = their average intensity of desire for it;
V = the available quantity of that value;
E = societal tension.

That is, if in an election we consider each voter's desire for the election of his candidate as equal and represented by 1, suppose a million voters have the privilege of selecting members to 20 seats in Congress. The situation described in the above formula becomes P = 1,000,000; D = 1; V = 20 $\therefore$ E = 50,000. In short,

we may say that under the conditions stated, the worth of, or societal tension towards each seat is measured by 50,000 of these vote-units. Obviously, if there were only half as many seats available, other factors remaining the same, the tension in terms of vote-units toward those seats would double under the assumptions of the equation. Likewise if P were reduced to 1000, other factors remaining the same, E would obviously be comparatively small, namely, 50. "The worth of an office is thus proportional to its electorate—the mayorship of New York outweighs that of a small town; the Presidency is more striven for than a governorship." [28] Whether the linear relationship among these factors as assumed in the equation actually obtains in given populations or the conditions under which they obtain, that is a question for empirical test. But the equation does formulate *in a form that can be tested* the quite generally accepted generalization (hypothesis) quoted above. *Dodd's formulas are not a substitute for sociological research. They are hypotheses for investigation.* Many of the same problems stated in folk-language are frequently mistaken for established laws.

The great contribution of Dodd's formulations is that they frame the hypotheses (research problems) in rigorously defined generalized terms so that results of different investigations would be cumulative with respect to the particular question under investigation and would also be a contribution to a system. That is, researches would be not isolated rocks in a pile, variously shaped and possibly of great individual excellence, but bricks in a gradually growing wall in which the gaps as well as the congruity and usefulness of the whole structure could be constantly observed. One of the great faults of some of the systems of the past has been the tendency to assume that just because the system was verbally consistent on paper, its verification was unnecessary. For the same reason these systems have usually failed to indicate clearly the methods of research by which verification, modification, or refutation of the system was to be attained. Accordingly, the tendency has been to memorize the system in vogue at a particular time and place and either rest on these hypotheses as conclusions or at most quarrel about their probable validity. Other scientists are constantly rechecking even their well-established laws. Students in these fields spend most of their time learning the methods by which reliable conclusions

have been reached in the past rather than in a mere memorizing of the conclusions. Sociologists will have to adopt that approach, and the present system has been evolved entirely from that point of view. *It is not a set of conclusions but an orderly and comprehensive set of hypotheses in terms subject to empirical test.*

The steps in the construction of a scientific system are the same in any field. A distinguished physiologist has described the procedure as follows: [29]

"The first step in building up the conceptual scheme of a new generalized system is the recognition, by induction, of a sufficiently definite class of phenomena like those classes designated by the terms dynamical system, physico-chemical system, and economic system. This is followed by the discrimination, definition, and choice of the abstract entities, like components, temperature, and pressure, that suffice for the characterization (to a certain approximation) of the system. This choice is limited by observation and experiment; it is determined by observation, experiment, logical and mathematical considerations, and by convenience. The closer the approximation that is sought, the greater, in general, will be the number of abstract entities that must be accounted for. Moreover, if the treatment is to be mathematical, it is necessary to set up mathematical functions or indices like concentrations in chemical equivalents per liter, temperature on the absolute scale, or pressure in atmospheres, corresponding to the chosen abstract entities. . . .

"The finding of the equations for the class of systems is the discovery of general laws (uniformities) that are descriptive of the class of systems, and the appropriate application of these laws in the form of equations. In the case of a particular concrete system, numerical values, for example, a particular mass, concentration, or temperature, or the numerical value of some other particular constant (parameter), have to be introduced. Such equations are commonly spoken of as the conditions. In the more advanced sciences the most general conditions are likely to be expressed in the form of differential equations.

"For the *complete* description of the conditions by means of equations, the results of counting or of measurement are indispensable. Therefore, it may be impossible to set up the equations. *But it is evident that this does not affect the logic.*" [Italics mine.]

It will be noticed that three major steps in the construction of a scientific system are specified above. First, there is the selection of a "definite class of phenomena." This we have done above in the quotation from Professor Sorokin. The second step is the "discrimination, definition and choice of the abstract entities, like components . . . that suffice for the characterization (to a

certain approximation) of the system." This we shall proceed to do in the next section and in Part II. Finally, there is the generalization of the uniformities observed in the behavior of the components selected. We discussed in the preceding chapter the implications of this requirement as regards quantitative methods. But in the meantime it is profitable to describe hypothetically the relationships in nonmetrical mathematical symbols.

The limitations and necessarily tentative nature of the formulations possible in the present stage of sociological development must be clearly recognized. The history of the other sciences suggests the type of developments which we must expect in systems of sociology. But this is no reason for not attempting systematization. In the presence of highly developed systems there is a tendency to forget the long, painstaking, and undramatic labors of the thousands upon whose labors these systems rest. Social scientists are frequently staggered by the task which remains to be accomplished if their fields are to be brought up to a level of other sciences. As a result, they are inclined to regard their field as not amenable to such treatment. We are prone to remember only the dramatic high points in the history of science, which we like to ascribe to flashes of genius. The facts in the history of sciences as in all other examples of high achievement indicate instead a slow and laborious growth. Henderson has summarized the situation admirably when he says:[30]

"The present knowledge of organic chemistry is the accumulated result of countless experimental researches, the equivalent of the work of not less than two or three thousand intelligent and highly skilled specialists working with perfected methods for a lifetime. In the beginning the classification of organic compounds was very simple and inadequate. It is today perhaps the most complex and elaborate classification that exists, and it has reached this condition by a long process of evolution through adaptations to the facts. *Social scientists are prone to overlook such considerations. Yet, there is no reason to doubt that the necessary conditions for the development of any science that deals with complex material are similar. Among these conditions we may recognize (1) an immense amount of methodical, systematic, skilled labor and (2) the use of theories and classifications. The theories are at first crude and the classifications simple, but by adaptation to the facts the theories are refined and the classifications made complex.* . . . [Italics mine.]

"In order to make use of variables, definitions are necessary, and when the facts are very complex, classification is necessary for defini-

tion. Thus, where complex classification is necessary, some provisional classification must, in general, precede the use of mathematics, or even of the kind of logic that the experience of applied mathematics has taught. This is almost intuitively perceived by those who set to work seriously on the facts, but it is not so plain to the onlookers."

3. Requirements of a Natural Science Theory

Having chosen to regard interhuman behavior in its most generalized form as a system of energy operating within a field of force, we next postulate that similarities and differences of characteristics, behavior, intensity of interaction, attractions, and repulsions—imbalances of whatever sort—within this total system determine the direction and the vigor of the flow of this energy. The vigor and direction of the flow of this energy in turn determine the configurations, the structure, the sequences, and the correlations in the behavior of human groups. The similarities and the differences or imbalances which determine the flow of societal energy may be of any kind—social-spatial (status), temporal, (e.g., age), sexual, economic, esthetic, temperamental, developmental, ideational, or any other. Specific behavior of any kind is then regarded as the resultant of all these similarities and differences, attractions and repulsions, as they operate in the delimited field of force (the situation) within which any or all of the factors or components may influence any or all of the others. The central task of sociology is to formulate predictable sequences (principles) of behavior within situations so standardized and defined as to allow the use of these principles in *any* situation whose significant deviations from the standardized situation can be measured.

This last requirement raises several considerations of fundamental importance in science. First, as will be further elaborated in the next chapter, it emphasizes the *generality* or abstractness of scientific principles or laws. They rarely, if ever, describe actual occurrences in uncontrolled nature. They merely provide norms from which individual, actual occurrences can be predicted within measurable probability-expectations, because of the carefully defined (measured) conditions always attached to scientific laws describing the highly abstract and standardized circumstances under which the law holds. Except for this general standardized and abstract character of scientific laws, we should, of

course, require a different law for each event in the universe. Secondly, the necessary generality of scientific laws requires that they be organized into a *system* compatible with each other and in terms of which all the behavior within the field can be described. That is, the system must be comprehensive. At the same time it should involve as few assumptions and basic terms as possible. Such systems afford a minimum of mental conflict and a maximum of convenience as an adjustment technic. Thirdly, a system is needed for the correlation of research so as to make it bear directly and with greatest economy of effort upon the problems (hypotheses) the field presents. Only within a carefully formulated system can cooperative effort as well as orderly verification or refutation take place.

A system requires, as we have said, that certain common factors or components of the selected universe, preferably few, be selected in terms of the variation of which all concrete situations can be described. This has been recognized by all systematizers and such "basic" factors are accordingly present in all systems. Spirits governing specific departments of the universe were basic components of many early systems. In others, a single such spirit endowed with all necessary attributes, is found. In Newtonian physics such factors as mass, time, and space are used as basic factors in terms of which all of the phenomena of a certain aspect of the universe are comprehended. When we turn to the social sciences, we find a great variety of such basic factors proposed. The most popular and prevalent type of factorization among the systematizers of the recent past have been the systems of instincts,[31] interests, wishes, and "residues." In some of these cases the authors labored under the delusion that they were in pursuit of and had discovered "ultimate realities" of some sort instead of convenient hypotheses in terms of which societal behavior could be coherently described. That is, theirs was a thinly veiled search for the historic philosopher's stone which would unlock all the doors to all knowledge.

The increasing pervasiveness of the methods and results of the "physical" and biological sciences, notably the development of behavioristic psychology, has in recent decades rendered the above type of approach untenable and has led to a point of view closely related to and compatible with the system proposed in

the present volume. Thus, Sumner and Keller [32] find in (1) man, and (2) land, two basic factors the ratio of which affords a point of reference for the explanation of much societal behavior. W. I. Thomas' [33] approach in terms of the interaction of *habit systems* (of human groups) to situations (total environment as defined, i.e., selectively responded to, by individuals or groups) represents a more dynamic and useful set of categories in that the emphasis is here on behavior-units. Of great interest from the standpoint of the factors selected in the present study is the formulation of the late Professor Geddes, following Le Play. Le Play held that all the subject matter of sociology could be conveniently organized into three great groups: (1) Folk, (2) Work, and (3) Place, bound together functionally in time and space.[34]

We shall adopt in the present work a set of components closely resembling those of Le Play but worked out independently by Professor Dodd in his *S-Theory* and fully developed by him in a companion volume to the present work. We shall give here only a brief summary of that theory and refer the reader to its full exposition in Professor Dodd's *Dimensions of Society.*

G. THE COMPONENTS OF DODD'S S-THEORY

We select as basic the factors given below because we believe that in terms of these factors, when their relative values are varied, any societal situation can most conveniently be described. Any (human) societal situation implies *people* (of some kind or kinds) engaging in *behavior* (of some kind or kinds) in time and space. An adequate statement of the relevant functional interrelationships of any or all of these factors would, therefore, describe any societal situation or event. The test of the adequacy of such a statement would, of course, be its demonstrable correspondence with empirically observed fact, past, present, and especially future, i.e., the value of the statement in prediction. If description of any societal situation in terms of the functional interrelationship of the above factors can be thus demonstrated, then the formulas of these terms describing such situations would constitute that brief generalized description which it is the purpose of science to provide in every field.

Proceeding on this assumption, Professor Dodd postulates that the essence of all sociological problems and subject matter can

be epitomized in the simple statement that "people's characteristics and environments change." In such a statement we describe social behavior in terms of (P)opulations with certain (I)ndicators of characteristics changing in (T)ime and/or spatial (L)ength. It is the basic postulate of this theory that in the permutations and combinations of these four factors all societal situations and behavior can be described. That is

$$S = (P:I:T:L)$$

It will be readily apparent that the representation of the tremendous intricacy of combinations of these components in the great variety of social situations necessitates that each of the factors be expressed in units and symbols that lend themselves to mathematical manipulation. We have no other symbolic system by which objective expression of relationships of such complexity can even be approached. This raises, of course, the fundamental question as to whether it reasonably may be supposed that the factors in this equation can ever be represented by quantitative symbols. Measures of Population, Time, and spatial Length are already relatively well developed. The main question, therefore, concerns the possibility of ever developing quantitative symbols to represent all the important characteristics of human groups (the objective evidences of societal behavior). Some of the grounds which make such an assumption reasonable have already been set forth in the preceding chapter.[35] Whatever may be the verdict of the future on this issue, the present work assumes this possibility for three reasons: (1) The history and logic of measurement in science as well as the notable advances on sociological measurement during the present century justifies the assumption that societal data are as amenable to quantitative statement as are the data of any other science. (2) The requirements of science leave us no alternative but to work in this direction regardless of what may be the ultimate limits of the attempt. (3) We are more likely to make progress in this important work if we assume it is possible than if we declare it in advance of trial to be impossible on account of *obiter dicta* about the "nature" of societal phenomena.

The bulk of the labor in the advancement of sociology as a science from this point of view lies in the development of the neces-

sary indices of all kinds of relevant social behavior. A great deal of work, most of it within the present generation, has been and is being done in this field. In the absence of quantitative data of any kind, the great systematizers of sociology, such as Spencer, Ward, Sumner and Keller, and Pareto, assembled as extensively as they could all the fragmentary descriptions of social behaviors in different parts of the earth, as revealed by explorers, travelers, etc., and tried to classify and generalize them according to some comprehensive but elementary scheme. These were laudable attempts and upon these data are based most of our broader sociological generalizations at present. Such studies must be repeated by means of constantly refined empirical data organized according to increasingly adequate logical systems, if social science is to advance.

During the last several decades there has become available a great amount of data aiming to describe more accurately the degree to which certain social behaviors occur and the conditions under which they occur to the degree stated. An impressive array of such data has been assembled by Professor Dodd for purposes of developing, testing, and illustrating the approach described above. Some 1500 examples in the form of graphs, maps, formulas, and paragraphs describing quantitative situations were collected representing the fields of Sociology, Economics, Political Science, Anthropology, Education, Religion, and Philosophy. In order to reduce possible selective biases, if a volume was scanned at all, *every* graph, table, etc., in it was included in the collection. Thus the seven chief sociological journals were culled for every available issue for the past ten years, a dozen text books of Sociology, Statistics, and other social sciences, and other representative books, such as *Recent Social Trends*, were similarly covered. Such data are, of course, at present available for only a negligible proportion of all relevant social behavior and even the best of it is highly irregular, discontinuous, and otherwise defective. Nevertheless it affords at least illustrative data indicating the trend of inquiry and enables us to project ourselves for theoretical purposes, as Professor Dodd has done, into a period when such data and indices will be very much more general and adequate than at present. It should be kept in mind that in assembling his samples of data, Professor Dodd has been doing in his own gener-

ation what Spencer and Sumner did in theirs. That is, he has selected from contemporary research material a great variety of samples of human behavior to serve as examples of the types of data which an adequate sociological system must cover. The difference is that while Spencer, Sumner, and others dealt mainly with individual cases, Dodd deals for the most part with groups of such cases, already partly generalized. As this type of data becomes increasingly adequate, increasingly broad and comprehensive, as well as increasingly accurate, generalizations will be possible.

The present volume embodies the same general point of view as Professor Dodd's without attempting to introduce the more rigorous symbolism in terms of which societal behavior will ultimately have to be described if that accuracy and verifiability which science insists upon is to be attained. In short, it is the purpose of the present volume to deal with the conventional subjects of present sociology from the point of view stated in these first three chapters, as a transition or introduction to the more rigorous formulations of Professor Dodd. The theoretical position of the present volume does not depend for its validity upon *any particular* components or formulations, including those advanced by Dodd. A number of different formulations might be quite compatible with the viewpoint we have defended. But because Dodd's system represents the most comprehensive attempt of the *type* here contemplated, we shall make frequent reference to it as an illustration of what our viewpoint involves.

H. CONCLUSION

We have noted repeatedly in these introductory chapters, that man reacts selectively to the universe according to the condition of the organism in relation to the situation in which it finds itself at a given time. These selective responses when symbolized become the words, sentences, categories, classifications, and formulas with which we describe and explain our universe. They range from the symbols for an individual experience of the most isolated sort to the classification of the sciences and to theories of the most comprehensive scope. These symbolic frames of reference constitute habit-systems according to which we order our responses.

In the second place we noted that relational thinking tends to structure itself in spatial terms. We find it convenient to discuss segments of the universe within a frame conventionally called a "field" in some sciences and a "situation" in sociology. Thus the sociological field is a space within which, for convenience of study, we assemble all the phenomena relevant to the explanation of a specimen of societal behavior, regardless of the diffusion of these phenomena in geographic space. These sociological fields or situations, being themselves frames of reference, are delimited by the same process of selective responses, as mentioned above. A field or a situation is delimited by the adjustment-needs of the observer. That is, all behavior is relative to the behaver's definition of the situation. The symbols in terms of which he makes that definition and his reactions to the situation as defined in these symbols constitute the data for sociological study. It follows that the "field" as defined above then includes not only the geographical area and other people, but also all the symbols and symbolic behavior representing gods, demons, taboos, beliefs, and ideologies of everybody in the field.[36] The fact that these latter items can be observed or inferred only as and through symbols, and in the behavior of people toward these symbols in no way makes them any less vital or "real" from the scientific standpoint. That is, they are items which must be taken into consideration in explaining a given specimen of societal behavior. The gods and the demons are obviously from this point of view in some situations quite as important as policemen and priests in other situations, and hence the former as well as the latter must be dealt with as objective data by sociologists.

Nor do these "cultural," "symbolic," "imaginary" entities represent any special problems because we can deal with all of them in science only symbolically. In sociology, the policeman and the priest as well as the gods become data for science only in their symbolic significance. Their meaning has to be inferred from the behavior of people toward whatever exites their behavior, whether this stimulus be people in uniforms, graven images in stone, totem poles or words. *Symbols representing these meanings as inferred from behavior* are the data of sociological science. (Other sciences may deal with the symbols representing height, weight, and metabolism of policemen and priests.) By overlook-

ing this essential fact, namely, the symbolic nature of the immediate data of all science, the impression of a fundamental difference in the "nature of the subject matter" of different sciences has been created resulting in an unfortunate neglect in some fields of the powerful methods developed in others.

In the third place, we have noted that one of the scientist's principal problems is to develop a set of symbols in terms of which he can analyze and synthesize the field he has defined. At first he relies on oral symbols consisting of animistic, metaphysical, poetic, and philosophical words. But relationships and situations which are at all complex simply cannot be communicated with any degree of objectivity or accuracy through the spoken word. Science depends almost entirely on written symbols. The relationships and descriptions which scientists wish to communicate are frequently much too complex to be matched in a succession of acoustic stimuli. Consequently the quest is for written symbols which provide an enduring instead of a fleeting stimulus, and offer possibilities of arrangement that cannot be communicated in oral language. In the course of this development we develop rude pictorial or topological representations, i.e., depictions of relationships of connection or position, without metric implications. Geometric, arithmetic, and algebraic ways of expressing relationships usually come with the maturity of every science. The advantages of the latter type of symbol have been pointed out above and in a previous chapter. The more intricate and variable is the situation we wish to describe the more dependent we become upon mathematical systems of symbolization.

Sociology has for some time felt this need. To begin with, this trend took the form of an extensive swing toward the simpler statistical methods in restricted fields where statistical units and data have existed for some time. More recently much work has been done in the development of measuring instruments adapted to societal phenomena hitherto unmetricized. With the rapid developments in this field, the time is ripe for the systematization of the whole field of general sociology in quantitative symbols which, however unique the subject matter to which they refer and however unmetricized as yet some of these phenomena may be, can nevertheless be manipulated according to the already

established and tested rules of mathematics. To this task Dodd has addressed himself in his *Dimensions of Society.*

It will doubtless be observed that in the approach here proposed, in the employment of such terms as fields of force and energy, and especially in the attempt to quantify sociology, we are "imitating" the "physical" sciences. If this statement means that we have been influenced in adopting this approach by its conspicuous success in other sciences, we are, of course, glad to admit such influence. If the coincidence and analogies between the approach here proposed and, for example, the terminology of physics were introduced as *substitutes* for sociological hypotheses and their verification, or as proof of sociological principle there would be legitimate objection to such procedure. But if no such claim is made for them, if they are introduced to stand on their own feet as useful frames of reference for sociological investigation, then the mere *coincidence* that they are also found useful in some other science can in no way be urged as an objection to them, but rather the contrary.

There is no more vicious error present in contemporary sociological thinking than the implied or explicit assumption that the introduction or adaptation of concepts and categories from other sciences constitutes *prima facie* invalid procedure. As a result we not only cut ourselves off from sources of most fruitful hypotheses, but also misguide students into historical and philosophical blind alleys instead of providing them with the technical equipment upon which all modern science relies for verification of its theories. Everyone agrees that the only criterion a scientist needs be concerned about in the development of his theories, methods, and units is their suitability for his purpose. The adoption or adaptation of concepts or methods from other sciences insofar as we find them useful in sociology proceeds entirely from this freedom and flexibility of choice. It is the barring of this "imitation" which constitutes a violation of the principle that data should be organized into *whatever* categories best serve our purposes.

Those who deplore the tendency in the social sciences to "imitate" the other natural sciences overlook that the alternative is to "imitate" some other system of philosophy, theology, or metaphysics. Unless it is assumed that theories come to us through out-

right revelation, it must be assumed that they come from the accumulated experience of man's life on the earth. Science and scientific methods represent the most generally applicable and reliable residue of that experience. Scientific methods are to an increasing degree accepted as the criterion with respect to which the reliability of all knowledge is gauged. As such, the influence of the other sciences upon sociological thought is not only inevitable but highly desirable.

A certain apparent respectability is imparted to this caution against "imitating" the other sciences by the logical legerdemain of introducing historical cases of such copying, the results of which are no longer valid. What is overlooked is that it was the heavy reliance of Comte, Spencer, and Ward on the concepts of other sciences, *even such as there were at that time*, which made possible the generally conceded contributions of these men. Inasmuch as the physics, biology, and psychology of their day have since undergone revolutionary modifications, it is not to be wondered at if their sociological formulations based on pre-Einsteinian physics and pre-functional behavioristic biology and psychology do not appear to have great utility for present day sociologists. The important fact to bear in mind is that the other sciences, imperfect as they were at the time, still provided an orientation for sociology vastly superior to the then existing methods of talking about societal phenomena.

But there is no need here to enter into an appraisal of the validity of any physical analogies whatsoever, either of the past or the present. No analogies whatever are introduced in this volume to prove a single generalization about societal behavior. What is sought is a set of concepts, categories, and symbols with which to construct a frame of reference within which rigorous logical manipulations of observed facts can be carried on. These concepts, categories, and symbols must be drawn from the best adapted language we have thus far devised for such purposes. If, in casting about for such terms we find various concepts of modern physics, biology, or astronomy, relatively well-adapted to our problem as compared with terms drawn from primitive folklore and ancient philosophy, it should require no apology if we adopt the former. Since the justification for any selection of terms, symbols, and hypotheses which we do make will rest upon the

results we get with them, the question of their origin is simply irrelevant.

It may be pointed out in passing that most of the objections to the use of the terminology of other sciences in sociology is simply a reflection of the unfamiliarity of sociologists as to the meaning of these terms even in the sciences where they are admitted to be useful. The delusion is still widespread in sociology that such terms as, for example, atom, electrons, or quanta, energy, force, etc., are small pieces of rock or explosives, or matter of some kind instead of merely words representing convenient observation units of *any* subject matter.[37] In short, if the word atom in the English language means merely an elementary unit of observation, it is as proper for us to use it in sociology as in chemistry. The same can be said for terms such as "satellite" and "constellation" as employed frequently in sociology. They stand not for subject matter but for behavior-relationships. Indeed, it is not only proper to adopt such terms, but necessary for intelligible communication with other scientists. The scientific illiteracy of some contemporary sociologists is hardly sufficient reason for not adopting such parts of the symbolism of other sciences as we find useful, instead of painfully traversing the same ground that they have adequately covered, on the theory that since other scientists find these terms useful, they must *ipso facto* be useless or dangerous in sociology. We have not advocated the opposite procedure as a blind rule, but merely as a permissible step when it serves our purposes.

Finally, critics may remark that in the above terminology and theory we are saying in new terms only what more conventional discussions of the community also say. We have no objection whatever to having it demonstrated that our descriptions in the new terminology coincide with some formulations which other scholars from Aristotle to Cooley have advanced. Indeed, we fully anticipate that this will be found in large degree to be the case. The difference, however, will be that with operational definitions of the concepts and processes described by these men and especially with the mathematical manipulations which these concepts lend themselves to, *demonstration* and *verification* of these theories, and their more rigorous formulation in terms of degree will be possible. On such a foundation, an indefinite extension

and growth of sociology might ensue instead of a constant sterile repetition of the pronouncements of seers of the past.

It cannot be emphasized too earnestly that the impasses of science are nearly always solved by a departure from the accepted categories and frames of reference. This does not mean that the existing data or principles are abandoned or destroyed. They merely become special cases of the broader theory and are translated into the new categories required by the new theory. In approaching sociological phenomena as here outlined, we do not propose to ignore any significant observation of community life which previous students, whether ancient or modern, have made. We merely propose to translate these observations into a set of concepts and symbols which lend themselves to a representation of the true position of our observations in a complex so intricate as to be impossible to represent adequately in the language of folklore.

I. NOTES

1. See Ch. II, note 12.

2. See W. C. Allee, *Animal Life and Social Growth* (Williams and Wilkins, 1932, Ch. 2), for such descriptions.

3. For further elaboration of this subject Ch. I, Sec. C, 3. Also Ch. VI, Sec. E, and note 29. My position is that it is the type of man's reaction rather than any intrinsic characteristics of phenomena which determines their classification as "cultural," "physical," etc. Very roughly speaking, phenomena which are recognized as human or interhuman behavior and/or the products of such behavior are called "cultural." Which phenomena are reacted to in this special way varies greatly, of course, according to circumstances. But to try to determine whether a phenomenon "really is" a cultural object regardless of anybody's reaction to it, is the kind of metaphysical nonsense I have attacked in the first chapter. (For a revealing summary of such attempts see Albert Blumenthal, "The Nature of Culture," *American Sociological Review*, I, December, 1936, pp. 875–893.)

4. The concept of a field of force as applicable to societal situations will be further elaborated in the subsequent text. See especially Sec. F of the present chapter and Chapters VI and XII. The following description of what constitutes a "field" and a system in another science is illuminating:

"An important characteristic of many of the natural sciences is the concept of a system, for example, the solar system. In order to fix our ideas, we may consider Willard Gibbs' generalized description of a physico-chemical system, which is the basis of a famous contribution to theoretical science that has stood the test of a half century of criticism and use. A physico-chemical system is an isolated material aggregate. It consists of components, which are individual sub-

stances, like water or alcohol. These substances are found, singly or together, in phases. Phases are physically homogeneous solid, liquid, or gaseous parts of the system: for example, ice, or a solution of alcohol in water, or air. The system is further characterized by the concentrations of the components in the phases, by its temperature, and by its pressure.

"The reader should note that this description of Gibbs' physico-chemical system is too brief to be rigorous. In particular, a more careful statement of the nature of components and more precise terminology with reference to concentrations are necessary for precision. . . .

"Gibbs' system is plainly a fiction, for no real system can be isolated. Nevertheless, a close approach to isolation, as in a thermos bottle, is possible. So results are obtained and then extended even to systems that are far from isolated. Also, the enumeration of the factors, i.e., concentrations, temperature, and pressure, is incomplete. But it is ordinarily necessary to consider at least these three factors, and sometimes no more need be considered. In other cases the consideration of other factors, like those involved in capillary and electrical phenomena, cannot be avoided. Sometimes, however, such considerations may be introduced after the first analysis in the form of 'corrections.' Finally, the concept is often irrelevant; for instance, the consideration of a watch as a physico-chemical system would be a waste of time.

"It need hardly be said that such apparent defects are in truth consequences of very real advantages. They are but signs of the well-chosen simplifications and abstractions that make possible a systematic treatment of complex phenomena. This instrument that Gibbs has put in the chemists' service has immeasurably advanced the science of chemistry: it has clarified, directed, and economized the thought of all chemists. It enables us to understand, for example, refrigeration, the manufacture of steel, and the respiratory function of the blood.

"The central feature of Pareto's General Sociology is the construction of a similar conceptual scheme: the social system. This possesses many of the same logical advantages and limitations that are present in the physico-chemical system. Pareto's social system contains individuals; they are roughly analogous to Gibbs' components. It is heterogeneous (cf. Gibbs' phases), for the individuals are of different families, trades, and professions; they are associated with different institutions and are members of different economic and social classes. As Gibbs considers temperature, pressure, and concentrations, so Pareto considers sentiments, or, strictly speaking, the manifestations of sentiments in words and deeds, verbal elaborations, and the economic interests. Like Gibbs, Pareto excludes many factors that are important in special cases, but he too has demonstrated that he can do much within the limitations that he has chosen, and that such limitations are necessary." (L. J. Henderson, *Pareto's General Sociology*, Harvard University Press, 1935, pp. 10–11, 15, 16.)

5. Consider, for example, the present situation in physics regarding the wave theory and the corpuscular theory of light. See A. Einstein and L. Infeld, *The Evolution of Physics*, Simon and Schuster, 1938, p. 278.

6. W. I. Thomas, *Primitive Behavior*, McGraw-Hill, 1937, p. 8.

7. In taking this view, we are not forgetting the position we have taken in the first chapter with respect to the unity of scientific method regardless of the subject matter to which it is applied. We agree that within the scientific framework and for most general purposes all observable behavior must be regarded as consisting of transformations of energy whether the behavior takes place in a test tube, a gasoline engine, an organism, or in the United States Senate. Now the sciences that deal with the subject of energy-transformation in its most general form might from this point of view be regarded as fundamental to those sciences which deal in a more restricted way, that is, with special types, forms, or cases of energy transformation. It is unquestionably of advantage to workers in the more restricted fields to know the more general laws of energy transformation (and *vice versa*) and as a matter of fact, all workers in the more specialized fields probably do have such knowledge, however informally they have come by it and however unaware they may be of possessing it. This is the knowledge they refer to and summarize as the "nature" of the behaving entity. Even if we reduce a phenomenon to atoms, electrons, or quanta, we have to say in the end that it is the "nature" of quanta to behave as they do. But it does not follow that the phenomena of special fields must be reduced for purposes of the special field to the most refined and abstract formulations of atomic physics. (An excellent discussion of the reductionist fallacy will be found in Read Bain, "The Concept of Complexity in Sociology II," *Social Forces*, VIII, March, 1930, pp. 374 ff. For a good statement of an opposing viewpoint, see M. King Hubbert, "The Place of Geophysics in a Department of Geology," American Institute of Mining and Metallurgical Engineers, Technical Publication No. 945 (1938).) On the contrary, this would frequently be no explanation at all of some questions to which answers are desired. A thorough understanding of the physics of all the motions involved in the behavior called marriage would not constitute the type of explanation of this phenomenon which the sociologist desires and needs in order to make societal predictions. Some phenomena are explained through analytic procedures involving breaking it up into parts, components, or factors. Others are just as truly explained through synthetic procedures involving the placing of a part in a larger scheme. Which procedure we adopt in a given case depends entirely upon the problem (the nature of the tension) with which we start out.

This question arises most frequently in sociology in connection with its alleged dependency upon psychology. Pursuing a mystical notion of "causation" and "explanation," a large number of sociologists have been at one time or another smitten with the notion that to "explain" sociological phenomena they must "reduce" them to psychological phenomena, which must in turn be reduced to biological, then to physico-chemical terms, and then (presumably) back to God, the craving for whom is doubtless at the bottom of the quest for this type of "cause" and "explanation." (For a philosophical discussion of the subject see E. Nagel, "The Logic of Reduction in the Sciences," *Erkenntnis*, V, Aug.–Sept., 1935, pp. 46–51.) The viewpoint still has some adherents and the question occasionally recurs in discussions regarding the "group fallacy" which we shall mention in a later chapter. In the meantime, as "physical" scientists themselves

are becoming more aware of the nature of their own explanations and more modest about its "ultimate" nature, it is being realized that the only explanation known in science is conceptualized description and that this may be as complete and objective on the sociological level in sociological terms as any formulation of physics or chemistry. An accurate statement of all the *sociological* conditions under which marriage occurs with a stated degree of probability is as full and scientific an explanation of the *sociological* aspect of this phenomenon as the statement of all the physico-chemical conditions attending a given type of explosion is an explanation of the physico-chemical aspects of the latter phenomenon. But an explosion may have sociological aspects which would in no way be explained by the physico-chemical analysis. Both types of events may be analyzed indefinitely from all points of view, i.e., in all their aspects. But explanation is not an absolute. It is always and entirely relative to the question we want answered. If that question is in sociological terms the answer must also be in these terms. The particular explanation which we desire in a given case will vary with the specific problem we have in mind. The latter will vary according to what we already know. An explanation which fully satisfies a child will frequently not satisfy an adult. Explanations of the cosmos and of man's origin which were regarded as entirely satisfactory at one time do not satisfy today as explanations. In short, we need not look for final or eternal explanations of anything. What constitutes an explanation will always be relative to the inquiring organism, and the frames of reference within which that organism is accustomed to function. Explanation is, therefore, a word we use to describe our feeling when some new phenomenon has been classified under some already familiar category so that our curiosity regarding the former comes to rest. It is not a mysterious key lying hidden somewhere in nature which if we "search" diligently we may "discover" and then know the "true" explanation of a phenomenon for all time. (See also note 3, Ch. I.)

8. J. A. Thomson and P. Geddes, *Life: Outlines of General Biology*, Harper, 1932, II, p. 1240.

9. W. M. Malisoff, "Arranging the Sciences: I. An Experiment," *Philosophy of Science*, IV, Apr., 1937, p. 263.

10. P. A. Sorokin, "Sociology as a Science," *Social Forces*, X, Oct., 1931, pp. 23-24. (Chart on p. 26.)

11. For one thing, the scientific theory which I have said is desirable, must itself be drawn from the accumulated experience of the race, the bulk of which must always be in the form of largely unrelated records of local adjustments made for immediate purposes. I am not deploring this type of research or advocating its abandonment. This reservation is all the more necessary here on account of the current practice in sociological discussion of assuming that if a person advocates some one approach he is *ipso facto* against all others. I therefore categorically state that, while the present volume confines itself to the conduct of systematic research directed by integrated theory instead of isolated and vagrant hypotheses, I also warmly favor (1) random observation, (2) systematic exploration, (3) testing of isolated hypotheses, and (4) any procedure whatever which yields results relevant to human adjustments. Under the limitation of

certain definitions, I may be compelled to call all of these alternative procedures unscientific or nonscientific. But this is not necessarily a derogation of them. (I have elsewhere elaborated this subject; see "Is Sociology Too Scientific?" *Sociologus*, IX, Sept., 1933, pp. 298–320. For an excellent discussion of the criteria of science as compared with *other forms of knowledge*, see also J. Michael and M. Adler, *Crime, Law, and Social Science*, Harcourt, 1932, pp. 44–76.)

12. See the excellent discussion by J. F. Brown ("On the Use of Mathematics in Psychological Theory," *Psychometrika*, I, March, 1936, pp. 79–82) of the concept of the psychological field which applies equally well to the sociological field as here used. See also note 20 below, and Ch. XII, note 1.

"There is always a *field* in which observations of *this* or *that* object or event occur. Observation of the latter is made for the sake of finding out what that *field* is with reference to some active adaptive response to be made in carrying forward a *course* of behavior." (John Dewey, *Logic. The Theory of Inquiry*, Holt, 1938, p. 67.)

13. This is a position which has been much emphasized in recent years by Gestalt psychologists, although they have shown a tendency to make fallacious assumptions regarding the nature of the "situation as a whole." (See G. A. Lundberg, "Quantitative Methods in Social Psychology," *Amer. Sociol. Rev.*, Feb., 1936, pp. 44–50.) The position has also been emphasized for some decades by sociologists, e.g., in the writings of W. I. Thomas and L. L. Bernard. A brief statement of the field-theoretical position here taken will be found in G. A. Lundberg, "The Demographic and Economic Basis of Political Radicalism and Conservation," *Amer. Jour. Sociol.*, XXXII, March, 1927, pp. 724–725 (footnote). See also S. A. Rice, *Quantitative Methods in Politics*, Knopf, 1928, Chs. 1–3. For a fuller application of the theory, see G. A. Lundberg, "Public Opinion from a Behavioristic Viewpoint," *Amer. Jour. Sociol.*, XXXVI, Nov., 1930, pp. 387–405. By far the fullest and ablest exposition of the theory as well as applications of it to sociology will be found in J. F. Brown, *Psychology and the Social Order*, McGraw-Hill, 1936.

14. Cf. R. Mukerjee, "The Regional Balance of Man," *Amer. Jour. Sociol.*, XXXVI, Nov., 1930. "Perhaps the most important contribution of ecology is the idea of the region as an intricate network of interrelations. . . . In the older sociological speculation man was treated as a part of nature, but in a frankly deterministic fashion; his plans and endeavors were conceived more as extraneous forces than as phases of the ecologic complex interwoven with the rest of the environment. Man is part and parcel of the process by which the balance of the region is maintained or shifted. . . ." (Pp. 455–456.) Cf. also A. F. Bentley, "Sociology and Mathematics," *Sociological Review*, XXXIII, Oct., 1931, pp. 45–107, 149–172.

15. See Ch. VIII, Section C, for elaboration of this point.

16. For a development of this position, namely, that tangibility, concreteness, etc., are not characteristics inherent in data but merely words describing the degree to which we have developed objective symbolic technics of dealing with such data, see G. A. Lundberg, "The Thoughtways of Contemporary So-

ciology," *Amer. Sociol. Rev.*, I, Oct., 1936, pp. 703 723. See also A. F. Bentley, *Behavior Knowledge Fact*, Principia Press, 1935. Chs. 19, 21.

17. See C. R. Shaw, *Delinquency Areas*, University of Chicago Press, 1929. Elsa S. Longmoor and E. F. Young, "Ecological Interrelationships of Juvenile Delinquency and Population Mobility," *Amer. Jour. Sociol.*, XLI, March, 1936, pp. 598–610.

18. See J. F. Brown, *Psychology and the Social Order*, McGraw-Hill, 1936, pp. 476 ff. Also K. Lewin, *Principles of Topological Psychology*, McGraw-Hill, 1936, Pt. II; and especially Dodd's *Dimensions of Society*, Macmillan, 1940.

19. The term correlation is here used in its broadest sense. See G. A. Lundberg, "Quantitative Methods in Social Psychology," *Amer. Sociol. Rev.*, I, Feb., 1936, pp. 41-43. See also Ch. II, Sections C and D.

20. We use the term "social space" in the Riemannian sense, i.e., as a mathematical (geometric) construct defined as a manifold in which positional relationships of *any kind* may be expressed. From this point of view we may employ spatial constructs to depict relationships quite independent of direction or distance. These may be relationships of connection, position, or any other properties of a qualitative, nonmetrical nature. According to Riemann, spaces may be constructed of any dimensions and properties provided they are logically consistent. He also showed that the properties of a space may be dependent upon the dynamics of processes within that space. Topology, as the geometry of such spaces, may therefore be of great importance to sociology as a solution of the controversy over quantitative *vs.* qualitative methods. That is, qualitative (as yet nonmetricized) relationships may through topological constructs be rendered about as objective as quantitative or metrical constructs. If so, present objections to qualitative operations and terms would disappear. The use of spatial constructs and terms with reference to social relationships is, of course, very ancient and merely reflects the fact that relational thinking tends to structure itself in spatial terms. (Cf. J. F. Brown, "On the Use of Mathematics in Psychological Theory," *Psychometrika*, I, March, 1936, pp. 77–90. See also P. A. Sorokin, *Social Mobility*, Harpers, 1927, Ch. II, for a good nonmathematical statement of the same point.) Algebraic description should, of course, supersede the geometric as soon as possible.

21. As an illustration of the ambiguity of the language used in current sociological discussion see my discussion, *Amer. Jour. Sociol.*, XLII, March, 1937, of an article by H. E. Jensen and Mr. Jensen's reply, in which he insists that his article means to him exactly the opposite of what it means to me. For another conspicuous illustration see the controversy between John Dewey and R. M. Hutchins, in *The Social Frontier*, III, Feb.–March, 1937.

For an excellent brief treatise on the nature of mathematical expressions, their importance and the impossibility of translating some of them into folk language or of making them vehicles of "intuitive understanding," see R. Carnap, "Foundations of Logic and Mathematics," *International Encyclopedia of Unified Science*, I, No. 3, especially pp. 44, 47, 60, 64–69. See also L. Bloomfield, "Linguistic Aspects of Science," *ibid.*, No. 4.

22. Einstein and Infeld, *op. cit.*, p. 226.

23. C. H. Cooley seems to have had some such thought in mind when he said: "There is no way to penetrate the surface of life but by attacking it earnestly at a particular point. If one takes his stand in a field of corn when the young plants have begun to sprout, all the plants in the field will appear to be arranged in a system of rows radiating from his feet; and no matter where he stands the system will appear to centre at that point. It is so with any standpoint in the field of thought and intercourse; to possess it is to have a point of vantage from which the whole may, in a particular manner, be apprehended. It is surely a matter of common observation that a man who knows no one thing intimately has no views worth hearing on things in general." (C. H. Cooley, *Human Nature and the Social Order*, Scribners, 1902, p. 117.)

24. See, for example, L. L. Thurstone, *Vectors of Mind*, University of Chicago Press, 1935.

25. C. A. Ellwood, *Cultural Evolution*, Century, 1927, p. 261.

26. H. P. Fairchild, *General Sociology*, Wiley, 1934, p. 323.

27. L. von Wiese and H. Becker, *Systematic Sociology*, Wiley, 1932, pp. 72–73. It should be said that the authors do not intend to imply that the mathematical operators are to be literally interpreted.

28. S. C. Dodd, *Dimensions of Society*, Macmillan, 1940, Ch. 5.

29. L. J. Henderson, *Pareto's General Sociology*, Harvard University Press, 1935, pp. 110, 111.

30. *Op. cit.*, pp. 107, 108.

31. The best example of these attempts is perhaps to be found in Wm. McDougall, *Social Psychology*, J. W. Luce, 1911.

32. W. G. Sumner and A. G. Keller, *The Science of Society*, Yale University Press, 1927, I, Chs. 1, 2.

33. W. I. Thomas, *op. cit.*, Ch. 3.

34. See P. Geddes and J. A. Thomson, *Biology*, pp. 139, 178–179, 237 238, 242. Also A. F. Bentley, "Sociology and Mathematics," *Sociological Review*, XXIII, Oct., 1931.

35. See also G. A. Lundberg, "Is Sociology Too Scientific?" *Sociologus*, IX, Sept., 1933, pp. 298–322.

36. For a fuller exposition of this point see Chapter VI as to the meaning of environment in sociology. Also Chapter XII.

37. Cf. W. M. Malisoff, "What Is an Atom?" *Philosophy of Science*, VI, July, 1939, pp. 261–265: "A tree can be an atom in an atomistic analysis of a forest, so long as its structure is not in question, i.e., its structure is non-existent in the context of the given analysis. This, incidentally, takes the wind out of the sails of the navigators of this theoretical sea, who propose to distinguish an atom from a tree, on the basis of the tree being a simple perception and the atom being a 'construct.' Some atoms may be too large to be seen. It is the difficulty of the demonstration of the *meaning* that varies. It is easy to *point* to a tree, it requires much more pointing to point out a chemical atom. The difficulty, however, has nothing to do with the character of being an atom in a given analysis." (P. 265.) See also W. V. Metcalf, "The Reality of the Atom," *Philosophy of Science, op. cit.*, pp. 367–371.

Chapter IV

SOCIOLOGICAL LAWS

A. THE MEANING OF LAW IN SCIENCE

The viewpoint developed in the preceding chapters has been adopted because it is the most convenient approach compatible with the generally accepted goal of all science. That goal is the formulation of valid and verifiable principles or laws comprehending with the greatest parsimony all the phenomena of that aspect of the cosmos which is under consideration. Since this is in science the crucial test of all points of views and procedures, it is desirable to summarize in this concluding chapter of Part I the meaning of law in science, with special reference to the possibility of developing such generalizations for societary phenomena.

It is our thesis that the term "scientific law" can and should mean in the social sciences exactly what it means in any of the other sciences. There seems to be considerable agreement among scientists as well as others that a scientific law is a generalized and verifiable statement, within measurable degrees of accuracy, of how certain events occur under stated conditions. More specifically then, a scientific law is (1) a group of verbal or mathematical symbols (2) designating an unlimited number of defined events in terms of a limited number of reactions (3) so that the performance of specified operations always yields predictable results (4) within measurable limits.

B. TYPES OF LAWS

Two types or degrees of generalization are usually included and sometimes confused under the rubric scientific law. One type merely states the statistical probability of the occurrence of an event under stated conditions. The other type, more common in sociology, is a tautological statement in which the conclusion stated is inherent in the definition of the words employed. Thus, the "law" of inertia, to the effect that matter will remain at rest

unless some force acts upon it, follows from the definition of force as *that which* produces motion.[1] That is, the law is a truism and requires on this level no empirical demonstration because it follows from the postulate and definition of force, and the definition of inertia as the state of matter in the absence of force. Such a law or verbal axiom may often be applied with as much validity to societal as to other phenomena. Comte's statement that "Kepler's law of inertia . . . is merely a particular case of the tendency of all natural phenomena to persevere in their state unless disturbed," [2] is obviously entirely sound because the conclusion follows from the definition of the terms used. That is, the statement amounts to saying that phenomena remain undisturbed unless disturbed. Within the framework selected, under the adopted postulate of force and its definition, it is logically irrefutable to say that all societies, institutions, customs, or societal behavior will remain as they are unless acted upon by some force. The practical uses of such a generalization in any field depends entirely upon our ability to estimate the relative probabilities of various hypothetical possibilities.

The same is true of such a generalization as Spencer's law that social motion follows the line of least resistance. If the line of least resistance is determined, as it must be, from the observation that some individual or group does act in a certain way rather than in a number of other theoretically possible ways, and if the observed behavior is regarded as the sole evidence of the line of least resistance, the generalization obviously follows. Nor is the law in any way invalidated by instances of men, unsuspected of a crime, giving themselves up "voluntarily," and, as the popular version has it, "choosing the more difficult path." The latter statement is clearly based on some definition of "line of least resistance" other than that employed above. Another illustration is Ward's "law" that individuals seek the greatest gain at the least cost. If relative gain and cost are considered as defined, measured, and demonstrated by the fact that the observed behavior, rather than some theoretical alternatives, took place, the conclusion undoubtedly follows, for the "law" is a truism.

Such truisms, or axioms, may have value in giving framework and direction to investigation.[3] A distinction should therefore be made between scientific tautologies and those which the dic-

tionaries define as "*needless* or *useless* repetition of the same ideas in different words." The practical value of scientific tautologies depends entirely upon the possibility of deducing from them theorems which correctly describe the behavior of large numbers of concrete observed events. The objective demonstration that these theorems do describe the events, waits upon the development of measuring devices for the standardization of human responses so that individuals can corroborate or refute each others' observations. Which postulate out of many possible ones are finally adopted depends solely upon their relative capacity to cover large numbers of cases with convenience and without inconsistency. That is, they are judged on the principles of parsimony, convenience, and consistency. The transition in the social sciences, notably since Darwin, in the direction of the other sciences is merely a quest for axioms from which societal as well as "physical" events can be deduced, thus obviating the need for a double set of axioms, one covering social, the other "physical," events. Such a quest may, of course, just as readily call for modification in the theoretical framework of the "physical" sciences as in the social.

The practical usefulness of either of the generalizations given above, and of others like them in all sciences, depends upon the possibility of developing devices for measuring "social resistance," "gain," and "loss." When such devices are developed any number of cases of resistance to a given social motion or change, as well as to alternative changes, can be measured and the degree of the alleged correlation can thus be determined. In the case of Spencer's "law" the problem would be to find reliable criteria of social resistance which can be standardized into an instrument of measurement (i.e., device for standardizing human responses). Such a measure should enable us to predict the likelihood that a change will be in one direction rather than another from the fact that the measured resistance to one change was less than to any of the others.

The axiom itself does not give us this essential information. It has to be secured through a careful analysis of empirical facts. It is this verifiable conclusion thus induced in terms of measured units, by which actual prediction of concrete events can be made, which constitutes the true scientific law. Until the generalization is thus

successfully subjected to empirical test it is a verbal truism, or axiom, rather than a law. Most sociological generalizations have not yet been verified by the empirical test. Before they can be so tested the terms in which they are couched must be reduced to repeatable operations of some kind so that the behavior from which such categories as "resistance," "gain," or "loss," are inferred, can be checked by different individuals, and the postulated presence of the "forces" related to specified changes.

The development of sociological laws as defined above, clearly calls for this indispensable development of instruments for more rigid and objective definition of the terms in which present generalizations are couched and especially the relating of these terms to concrete behavior. Consider such "laws" as the following: "All growth of personality in the members of a community involves a correspondent change in their relations to one another, in the social structure, in the customs, institutions, and associations of community." [4] A briefer statement of the same "law" by the same author is "The differentiation of community is relative to the growth of personality in social individuals." [5] What is needed here is an objective measure of "differentiation" and of "growth of personality," not to mention "community." The compulsion to define such terms in observable behavior-segments would doubtless in itself lead to illuminating results, possibly even necessitating the abandonment of such a term as personality for scientific purposes. Until the "law" can be thus stated in terms of objective units referring to actual behavior, it is not susceptible of either proof or disproof, except, of course, insofar as it is a truism in which "growth of personality" and "differentiation of community" are defined in terms of each other. As stated above, this has some value in giving direction and a frame to investigation. The ultimate end is the correlation of two disparate sets of behavior phenomena so that the statement of their relationship will be consistent with sense experience. Only when standardized symbolic instruments for the observation and measurement of these behavior phenomena are developed can the generalization be put to empirical test, and prediction be made.

Many thousands of "laws" of the type exemplified above could readily be assembled. They would range from the most trivial proverb such as "the voice with the smile wins" or "honesty is

the best policy" to generalizations of cosmic scope. We have noted above that most of these laws are not in their present form susceptible to empirical verification. In addition, and taken as a whole, they lack one other requirement of useful scientific laws. This is their lack of relationship. Petty generalizations regarding local affairs are inextricably mixed up with broad generalizations purporting to be valid for human society as a whole. There is frequently no systematic attempt even by the same author to relate his various generalizations and to derive them from a limited number of basic concepts. Such a synthesis must, of course, spring from the accretion of a multitude of minor generalizations and there is here no desire to disparage the somewhat chaotic work which has been done. On the other hand, the principle of parsimony and consistency with other known scientific laws, must always be an important consideration in science. The achievements of science in this respect is one of the principal measures of its advancement. Accordingly, unity, coherence, and integration of generalizations, as well as the multiplicity of their applications must be the ideal sought.

C. OBSTACLES TO THE DEVELOPMENT OF SOCIOLOGICAL LAWS

We have reviewed in preceding chapters the more common misapprehensions regarding the possibility of arriving at reliable scientific laws of societal phenomena because of the alleged subjectivity, heterogeneity, complexity, and nonmeasurability of these phenomena. As one writer has quaintly put it, "social scientists . . . set for themselves the paradoxical ambition to be objective about the subjective aspects of life."[6] The same statement as regards homogeneity, complexity, and measurability would constitute a very adequate summary of the position which we repudiate. According to the view cited above, objectivity and subjectivity, as well as homogeneity, complexity, and measurability and their opposites are given in the data. The Lord not only created the data but clearly labeled them unmistakably as to objectivity, measurability, homogeneity, and so forth. We have repeatedly pointed out in preceding chapters the untenability of such an assumption in a scientific universe of discourse. Objectivity,

measurability, homogeneity, complexity, etc., must, under the postulates on which science proceeds, be regarded not as inherent characteristics of phenomena but as designations of man's ways of responding and communicating his responses.

Consider, for example, the specious illustration which points to the "law" that "water" freezes at 32°F as evidence of the invariant validity of the laws of physics as a result of the "stability" of "physical" subject matter. What would become of the reliability of this law if water were not first defined as H_2O instead of including under that word all fluids that our unaided senses identify as water, and if instead of a thermometer's reading of temperatures, the subjective estimates of different individuals were accepted? "Water" would, under these conditions, "freeze" under such apparently varied "temperatures" as to make the law as unreliable as most sociological laws are today. The homogeneity of H_2O resides precisely in the abstraction of these elements, as contrasted with the full heterogeneity of all the liquids that are called water in daily discourse. The heterogeneity of societal data at present resides in the relative crudeness of the categories we employ to delimit and designate societal observations.

Another obstacle which is supposed to be especially insurmountable in the development of sociological laws is the alleged impossibility of controlled experiment—"to exclude all irrelevant factors and to control all relevant factors."[7] This objection comes near to stating the principal shortcoming of the social sciences today, namely, their inability to measure and therefore to "control" the various conditions that influence social behavior. There are two ways in which this control can be achieved; (1) By laboratory elimination of the disturbing influences (e.g., vacuum chambers, glasses eliminating certain light rays, etc.) or (2) by measuring these influences so that allowance can be made for their influence in the observed results. The reservation of "other things being equal" is not the serious drawback which it is generally assumed to be, nor is it unique in the social sciences. As we have frequently pointed out, all scientific laws stipulate under what conditions the reported sequence occurs and implicitly or explicitly the degree of probability of their occurrence under these conditions. The really serious difference between this situation

and that which obtains in the laws of social science today is that the latter do not know *what* conditions and *what* degrees thereof they include under the reservation "other things being equal." Only when these conditions are known and measured do we have a scientific law as defined in this volume.

It is by virtue of this knowledge that the other sciences can control, or what amounts to the same thing, allow for, the operation of these conditions, both in the laboratory and especially in the practical applications of these laws toward the objects of human striving. The control of altitude and air pressure in a demonstration of the law of falling bodies comes only after we know that these factors influence the behavior in question. The usefulness of this law, for example in the calculation of the path of a projectile or other practical use, depends upon our ability to *measure* to what extent these conditions in a given practical situation influence the event. Without the knowledge of what conditions influence the behavior described by a law, the necessary laboratory conditions cannot be set up and the law cannot be formulated. Without methods of measuring to what degree conditions in actual practical situations deviate from those laboratory conditions, the law is useless for practical purposes. Actually, of course, the knowledge of the conditions that influence the behavior described by the law means some kind of measurement of these conditions. The most conspicuous defect of most present "social laws" is, as stated before, precisely this: *We do not know under what specific conditions they are true and to what degree they are verifiably true under these conditions.* This defect can be remedied in social as in physical science only by the development of technics of measurement.

Closely related to the above objections, if indeed not implicit in them, is the feeling that sociological laws must always be relative to a specific culture and therefore can never have the general validity of laws in, for example, physics. This objection flows perhaps even more from a common misapprehension of the laws of physics than from misconceptions regarding the nature of sociological laws. What is usually referred to as the laws of physics in this connection are the axioms or truisms considered above. They owe their universality as we have seen to the logical syntax of the language in which they are stated, not to any empirical refer-

ence. To say that a body will remain at rest unless disturbed is like saying that a person without contacts will be isolated. When it comes to laws with empirical references, the laws of physics are not only rigidly circumscribed in their applicability, they usually describe behavior as it occurs *nowhere* in the natural, uncontrolled universe, but under laboratory conditions such as, for example, in a vacuum, under the assumption of no friction, or under other ideal or theoretical conditions. The universality of their *practical application* flows from the refined measuring instruments that have been devised for measuring the *degree to which actual natural situations deviate from* the ideal conditions specified in the formal statement of the law. Except for these measurements, physics would have to have a separate law for every altitude and every wind velocity. In short, every community would have its own laws of physics, as it is now sometimes contended that every cultural group must have its own sociological laws. The remedy for the latter situation is clearly the same as has already been applied in the former, namely, the selection of social behavior phenomena so general as to be present in all cultures (e.g., Le Play's "Folk, Work, and Place") and deriving from these universal phenomena measures of variation describing *in the same basic categories* all variations thereof.

Such attempts have, indeed, been made in the social sciences. The concept of the "economic man," for example, was such an ideal construct. The trouble with this construct was not that such abstraction is inherently fallacious, but in the forgetfulness of its creators that this was an ideal construct and in their consequent failure to develop the necessary methods of measuring the deviation of the various concrete existing economic men and situations from their ideal construct of a theoretical economic man on an isolated island. No opinion is here expressed as to the value of this particular construct as a norm from which to measure deviations. I am using it only as an illustration of a method of procedure which is inevitable in science, because it is intimately related to the principle of parsimony. The alternative is a law for every situation, which is a negation of the meaning of law in science. The central problem is how to standardize a set of social situations so that deviations from them in standardized terms can be most conveniently measured, i.e., so that prediction can be

made when the degree of deviation of conditions in a concrete situation from those of the ideal situation are known.

In the absence of the possibility of laboratory control, as is perhaps inevitable in most sociological inquiry, the establishment of statistical norms and the accurate measurement of variations around these norms achieves the same purpose in measurable degrees. It is a commonplace that a statistical mean frequently does not correspond to or correctly describe a single item in the series averaged, just as it has been pointed out that the "economic man" of the economists does not correspond exactly to a single one of the millions of men on the earth. The mean is nevertheless a powerful device for describing, and with its ancillary methods, for predicting and estimating probabilities. Much of the criticism of economic theories involving the "economic man" has been justified because some of the theorists employing the concept, as well as their critics, have assumed it to represent something which it could not possibly represent. They have accordingly engaged in much irrelevant discussion. But to assume that science can get along without type-concepts or abstractions of this sort is as vain as to assume we can get along in science without means, "ideal types," and other statistical devices. In fact, many sociologists are inclined to forget that physicists are at their best when they report the behavior of specially manufactured balls rolling down perfectly smooth planes in vacuum chambers, etc. They do not fill their books with innumerable anecdotes about stones rolling down actual mountains in different parts of the world. Concepts of "normal," "other things equal," etc., are as essential in the social sciences as in other sciences.

Whatever their shortcomings, the analyses of business statistics for individual businesses and industries as well as the work on general business cycles represents an incomparable improvement in systematized knowledge and predictability over what would obtain if no such systematized records were kept. Likewise, it is possible from life tables to predict with great accuracy the frequency and incidence of deaths by age, sex, and other characteristics. If it be objected that death is an event not subject to the "whims" of human "choice" which is supposed to be so fatal in sociological prediction, it may be pointed out that the incidence of marriage, for example, which is alleged to allow such

"whims" may also be predicted with great accuracy for populations with adequate records of past experience. The incidence of auto thefts can be predicted with remarkable accuracy from the size of the city.[8] Traffic fluctuations with the time of day, the seasonal fluctuation of relief loads, and probability of student failures in college on the basis of their high school records, are matters of common knowledge and of great practical use to all administrators in the fields concerned. Already the social sciences have a large number of such correlations demonstrably established, and whenever we find relatively intelligent and efficient social administration in any area, it is usually attributable to the existence, and use in that area, of relatively reliable correlations of the type here mentioned.

D. PRESENT STATUS AND PROSPECTS OF SOCIOLOGICAL LAWS

The systematic development of probability tables for social phenomena other than those covered by life tables and other actuarial data is still in its infancy. The pioneer work of Hart [9] and Burgess [10] and the subsequent work of the Gluecks,[11] Vold,[12] Monachesi,[13] and Laune [14] on criminological phenomena, as well as the work of Burgess and Cottrell [15] on family adjustment are, however, most promising attempts to extend the actuarial technic into new and broader fields of human interrelationships. As has frequently been true in the history of the development of scientific laws, the immediate incentive for the attempts here noted is to develop a practical device for the more efficient handling of a specific administrative problem perhaps for a very restricted group. But technics thus developed and applied frequently throw a flood of light upon much more general and fundamental problems.

Early experiments in probability laws were regarded as an amusement and a sport, and were considered as applicable only to gambling devices and games of chance. Today the probability calculus dominates every department of science. The experiments of Clerk Maxwell and Faraday were at the time regarded as curious observations of doubtful general significance. They turned out to be of fundamental importance to the whole framework of

science. At the present time the attempt to develop, for example, probability tables from which can be predicted various degrees of adjustment in marriage is generally regarded as of importance chiefly as a practical device by which unwise marriages might be avoided, or chiefly as a type of inquiry designed to throw light on domestic problems. The scientific by-products of such studies if extensively and intensively carried out are likely to be much more far-reaching. Reliable probability tables of degrees of adjustment in marriage would not only yield reliable data on the relative influence, if any, of all the factors today alleged to be related to marital adjustment but would yield very valuable information and hypotheses regarding the more general basis of attraction and repulsion among people, which is probably basic to all social science.

Perhaps the most frequently urged objection to the possibility of developing probability tables regarding the more complex social behavior phenomena is the contention that social change would constantly invalidate such tables and that the existence of such tables and predictions from them would themselves be influences tending to invalidate predictions from them. If, for example, the indicated probability of failure of a proposed marriage is high, and if this fact together with the reasons for the unfavorable prognosis is made clear to the contracting parties, might not this knowledge itself operate so to alter what would otherwise have been the probable result so as to invalidate the prediction shown by the table? To be quite specific, suppose the presence of a mother-in-law in the household is shown to be a hazard in marital adjustment. Might not this demonstrated fact so alter the customary relationship of all members of a household in which the condition exists, so as largely to vitiate the expectancy as shown by probability tables constructed *before probability tables became a condition affecting marital adjustment?*

That such tables might have considerable effect not only on marriage selection but on the customary weight of other factors in the marital relationship is undeniable. Neither can it be denied that the known hazards of such conditions as, for example, overweight may, as a result of the demonstration of this fact by specific life tables, and discrimination against such cases by life insurance companies, induce many people to take active measures

to prevent overweight or to guard against its expected hazards. To the extent that the latter can be done, the life tables based upon experience before such precautions became prevalent, lose their validity. This consequence can be avoided only by continuous revision of the tables basing them upon the most recent data. As a matter of fact, such changes in habit would themselves be only gradual, so that the continual revision of expectancy tables by dropping the data of the earliest years of the period on the basis of which a given table is computed and adding the most recent would probably keep the tables up to date and sensitive to all but the most sudden and revolutionary changes.

This technic is, of course, already worked out to a high degree of flexibility in various forms of insurance. The addition of a night watchman to a factory, for example, calls for a revision in the fire expectancy and a corresponding reduction in the insurance rate. The only sound basis for such reduction is an adequate record of experience with establishments served by night watchmen as contrasted with those not so protected. Actuarial estimates are themselves undoubtedly a major influence in bringing about a change in the probabilities of the events predicted. But this fact has in no way destroyed the soundness of actuarial principles and methods or in their continued practical usefulness.

The extension of these methods into all departments of societal behavior would require the same constant accumulation of experience and the same constant revision of our probability estimates. But at any given time, a statement of the probability of any given event that can be predicted from an actuarial table constitutes a "natural law" of that class of events in the same sense that this expression is now used in physics. All laws of physics likewise hold only upon the stipulated condition that the conditions under which they were formulated (usually laboratory conditions) remain constant. If these conditions change, the law, as a description of what actually occurs under the changed conditions, must be altered.

E. THE INSTABILITY OF SOCIETAL PHENOMENA

There will doubtless be those who, while finding the above analysis logically irrefutable, will nevertheless feel that the points

of reference from which the laws of physics are derived are nevertheless intrinsically more stable and unchangeable than the corresponding points of reference upon which social scientists must rely. This view derives partly (1) from the assumption previously criticized, namely, that the conventional points of reference in the language of contemporary science are "physical" entities rather than symbolized response categories, and (2) partly from a highly distorted perspective in time and comparability of units in the physical and in the social sciences. The latter is perhaps primarily attributable to a deepseated anthropocentrism on account of which it is felt that the human life span or at most the affairs of a local culture are in the social sciences the counterpart to the solar system, for example, in astronomy.

A favorite method of arguing this point is to refer to the stability of such reference points as the earth's orbit and other astronomical regularities. The argument is that there are no comparably stable frames of reference for social phenomena. Social scientists are fond of pointing to this staggering obstacle as an excuse for the shortcomings of their sciences. Change, it would appear, is a phenomenon encountered only, or at least mainly, in societal phenomena. The point is supported by a wealth of illustrations of the transitory character of human life and institutions, the ups and downs of governments, and other recurring upheavals in technology and culture generally.

It is a fact of common observation that to unaided human senses, at least, the sense of movement or change is always relative to some points of reference. We are not aware of our direction or speed of movement in an airplane unless we see the ground, the clouds, or other not too distant objects. The fluctuations in any phenomena are frequent and violent in proportion to our closeness to the phenomena in time and space. The automobiles immediately before us shoot by at terrific speed; an equally rapidly traveling car two miles away seems to be barely moving at all. As for the movements of the heavenly bodies and the earth itself, we infer them from the different relative positions which they occupy at different times. It follows that the more macroscopic the perspective which we choose, the more apparently stable and invariable will be events within that macrocosm, because it includes within itself the points of reference, without which no

sensation of change or instability is possible. If the macrocosm selected is bounded only by the uttermost reaches of human senses, *that* macrocosm would necessarily be stable for there are no points of reference with reference to which its movement or change can be inferred. Indeed, when more powerful telescopes permit the extension of our senses and thus provide new points of reference the erstwhile "stable" macrocosm becomes unstable and astronomers "see" constellations rushing through space at great speed. By use of other instruments and reference points, geologists "see" continents rising and falling. To those of us who spend a brief life-time upon these continents they are stable—sufficiently stable for us to use them as a fixed frame of reference for most of our adjustments. Such also is the stability of the earth's orbit and the earth's movements with reference to it and the heavenly bodies. As John Dewey has said: "As we can discourse of change only in terms of velocity and acceleration which involve relations to other things, so assertion of permanent and enduring is comparative. The stablest thing we can speak of is not free from the conditions set to it by other things."[16]

We postulated in the first chapter that all phenomena of man and culture are entirely contained within the physical cosmos and entirely dependent upon the energy transformations within that cosmos.[17] It follows that man's social universe, not to mention individual cultures, are *part* of that cosmos and are therefore surrounded with points of reference without which, as we have seen above, change cannot be perceived. The smaller the social segment under observation, therefore, the greater will be its instability within the range of discrimination of human senses. As we go beyond that range, for example, into atomic levels, stability reappears (to the unaided senses). In short, both macroscopic and microscopic changes are largely lost to the unaided senses because these senses cannot detect in either case the reference points without which the sensation of motion, change, or stability is impossible.

As a fact and as a difficulty to be reckoned with, this instability is in no way reduced or vitiated by the above analysis, which merely shows the relativity and the nature of our concepts of stability and change. But this analysis does suggest that the instabilities of social phenomena are of the same character as the in-

stabilities of other phenomena which have less than cosmic points of reference. The latter, in fact, include the bulk of the phenomena with which physical science deals. Whatever appears to be the stability of the earth's orbit and the regularity of the motions of heavenly bodies, there is no pretense in physics of any other than statistical regularities and the stability of probabilities. In short, through the development of refined instruments and methods of dealing with *change*, science has achieved some of the same results which theologians and metaphysicians attempted to achieve through postulates of the *unchanging*.

The apparent stability of some of the broader and more "ultimate" (?) points of reference of astronomy, for example, will doubtless continue to inspire envy in a large number of social scientists. It is easy to understand their quest for a corresponding Rock of Ages to which the social sciences can be moored. I have attempted above to point out that the phenomenon in question is actually not inherent in one subject matter as contracted with another, but that it is the effect of perspective in time and space. From some points of view, this fact in no way affects the significance of the apparent difference. From the point of view here under consideration, namely, the applicability of certain methods of study to societal phenomena, the viewpoint is of fundamental significance. We shall return to this consideration in later chapters.

In conclusion, it may be pointed out that even the major alleged stabilities or constants of astronomy themselves undergo radical transformations in the course of the centuries. It must be remembered that the notion of the earth's orbit is only an improved verbal framework (as compared with the Ptolemaic) within which at present certain observed astronomical behavior-phenomena can be comprehended more adequately. These same phenomena were for many centuries comprehended by a radically different framework. The provincial view that the former was merely a "wrong" notion held by men until the "true" orientation was "discovered" unfortunately still persists quite generally with regard to the nature of scientific formulations. The mounting of a new and powerful telescope which will penetrate millions of light-years hitherto unknown to man is even now under way. May it not reveal vistas and behavior to comprehend which mod-

ifications of present astronomical orientations will be necessary? Thus may the stabilities of the foundations of our present universe be transformed and the fundamental instability of all phenomena, or at least of man's response to them, again be demonstrated.

F. CONCLUSION

This and preceding chapters have attempted to show that the apparent difficulty of applying the methods of natural science to societal phenomena flow not from any intrinsic characteristics of these phenomena but from the retention in the latter field of postulates long since repudiated in the other sciences. Indeed, the postulate of such intrinsic difference as regards man's method of knowing about the two fields of human observation is the principal assumption which must be abandoned if the social studies are ever to become sciences in the sense that physics or chemistry are sciences.

Since Darwin, the abandonment of that postulate has been reluctant but steady. The abandonment of a time-honored postulate and the adoption of a new frame of reference frequently calls for cruel partings with eloquent vocabulary, learned lecture notes, and vested intellectual interests. We try to achieve the transition as gradually as possible in order not to shock the organism too violently by the change. The technic of changing one's postulates usually is to quit talking about postulates entirely until one has developed some verbal facility in the new orientation. Social scientists are in this transition at present. The ways of science attract us strongly both because of the results that can be achieved with science and because of its academic and public prestige. But we also like to retain some beloved articles of our erstwhile faith. The latter frequently embarrasses us, so we try to hide it as much as possible, but continue to use it until we can acquire equipment suitable to the new orientation.[18]

Social scientists are at present engaged in the old attempt to eat their cake and have it too—to be scientific but not to learn any mathematics, to generalize but not to acquire the only technic by which masses of data can be legitimately generalized. They have never explicitly stated the fundamental postulates upon which they proceed and for the most part have refused to face

those which indubitably underlie the whole scientific approach. In short, they are engaged in trying to bootleg their nonscientific concepts and frameworks into the law-abiding domain of science.

The postulate that some data are inherently and intrinsically objective or subjective, homogeneous or nonhomogeneous, measurable or nonmeasurable, is in some orientations entirely defensible. The scientific orientation proceeds, however, on a contrary hypothesis, namely, that these categories represent not intrinsic characteristics of data, but different ways of responding to data. All known data have this important characteristic in common: They become known through human reactions. I hold that by certain methods, through certain inventable operations, the subjective becomes objective, the nonhomogeneous becomes homogeneous, the "complex" becomes "simple," and the nonmeasurable becomes measurable.

From this point of view, I find Margenau's statement in another connection the inevitable conclusion. He says:

"If the fundamental thesis of quantum mechanics is correct, *all* physical observations form a probability aggregate, that is, a set of data to which the probability calculus can be applied. . . . And if, as is frequently supposed, the data of all exact empirical sciences are basically physical, we are confronted with the possibility that the entire physical world [in which I include the social—G. L.], ultimately resolves itself into a set of events joined merely by the rules of the probability calculus." [19]

If this is the nature of contemporary science, then I think the methods by which scientific laws are to be achieved in the social sciences were correctly summarized more than twenty-five years ago by Henry L. Moore in his *Laws of Wages* (pp. 4–5), when he said:

"The problems of natural science have required the invention of a calculus of mass phenomena that will probably yield its best results when applied to the material of the social sciences. The wealth of the statistical material . . . is itself a source of embarrassment. To utilize it for scientific purposes, it must be described in brief, summary formulae, and these formulae must be arranged upon a plan of increasing complexity so that it will be possible to pass from accurate descriptions of mass aggregates to the relations between the aggregates themselves."

The ends of science are the same in all fields, namely, to arrive at verifiable generalizations as to the sequences of events. Any

methods that yield these results are permitted in all the sciences. It happens, however, that generalization implies applicability to *numbers of cases*, and hence all scientific laws, including those arrived at by so-called qualitative analysis, ultimately rely for their scientific validity upon the fact that they can be, and have been, corroborated in numbers of cases. The trend toward the adoption of mathematical technics as any science matures is, therefore, not due to any compulsion to imitate any other science. The compulsion flows from the nature of accurate generalization, which is the essence of science.

In short, we adopt no concepts or mathematical technics *because* they are used in other sciences. We adopt them, if at all, because they are effective tools in reaching admittedly desired ends. The latter criterion also allows full scope for the invention by social scientists of new symbolic systems or procedures uniquely adapted to their special problems. The postulate of the ultimate unity of all science is doubtless implicit in the principle of parsimony. But this principle may just as readily call for modifications in the physical sciences as in the social, if the principles of the former are found too narrow to encompass the latter.

Finally, we recognize that the approach we advocate in this volume assumes technological developments within the sociological sciences which will make possible and perhaps easy many tasks which from the standpoint of our present technics may seem impossible or of staggering difficulty. Sociologists have always been conspicuous in calling attention to the revolutionary effects of technological developments in practically all departments of life including the other sciences. Where sociology itself is concerned, the assumption seems rather to have been that the concepts, technics, and types of scholarship of the great social philosophers represent the only valid method of attack. Sociology is perhaps the only science in which a leader of a century ago would not be greatly handicapped if he should suddenly come to life again. The technological developments during the same period within all other sciences have completely transformed them. The most distinguished scholar of a century ago could not read even an elementary treatise on these sciences. Can it be that sociology is the one unique department of life and of thought where further technological development is not possible?

G. NOTES

1. The same reasoning would hold for Newton's modification of this (Kepler's) "law" to the effect that if no force acts on a body in motion, it continues to move uniformly in a straight line.

2. A. Comte, *Positive Philosophy.* (Translated by H. Martineau) Trübner, 1853, II, p. 537.

3. "An axiom . . . means a self-evident truth that is . . . one that will be immediately accepted by every intelligent person. A postulate . . . is an assumption or hypothesis, i.e., something agreed upon for the sake of argument. (P. 484.) One often hears the statement that in any deductive system, all the theorems are implicitly contained in the postulates; or, in other words, that the process of deduction from the postulates never yields anything essentially new. (P. 493.) The impression though widely prevalent is quite erroneous. In every live deductive theory, novelties are constantly appearing, due to the introduction of new definitions by ingenious and original investigators. These new combinations are not implicitly contained in the postulates, but reflect the intelligent interest of some creative human agent. The postulates are like traffic laws: they prohibit traveling in wrong directions, but they do not provide any motive power. Similar remarks apply to the choice of the postulates themselves. The postulates adopted as the basis of any system constitute the definition of that system, within its universe of discourse. . . . The technique of the postulational method effects a great saving in mental effort, in connection with definitions, just as it does in connection with theorems. . . . In other so-called exact sciences, like physics and chemistry, only a very few basic concepts are required, all the other concepts in the science being defined in terms of the fundamental ones (as velocity in terms of length and time, work in terms of force and distance, etc.) It is due largely to this fact that these sciences have acquired as much exactness as they have." (P. 494.) (E V. Huntington, "The Method of Postulates," *Phil. of Sci.*, IV, Oct., 1937, pp. 482–495.) See also the Introduction to Part I of the present text. On the general subject of scientific laws of societal phenomena see A. Lesser, "Research Procedure and Laws of Culture," *Phil. of Sci.*, VI, July, 1939, pp. 345-355.

See the notable work of Clark Hull in applying this method in the field of psychology. ("The Conflicting Psychologies of Learning—A Way Out." *Psychol. Rev.*, XLII, Nov., 1935, pp. 491-516.) There will be those who feel that the "elaborate" demonstration of "what everyone knows" is nothing more than an attempt to "imitate" some other science, or at best mere pedantry. The appeal to "what everyone knows" has always been a trump card in the hand of the obscurantist. Nothing seemed more self-evident than the parallel axiom before Einstein's epoch-making abandonment of it. The scientist does not consider his task completed, but only begun, when he has achieved a personal conviction that a certain relationship holds. The objective recording of *the steps, the operations*, linguistic (logical), or other manipulatory procedures, *through which the conclusion was reached*, so that others may corroborate them, remains his major task. The obligation of the scientist to make clear the steps by which he

concludes that the earth is round is in no way abrogated by the fact that all people may already agree to the conclusion. Scientific contributions frequently consist chiefly of laying bare—rendering explicit—the steps and operations by which a relationship, long observed, can be rationally (logically) explained. Only when these sequences are thus rendered explicit can the *principle* which a phenomenon illustrates be derived, generalized, and applied to other situations, for purposes of prediction and for general economy of effort in interpreting the plethora of individual events with which our senses are bombarded. Only when the principle governing a phenomenon is thus deduced from known data, can we with safety assume that our adjustments based on such data will also be adequate in similar situations as yet unexperienced.

4. R. M. MacIver, *Community*, Macmillan, 1931, p. 417. MacIver's further development of this subject is entirely compatible with the position here taken and is indeed a necessary analysis prior to the type of definition and measurement here advocated.

5. *Ibid.*, p. 231.

6. Eleanor Bisbee, "Objectivity in the Social Sciences," *Phil. of Sci.*, IV, July, 1937, pp. 371–382.

7. *Ibid.*, p. 378.

8. J. Hall, *Theft, Law, and Society*, Little, Brown, 1935, p. 242.

9. H. Hart, "Predicting Parole Success," *Journal of Criminal Law and Criminology*, XIV, Nov., 1923, pp. 405–413.

10. E. W. Burgess, "Factors Determining Success or Failure on Parole," in *Study of the Indeterminate Sentence and Parole in Illinois*, by A. A. Bruce *et al*, Supt. of Pub. Documents, Springfield, 1928.

11. S. and E. T. Glueck, *Five Hundred Criminal Careers*, Knopf, 1930.

12. George B. Vold, *Prediction Methods and Parole*, The Sociological Press, Hanover, New Hampshire, 1931.

13. E. D. Monachesi, *Prediction Factors in Probation*, The Sociological Press, Hanover, New Hampshire, 1932.

14. F. F. Laune, *Predicting Criminality*, Northwestern University Studies in the Social Sciences, No. 1, Northwestern University, 1936.

15. E. W. Burgess and L. S. Cottrell, Jr., "The Prediction of Adjustment in Marriage," *American Sociological Review*, I, Oct., 1936, pp. 737–751.

16. John Dewey, *Experience and Nature*, Norton, 1925, p. 70. See also pp. 71–72.

17. For further development of this point, see Chapters I and VI.

18. V. Pareto has analyzed this process in terms of residues, derivations, and nonlogical thoughtways. See his *The Mind and Society*, Harcourt, 1935, I.

19. *Journal of the American Statistical Association*, XXXI, March, 1936, p. 27. Discussion by Henry Margenau of paper by E. Nagel, "The Meaning of Probability."

PART II

SOCIETAL DYNAMICS

¶ *"The very words which must be used are words that have had their meanings fixed in the past to express ideas that are unlike those which they must now convey if they are to express what is intended. To those who are naturalistically inclined, the attendant 'fallibility' will be but a spur to do better the work which this volume attempts to do. The present volume is an approach not a closed treatise. The aim it hopes to fulfil is that of being a sufficiently coherent and systematic approach to move others to undertake the long cooperative work (never-ending in any case as long as inquiry continues) needed to test and fill in the framework which is outlined in this book. . . .*

"Both the history of science and the present state of science prove that the goal of the systematic relationship of facts and conceptions to one another is dependent upon the elimination *of the qualitative as such and upon reduction to non-qualitative formulation."—John Dewey,* Logic. The Theory of Inquiry. *(Holt, 1938, pp. 40, 65.)*

INTRODUCTION TO PART II

We have considered in Part I certain underlying assumptions of the adjustment technic called science. We discussed the implications of this technic in regard to symbolic systems in general and especially with regard to the more objective and refined symbolic systems called mathematical measurement. We finally considered the nature and sources of frames of reference and the possible results in the way of scientific laws if we proceed within the framework and according to that set of rules generally designated as the scientific method.

What we have said in Part I on this subject applies with equal validity to all the social sciences, although we have drawn our illustrations chiefly from those fields which are today conventionally classified as sociology. In Part II we turn more explicitly to the latter type of subject matter. "Sociology," "the science of society," etc., arose when men became interested in certain phenomena of group behavior as objects of scientific study. The basic phenomenon has been recognized on nonscientific levels since the earliest times. All languages have words designating numbers-of-individuals-in-interaction as behaving entities about which generalizations can be made.

The validity of treating collective behavior, *as such*, as an area of separate scientific study has been called in question in some quarters on the ground that individuals are the only "real" behavers, group concepts being merely "figurative," "superorganic," etc. Applying the reasoning of Part I to this position we consider in the first chapter of Part II (Chapter V) the scientific validity of group concepts in general and, as an illustration, analyze in some detail the behavioral meaning of such a term as "public opinion."

We conclude from Chapter V that from the point of view we have adopted in Part I, group concepts are no more figurative than concepts referring to the individual. We consider in this chapter the nature of behavior mechanisms of plant and lower animal life as well as of *homo sapiens* and of societal groups. We

review all of this material in order to bridge the gap which is frequently assumed to separate the mechanisms of individual behavior from the mechanisms of group behavior, especially in the human species. We show that *mechanism* is a word adopted by man to designate *any* functional arrangement of parts. That arrangement is so clearly defined and well known in the more familiar "mechanical" gadgets and in the simpler organisms as to give us the impression that these *are* mechanisms—the only ones properly so called. We take the view that there are equally demonstrable functional arrangements of parts affecting group behavior and that these can be called mechanisms and advantageously can be studied as such without the reservation that such usage is at best only "figurative" or "analogical."

We develop this subject more fully in Chapter VI * in considering the fundamental framework within which science interprets *all* behavior. As we have pointed out from the outset, it is the generally recognized business of science to develop increasingly broad and inclusive principles which will hold for increasingly varied types of phenomena. We here repudiate the notion that such categories as atom and the transformation of energy are the exclusive "subject matter" of other sciences. They are behavior categories which like "environment," "cycles," "mobility," etc., may be found generally useful regardless of specific subject matter.

It does not follow that we adopt the common fallacy of assuming that *sociological* explanation must consist of reducing societal behavior into the particular *units* found useful in psychology or physics. But it is important that the categories and units we do adopt in sociology should not be *incompatible with* the general framework and findings of the other sciences. That is, sociological categories and methods should be compatible with the postulates and the methods of natural science as set forth in Chapter I. We have introduced in Chapters V and VI numerous illustrations and references to data and categories of other sciences, not *to prove*, by analogy or otherwise, any sociological hypothesis whatever. We have introduced this material merely to justify further *the hypothesis* underlying the present book, namely, the unity of

* Those who prefer a logical rather than a psychological development of the subject should read Chapter VI before Chapter V. I have arranged these chapters in their present order in the belief that the less advanced student will find this sequence preferable because it introduces conventional sociological material at an earlier point.

all the sciences, and to emphasize that the succeeding sociological analysis is in accordance with this hypothesis.

In Chapters VII and VIII we have adopted the conventional categories used in contemporary sociology to describe societal processes. Rather than submitting a new list of words representing our own linguistic preferences, we have tried to suggest a type of analysis and research which might result in making specific, refined, and objective the meaning of these terms, or of those which such analysis might suggest as substitutes. Our main hypothesis here has been that perhaps they are all reducible to a continuum involving different degrees of communication or some other common factor or factors. Dodd has explored more fully in his *Dimensions of Society* a large sociological vocabulary and suggested objective, operational definitions of many of these terms. We conclude (Chapter VIII) with a consideration of the limitations of the present definitions of primary and secondary groups, and with a discussion of the criteria and measurement of social status.

Chapter V

MECHANISMS OF BEHAVIOR

A. THE MEANING OF MECHANISM

The word mechanism is used in this book to designate any combination of circumstances, conditions, or movements correlated in some degree, under stated conditions, with any observed behavior.[1] Since some of the clearest illustrations of such arrangement or relation of parts of anything in the production of an effect are to be found in certain widely diffused "machines" or "mechanical" gadgets, the tendency has been to reserve the term mechanism for the arrangement of the parts of such machines only. Nearly everyone in technologically developed countries today has had occasion to pick apart some simple machine and put it together again. Very few have had similar experience with respect to organisms and almost none have this kind of first-hand analytical knowledge of the neuro-muscular structure and functioning of human beings. Accordingly, it seems far-fetched and at best an analogy to consider the human "mind" as well as the lawn mower a mechanism, although the definition given above clearly applies as well to the one as to the other.[2]

In the meantime the tremendous expansion of intricate machinery in recent times has operated to bridge, in part at least, the apparent gap between machines and men. Photo-electric cells automatically open doors as we approach them and robots imitate the behavior of men in many respects. Psychological laboratories display "thinking machines" which actually run mazes and "learn" as do rats. Scientists report that an iron wire immersed in a strong solution of nitric acid—a purely inorganic, chemical set-up—reacts very similarly to a nerve or other sensitive protoplasmic system. The well-known tendency of a wire to bend more readily in a place where it has previously been bent, and as compared with a wire which has never been bent, is identified as perhaps of the same atomic character as learning in nervous systems.[3] The wire also shows a tendency to "forget" in time.[4]

Finally, even popular magazines carry accounts of "mechanical hearts" and instruments for measuring "brain waves." Under the impact of these developments, the word "mechanism" has naturally lost much of its terror as applied to man. Mechanism has taken on a much broader meaning than that which would limit it to such arrangements and synchronization of parts as constitutes the spinning-wheel or the transmission gears of an automobile.

This extension of the range of phenomena to which the word mechanism is now applied has resulted in an important change in the meaning of the word itself. As mechanisms become more and more intricate, or as we pry deeper and deeper into their common foundations, we find states which can be described adequately only in terms of statistical probabilities. Thus, the mechanism governing the behavior of gases, for example, is not explicable in terms of simple classical mechanics but only in terms of the probabilities of quantum mechanics. As we have repeatedly pointed out in preceding chapters, sociological mechanisms are of this character. When, therefore, we shall speak of mechanisms of group behavior it must be remembered that we merely mean the determined probability of certain conditions necessary and sufficient to produce a stated effect. As this probability approaches certainty, the behavior sequence tends to resemble the sequence of everyday common-sense experience with simple machines, the "invariant" laws of classical mechanics, or the broader dogmas of theology.

There is indeed a striking resemblance between the transition in theoretical physics from classical mechanics to quantum theory and the transition in sociology from theological determinism to statistical probability, from vitalism to mechanism. Classical mechanics assumed the possibility of accurately describing "all natural phenomena in terms of simple forces between unalterable objects." [5] From a knowledge of these forces and the initial states of all objects, it was assumed that all individual events could be predicted with certainty. Knowledge of God's Will gave theologians a similar power to predict any individual's future. The soul, conscience, instincts, etc., were the mechanisms through which Divine Will operated. On certain levels of observation this theory doubtless covered the observed facts just as the laws of

classical mechanics are within certain limits of accuracy also applicable to the motion of the planets and to generally observable behavior of the machines mentioned above. On atomic levels it is found, however, that the attempt to explain the behavior of a gas by calculating the position of individual particles from known initial states according to the laws of classical mechanics is quite out of the question. We content ourselves with average values typifying vast aggregates of gas particles. Likewise, the only type of predictions of societal behavior which can be demonstrated to possess any validity of the type science recognizes are the predictions of statistical probabilities. (See Chapter IV, Sec. D.)

This point of view is as yet not widespread among people in general either in the field of physics or in sociology. The level of events with which the man on the street is primarily concerned seems to function according to classical mechanical laws rather than according to probabilities and indeterminate principles. Machines as a whole seem to function with unerring regularity when switches are turned and levers are moved. There is some tendency, likewise, to transfer this simple view to the interpretation of human behavior. Traffic moves or stops with mechanical regularity as policemen blow whistles. The decision of the policeman to stop the traffic just as we were about to get across is not infrequently attributed to a mechanism of malice in his make-up rather than to an aggregate of circumstances from which only a certain probability of a given behavior can be predicted. A not infrequent view is that if we have characteristics that satisfy this "like-dislike" mechanism of the policeman, he lets us pass. If we do not have these characteristics he stops us. More especially is this reasoning applied to the actions of public officials, leaders of public movements, and the course of history generally. The course of history is still popularly explained in terms of a simple mechanism obviously adopted from theology. God willed events and they invariably occurred; political leaders cause wars, depressions, and revolutions the same way. Thus, while the immediate event seems quite mechanical, the decisions of the leaders are usually attributed to moralistic imponderables of goodness, malice, or pure, unaccountable whim. The application of the logic of quantum physics to human will and choice is as yet in its infancy.

Inability to think in terms of probabilities and aggregates is

also responsible for the protracted discussions in the literature of the social sciences of a dichotomy which is felt to be quite basic, namely, "the individual and society." More frequently what is meant and sometimes stated, is "the individual versus society." We shall return to this subject in the next chapter. The feeling is widespread that as between these categories the individual has a primacy and a "reality" to which society can never aspire.[6] This view is so deepseated that even many sociologists are disposed to avoid the issue, to concede the "fictional" character of society by vigorously disclaiming any organismic implications or by devoting themselves entirely to the problems of the individual personality as affected by community influences. The latter is, of course, an entirely permissible and valuable objective of scientific study. Being usually more obviously related to warm human problems and therapeutic technics of obvious interest and importance to the individual human beings, it is usually necessary to make all public explanations of the content and purpose of the social sciences pretty largely in terms of the individual personality.

Psychiatric and psychoanalytic developments within the social sciences doubtless owe their popularity to this public predisposition to regard the individual as the primary entity, according to good anthropocentric tradition. To the extent that these approaches result in the systematic accumulation of clinical records, they may make important contributions to social science. But in the end, here, as in all other sciences, the meaning of individual records will depend entirely upon the adequacy of the statistical aggregates to which a given case can be referred. All prediction of the individual behavior will depend upon the adequacy of our probability tables governing the kind of conduct in question. The broader and distinctively *sociological* generalizations will then be used as norms from which the probability of given individual behavior will be estimated.

This raises certain questions in some quarters as to the "reality" of group concepts and the alleged "figurative" nature of such entities as society, the state, the public, and other collective designations. Since it is the purpose of this chapter to discuss mechanisms of *group* behavior, the validity of this concept must first be considered.

B. IS THERE A "GROUP FALLACY"?

The view that all individual human behavior can most adequately be comprehended from the mechanistic point of view as here defined is perhaps now quite generally taken for granted. The transition first took place with respect to the anatomy of the larger bones and muscles. The "mechanical" functioning of the better known organs such as the stomach and the heart next became generally known and accepted. As the antecedent conditions of nervous and "mental" activity have become better known it has been found that the word mechanism here also describes the state of affairs which that word is used to designate in all other fields. The argument as to whether the human body and the "mind" *are* mechanisms or machines is, therefore, the kind of confusion of words with things words stand for which we have discussed at length in previous chapters. Whether we want to describe with different words the "jump" of a stone across a brook and the similar behavior of a child is a matter of linguistic taste and convenience. So is the question as to whether we shall describe the generalized conditions antecedent to each action as "mechanisms." In science our taste in these matters is governed by certain practical utilitarian tests such as the principle of parsimony, objectivity, and verifiability. On this basis we shall in this book use the word mechanism to describe that necessary and sufficient set of relations or circumstances by means of which any behavior whatsoever takes place, whether it be the jump of an electric spark, the thoughts of a human being (including his telepathic and clairvoyant powers, if any), the milling of a mob, or the vote of a deliberative assembly.

While this is perhaps already, as we have said, the commonly accepted view of individual behavior, there is some doubt as to whether this terminology can be strictly applied to the behavior of human groups. The need to describe individual behavior in terms of vitalistic "elan," "spirit," "will," "conscience," and even "instinct" seems definitely on the wane. The tendency has been to adopt instead the words used to describe behavior phenomena in other fields. A similar tendency in the terminology describing group behavior has made less headway, as yet. The social sciences are still greatly handicapped by the anthropomor-

phic vocabulary of journalists, theologians, and other evangelists. Accordingly, the tendency is to discuss the phenomena in this domain in vitalistic, "volitional," and animistic (personalistic) terms instead of in the mechanistic frame of reference which has been found more advantageous in dealing with all other behavior. Before proceeding with an outline of the principal behavior mechanisms to which we shall attribute all human behavior, individual and social, it will be necessary therefore to consider certain points concerning the nature of groups and group behavior.

In previous chapters we have discussed at some length the fallacy of assuming that such categories as "part," "whole," "individual," and "group," are given in the phenomena to which we respond. We have shown that these categories must instead be regarded as convenient designations of different ways of responding. We have pointed out in this connection that under different circumstances we may properly designate the solar system as a part and an atom as a whole or *vice versa*. The same holds for such categories as "individual" and "group." Nothing could be a clearer illustration of the still surviving confusion as to the nature of language than the attempt on the part of some psychologists and sociologists to find in the "individual" a certain "primary" "reality" as contrasted to the "group" which, it is contended, is "after all" only a "collection" of individuals. Discussions of any group behavior or group mechanisms are, therefore, alleged to be purely "figurative," "imaginary," "illusory" and a mischievous type of personification or reification of words.

The latter position can be well illustrated from the works of F. H. Allport and A. Korzybski, not to mention more popular sources. These writers have been impressed with the current careless use of collective designations and the frequent failure to keep in mind the distributional nature of the referents of these designations; Allport, for example, is oppressed with the "vagueness" of the statement that "the University has decided" this or that.[7] Korzybski insists *ad nauseam* that one must not speak of "man" or "animal" without realizing that these words only mean Smith_1, Smith_2, . . . Smith_n, Fido_1, Fido_2, . . . Fido_n.[8] With this position I have no quarrel whatever. But when, in elaboration, he goes on to emphasize that "life" is composed of "absolute individuals," he seems to forget the very principle he so voluminously

expounds. For, by the same reasoning, we might insist that when we speak of an individual we must keep in mind $cell_1$, $cell_2$, . . . $cell_n$. Every psychiatrist knows the conflicting ways in which an organism may be motivated, although *as a whole* it makes certain overt adjustments. The statement that a person did not commit murder is a significant statement of fact regardless of how strongly the individual was "tempted" to commit the act. From some points of view the conflicting motivations of the actor may be of great interest. But his divided personality certainly does not destroy the scientific validity of the observation that as an organism as a whole he did act in a certain way. Chase [9] has recognized this point when he allows that it may be legitimate to say "I don't like Harvard University" provided one is fully conscious of the "abstraction," or "short-cut" taken. The "real" content is here considered as possibly being a sort of balance between the favorable and unfavorable aspects thought of as constituting the university. Otherwise we are likely to be guilty of disliking a "phantom." Allport seems unable to make a similar adjustment to the statement that the university "decides" something. He feels that the statement that certain individuals decided something is the only "real" fact.

In calling attention to the distributive and collective aspect of words employed and the importance of keeping in mind their concrete referents these men have performed a valuable service. Only to the extent that their work implies some intrinsic or higher order of "reality" for "individual" as contrasted with "group" designations are they open to criticism. For this constitutes a forgetfulness of their main general point, namely, that *all* words are only designations of our selective responses to segments or aspects of the cosmos.

In short, these discussions of the purely linguistic nature of group designations are frequently entirely correct. The error lies in overlooking that exactly the same may be said about designations of the individual and all his alleged attributes and behaviors. The reservations and explanations as to the purely pragmatic, linguistic nature of group concepts are quite in line with our position. We merely point out that exactly the same reservations must be made regarding all concepts whatsoever. We shall refer, therefore, in this book to folkways, customs, public opinion,

institutions, etc., as mechanisms of group adjustment in exactly the same sense that we refer to tropisms, reflexes, or habits as mechanisms by which other entities adjust. We do not regard the former as in any sense more "figurative" than the latter. Both "individual" and "group" are words designating sensory responses to phenomena. In this respect they are equally "figurative" and equally "real." For the same reasons we shall speak of the behavior of groups—parties, organizations, states, or any other—in exactly the same sense as we speak of the behavior of individuals. Since the point is quite fundamental in a viewpoint which contends for the applicability of the methods of other sciences to sociological phenomena and which distinguishes the latter as *group* phenomena, we shall review again the reasoning upon which our position rests.

The feeling that such words as "man," "person," or "individual" represent "real" and "tangible" behaving entities as compared with such words as "group," "public," "community," or "nation" is mainly a result of linguistic conventions. The large literature on the subject reveals that the principal difficulty which writers find with group entities is that the locus of *group* mechanisms of behavior cannot be satisfactorily determined. They assume that this is no problem in the case of the individual because the "mind" is assumed to be located in the head and this naive linguistic habit is so well established that it gives to individual behavior a comfortable sense of "reality." Indeed, this feeling of familiarity which allows curiosity, doubt, and other tensions to come to rest is what is usually meant by the word "reality." The conventional language pattern used to describe human societal behavior is to attribute it to a "mind" to which is attributed in turn all the attributes of other organs (e.g., stomach, heart, etc.) in terms of which we are even more accustomed to describe behavior. Thus, we naively locate the mind in the head and attribute to it the behavior which we wish to explain. Attempts to reason similarly about group behavior is felt to involve insuperable difficulties because the notion of a "group mind" is found insupportable: where could such an entity be located?

A glance at the history of the quest for the "seat" of the individual mind will be revealing in this connection. At first it was identified with the breath or warm air which circulated through-

out the body and was at once the source of heat and of activity. According to this view the soul or mind was diffused throughout the organism. At the same time there was a tendency to assign special centers to mental activity. Thus, in Homer, we find the heart figuring as the seat of the mind. Plato referred the inferior operations of the mind to the abdomen and the thorax, reserving the cranium for reason. Aristotle, however, thought the heart was the seat of the mind. Even as late a writer as Galen (A.D. 131–200) thought the warm air in the ventricles of the brain constituted the true seat of mental activity.[10]

As has been pointed out in preceding chapters, modern psychologists no longer find the quest of the soul, the psyche, or the mind a profitable pursuit. We find that the behavior which these entities were invented to describe can be more adequately explained in a language congruous with that used to explain the behavior of all other phenomena. "Thinking" becomes from this point of view reflective behavior [11] consisting fundamentally of internal neural adjustments which may or may not result in immediate or delayed overt adjustments. "Will" and "choice" thus become merely designations of the response to a preponderance of stimuli motivating the organism to respond in one way rather than in another.

Interestingly enough, while this question of "mind" and "opinion" has thus been disposed of with reference to the individual, it still receives, as we have seen, serious discussion as applied to groups. Is there a social mind? The question has received much learned attention.[12] The reality of the entities designated by such terms as "group," "crowd," and "public," has been questioned on the ground that they are merely collections of individuals, which are the "reality." Consequently it has been found necessary to warn against the "group fallacy," "oversouls," and the "group mind" in all its alleged manifestations. One of the difficulties here as in the case of individual psychology has been to find a "seat" or residence of a social mind. This difficulty has been solemnly urged by the individualists as itself sufficient reason for denying the reality of group concepts of any kind. The solution of this controversy is, of course, the same as in the case of individual psychology—the redefinition of mind in terms of the behavior of a total unit.

As soon as this solution is adopted the category of "mind" itself and the large vocabulary of related terms recede into the background. The need of locating in a naive spatial sense any of these entities, as such, likewise disappears. Yet sociologists have been a bit reluctant to take this obvious step. While avowing *group* behavior as their principal subject matter they have allowed themselves to be frightened away from a logically impregnable position by questions about group minds, oversouls, etc. A few illustrations will make clear the nature of the difficulty which is supposed to inhere in a realistic view of group behavior. One writer, after a discussion of crowd psychology and crowd behavior, says: [13]

"The concept of the group mind would seem to be at best only an analogy. Now this group mind either means that there is a psychological entity which is exclusive of individual psyches and yet includes them, or it means that for certain purposes individual differences may be ignored and we may speak of collective behavior as the behavior of the collectivity. In the first case the group mind is a mystical concept, and in the second case it is tautological. *There is no more reason for believing in a collective mind than in a collective stomach.*" [Italics mine.]

The last sentence here betrays the true seat of the difficulty. The "mind" is still conceived as an organ like the stomach! The individual is equipped with this thinking organ. In the group, we experience the same difficulty in finding the organ as the ancients (and some modern psychologists) experienced in locating the individual mind. So embarrassing is the search for this kind of a group mind that most of the contenders for the reality of groups as living, thinking, behaving entities abandon their position at this point. They are frightened at the specter of a thinking organ located in the cranium of the individual, for which they can, of course, find no counterpart in the group.

Another, and perhaps the central, reason for the inferiority feeling and corresponding defense reactions of sociologists when confronted with the social-mind bogey as a logical implication of their position, is the inglorious history of this concept as a survival of the extreme social organicists of the last century.[14] This group of writers, becoming impressed with the same organic aspects of society which have impressed thinkers of all ages, and having had their attention dramatically called to the post-Darwinian developments in biology, became overenthusiastic and

uncritical in the application of individual-group analogies as an end in itself rather than as a means of understanding the phenomena at hand. Much of their work in this connection has since fallen into disrepute, and a general abandonment of their position has ensued.[15] As frequently happens in such cases, also, organismic theories of any kind have become a sort of intellectual taboo.[16] That is, any reference to the organic and functional unity of society is usually accompanied by a disavowal of all organismic implications. As has been pointed out above, this results in some interesting inconsistencies and confusions. There is a large and apparently growing group of "cultural" sociologists who contend vigorously, and I think correctly, for the organic unity and behavior of social groups. The more realistically they hold to this position, the more closely they approach the position of the condemned organicists.[17] To take this view is intellectually taboo although it is desired to retain a position, which, except for a functional instead of morphological definition, is practically the same.

In short, sociologists find themselves in difficulties as a result of their adoption of a vocabulary and a set of meanings from a theory which has already been abandoned in the fields from which the terminology was borrowed, namely, nineteenth century physiology and psychology. This orientation in sociology encounters precisely the same difficulties as it has encountered in the fields from which it was adopted. On the other hand, the acceptance of modern definitions of the concepts of physiology and psychology makes some of these concepts as useful in sociology as in any other field.

Consider, for example, a modern definition of an *organism.* Child speaks of an organism as "a more or less definite and discrete order and unity, in other words a pattern, which not only determines its structure and the relations of its parts to each other, but enables it to act as a whole with respect to the world about it." [18] This seems to me to be also a very lucid and useful description of a social group. It is certainly identical with the sociologist's definition of culture patterns. Apparently the biologist has found the term "organism" a useful concept to describe these relationships and hence has adopted it as a unit of investigation—a symbol for a set of relationships, a term for communication, description, and thought. This usefulness is the sole war-

rant for the employment of the concept in biology. If we find it useful in exactly the same way in sociology, is there any canon of philosophy or science, not to mention biological patents or copyrights, which forbids its use?

We have remarked in the preceding chapters on the provincial view which regards the terminology of science as determined by unique subject matters rather than as designations of behavior and relationships of *any* subject matter. The real reason for the sociologist's inhibitions concerning the "organismic" view of society is his antiquated and inadequate knowledge of biology. As Child very pertinently says:[19]

"Objections such as those that human society is not a big animal, that it has, for example, no stomach, no muscles, etc., etc., are just as true for many organisms as for society. It has been said that social mind has no sensorium. But do not the individuals in relation to each other and to environment constitute the sensorium of the social mind just as truly as cells and cell groups in relation to each other and to the external world constitute the sensorium of the individual mind? . . . Even though we decline to speak of the social organism we find it very difficult to dispense with the term organization, simply because the term expresses better than any other certain processes and phenomena in society as well as in the organism."

A favorite point upon which much discussion of the "reality" of group designations usually converges is the notion of the State. Recent developments in the direction of so-called "totalitarianism" have warmly revived this venerable issue with its principal practical problem of the relationship between the individual and society. The idea of the State, it is felt, involves some notion of a "super-individual." To attribute to such a super-individual all the animistic behaviors, feelings, and characteristics traditionally attributed to the individual can be made to appear quite absurd.[20] Our point is that it is *also* absurd, in a scientific frame of reference, to discuss individual behavior in these terms, and for the same reasons. But so deepseated are the linguistic habits governing the use of certain words as applying only to the behavior of so-called individuals that another set of words are felt to be necessary to describe the behavior of either smaller (e.g., cells) or larger (e.g., social groups) behavior units. In the meantime science, in conforming to the principle of parsimony, is constantly

working in the direction of showing that "different" and "unique" phenomena are only special cases of its general principles. Accordingly, these unique phenomena are to be explained not by special systems predicated on the intrinsic uniqueness of the subject matter but by a broadened and more generalized definition of scientific categories so as to include the hitherto excluded fields of phenomena. We shall deal in a later chapter (Chapter VIII) with some of the traditional questions of the relationship of the individual and society, mainly, to show the illusory nature of the issue, or more correctly that it arises from the nature of certain traditional assumptions regarding man and society which are here repudiated. We mention the matter here only as incidental to a discussion of group mechanisms of behavior.

Except for the fact (a) that I wish to consider below the mechanisms of group behavior and (b) that I wish to consider them from the same point of view as the mechanisms of any other behavior whatsoever, I should not, of course, concern myself even casually either with such a term as "group mind" or with the applicability of the word "organism" to social groups. I have merely pointed out that there is *no more* objection to such a category as "group mind" than there is to such a term as "individual mind." Both concepts in their traditional meaning are obsolete and I do not find either of any value in explaining behavior. Sociologists must take the same attitude toward the "group-mind" controversy as the behaviorists, and indeed most psychologists, now take toward the individual mind as a scientific category, i.e., to define it, if at all, in terms of the total behavior of the organism or entity under discussion. I am here merely making a concrete application of the principle developed in earlier chapters that scientific terms must be defined operationally in terms of the behavior they aim to represent, regardless of preconceived notions that certain scientific behavior-and-relationship categories are applicable only to certain restricted subject matters.

We may summarize our position on the theoretical aspects of the "group" controversy as follows:

The question of the reality of the entities designated by such terms as "group," "crowd," and "public" has arisen from a mistaken notion of the nature of all categories and units.[21] In this case, the argument has been that groups are merely "collections"

of individuals and that we cannot scientifically speak of a social group as acting and thinking, since it is the individuals composing the group that think and act. This reasoning is purely the result of habituation to one set of units rather than to another, and the objections raised against such units as "group" and "public" are equally applicable to the individual as a unit. Suppose that biologists should insist that it was improper for psychologists to speak of the individual as such because it is, after all, cells that behave. Suppose, further, that biochemists or physicists should thereupon remonstrate with the biologists for speaking of the behavior of cells when everyone knows that it is the atoms, molecules, electrons, etc., that behave. In such a controversy all parties would be right. The size of the unit we see depends on the focus of our lenses, which in any given case is determined and justified by whether it helps us to understand and explain the behavior of the unit in which we are interested. We shall show below that the group concept is useful in this sense. It serves, in fact, the same purpose relative to societal phenomena that the concept of the individual has served in psychology. That is, when social units and phenomena are recognized to possess the same kind of reality as other phenomena, the same methods that have brought results in other sciences will be applied in sociology, with corresponding results.

In short, all units are the constructs of man's convenience, which is the sole criterion of both their reality and their justifiability.[22] That the behavior of any given unit can be shown to be made up of the behavior of constituent units in no way invalidates our use of the larger synthesis as a unit if such usage serves our purpose. It is therefore just as permissible to speak, for example, of public opinion as of individual opinion and as permissible to speak of the thinking, feeling, and acting of a group as it is to attribute those phenomena to individuals. In both cases, these words merely indicate a technic through which the unit referred to achieves a tentative adjustment.

With the above theoretical considerations before us, we may now consider the major mechanisms of human behavior, both individual and collective. We shall consider the former only briefly. Group mechanisms are here our primary concern. In connection with our discussion of the latter, we can best consider

the practical implications of the theoretical position we have taken above and the objections that have been raised to that position.

C. THE MECHANISMS OF ACTION, INTERACTION, GROUP FORMATION, AND OTHER BEHAVIOR

The basis of group life may be any characteristic, likeness, or difference of individuals which sets up that interrelationship which we have called societal. Different writers have attempted to explain the phenomenon by postulating gregarious instincts, consciousness of kind, common interests, and so forth. As an hypothesis there is, of course, no objection to postulating any force to describe a social gravity or magnetism which operates to draw people together or pull them apart. But such a postulate must be the beginning of inquiry rather than the conclusion. The *analysis of the behavior* on the basis of which we make the postulate becomes the real task. Only by such analysis do we learn *how* this gravity works, which is the concern of science rather than *what* gravity is. The present volume is devoted to the outlines of this task as regards human societal behavior. To begin with, however, we shall summarize here the commonly accepted mechanisms in terms of which it is found convenient, in the present state of knowledge, to discuss organic behavior of individuals and of groups.

As science has advanced, the mechanisms of action have been described in terms of succeedingly lower levels (i.e., in terms of constituent factors) of explanation.[23] For example, group movements are describable in terms of the movements of the constituent individuals, the individuals in terms of cells, and cells in terms of the more elemental units of chemistry and physics.

The mechanisms within constituent individual units, i.e., next below the unit we have chosen as basic to our problem, we leave, in the present volume, to other sciences which have already specialized in these fields. We are not concerned, for example, with the principles of atomic or cellular structure and function which it is generally agreed underlie the behavior of all matter. Likewise, we are not primarily concerned with the problems of the physiology and psychology of the individual human organism.

The *group or interrelational behavior* which we have defined as the province of sociology is susceptible to observation and description in its own terms and on its own level regardless of what may be the internal physico-chemical processes involved in or constituent to that behavior. To make this point is not to minimize the importance of any or all of these other fields of study. On the contrary it is because we recognize their importance that we believe the accredited workers in these respective fields should be allowed to speak regarding them.

The extended treatment in sociology texts of problems of genetics and physiology may have contributed considerably toward a diffusion of elementary knowledge of these subjects but has not contributed a great deal directly to the solution of sociological problems. It happens, however, that the mechanisms of action on the lower or more atomic levels have been more adequately studied and reduced to verifiable sequences than have the mechanisms by which groups act. A study of the more elementary mechanisms may accordingly be valuable in throwing light on and suggesting hypotheses for the study of the action-mechanisms of larger units. Purely as a point of departure, therefore, and only in order to clarify further the assumptions from which we start, we may briefly set down the main types of mechanisms of mutual attraction and repulsion in organic matter, including human beings, that are at present generally accepted. The present state of knowledge on this subject is, of course, highly imperfect especially as regards human groups, but the following summary will illustrate important mechanisms of organic interaction and suggest some of the problems involved in their further study.

In adapting the conventional classifications of mechanisms given below one caution must be kept in mind: We are not under the delusion that we are describing mysterious entities of some sort with an independent existence apart from the behavior which constitutes them. Nor do we use these categories as *causes* of behavior. We use such categories rather to designate certain types of *uniformities of behavior* under certain conditions. A description of the conditions under which the behavior takes place is still the *sine qua non* of scientific explanation. Likewise, it should not be assumed that the categories used below in the classification of mechanisms of behavior are sharply distinguishable from each

other. Herrick's statement about reflexes in this connection may be repeated with special emphasis as regards societal mechanisms:

"No one has yet succeeded in formulating a cleancut definition of the limits of the reflex either at its lower or at its higher extreme, and perhaps no one ever will; for the whole list of behavior types, from machines to men probably form a closely graded series." [24]

With this caution we may now enumerate the more commonly recognized types of mechanisms. We include among them the simpler organic mechanisms as well as the highly developed mechanisms of societal behavior, not because we intend to use the former in sociological explanation but because we wish to emphasize again that *all* of them are *behavior categories* rather than "gadgets" or "things," and that all of them are comprehensible under the same theory of behavior and amenable to study within the same framework and by the same general methods.

1. Tropisms

These are elementary mechanisms which in their various forms may become the basis of aggregations of individuals in the sociological sense. They take various forms according to the environmental stimuli that set the mechanism off. The heliotropism and the galvanotropism and the chemotropism illustrate this mechanism. The larvae of the annelid worm *Arenicola*, for example, will turn directly toward a light without preliminary trial movements. "By using two sources of light so situated that the rays cross at right angles in the region where the specimen is located, and then alternately intercepting the light from each of the two sources, it can be seen clearly that the larvae, by muscular movement, turns the anterior end toward the source of light directly. There is no trial reaction in this process. It is an asymetrical response to an asymetrical stimulation." [25] *Galvanotropisms* are postulated on the basis of similar responses to electric currents. Certain fishes apparently get definite chemical stimuli through their barbels (tentacle-like processes which grow out around the mouth) to which they react negatively or positively and which becomes the basis of groupings. "If they have moved towards a black paraffin model of a catfish minnow, on touching it with the barbels, they move away apparently recognizing that the model

is not the real thing. Their touch-chemical sense is not very sensitive for they apparently cannot distinguish other species from their own. They attempt to push against a second fish whether of their own or of another species; if both are catfishes a mutual pushing results which, if many are present, leads to a dense group formation. If the second fish belongs to some other species, it moves away and leaves the catfish alone. There is some evidence too, that even blinded catfishes can recognize the passing of another fish by the vibrations which it sets up and that they will turn and follow such vibrations." [26] These groupings are not necessarily true groups in the sociological sense, since the aggregation may be due to reactions of the organism to other common surrounding rather than to other members of the species. This may also be true of some aggregations among higher forms of life such, for example, as the overnight or sleeping aggregations of solitary wasps, swarming locust, butterflies, insects, and many birds.[27]

2. Reflexes ("Inborn" and Primitively Conditioned)

With the appearance of nervous systems more complicated reaction mechanisms appear which are sensitive to a variety of stimuli. In ants, for example, "recognition of other members of the family-colony is usually by a contact-odor sense. Many ants are totally blind and even those with eyes frequently live in totally dark places. For all such it appears that theirs is a world of odor-shapes and spaces, just as ours is a world of color forms. Ants will attack and kill another that lacks the colony odor to which they are accustomed. The ants appear to learn which odor to accept, for observations have shown that if newly emerged, so-called callow ants are placed together, though they come from different species as well as from different colonies, and if for the first few days of their adult life, each is made to touch every other member of the artificially mixed colony with her antennae at least once a day, then this group will form a new unit and will attack outsiders that lack the nest odor to which they have become accustomed." [28]

"Sight plays an important role in the integration of many aggregations which range from herds of mammals, flocks of birds, and schools of fishes to the breeding collections of many frogs,

where the males will attempt to clasp any moving object of about a frog's size which they can see. Similarly the well-established flashing in unison of fireflies appears to be set off by the synchronous flashing of some pace-setting individual.

"Many of the activities of animal groups are regulated by low frequency vibrations which are perceived through the substratum while other groups are bound into working units by sounds carried through the air. Beebe has found that there is a close correlation between the development of vocal powers of tropical birds and the habitats in which they live. Relatively solitary birds that live in the open country where the view is undisturbed tend to have negligible voices and react to their fellows by sight, while those of the nearby jungle, where vision is distinctly limited, have remarkable vocal powers, with loud staccato calls or insistent rhythms. With many animals, including such widely separated forms as pigeons and men, the social integration depends primarily on the use of voice as a means of social control." [29]

It should not be assumed, however, that all sounds produced by animals are of social or other importance to the animal producing them. Sometimes these sounds appear to have only generalized significance as outlets of energy and in stimulating to activity.

3. Habits

Habits are distinguishable from reflexes only by the fact that the conditioning technic by which they become established is relatively well known, and therefore subject to "teaching" and "learning," as distinguished from "hereditary" and "inborn" characteristics. But obviously, as will be pointed out in a later chapter (Chapter VI), the "hereditary" and "inborn" characters are also acquired in their own way—some by the combination of environmental circumstances determining genetic combinations, others by embryonic conditioning.[30] In organisms with nervous systems the technic of conditioning is highly developed and affords, of course, almost unlimited opportunity for the development of action patterns of vast complexity. Especially is this true of the human species because of its capacity to acquire linguistic and symbolic mechanisms. The latter are, in fact, habits so predominantly the basis of social groupings in the human spe-

cies that symbolic patterns are practically the only mechanism that needs to be considered in accounting for human groups, because they represent and largely overlay all the other mechanisms. Linguistic patterns representing group patterns of behavior called folkways, public opinion, traditions, customs, mores, and institutions constitute, as we shall see, the principal subject matter of human sociology.

Habits are formed when the adjustment needs of the organism are not adequately served by the so-called inherited behavior patterns such as tropisms and reflexes. On their most elementary level, habits consist perhaps of combinations of the simpler mechanisms. The simplest kind of habits are probably formed as a result of the overt trial and error adjustments of the organism. The successful adjustment tends to be reinstated on subsequent occasions more readily than any other random movement. With the development of symbolic behavior, this process is greatly complicated. Certain outcries of an animal, such as of fear, serve as a substitute stimulus to other animals which have acquired the habit of responding in a certain way to a certain sound. Thus the fear response may be aroused in the latter without their being actually or immediately exposed to the original fear-situation. When this primitive method of communication is supplemented by speech the variety, kinds, and degrees of substitute stimuli and responses are greatly accentuated.

Language symbols may serve as stimuli situations not only for immediately impending adjustments but for situations in the indefinite past (memory, tradition) or in the future. Likewise, symbols may represent relatively easily verifiable referents ("real" situations) or situations with no such verifiable referents ("imaginary" situations). From the scientific viewpoint *behavior evoked by* purely "imaginary" symbol-situations is, of course, as important an object of study as any behavior evoked by symbols representing "real" situations or concrete adjustment situations of a nonsymbolic sort, such as dodging a falling object. That is, the worship of a deity by a primitive tribe constitutes societal behavior just as truly as their fleeing (as a group) from a forest fire. The objectivity of the phenomena responded to varies in the two cases in that only people conditioned to the religion in question will respond to the religious symbols while the culture-

pattern of fleeing from a forest fire is doubtless very much more widely diffused. When people persist in responding to "private" imaginings, they are regarded as the victims of illusions and hallucinations. The distinction between these types of behavior lies in the possibility of securing corroboration of the referents of the symbols involved.

Prior to the development of written symbols, symbolic behavior consists of the gesture and speech habits acquired and entirely contained in the neuro-muscular systems of individuals. With the appearance of written symbols, themselves highly intricate and charged with meaning, the external storage of man's experience in books, libraries, and museums, becomes possible in a volume and with a degree of accuracy quite impossible as long as oral and gestural symbols alone exist. (See Chapter II.) Written symbols in various art forms as well as in words and mathematical formulas become prodigiously rich and concentrated symbolic stimuli for the release of enormously intricate habit systems either of "inner" adjustments (thought) or of overt adjustment responses. In the accompanying table, Chapin has summarized with admirable compactness the various levels in the process of symbolic substitution. The table illustrates, as its author aptly remarks, "the twin dangers, on the one hand, of getting out of touch with reality by reliance on symbols of too attenuated a kind, and, on the other hand, of grubbing around in such close touch with practical details as to fail to see the forest for the trees." [31]

Through this process of inventing and transmitting symbols and symbolic systems and technologies as well as their non-symbolic counterparts in concrete tools and instruments, man's experience and his adjustment technic become cumulative. This societal behavior, together with its man-made products, in their interaction with other aspects of human environment, creates a constantly changing series of phenomena and situations to which man must continuously adjust through the development of further habits achieved by the same process. The concrete manifestations of these processes are usually designated by the vague word "culture." [32] In the midst of this constant flux man nevertheless clings to certain reference patterns of various degrees of stability. These are called by such terms as folkways, customs,

TABLE 1. LEVELS IN THE PROCESS OF SYMBOLIC SUBSTITUTION

(Read Up)

(From Chapin)

Level of Experience	*Description of Experience*	*Form of Symbolic Substitution*	*Type of Educational Transmission*	*Level of Trial and Error Process*
6th level	$y = a + bx + cx^2$	Abstract mathematical formula or family of curve	Highly abstract symbolic substitution	Symbols substituted in the process of mental manipulation
5th level	$y = 100 - 3.5t + 0.264t^2$ (equation fitted to the trend of the tabulated figures)	Specific arithmetical and algebraic symbols in an equation that summarizes a trend of the data	Specific numerical substitutes	
4th level	Graphs based upon tabulated numbers of cases per month	Generalized description in graphs and tabulations	Summarized description in number symbols	Numerical substitute stimuli and responses
3rd level	Monthly statistical reports of cases of a poor relief department	Specific numerical data		
2nd level	Case records of names, addresses, notes on needs, resources, etc. of relief clients	Specific records of human experience stored in verbal symbols	Qualitative word-symbol substitutes for non-present persons	Qualitative word-symbol substitutes for direct experience
1st level	Memories of sense impressions (after office hours) in the minds of social workers who interviewed clients	Visual and auditory images as substitutes for experience	Conversation and discussion	Overt level of wasteful manual manipulation
0-level	Unemployed persons in need of relief	Sense perceptions	Personal face-to-face contacts	

mores, and institutions. The description of these collective behavior-patterns or group habits (and through them, the prediction of

behavior) constitutes the principal task of the social sciences. These habit-systems consist of language and other symbolic patterns constituting ideologies, together with the nonlinguistic behaviors involved in adjustments to the total environment. The bulk of the literature of the social sciences consists of descriptions of innumerable cases of these behavior complexes. We enumerate here only the main classifications of them which are at present commonly used.

4. Folkways

Folkways in common with the other designations of group behavior patterns to be discussed below are the collective aspect of what we call habit in the individual. "Folkways" is a word used at present to designate these uniformities in the behavior of a group which develop relatively spontaneously and even unconsciously in adapting to common life-conditions and which become established through repetition and general occurrence. "Men begin with acts, not with thoughts," says Sumner in his classical study of this mechanism. "If asked why they act in a certain way in certain cases, primitive people always answer that it is because they and their ancestors always have done so." [33] While we now regard thoughts also as acts, this appraisal of conduct by primitive people themselves is in many ways a more sound and adequate explanation of societal behavior than the sophisticated rationalizations which theologians, philosophers, and others frequently have advanced. For it implies the fact that societal action patterns come into being simply through behavior in a societal environment. The successful adjustments made by one organism, one group, or one generation not only predisposes those behavers to future similar action, but their behavior becomes part of the environment of other groups and as such influences the behavior of the latter in the direction of similar adjustments. All mechanisms of group behavior consist fundamentally of such uniformities in the behavior of groups. That is, we observe behavior; the conditions to which we attribute this behavior constitute the mechanism.

5. Customs

Customs are those folkways that persist over relatively long periods of time so as to attain a degree of formal recognition and

so as to be passed down from one generation to another. *Convention, fashion, fad,* and *craze* are words used to denote the present, contemporary, or relatively transitory aspects of custom.

6. Traditions

Traditions are the memories and verbal reports of customs and the reputed past experience of the group.

7. Mores

Mores are those behavior patterns of a group to which conformity is required on pain of group coercion.

8. Institutions

Institutions are the most stable, uniform, formal, and general of the group behavior patterns. They are frequently merely the formal organization of mores. Chapin has conveniently classified institutions into two types: (1) Diffused-symbolic institutions, such as science, art, religion, and law; (2) nucleated institutions, such as a school, a church, a family. Examples of each of these kinds of institutions will be considered later.

Nearly the whole content of sociology and of the social sciences consists of the voluminous reports of the folkways, customs, conventions, fashions, mores, and institutions of various peoples at different times and places. These data are, of course, the raw materials of the social sciences. Accordingly, we must leave the detailed discussion of the mechanisms enumerated above to monographs and specialized treatises, although special aspects of these mechanisms will be treated in subsequent chapters. The purposes of science, however, require (1) that the recorded anecdotes, cases, and instances be reduced if possible to some common units of societal behavior; and (2) that they be systematically analyzed in terms of these units. The hundreds of graphs and tables of Professor Dodd's *Dimensions of Society* represent from this point of view a sample of those uniformities and correlations in societal behavior which are constituent of such general and somewhat vague categories as folkways, mores, and institutions. Just as the individual anecdotes of anthropological and sociological literature constitute a record of such uniformities and correlations of behavior in individual cases so the graphs of Professor

Dodd's volume represent an attempt to express *in generalized form* the behaviors that constitute group behavior patterns and which for convenience in classification we attribute to mechanisms of the types here discussed. It is not our purpose here to add to or to recount further illustrations of folkways, mores, and institutions. *From their operation,* what laws of societal behavior are discernible? This is the principal question of scientific interest and the method of approach to that question is our principal subject. With this end in view our interest hitherto has been to identify and characterize these behavior patterns and to elaborate a framework within which group behavior may be systematically studied.

It will be observed that all of the above terms at present used to designate the major types of group behavior patterns (adjustment mechanisms) are rather vague categories in the language of folklore. The terms have at present widely overlapping boundaries, instead of the definite operationally definable limits desired in scientific categories. The classification of any given behavior complex in any of the stated categories depends at present apparently very largely upon the degree of generality, persistence, formality, and perhaps above all, on the attitude which the behaving group itself takes toward the behavior. The latter would, of course, itself have to be determined from the group's behavior. The scientific definition of these categories or of others which it may be desirable to substitute, waits upon further analysis of the complexes observed. They are at present used to designate various degrees of uniformity, generality, persistence, and compulsiveness in conduct. A more adequate definition calls for the reduction of these characteristics into measurable units and the definition of each category in terms of arbitrary intervals of a continuum. This systematic analysis of the *constituent behavior* represented by present sociological categories or of others which it may be profitable to substitute, rather than further literary discourse on the "nature" of institutions, is our greatest need.

We have found it convenient in science to classify inorganic and organic behavior, including that of the individual human being, in terms of the mechanisms through which the observed behavior takes place. As previously stated, we mean by mechanism merely that arrangement or relation of parts of any situa-

tion which is adapted to produce a given effect. Accordingly, we have taken the position above that those relationship-or-interaction-situations which operate to produce uniformities in the behavior of groups may profitably be considered as mechanisms of group behavior. The justification is exactly the same as that under which we adopt words like tropism, reflex, and habit to describe different relationships of parts and interactions in individual organisms.

We have, therefore, taken the view that folkways, customs, mores, and institutions are merely ways of designating group habits of various degrees of uniformity, formality, and persistence. This usage is no more figurative in the one case than in the other for in each instance the mechanism must be described in terms of the behavior which constitutes it (from the dynamic point of view). From this point of view mechanisms are merely convenient categories under which behavior can be significantly and verifiably classified. As we have seen, plants and animals are frequently classified on the basis of the mechanisms which govern their behavior. We have adopted such categories as mob, assembly, public, caste, class, and nation to describe different types of societal groups on the same basis, namely, the nature, degree, and type, of the interrelationships between the parts, i.e., the mechanism governing the behavior. In short, interactional behavior is classified from the static or structural point of view as types of groups (see Chapter IX). From the dynamic point of view groups may be distinguished by their behavior mechanisms. The same behaving entity, e.g., an individual or a group, may accordingly be variously classified according to the behavior mechanism that governs the behavior on different occasions. Thus the same group of people might be classified as a mob, an assembly, or a public.[34] Likewise, the same individual is at different times variously characterized as fanatic, statesman, or scientist.

We have taken the position that group behavior may be scientifically studied within the same general framework as individual behavior. Some of the more naive objections to this position, such as the problem of finding the "seat" of group mechanisms, have already been discussed. The nature of group mechanisms will be further considered in Chapters IX and X. We turn now to a consideration of some of the practical aspects of the above posi-

tion. Does it, when applied to concrete situations, involve us in absurdities and contradictions which make it practically inadvisable, however logically defensible it may be? It is obviously useless even in the name of parsimony to force widely disparate behavior into a common framework if by so doing we are hampered rather than helped in describing meaningfully the behavior in question. Let us consider, therefore, some of the principal problems that arise in analyzing group behavior in terms of a group mechanism, in the same way as we describe individual behavior in terms of a reflex or a habit.

D. PUBLIC OPINION AS A GENERAL FACTOR IN GROUP BEHAVIOR MECHANISMS

One of the commonest group designations used in discussing collective behavior is the "public." Together with the word "opinion" the resulting phrase is today widely used to designate a sort of all-pervading group force behind a great many societal adjustments. As such it is a term of great convenience and utility. Its weakness lies in the fact that it has not as yet been defined in terms of the behavior to which it is applied. Instead, persistent attempts have been made on the one hand to define the term and to explain the phenomena to which it is supposed to refer, by reducing it to the behavior of constituent individuals. On the other hand, attempts have been made to elevate the term into a transcendental verbal realm in which no definite behavior-referent needs be given. Both approaches have resulted in confusion and some of the most ludicrous literature in the social sciences.

It is quite common to say that "the public" "likes" or "thinks" thus and so, is shocked by this or that, believes, disapproves, and acts. Are such statements merely "figurative" or in any case *more* "figurative" than similar statements about an individual? Since our conclusion on this point regarding the public will also be applicable to other group designations such as family, club, party, state, nation, and society, we shall take the terms "public" and "public opinion" as illustrative of the practical defensibility of the theoretical position we have espoused above. This can be done most economically by considering some of the chief difficulties that have been urged against our position. We summarize

below some of the more common questions that have arisen in this connection, together with our solution of them from the point of view taken in this chapter.

1. Vagueness in Definition of the Term "Public"

A principal source of difficulty in the definition of public opinion has been the varied and confused usage of the term "public." Sociologists have been guilty of using somewhat interchangeably a large number of terms to designate societal groups of various kinds, with resulting confusion. Perhaps the principal reason for this confusion has been the failure to recognize that, since the essence of a social group is interaction among its members, all social groupings are fundamentally sociological and must be defined on this basis. Now societal and "psychic" processes usually center around some very objective and physically tangible core. Because of the convenience of thinking and talking about these processes in terms of their material locus, we fall into the error of mistaking the latter for the former. The result has been endless confusion in attempting to define societal categories in static and morphological instead of functional terms.[35]

All societal groups are sociologically and psychologically similar in that they involve (a) a number of individuals, and (b) interaction between the members (the mark of a social group as distinguished from a mere aggregate). For convenience in discussion, we classify these groups in various ways on the basis of some easily recognized, even if superficial, characteristics which distinguish one group from another. The basis of this classification, as of all classifications, will be our immediate interest or problem. If we are interested in the geographical aspect of a societal grouping, we call it by such names as neighborhood or city. If our interest is chiefly in the degree of formal organization present in a group, we use such terms as crowd, mob, or assembly. If we are interested in classifying societal groups on the basis of common beliefs, opinions, principles, creeds, or dogmas, we use such terms as sect, party, or public.

Public has been variously defined and distinguished from other groups on the basis of physical, political, and psychological criteria. Thus Tarde, in attempting to distinguish between "crowd" and "public," limited the former to a group of such size that it

can be reached by the human voice and calls the public the result of contagion without contact—a "purely mental collectivity." [36] The difficulties of this distinction under modern conditions of communication, radio, television, etc., are obvious. Perhaps most discussion of the subject implicitly assumes the identity of the public with political units. Thus the people of a city, and especially the citizens, are assumed to constitute the public with reference to all questions affecting the city. State and national publics are similarly defined. It has remained for the sociologists to emphasize the spontaneous and informal but deliberative characteristics of the public as compared with associations, assemblies, and organizations on the one hand, and crowds and mobs on the other. The essential basis for defining a public is a common interest of some sort. The evidence of such common interest must lie in common behavior of some kind. The behavior by which membership in one public or another is known is frequently merely verbal, but may include all forms of behavior. In short, we must define a public as any group "which thinks or acts as if it thought the same on closely similar or complementary things." [37] This is virtually also a definition of public opinion. *Public opinion is the tentative deliberative adjustment of a public to any situation.* Any group which makes such an adjustment may be called a public with reference to the question on which it acts—actively or by acquiescence. It follows, of course, that a person may belong to as many publics as he has interests, and that a public may or may not coincide with physical, geographical, or political units.

2. Must Public Opinion Be Unanimous?

Is it necessary for public opinion to be unanimous? Is it synonymous with *majority* opinion? How small a minority opinion may be public opinion?

Under our approach these questions may as well be asked regarding individual opinion. If an opinion is the preponderance of one type of reactions to a situation, the degree to which stimuli are present motivating the organism in another direction is essentially the question as to how unanimous an individual opinion is. Such conflicts in personal adjustments are usually present. The experience of being torn between two opposing choices or points of view is not uncommon. For example, we are sometimes

very much in doubt as to which of two articles to buy, and although we finally make a choice we sometimes continue to debate with ourselves whether we should not have selected the other article. While the degree of intensity of the conflict varies greatly, it is usually present in all cases of opinion formation. That is to say, our individual opinions are not "unanimous." In fact, it is this element of doubt which distinguishes opinion from belief, conviction, etc. Likewise, we call the attitudes held unanimously by a group by some such term as belief, conviction, or mores.[38]

What happens finally in a given situation is that practical necessity compels us to "choose" or "make up" our minds, i.e., make an adjustment. For all practical purposes this adjustment stands as our opinion, no matter how much in doubt we may have been. One writer has approached this question of the unanimity of public opinion by saying that "a majority is not enough, and unanimity is not required, but the opinion must be such that while the minority may not share it, they feel bound by conviction not by fear, to accept it." [39] From the behavioristic viewpoint the question of unanimity or majority consent is of no *immediate* importance in defining public opinion. The significant thing is the adjustment which is made. If the public for any reason acquiesces in the opinion which finds concrete expression in practical adjustments (verbal or other), the adjustment must be regarded as that public's decision regardless of whether a majority engaged in "weighing the evidence," or took part in voting.[40]

From the scientific standpoint we have no choice but to define public opinion as that opinion, though it be the opinion of only a single individual, in which the public in question finds itself for any reason constrained to acquiesce. This acquiescence or conformity is operationally definable behavior. The reasons for, or the degree of, its acquiescence are important data from *other* points of view—in further describing the opinion, predicting its permanency, etc.—but they do not affect the necessity of defining as public opinion that opinion which becomes the basis of the practical deliberative adjustments of a public. This is exactly how we treat the matter in the case of individual opinion. The deliberative adjustment which is finally made for the organism as a whole we properly call the individual's opinion, regardless of the degree to which the individual was divided "in his own mind."

Now this behavior in terms of which public opinion must be defined can for practical purposes best be stated in terms of probability. Holmes' definition of law as "the prophecies of what the courts will do in fact" [41] suggests also the practical definition of public opinion. As Alpert has said, "Of what scientific value is such a definition of law [public opinion] as 'the will of the state' [community] or 'the command of sovereignty' when it leads students to dispute the *true* meaning or the *real* essence of will, sovereignty, or what have you?" [42] [Parentheses mine] From our point of view, then, public opinion is, at any given moment, the probability that any given public as a group will make a given deliberative adjustment.

3. Sudden Changes in Public Opinions

Closely related to the question of the unanimity of public opinion are the sudden changes to which it is alleged to be subject. Much data could be submitted to show the apparent fickleness of public opinion. It has been pointed out that leaders and programs which at one time appear to have almost unanimous and enthusiastic support may in a period of a few brief months be rejected and scorned. A program overwhelmingly indorsed at one election may be just as emphatically rejected at the next. Such instances, familiar to everyone, appear to be a contradiction of the alleged cultural inertia of large groups.

A more careful analysis of the cases of ostensibly sudden changes in public opinion leads to the conclusion that such changes are frequently more apparent than real. Many of the cases of apparently sudden changes are illusions resulting from (1) our confused definition of the term "public" and consequently of public opinion; and (2) our crude and unreliable methods of measuring and determining public opinion. The first difficulty was discussed above. If, for example, the farmers through general participation in one election adopt an agricultural program, and at the next election fail to participate in the voting on account of overconfidence or on account of a snowstorm, with the result that the same program is overwhelmingly defeated, this will be heralded as a sudden change in public opinion. Yet every individual may hold exactly the same opinion as before. They merely vote in unequal proportions at successive elections. By the same process a man

may be recalled from office for high crimes and misdemeanors in one year and in the next year may be triumphantly elected to the same or a higher office ostensibly by the same electorate.[43] While such a case may, of course, represent a real change of opinion in the community, it does not necessarily indicate any change whatever in attitude. Frequently, the apparently sudden change in public opinion is an illusion flowing from the fact that different people in the electorate participated to a different degree at different elections. In other words, different "publics" have functioned.

A further difficulty in the explanation of apparently sudden changes in public opinion is the lack of any objective methods of measuring the intensity with which an opinion is held.[11] Under our definition and a strictly behavioristic approach, in the absence of any other qualifying data, we must regard purely formal and habitual behavior as our index to opinion. Millions of people attending certain churches and rendering lip-service to certain doctrines over a period of many years would appear to justify the assumption of a rather settled opinion on these matters. Nevertheless members of such a group may suddenly abandon their affiliation in large numbers and take positions of advanced skepticism. In such cases the course of disintegration of their old beliefs may have been a very slow process. But, to the extent that it has been private, the change seems sudden. The behaviorist is, of course, as interested as anyone in devising methods whereby the mechanisms behind the more formal and overt behavior can be observed scientifically.[45]

While many cases of alleged sudden changes in public opinion are thus to be attributed to our inadequate methods of determining group opinion, it cannot be denied, of course, that if we include the less rational and less deliberate group adjustments, sudden changes are both real and pronounced. The fickleness of the mob, for example, can be rather well substantiated. To the extent that public opinion approaches the mob level in spontaneity, emotionalism, and shallowness, sudden changes are likely.[46] Opinions lightly held either through indifference, lack of contact with relevant facts, or lack of deliberation regarding them, are, of course, correspondingly easy to change. Many of the so-called sudden changes in public opinion are really mob reactions.[47] A program

initiated and carried through with much enthusiasm is very likely to be carried too far in the sense of disturbing more fundamental conditions, with the inevitable reaction. The swingback is likely to be sudden and violent in proportion to the emotionalism and lack of deliberation which characterized the original movement. Such changes, however, must be regarded as manifestations of mob-mindedness rather than of public opinion as we have here defined it. It must be conceded that much so-called public opinion is really a mob phenomenon. The great masses can have very few rational opinions for they have neither the necessary access to the facts nor the ability to interpret them.

Finally, it should be recognized that opinion is always relative to definite situations, and that therefore what appears to be inconsistent or erratic public opinion on a subject is frequently merely reactions to different situations. If a political party or other public declares itself vigorously in favor of improving the condition of the farmer during the campaign and after election ignores the practical measures of agricultural relief, it does not necessarily prove either that the announced platform was not the "true" opinion of the group at the time of the campaign, or that their opinion has undergone a change in the meantime. The two situations are different both as regards the ends to be achieved and the means whereby they are to be attained. In the first case, the principal end is to capture the farmers' votes and the means are verbal promises. After the election the practical program involves many considerations not present in the first situation. The opinion has changed because the situation has changed.

4. The "Superiority" of Public Opinion

A fourth aspect which has received attention in the literature of public opinion is the question as to whether public opinion is "superior" to individual opinion. The problem is, of course, a survival of dualistic social thought which sets up the individual and the public as mutually exclusive entities. Thus, McDougall says: "It (public opinion) has in any healthy nation far higher standards of right and justice and tolerance than the majority of individuals could form or maintain; that is to say, it is in these respects far superior to an opinion which would be the resultant or algebraic sum of the opinions of all the living individuals."[48]

This is true, according to Professor McDougall, because "leading personalities" tend to dominate public opinion. Cooley comes to the same conclusion and is somewhat clearer in his terminology. "A little common sense and observation," he says, "will show that the expression of a group is nearly always superior for the purpose in hand to the average capacity of its members. I do not mean morally superior, but simply more effective in the direction determined by the prevalent feeling. . . . If a group does not function through its most competent instruments, it is simply because of imperfect organization." [49] This is necessarily so, since, if "the purpose at hand" is itself defined by the group, the "most competent instrument" will be that which, in the group's opinion, best fits the purpose so defined. The statement is really equivalent to saying that an organism tends to make the adjustment it considers best in a given situation. Of course, the organic view of public opinion which we have here taken renders this problem of no greater interest or difficulty than would be the question as to whether the adjustment which an individual finally makes in a given situation is superior to any or all other adjustments which he may have felt more or less strongly motivated to make.

Thus it appears that the realistic discussion of the behavior of groups presents no special difficulties which are not also present in similar discussions of individual behavior, even when we adopt for the group the somewhat vague categories at present popularly employed in the discussion of individual behavior. In the meantime, the behavior of groups is being more and more adequately recorded and correlated. Changes in rates of reproduction, age distribution, income, and opinion of families, communities, and nations are charted and correlated *as group behavior*. These data constitute the evidence of the uniformities which we variously call folkways, customs, mores, and institutions. The refined analysis of this behavior rather than protracted exegesis of these conventional words is the task that confronts us.

E. CONCLUSION

Sociology professes to be, in large part, at least, a study of group behavior. In this connection the question has arisen as to whether

such an expression as "group behavior" is merely a figurative way of speaking or whether the expression may be considered as literal and directly meaningful as any statement about individual behavior.

A large and for the most part inconclusive literature has appeared on both sides of this issue. The literature is inconclusive because it has failed to recognize the fact that the conclusion here, as in all arguments of this type, depends upon the assumptions one chooses to start from. The basic issue involved is the philosophy of the whole-part relationship which has been briefly considered in an earlier chapter. If we postulate at the outset a certain higher order of intrinsic "reality" for some segments of the universe (i.e., for the referents of some of our responses) e.g., the individual, as compared with others, e.g., the group, the conclusion undoubtedly follows. Under such a postulate "group behavior" is a derived and figurative expression and statements about groups "feeling," "thinking," and "acting" are scientifically unpermissible or at least undesirable expressions because they refer to "illusory" entities, "super-individuals" or "over-souls." But, as we have seen, there are no grounds for such a postulate.

In this book we have repudiated as incompatible with a scientific orientation the idea that the units and categories on the basis of which we make our adjustments are given in the phenomena to which we respond. We have taken instead the position that these units (response-categories) are the particular ways of responding by particular types of organisms with all their societal and other conditionings. This position rules out as of purely metaphysical interest all questions of the "nature" and "existence" of a world beyond the reach of man's senses at a given state of development of the organism and of technology. From our point of view the sole criterion of "existence," "reality," "wholes," and "parts" is the adjustment-convenience of the selective response as attested by the uniformity or the agreement of the adjustments of numbers of human beings.[50] From these responses, projections and inferences regarding the "nature" of that which arouses these responses are made. These inferences in the form of symbols, together with the nonsymbolic stimuli to which we respond, constitute at any given time "the world" to those who are subject to these responses.[51]

Strong habituation to certain verbal categories as well as to nonlinguistic forms of behavior produce in men the "feeling" that these units, categories, or other behaviors, refer in some *intrinsic* way to entities of a more "ultimate" character than others. "Individual," "person," "man" are words of this kind as contrasted with such words as "group," "public," and "society." Similar addiction to particular words can, of course, be illustrated from the history of other sciences as well. But the more rapidly expanding horizons of "physical" sciences in the last century have prevented as deepseated habituation to particular words as has occurred in the social sciences. As a result of the rapid change in orientation that has characterized physics, for example, it is not surprising that physicists and mathematicians were the first to recognize the essentially verbal and relative nature of the categories with which they operate. Accordingly, such issues as the individual-group controversy discussed in this chapter have disappeared from the other sciences. Questions of the relative "reality" or figurativeness of atoms and electrons, of molecules and cells, and of cells and organisms of different degrees of complexity would be regarded as ridiculous or meaningless in most scientific circles. The propriety of speaking of the behavior of any of these units as independent entities is recognized as the accepted verbal technic of analytical discourse. Insistence upon the primary or other intrinsic "reality" of one of these categories as contrasted with any other would in science be taken merely as evidence of a primitive notion of the nature of language symbols. We have here taken the same attitude toward the "group-fallacy" argument in the social sciences.

In so far as objection has been raised to group concepts on the ground that their users have attributed to the entities so designated characteristics of which they are unable to give verifiable evidence from behavior data, these objections may be cheerfully granted for the same reasons that we grant similar objections to the terms angels, ghosts, or spirits. The objection is in no way especially applicable to group-concepts. The proper objection is to the use of words representing entities for which no verifiable behavior data can be exhibited. Of course, it is nonsense to maintain (if anyone does so) that "the State is some sort of super-person" or to contend that the functioning of such a super-person

is "different from" the functioning of the individuals or groups of individuals in a larger group such as we have observably before us.[52] It is *equally* nonsensical to contend that the functioning of any individual is "different from" the synchronized functioning of his constituent parts when we respond to these as a whole. Epigrammatic statements about the "whole" being *something more* or "different" from the "sum of its parts," thrive only as long as no one attempts an operational definition of the words used. When analyzed, such shibboleths turn out to be devoid of behavioral meaning. But the above admissions in no way destroy the behavioral meaningfulness of the statements that Brazil exported a million pounds of coffee, that the American League or any of its member teams has won a certain number of ball games, or that the Blank family *is* poor, *feels* depressed, and *decides on* a suicide pact.[53] The observable organization through which these groups carry out observable behavior constitutes as tangible a mechanism for scientific study as the mechanisms through which any individual acts. We find it convenient in science to designate by the word *mechanism* any arrangement or relation of parts in the production of an effect.[54] Herein and herein alone lies the justification for the segregation, naming, and study of any mechanism whatever.

Mechanism is, therefore, on any level and in any science, merely a word which we use to encompass a behavior complex in order to relate it with economy and convenience to other complexes in the description of phenomena on whatever level of interest, microscopic or macroscopic, which happens to concern us. Such words as the State, the Public, Science, etc., are symbols of behavior complexes just as the words "organism," "individual," "loyalty," and "duty" are symbols designating behavior complexes. The attitudes of people toward symbols like the State are no less "real" or devoid of scientific interest than are people's attitudes toward the behavior-referents of these group symbols or of symbols designating individuals. Perhaps the referents of symbols designating individuals are more readily apprehended and kept in mind by the ordinary man than are the referents of group symbols. That is a matter of education and conditioning. At present, the concrete content of all of these symbols is usually left to inference from the context in which they are used. This

is a notoriously unreliable way of designating meanings, and for this reason all of the above terms should probably be abandoned for scientific purposes.

In earlier chapters we have shown that all folk-designations are for scientific purposes likely to be defective. Our argument here has been that this is perhaps *no more* characteristic of group designations than of words designating individual behavior. All of them will doubtless have to be supplanted by mathematical symbols or formulas which lend themselves to the designation of *degrees* of interaction, organization, or whatever may be the relational phenomenon it is desired to designate. The actual behavior-complexes today designated by such words as "state," "public," "marriage," and "family" are undoubtedly so varied as to be practically useless for scientific purposes. The same is true of "individual," "person," "personality," and many other terms assumed to have very specific meaning. In any case, the fault with group concepts is not that they represent less "real" behavior phenomena than the words with which we designate the behavior of individuals. The fault with group concepts, as with many others, is their failure to designate adequately the behavior they are supposed to designate. This is likely to happen when we attempt to apply the language of a simple primitive, primary-group society to a secondary-group society of radically different content.

F. NOTES

1. Cf. Webster's *New International Dictionary* (Second Edition) which defines mechanism as "the arrangement or relation of parts of anything as adapted to produce an effect."

2. We are not here concerned with the question of whether the principle of indeterminism and other recent developments in physics constitute a departure from a mechanical view in the "physical" world. These more recent developments are clearly a departure from the more elementary views of classical mechanics, but certainly not in the direction of a "vitalistic" view. In short, from the point of view of the definition of mechanism here adopted, the quantum mechanics are clearly a more refined development of the mechanistic position. (See S. Hecht, "The Uncertainty Principle and Human Behavior," *Harpers Magazine*, CLXX, Jan., 1935, pp. 237-249.)

3. N. Rashevsky, "Learning as a Property of Physical Systems," *Journal of General Psychology*, V, Apr., 1931, pp. 207-229.

4. G. W. Gray, "Machines Which Imitate Life," *Harpers Magazine*, CLXXI, Feb., 1936, p. 352.

5. A. Einstein and L. Infeld, *The Evolution of Physics*, Simon and Schuster, 1938, p. 58.

6. See, for example, F. H. Allport, "The Group Fallacy in Relation to Social Science," *Am. Jr. Soc.*, XXIX, 1924, pp. 688–706; "'Group' and 'Institution' as Concepts in a Natural Science of Social Phenomena," *Pub. Amer. Sociological Society*, XXII, 1928, pp. 83–99; also his *Institutional Behavior*, University of North Carolina Press, 1933, Ch. 1.

7. F. H. Allport, *op. cit.*, Ch. I; also his "The Group Fallacy in Relation to Social Science," *op. cit.*

8. A. Korzybski, *Science and Sanity*, Science Press, 1933, p. 167.

9. S. Chase, *The Tyranny of Words*, Harcourt, 1938, p. 92. C. H. Cooley long ago recognized the speciousness of the controversy here under discussion. "A separate individual is an abstraction unknown to experience, and so likewise is society when regarded as something apart from individuals." (*Human Nature and the Social Order*, Scribners, 1902, p. 1.)

10. James Sully, *The Human Mind*, Longmans, 1892, pp. 37–38.

11. For a good brief elaboration of this view see J. F. Markey, *The Symbolic Process*, Harcourt, 1928, Ch. 10.

12. For an excellent summary of the various ways in which the concept "social mind" has been used by different writers, see M. M. Davis, *Psychological Interpretations of Society*, Columbia University Press, 1919. Of especial interest in the present connection are the views of Wundt and Durkheim. For more recent discussion of the subject see the works of F. H. Allport cited above.

13. E. D. Martin, "Some Mechanisms That Distinguish the Crowd from Other Forms of Social Behavior," *Journal of Abnormal Psychology and Social Psychology*, XVIII, 1933, pp. 187–203 (reprinted in M. Willey and W. D. Wallis, *Readings in Sociology*, Knopf, 1930, p. 311). See also an even more striking example of this point on p. 297 of the same text, "Does the Crowd Have a Mind?" (reprint of an article on "Social Constructiveness" by A. C. Haddon, *British Journal of Psychology* (General Section), XVIII, 1928, pp. 401–404).

For a more recent illustration, see Milla Alihan *Social Ecology* (Columbia University Press, 1938). Criticizing a passage from R. E. Park, Alihan says: "In other words, each community is an organism, even though it may be an organ of the larger community of which it is a part. It is perhaps sufficient to point out here that this statement is a contradiction in terms. In effect, the ecologists extend at will the concept of environment so that more often than not it includes the geographical, physical, economic, and social environments; and the result is that organism and environment merge into one another, so that the ecological organism is sometimes treated as though it were its own environment." (Pp. 243–244.)

This author is shocked to note that the ecologists have extended the meaning of the concept environment to include the "geographical, physical, economic, and social environments." One is left to wonder which of these are *not* legitimately to be considered environment when the problem demands. This is the

more puzzling since the author herself calls all of them "environments" in the sentence quoted. In any event the complaint seems to be that to consider all of these aspects of a situation as environment makes it appear that the organism is "its own environment." To the rhetorically minded, the physiologist's definition of the environment of a cell quoted in Chapter VI (p. 223) will doubtless seem a flagrant case of the same kind. It is, nevertheless, the only definition of the word which is found useful in science and under the circumstances scientists offer no apology for extending "at will" their concepts (always defining them) regardless of the primitive meanings and associations with which the non-scientific may invest these terms. The same holds for the alleged contradiction in terms in the above quotation. See the passages from Child referred to in the text and in note 18.

14. E.g., P. Lilienfeld, *Zur Verteidigung der organischen Methode in der Sociologie*, Berlin, 1898; R. Worms, *Organisme et société*, Paris, 1896; J. Novicow, *Conscience et volonté sociales*, Paris, 1897.

15. For a summary of the positions of various organismic schools as well as a criticism of them see P. Sorokin, *Contemporary Sociological Theories*, Harper, 1928, Ch. IV. See also F. W. Coker, *Organismic Theories of the State* (Ph. D. Thesis, Columbia Univ., 1910).

16. An interesting by-product of the organismic taboo is the taboo on analogy as a method of reasoning. The notion has gained wide currency that because of its frequent misuse, and especially its misuse by the organicists, analogy as a method is itself disreputable, and useless. As a matter of fact, analogy has been man's most fruitful method of attack upon new problems. "It has often happened in physics," say Einstein and Infeld, "that an essential advance was achieved by carrying out a consistent analogy between apparently unrelated phenomena." (*The Evolution of Physics*, p. 286.) We are totally helpless in the face of a new situation unless we can see some resemblance between it and situations with which we are familiar. The technics with which we attack new situations are always adopted because of the success of these methods in analogous situations. The only legitimate objection to analogy as a scientific method lies in its unrestrained, uncritical use as an end in itself rather than a means to an end. Its justifiability in any case lies in its usefulness for the purpose at hand. For further discussion of this subject see G. A. Lundberg, *Social Research*, Longmans, 1929, pp. 81–82.

17. Such terms as "super-organic" and "super-organismic" have been invented to get around this taboo.

18. C. M. Child, *Physiological Foundations of Behavior*, Holt, 1924, p. 1. Elsewhere (p. 270) the same author says: "The organism is a dynamic order, pattern, or integration among living systems or units. A social organization is exactly the same thing." Nearly all of the literature before Spencer and most of it since his time shows only the vaguest notion as to the meaning of organism in biology. For illustrations see F. W. Coker *op. cit.*, p. 195.

19. C. M. Child, *op. cit.*, p. 269.

20. See for example, P. W. Bridgman, *The Intelligent Individual and Society*, Macmillan, 1938, p. 134.

21. For a more extended discussion of this subject, see G. A. Lundberg, *Social Research*, Longmans, 1929, Ch. 3. Also Jacques Rueff, *From the Physical to the Social Sciences*, Johns Hopkins University Press, 1929; M. A. Copeland, "An Instrumental View of the Part-Whole Relationship," *Journal of Philosophy*, XXIV, 1927, pp. 96–104; W. D. Wallis, "The Independence of Social Psychology," *Journal of Abnormal and Social Psychology*, XX, 1925, pp. 147–150.

22. For a discussion of the philosophical aspects of this subject see citations in preceding note. Acceptance of this position does not, of course, mean that individualistic approaches to sociological problems are invalid or useless. Methodologically, both methods are equally defensible, and the approach in a given case must be determined entirely by the nature of the problem and the purpose and convenience of the investigator. (Cf. Sorokin, *op. cit.*, pp. 457–459.)

23. Regarding the fundamental identity of "explanation" and "description" see Chapter I.

24. C. J. Herrick, "The Evolution of Intelligence and Its Organs," *Science*, XXXI, 1910, p. 18.

25. W. C. Allee, *Animal Aggregations*, University of Chicago Press, 1931, p. 39.

26. W. C. Allee, *Animal Life and Social Growth*, Williams and Wilkins, 1932, p. 106. (Citing S. O. Mast, *Light and Behavior of Organisms*, Wiley, 1911.)

27. *Ibid.*, pp. 110–111.

28. *Ibid.*, p. 107.

29. *Ibid.*, pp. 113–114.

30. Ch. VI, Sec. D, 2.

31. F. S. Chapin, *Contemporary American Institutions*, Harper, 1935, pp. 140–141.

32. For an illustration of the struggles of sociologists and psychologists to define this word see the summary by A. Blumenthal, "The Nature of Culture," *American Sociological Review*, I, Dec., 1936, pp. 875–893. The case is an admirable example of what happens when we set out to "find" the "correct" and "true" definition of demarcations assumed to be given in nature, instead of arbitrarily agreeing upon the limitations of a phenomenon which we wish to designate with a certain word. See also Ch. III, note 3.

33. W. G. Sumner, *Folkways*, Ginn, 1906, p. 23.

34. For an excellent description of such groupings see R. T. LaPiere, *Collective Behavior*, McGraw-Hill, 1938.

35. We shall return to this subject in Chapter IX.

36. G. Tarde, *L'Opinion et la Foule*, Alcan, 1901, p. 2. ". . . une collectivité purement spirituelle, comme une dissémination d'individus physiquement séparés et dont la cohésion est toute mentalle."

37. L. L. Bernard, *Social Psychology*, Holt, 1926, p. 184. See also F. H. Allport, *Social Psychology*, Houghton, 1924, p. 308: "Psychologically speaking, 'the public' means to an individual an imagined crowd in which (as he believes) certain opinions, feelings, and overt reactions are universal."

38. Cf. R. E. Park and E. W. Burgess, *An Introduction to the Science of Sociology*, University of Chicago Press, 2nd Ed., 1924, p. 832.

39. A. L. Lowell, *Public Opinion and Popular Government*, Longmans, 1921, p. 15. The attempted distinction between "conviction" and "fear" as the motive for an adjustment is a very dubious undertaking, inasmuch as fear (of social disapproval) may very easily be the determining factor in conviction. Conviction itself cannot be regarded as anything more than a more firmly held opinion, i.e., a more permanent and "unanimous" adjustment.

40. Confusion and argument on this subject is usually the result of a loose definition of the term "public," especially that by which it is taken to mean all people within a particular political jurisdiction.

41. "If you want to know the law and nothing else, you must look at it as a bad man, who cares only for the material consequences which such knowledge enables him to predict . . . what constitutes the law? You will find some text writers telling you that it is something different from what is decided by the courts of Massachusetts or England, that it is a system of reason, that it is a deduction from principles of ethics or admitted axioms or what not. But if we take the view of our friend the bad man we shall find that he does not care two straws for the axioms or deductions, but that he does want to know what the Massachusetts or English Courts are likely to do in fact. I am much of his mind. The prophecies of what the courts will do in fact, and nothing more pretentious, are what I mean by law." (O. W. Holmes, "The Path of Law," *Harvard Law Review*, X, 1897, quoted in H. C. Schriver, ed., *Justice Oliver Wendell Holmes: His Book Notices and Uncollected Letters and Papers*, p. 23, footnote 21, Central Book Co., New York, 1936.)

The same view has been expressed by W. W. Cook (quoted in J. Frank, *Law and the Modern Mind*, Coward-McCann, 1930, p. 129) and B. N. Cardozo (*The Growth of the Law*, Yale Univ. Press, 1924, pp. 33–34). The following quotation from the latter source is especially suggestive with regard to the definition of public opinion:

"Law, like other branches of social science, must be satisfied to test the validity of its conclusions by the logic of probabilities rather than the logic of certainty. When there is such a degree of probability as to lead to a reasonable assurance that a given conclusion ought to be and will be embodied in a judgment we speak of the conclusion as law, though the judgment has not yet been rendered, and though, conceivably, when rendered, it may disappoint our expectation."

42. H. Alpert "Operational Definitions in Sociology," *American Sociological Review*, III, Dec., 1938, p. 858. This excellent paper also suggests the extension of Max Weber's concept of *Lebenschance* to the probability-operational definition of social class status. (See below Ch. VIII, Sec. C.) Alpert also first suggested to me the specific applicability of this point of view to the definition of public opinion. I have, of course, from the beginning (see Chs. 1 and 2) recognized and emphasized the dependence of my viewpoint, and indeed of all scientific generalization, upon the philosophy of probability.

43. E.g., the case of Senator Lynn Frazier of North Dakota. He was elected governor in 1920, recalled in 1921, and elected to the United States Senate in 1922.

44. See S. A. Rice, "The Political Vote as a Frequency Distribution," *Journal of the American Statistical Association*, XIX, March, 1924, pp. 70–75. Also the same author's *Quantitative Methods in Politics*, Knopf, 1928, Ch. 6. Rice's contributions indicate the difficulty of interpreting the vote as an index of opinion because elections call for a "yes" or "no" decision on alternatives on neither of which the voter has very emphatic views. Election issues tend to be drawn as near as possible to the central massing of opinion in order to attract the large groups of moderates who are "on the fence." The people with emphatic or extreme views will vote for the side which seems closer to their view. But the intensity with which an opinion is held is obviously of great importance in determining the ease with which it can be shifted. Since the issue is drawn as finely as possible between the two large opposing moderate groups, the result is obviously easily shifted from one side to the other by (a) a very slight change in issues, or (b) by a slight increase in the vigor of the campaign of the opposite side or other factors affecting the participation in the election. The result may appear as a sudden change in opinion, although the views of each public remains practically the same as it was when the other party won the election. (On the probable effects of campaigns on opinion, see Rice, *op. cit.*, Ch. 18. Also G. A. Lundberg, "Campaign Expenditures and Election Results," *Social Forces*, VI, March, 1928, pp. 452–457.) (See also Margaret Mead, "Public Opinion Mechanisms among Primitive Peoples," *Public Opinion Quarterly*, July, 1937, pp. 5–16.)

45. See L. J. Carr, "Public Opinion as a Dynamic Concept," *Sociology and Social Research*, XIII, Sept.–Oct., 1928, pp. 28–29. Carr gives an excellent summary of the types of problems the investigation of which would furnish data as to the intensity or casualness of opinion. There is considerable misunderstanding of the behavioristic point of view in this connection. Thus Professor Hornell Hart (*Amer. Jour. of Sociology*, XXXV, Jan., 1930, pp. 597–598) criticizes the alleged views of the writer and others (especially Read Bain) for our position regarding attitudes, wishes, desires, etc. The nature of my objections to these categories has been mentioned in Chapter I and will be further elaborated in Chapter VII. Much of the controversy turns on the question as to whether we shall define science in terms of subject matter or in terms of method, and, in the latter case, what degree of objectivity and verifiability we shall require before we can use observations as a basis for scientific generalizations. Objectivity of concepts which become the data of science I have defined in the first chapter in terms of their capacity to evoke similarity of responses from all qualified observers. Now I regard it as not only permissible but highly desirable that science should probe into the most remote internal mechanisms determining the more overt behavior of all phenomena. But before we can consider observations of these mechanisms as scientific data, we must develop sufficiently standardized symbolic response mechanisms so as to approach that degree of similarity and verifiability of observation on which we insist in the physical sciences. When such tools of observation have been developed, the behaviorist will be as interested as anyone in the full exploitation of the data of wishes, desires, and what men "think in their hearts." We are merely insisting that until these phenomena become amenable to the type of observation and verification recog-

nized as scientific we cannot employ these hypotheses as scientific explanations.

46. Behavior characterized as "emotional" and "fickle" is, of course, to be explained in terms of balanced opposing action patterns each of which is about equally ready to respond to a given situation. Mob-mindedness, therefore, is fundamentally a condition of badly integrated or unstably organized action patterns.

47. Cf. E. H. Paget, "Sudden Changes in Group Opinion," *Social Forces*, VII, March, 1929, pp. 438–444. This article is a good survey of the whole question of sudden changes.

48. William McDougall, *The Group Mind*, Putnam, 1921, p. 264.

49. *Social Organization*, Scribner's, 1927, pp. 124–125.

50. Cf. P. W. Bridgman, *The Intelligent Individual and Society*, Macmillan, 1928, p. 157: "Now I have found as a matter of experience that I am usually least likely to be making mistakes when my own conclusions agree with those of my fellows, so that in practice it may be that the first step which I take in verification is to find what my fellows do or think; i.e., whether they sense what I sense."

51. Cf. *ibid.*, p. 34; "Operationally, the meaning of 'object' and 'existence' is to be found in *all that we do* in the complex situations just suggested." [Italics mine.]

52. *Ibid.*, p. 135.

53. For an application of the notion of social distance to organizations see S. H. Jameson "Social Distance between Welfare Organizations," *Sociology and Social Research*, XV, Jan.–Feb., 1931, pp. 230–243. Also "Social Nearness among Welfare Institutions," *ibid.*, March–Apr., 1931, pp. 322–333. Also *Status and Social Welfare Organizations*, University of Southern California Press, 1934.

L. Bloomfield ("Linguistic Aspects of Science," *International Encyclopedia of Unified Science*, I, No. 4, 1939, p. 15) suggests that language is the connective tissue between individual nervous systems and that "much as single cells are combined in a many-celled animal, separate persons are combined in a speech community—a higher and more effective type of organization. If the word 'organism' be not confined to denote an individual animal, we may speak here, without metaphor, of a social organism."

54. For a further illustration of a type of mechanism which has some of the characteristics of living systems, see R. G. Krueger and C. L. Hull, "An Electrochemical Parallel to the Conditioned Reflex," *Jour. of Gen. Psychol.*, V, 1931, pp. 262–269. See also note 4 above.

Chapter VI

DYNAMICS OF BEHAVIOR—GENERAL

A. FUNDAMENTAL CONCEPTS

We stated in the first chapter that we would proceed on the assumption that all phenomena of scientific concern consist of energy transformations within the physical cosmos. These energy transformations manifest themselves in various forms of *motion* [1] or movement. Those movements (behaviors) of man which determine his status (relationships) in a group are the general concern of the social sciences. Before undertaking an analysis of societal behavior it will be well to review the orientation within which all science today finds it convenient to describe behavior of whatever kind and however manifested. This review is not undertaken because we intend to make sociological explanations in terms of the units of other sciences, but because we want to emphasize the compatibility of the methods of sociological explanation which we do adopt with the general framework of the other sciences.

At the present time physicists find it convenient to explain physical phenomena mostly in terms of the hypothetical elements *electrons* and *protons*. The properties ascribed to these units (the further analysis of which is unnecessary for our present purpose), are attraction and repulsion of their own kind. That is, electrons move toward protons and away from other electrons; protons move toward electrons and away from other protons. The magnitude of the attraction or the repulsion is some inverse function of the distances between the particles. The arrangement of electrons and protons into various types of groups of different symmetrical relations to each other constitutes *matter*. All substances that have the same geometrical electron-proton arrangement are alike. The differences which we note in substances are likewise attributed to differences in the spatial patterns and the dynamic orbits of the several electron-proton aggregates. This theory of the fundamental constitution of behavior and of matter is at present found more compatible with observed facts than any other theory.

The structure of matter (and of behavior) is, then, a function of its electron-proton configuration. These configurations are for practical purposes assumed to be as varied as our sense discriminations of differences are refined. From these elementary hypothetical entities systems of all degrees of complexity are constructed, variously called atoms, molecules, elements, compounds, tissues, plants, animals, men, races, nations, planets, constellations, galaxies, etc. Each of these types of phenomena are again classified on the basis of various characteristics into myriads of sub-classes. All of this diversity and similarity is, in the present framework of science, attributable to differences in electron-proton configurations.

We classify the sciences, as we have seen, according to the level of behavior-configuration with which each concerns itself. Each level of configuration is for purposes of study regarded as a closed system. The fact that any chosen level of configuration may be considered as made up of configurations of other levels does not in any way make the former a less "real" object of scientific study than the systems constituting it. As we saw in the preceding chapter, much philosophical nonsense has followed from a contrary view, namely, that some one system (usually that in which the particular philosopher is most interested) is the only "real" one. The others are, under this mistaken viewpoint, regarded as "fictions," "figures of speech," "phantoms," etc. We discussed this fallacy in the preceding chapter.

The social sciences are concerned, then, with the behaviors of those electron-proton configurations called societal groups, principally human groups. It is sometimes convenient to use different words to designate behavior mechanisms of different systems or levels of electron-proton configuration. But certain basic concepts of motion, energy, and force are equally applicable to all behavior. These should be reviewed and kept in mind as we pass to a consideration of the highly specialized forms of these processes which we find in societal behavior. Weiss has summarized the subject as follows:

"The electron-proton movements may be grouped into various geometrical types. Some movements, like those occurring in a luminous body, are transmitted enormous distances and at a rapid rate, as in light, magnetic, and electrical waves. Others

are primarily surface effects, such as pressure; or dispersion, as in vapors and gases; or intermolecular changes, as in heat; vibratory motions in air particles, as in sound waves, etc. These forms of energy are to some extent convertible into each other, as light into heat, magnetism into electricity, etc. When water changes into steam on boiling, the general environmental conditions surrounding the water molecules are such that the electrons and protons in the liquid molecule change their positions with respect to each other and take up the position which they possess in the vapor molecule. It is this *change* from one pattern or system of symmetry to another that has been named the *transformation of energy*. Just as the properties of a substance are a function of the dynamic and spatial arrangements of limited groups of electrons and protons, so the various energy transformations are functions of the *movement* types by which one type of electron-proton symmetry changes into another until a new symmetry has been established. Matter may thus be regarded as a relatively stable electron-proton symmetry and energy as the *change* from one type of symmetry to another." [2]

Energy, then, is not an entity, or an attribute of substances, but a name for *amounts of changes in relationships*. *Force* is the rate of such changes in time.[3] In the social sciences (and even in physics) these terms have been widely misused as the *cause* of the observed behavior. From this insidious linguistic fallacy of imputing a *causal* property to words which merely indicate a *relationship* of societal significance vast confusion has arisen in the social sciences especially. As a result, a large part of the literature or sociology has been given over to the elaboration of long lists of "interests," "desires," "wishes," "satisfactions," "drives," and "instincts" as *causes* of observed behavior. The congeniality of this mode of thought in sociology is probably to be attributed to the training of early sociologists in theology rather than in science and consequently the adoption of thoughtways from the former rather than the latter.[4] We shall not here review the various classifications of such "forces" that have been proposed. Only occasional references will be made to these attempts. We are interested here merely in pointing out the difference in this use of the term "force" and the scientific conception of force and energy as we shall employ these words.

B. THE TRANSFORMATION OF ENERGY

The conversion of energy into human behavior takes place through the well-known metabolic process of the combustion of fuel, in this case called food. Fuel of all kinds consists of stored (potential) energy of the sun's heat. Sometimes, as in the case of coal, it is the sunshine of past ages. Whatever activity, physical and mental, men manifest as individuals or as groups takes place through conversion (manifestation) of this (potential) energy. The methods of its conversion are extremely varied. These forms of energy conversion and the conditions that determine the form, time, place, efficiency, or effects of various types of energy conversion constitute the subject matter of all the sciences. In short, societal energy is, from the static point of view, the potential *capacity* (potential energy) of a group to act. In the last remove, therefore, the amount of energy available for societal activity will condition in a basic way the societal life of any people.[5] This is usually recognized as a matter of course by most writers and has been more adequately exploited by geographers and ecologists. It is also recognized in such basic terms as Sumner's man-land ratio. But it is frequently forgotten in the social scientists' preoccupation with details of the superstructure of this fundamental process.

Energy may be regarded as in the nature of pressure in a tank. It may dissipate itself in chaotic, uncanalized, or explosive outbursts wrecking the tank *and* its surroundings. Or it may vent itself through channels or turbines which in turn achieve for man many of his adjustments and objectives with a maximum efficiency. That is, it may produce an amount of work in the highest possible proportion to the energy expended. The tendency of protoplasm to form habits might be regarded as a way of economizing the expenditure of energy in relation to given adjustments.

The relation of the power which an engine delivers to the fuel it consumes determines the efficiency rating of that engine. Persons may be somewhat similarly rated. A person may dissipate a given amount of energy in chaotic, random, trial-and-error movements (including thinking) in a state of great nervous agitation. Or he may vent his energy calmly through highly systematized habits and the use of instruments each best adapted to

the particular adjustment sought. The tangible output of the process whether reckoned in terms of private satisfaction or in objective results will vary enormously according to which type of energy conversion takes place. A community, likewise, may dissipate its energy through antiquated engines which produce a minimum of product in relation to the energy consumed. Community as well as individual behavior may even be conflicting and self-frustating in ways which leave no positive satisfaction or product whatever. On the other hand, the community may expend its energy through the channels, the machines, and the organization which in the existing state of technology (including knowledge of social organization) yields the highest return for energy expended.

This general pattern of energy transformation is basic to all activity and therefore to all science. It is the common point of departure for the "physical" as well as the social sciences. The varieties of forms of energy transformation are so numerous, the resultant products so varied, and their common ultimate source so hidden in the complexities of their interrelationships that it is not surprising that some of the various scientific fields have been assumed to have little in common with others. It has seemed especially that man and his societal activities constituted a realm entirely apart. But the essence of science is parsimony in comprehending the universe. In that quest it must assume as an hypothesis greater unity underlying widely disparate phenomena than is obvious to common sense and can at any given time be demonstrated fully. It must be admitted that the detailed connections between the multifarious societal phenomena which we have under consideration in this book and the general pattern of energy transformation stated above are as yet highly uncharted. Enormous gaps remain to be filled. Yet this is the general framework within which the promise of ultimate unity and coherence of knowledge is the greatest.

C. EQUILIBRIUM, CYCLES, AND NORMALITY

1. Equilibrium

All sciences rest upon the basic postulate that in any given situation or system, at any given time, there is a next stage *of de-*

terminable probability. Any events for which some stated probability cannot be assigned must be regarded as completely chaotic and for the time being outside the pale of science. That is, such events would be completely unpredictable with any degree of probability. The main quest of science is, in fact, to determine with increasing accuracy the uniformities in all observed events under given conditions in order to predict them with increasing accuracy. All prediction is necessarily based on the assumption that *different possibilities have different degrees of probability.* The most probable state of a situation or a system is in physics called *equilibrium.* In everyday speech, the word equilibrium or balance is used primarily to designate the position of bodies in relation to their center of gravity. When objects customarily occupying an upright position fall over we say they "lost their balance." Air moves from regions of higher to regions of lower pressure. This movement tends to equalize the pressure for the area in question, which is then regarded, however temporarily, as in equilibrium. All natural movement therefore may be thought of as tending to establish an equilibrium within the area where it operates.

The physiologist also finds the term useful in describing organic behavior. The irritability of protoplasm in its exposure to differential environmental conditions sets up differential rates of metabolism or energy discharge which results in a disturbance of the equilibrium of the system under consideration. These same differentials of energy discharge set up physiological gradients which taken together constitute the pattern or organization of the system as found, for example, in an organism. This process we shall think of as operating in systems of any size, from the smallest electron-proton combination to the adjustments between modern nations. But in living systems especially, the equilibrium achieved by the adjustments of the system to its environment is a dynamic, a moving, rather than a static, equilibrium.[6] The mechanisms by which these adjustments take place in various types of systems are of great variety and subtlety. "It is evident," says Child, "that organisms are within certain limits complex dynamic equilibrating systems. We mean by this that more or less complex internal alterations, compensations, reversals of former processes, etc., occur in relation to each other, in the living system following action upon it of an external factor, with the result that

the system either approaches more or less closely its previous condition or progresses toward an altered equilibrium. . . . Physiological equilibrium does not necessarily consist in return or approach to a preexisting or normal condition, but may involve persistent alteration of the living system.

"From this physiological standpoint the normal condition appears, not as a condition independent of external factors, but rather as the range of conditions determined in a particular organism, species or group by the range of quantity, intensity and kind of external actions to which it is ordinarily subjected in its natural environment. In other words, the normal is nothing more than the usual, as standardized in the course of evolution. . . . It seems clear that the regulatory mechanisms are mechanisms of dynamic equilibration, and that regulation is in general dynamic equilibration of some degree and some sort, in reaction to a disturbance. But if it is true that an organism is never the same after action of an external factor as it was before, every equilibration is, strictly speaking, an alteration, and every regulation is to some extent a modification, rather than a return to a preexisting condition."[7]

Child, Lotka, and others have discussed this general phenomenon of equilibrium in physical systems in great detail as well as the mechanisms by which the phenomenon seems to be accomplished. We refer to this treatment here only as a preliminary manner of defining or illustrating the meaning of certain terms which we shall later want to use and define more specifically as they apply to societal phenomena. This preliminary summary is designed only to indicate the point of view from which we wish to consider societal behavior.

According to modern science, all the phenomena of the universe, as we noted in the preceding section, are regarded as consisting of electron-proton systems constantly rearranging themselves in various configurations. The universe is a continuum of such systems. For analytical purposes we may assume the relationship between a single electron and a single proton (themselves hypothetical) to constitute *a system* as truly as the relationship between *any aggregates* of electrons and protons. Thus any segment of the universe we select for study becomes for purposes of such study a closed system. We call it a *closed* system

because we intend, for the purposes of study of events within that system, to ignore for the time being the influences *outside* the system selected. This is an arbitrary procedure dictated, as we have noted in preceding chapters, by the limitations of man's sensory equipment and his consequent capacity to respond only to segments of the total universe at any one time. The problem or situation that confronts us at the time determines whether we consider the atom some aspect of an individual, of a nation, or of the solar system as the closed system under study.

From a static viewpoint, *if the elements under consideration in any closed system are so arranged or so acting relative to some point of reference within the system as to balance each other, in terms of the measures employed, the system is said to be in equilibrium.* Since such a state must always be relative to a given point of reference and since that point of reference in a dynamic system is constantly changing, it follows that under these circumstances a moving rather than a static equilibrium must be contemplated. We may say therefore that *in any dynamic system there is some one most probable next state toward which the system is moving. From the dynamic point of view that most probable state toward which any system is constantly moving is, therefore, for that system, the state of equilibrium.* The system under consideration is always a part of a larger system and is itself moving toward equilibrium (the most probable state) within the system of which it is a part. The same is true for each successively larger and smaller system. In other words, any and every change or motion in any part of the cosmos theoretically affects all other parts.[8] For practical purposes we are unable to observe and hence disregard, the smaller of these influences. But the energy interchanges and the successive equilibria that are established are aspects or segments of cosmic movement, which is the most general term by which we designate whatever it is that irritates our senses to respond. The *ultimate* origin or end of that movement is not a necessary problem of scientific concern.

We have already defined energy as the *amount of these changes* in any and all systems. Since *the conditions called energy* are conceived as universally present, every change of motion in any system can best be regarded as a function, in the mathematical sense, of all the other changes that occur. The definite quantitative

relation of these functions remains, of course, largely unknown in most sciences and almost entirely so in the social sciences. The pursuit of knowledge within the scientific framework leaves no alternative but to attempt the formulation and increasingly accurate statement of these functions. It is the endless quest to which science is committed. The quest is endless because each successive achievement opens new vistas and creates new situations today nonexistent either because they have not yet occurred or because they are beyond the reach of our senses. But when we become sensitive to them, they will provoke the same curiosity and study which our world of today provokes. It is for this reason that science is important as a *general method of approach to an unlimited variety of new problems* rather than as a body of solutions of present and past problems, although the latter are always basic both to the prediction and the solution of the problems of the future.

2. Cycles

Closely related to the concept of equilibrium in science is the concept of the *cycle* and its various synonyms such as "pulsations," "rhythms," "resurgences," and many others employed to designate societal movement of a periodic sort. All major writers on systematic sociology, including those who warn against the use of such terminology, employ terms of the same or equivalent import. We may regard the terms, therefore, as a general habit of responding to periodic motion in all aspects of the universe. Very little has been done as yet in the social sciences to define these pulsations operationally.[9] The controversies and confusions that have arisen over business and "culture" cycles are, therefore, mainly due to our as yet imperfect and incomplete methods of measuring societal movement. The fluctuations of an individual commodity in an individual business or area, or the fluctuation of an individual phenomenon such as relief in a single agency or in a single city can be charted and predicted with considerable accuracy.[10] But as we attempt increasingly composite indices for increasingly broad fields of societal activity such as is attempted in a *general* business cycle and more especially in the "culture" cycle, the results are bound to be fairly unreliable in the present state of adequacy of our measuring units and technics. These are

highly defective both as regards individual indices and our methods of combining them. As compared with some of the cycles and equilibria, which the "physical" sciences exhibit for chemical and biological phenomena, these "culture" cycles seem discouragingly crude and unreliable. In the face of such unreliabilities the question occasionally arises as to whether the whole assumption of cycles in societal phenomena is not unwarranted. It is also pointed out that the same data result in different types of cycles according to the statistical manipulations adopted.[11] From one point of view, this objection is, of course, merely another illustration of the tendency to confuse symbols with the phenomena represented. That is, the question is raised as to whether there *really are* "cultural" cycles and more especially if they *really are* of a certain type.

Since all cyclical or other representations of the behavior of phenomena are symbolic devices invented by man, their specific form will obviously be determined by statistical or other symbolic "manipulations." The same data plotted on different coordinates will obviously yield a "different" cycle. Different methods of grouping or averaging will likewise produce various types of cycles from the same data. But this can hardly be taken to prove the futility of attempting to chart the pulsations of societal activities. It merely indicates that *the most useful* and reliable methods of representing these activities must be developed and adopted. The question is *which type* of statistical manipulation results in a cycle most useful in practical adjustments. "Cultural" indices and cyclical charts are, as a matter of fact, and in spite of their shortcomings, already the compass and guide of all large business and social and governmental agencies, without which their activities would quickly degenerate into complete chaos.

The concepts of equilibrium, balance, rhythm, and cyclical fluctuations are ways of responding to societal as well as to "physical" movements. The type of response conventionally represented by cyclical symbols has been found enormously useful in man's adjustments to a large variety of situations. The highly inadequate status of these chartings of societal phenomena is one of the principal reasons for the confusion in societal adjustments. We shall deal in Part III with various concrete manifestations of societal fluctuations and cycles. We shall also deal more specifi-

cally in Chapter XII with the meaning of equilibrium as it applies to human society. Our interest here has been merely to call attention to these topics as among the fundamental concepts and coordinates generally used in science and in terms of which perhaps societal phenomena also can be represented meaningfully.

3. Normality

Most of the confusion regarding the "normal" in the social sciences has arisen from the failure to recognize the purely statistical nature of the concept as it is used in science, and consequently the complete relativity of the "normal" to a specified criterion, system, social segment, or culture. Most frequently, normal is defined (by implication) as that state of affairs which the writer in question considers desirable.[12] That is, it is an "evaluative" term. Now "evaluating" is from our point of view a kind of behavior as much as any other. "Valuative" behaviors are merely negative and positive responses, chiefly habitual, and are acquired like other habits. Most frequently they consist of attitudinal behaviors by which we mean a postural, verbal, or preliminary adjustment-set of the organism as contrasted with complete neuromuscular adaptation to immediate environment.[13] The words customarily used to designate our *evaluative reaction* to a situation are not likely to provide a very objective description of the situation, in view of the wide variety of conditioning of people as regards their likes and dislikes. The absence of objectively determinable content in many evaluative terms and the failure to recognize that a great many of the concepts of sociology are of this nature is one of its most serious handicaps.

A vast literature on "social pathology" and "social disorganization" has appeared, a great deal of it written from this subjective point of view. There is, of course, no objection to the use of such words as abnormal, pathological, and disorganized if they are operationally defined in terms of the norms from which they are, by implication, deviations. In the absence of such definition, references to the abnormal are only sources of confusion. Normal and abnormal societal activities are not to be defined as kinds of activity without reference to the *frequency of their occurrence within the system considered*, i.e., without explicit reference to time, place, and circumstances. If, for example, the group considered

consists of advanced cases of typhoid fever, a temperature of 102 may be normal (i.e., most common for such patients) although this is regarded as "abnormal" for an unselected group. Criminal activity, likewise, is the same *kind* of activity as noncriminal activity.[14] When a given act deviates sufficiently far from the ordinary or usual, i.e., falls outside, say, the interquartile range of customary behavior of the group in question, such an act is deemed abnormal. If it is a deviation in a socially approved direction it may be called supernormal or genius. If the behavior is in a socially disapproved direction, it is called subnormal, criminal, immoral, pathological, etc. A jury tends not to convict the defendant who has not violated the law *to a greater extent* than the jury feels is common in their community.

We here take the view that categories of any valuative behavior may be profitably regarded as subject to distribution on a continuum. We may then arbitrarily designate within what range of the continuum we shall designate behavior as normal, within what range we shall regard it as supernormal, or subnormal, moral or immoral, sane or insane. All of these categories represent a group's evaluation of behavior according to some criterion. Usually that criterion is the assumed advantage or disadvantage of the behavior to the group which maintains the attitude (evaluation) in question. Now normality, sanity, morality, and their opposites as well as all the other categories which form the basis of all evaluative differentiation may be considered as characterizing individuals or groups in different degrees. Accordingly, Dodd has suggested the following definition of different gradations of normality:

a. Minimals = below -2σ or in the lowest 2%.
b. Subnormals = below -1σ or in the lowest 16%.
c. Normals = between $+1\sigma$ and -1σ or in the middle 68%.
d. Supernormals = above $+1\sigma$ or in the highest 16%.
e. Maximals = above $+2\sigma$ or in the highest 2%.

This definition can also be applied to a dynamic series like the business cycle. That is, the normal for business would not be a point or a mean but a *band of a certain stated width* (*e.g., one standard deviation plus and minus*) *within which business fluctuates most of the time.* This is, in fact, how an individual business man now defines the term in his own case and what groups of business

men uniformly consider normal for any special business field. In proportion as a variety of fields of activity are included in "Business" in general the meaning of "normal" necessarily becomes vague in the absence of definite specification of the type here contemplated.

Distributions of populations according to general intelligence and special aptitude test scores as measured on scales is, of course, already common. The above proposal contemplates the development of similar measuring scales *for all types of behavior regarded as of scientific or practical significance.* As an illustration of the possible application of this proposal to the major fields of sociological interest, Dodd has developed the accompanying table.[15] By such a procedure, a large vocabulary of terms in common and indefinite usage in sociology could be objectively and operationally defined. The particular designations applied to different ranges on a given scale or the precise standard deviation units in terms of which it is defined would, of course, be entirely a matter of practical convenience. As a matter of fact the above method, informally and inaccurately carried out, is the method by which the designations we now use were first arrived at and that is how their content is still determined. Our suggestion looks toward objectifying the procedure.

TABLE 2. TYPES OF "MINIMALITY"

(From Dodd)

Bernard's Derivative Institutional Control Environments (Modified)	*Examples of Value Indicators Distributing Characteristics in These Environments*		*Which Define Corresponding Social Problem Plurels, i.e., "Minimals" (-2σ)*
	For Individuals in a Plurel, Chiefly	*For Plurels in a Population, Chiefly*	
(1) Domestic	Marriage adjustment scores (Burgess and Cottrell).	Divorce, marriage, fertility, illegitimacy rates.	Divorcees, prostitutes, illegitimates.
(2) Medical	Temperature, blood pressure, and other physiological tests, and psychoneurotic tests.	Morbidity and mortality rates. Institutional commitments. Public Health Appraisal forms.	The sick. The defective (blind, crippled, insane, etc.).

TABLE 2. TYPES OF "MINIMALITY"—*Continued*

(From Dodd)

Bernard's Derivative Institutional Control Environments (Modified)	*Examples of Value Indicators Distributing Characteristics in These Environments*		*Which Define Corresponding Social Problem Plurels, i.e., "Minimals" (-2σ)*
	For Individuals in a Plurel, Chiefly	*For Plurels in a Population, Chiefly*	
(3) Economic	Income. Days per year employed.	Average income. Percent unemployment.	The poor. The unemployed.
(4) Political	Attitude tests. Party membership. National citizenship plus indicators of degree of war participation.	Crime rates. Political arrests and prisoner rates. Rates of war damage in bereaving, maiming, impoverishing, exiling.	The criminals. Political refugees. War-caused dependents.
(5) Racial	Skin color, cephalic indices.	Anthropometric indices.	Inferior races—Bushmen, Pygmies, etc.
(6) Educational	School achievement. Tests of information or skill.	Illiteracy rates. Annual books per capita. Educational budgets.	The illiterate. The ignorant or "backward" peoples.
(7) Recreational	Variety of leisure activities. Rating in a particular leisure activity.	Per capita public expenditure for recreation. Weighted indices of participants × occasions × types of recreation.	The overworked and underprivileged classes (not necessarily the lowest incomes).
(8) Esthetic	Artistic appreciation tests (e.g., Seashore's Musical Talent). Contests for artistic production.	Indices of institutions for art, music, gardening, etc.	The offensively vulgar, vandals.
(9) Ethico-religious	Attitude indicators. Participation indicators. Character tests (May).	Church membership and attendance rates. Institutional indices (Chapin).	The atheists or anti-religious. The vicious.
(10) Linguistic	Standardized language achievement tests.	Average scores on language tests. Percent speaking a language.	Foreign language minorities, the dumb.
(11) Communal	Percent of community's culture traits participated in. Social distance scores.	Social distance scores between communities.	The hermit or isolated. The ostracized.

D. *INTERACTION*

1. The Constructs "Organism-Environment" and "Stimulus-Response"

Very prominent among the concepts used both in the physical and the social sciences is the word interaction. The immediate datum of all sciences, as we pointed out in the first chapter, is a human response. Responses are commonly considered as consisting of *action* (*behavior, movement*) of some sort. All of these words are accepted as designating a basic characteristic of the phenomena of all sciences. *Interaction* is a word employed to denote reciprocal or interdependent behavior between or among any number of components in a situation. We have already defined *situation* as that aspect or segment of the universe to which we react as a whole. The conventional linguistic construct which science has found most generally useful in factoring all behavior is that which regards all action as consisting of (1) *a responding entity* and (2) *that to which* it responds, generally designated as *environment.* The responding entity may be designated by any category we choose to regard as a component in a situation— ion, electron, atom, gene, chromosome, cell, organism, person, society, constellation, or solar system. Any or all of these entities may in turn be regarded as environment with respect to any other entity or entities. Any *reciprocal* or interdependent action between the components of a situation individually or collectively we shall call *interaction.* The process will be amply illustrated in a later chapter as it applies to individuals and to groups.

As has been previously pointed out (Chapter III), the limitations of man's sensory equipment compels him to react selectively to his world. That is, he reacts at any one time only to a portion or an aspect of the total universe to which he is capable of reacting. The nature of the adjustment problem which confronts us determines our definition of the situation. This situation, as we have already pointed out, we treat for the time being as a closed system. That is, we abstract it from the total universe by representing it by pictorial, geometric, or verbal symbols of some sort and then deal only with the components which we have included in the segment thus marked off.[16]

The simplest conceivable situation or field within which inter-

action could take place would be a closed system containing only two components, mutually interacting. When the adjustment problem which confronts us is one which requires us to define the situation so as to include a large number of components, the problem of representing and measuring their various influences becomes correspondingly difficult. As the environment to which man finds it necessary to adjust has expanded or, what amounts to the same thing, as man seeks increasingly extensive and refined adjustments to his environment, simple symbolic systems of anthropomorphic one-way causation have been abandoned in the "physical" sciences in favor of field constructs, quantum mechanics, and relativity. With these developments have gone developments of new forms of mathematics for describing the subtleties and multiplicities of the interactions between the large number of components which these new systems include. In fact, the more complicated types of interaction can be described only in terms of higher mathematics. The most that can be done in ordinary language or diagrams is to convey the general idea of the phenomenon.

The basic nature of interaction in all science including sociology justifies further emphasis upon the subject at this time. "The complications that result from the state of interdependence of the variables," says Henderson, "present a logical problem of the first importance. It has arisen again and again in every science that has reached a certain state of development, whenever the task of describing complex systems has presented itself and has been seriously attacked, and it has been invariably solved in accordance with the same principles." [17] He adds the simple mechanical example reproduced here with the following comment on Figure 4.

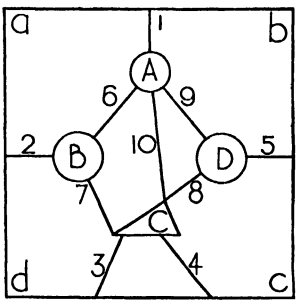


FIG. 4. Diagram of Interaction. (From Henderson.)

"The four rigid bodies A, B, C, and D are fastened to a framework a, b, c, d by the elastic bands 1, 2, 3, 4, and 5. A, B, C, and D are joined one to another by the elastic bands 6, 7, 8, 9, and 10. Here the conditions of statical equilibrium can be worked out mathematically, or determined empirically by introducing spring-balances into the bonds 1, 2, . . . 10, and reading the balances.

"Now imagine the point of attachment of 5 on the frame to be moving toward b, all other points of attachment remaining unchanged. What will happen? Consider A. There will be action on A by the path 5, 9, by the path 5, 8, 10, and by the path 5, 8, 7, 6. But in each case these actions do not cease at A, just as they do not previously cease at D. The first, for example, continues along the path 10, 8, and so back to 5. If we try to think of all this as cause and effect we must inevitably reach a state of confusion." [18]

If instead of the few components and the few rubber bands contemplated by the above diagram, we assume a very much larger number of components and a maze of criss-crossing rubber bands of various degrees of resistance we secure some inkling of the phenomenon which we try to convey by the word interaction. If further we remember that with each movement in the system, its components are conditioned so that the next time they react differently under a similar stimulus, and that an indefinite number of new interconnections may occur in the same way, we gain some idea of the meaning of interaction in physiological and sociological systems. When thus considered in its full complexity, the concept of interaction becomes useful also as the most elementary verbal construct in terms of which we describe such processes as metabolism, growth, thought, learning, crowd behavior, religious, economic or any other behavior whatsoever.

The symbolic nature of such constructs as organism-environment, as indeed of all scientific formulas, theories, and principles, must again be emphasized in this connection especially as regards the social sciences. Man's preoccupation with himself is so great that, while he pretends to have divested himself for some purposes of the anthropocentric notion that he is an intrinsic center around which the rest of the universe revolves, he readily lapses back into this ancient thoughtway by making unwarranted assumptions about such constructs as organism-environment [19] and heredity-environment. The literature is still full of explicit and implicit assumptions about the relative "priority" and individual influence of these components. They must be regarded here, as in all science, purely as verbal constructs which in the present stage of scientific development are found generally useful as basic general factors in terms of which multitudes of phenomena in all fields can be interpreted. The relationship between the two is best

represented by the mathematical construct of *variable* and *function* or independent and dependent variables in statistics. Which of two or more factors is the "variable" and which is the "function," "dependent," or "independent," depends entirely upon the discretion, convenience, or immediate objective of the mathematician. It is not determined by an inherent characteristic of the entity represented by either factor. The responding entity may be regarded as variable and the environment as function or *vice versa* in any generalized statement of the relationship. "Responding entity" (a more generalized designation of "organism") may therefore be any component, i.e., any category, part, or aspect of a situation to which we can respond independently and which we can symbolize. It follows, of course, that any part of an entity, e.g., "organism," may be regarded as a responding entity with reference to which any or all other parts are environment.

This elementary fact is frequently overlooked. It is assumed instead that the organism-environment construct applies only to the organism (apparently thought of as an entity bounded by the skin) and all other factors outside of the skin regarded as environment. The incongruities resulting from so crude a conception of the organism-environment conception have caused some of the abler thinkers to make reservations to the effect that "institutions consist of persons but not of whole persons." But in general this naive conception of organism and environment has necessitated the continued maintenance of a separate universe of discourse to cover the so-called "internal" behaviors of the organism, namely, the "mind." To this entity is attributed mysterious "faculties," "feelings," "will," etc., the operation of which is generally covered by such terms as "experience," "immanent perception," etc., etc. The constant switching from this universe of discourse to that of *reacting entity-environment*, which is the basic construct of all other sciences, is responsible for a morass of absurd controversy and confusion which, as noted in the preceding chapters still pervades considerable sections of the social and psychological sciences.

The transition to the viewpoint taken in the present volume is marked by the use of the term "internal environment." Thus W. I. Thomas remarks:

"The physiologist Claude Bernard has emphasized a distinction between life as it is *led* in an external environment and life as it is *lived* in an internal environment. There are for the animal really two environments, an external environment in which the animal, the fish, the worm is placed, and an internal environment in which the constituent cells live and are bathed by a nourishing blood stream.

"The internal environment contains an incredibly complicated integration of cells, blood chemicals, hormones, enzymes, various nervous systems, chromosomes, endogenous electrical stimuli, catalytic transformations, tensional relationships, etc. The chemically generated energy of this system of organs is devoted partly to the regulation of the growth and the integration of the parts of the organism into a unity and partly to initiating and sustaining anticipatory goal reactions. The two organic drives or impulses involved in goal seeking are the hunger and sex appetites, whose satisfaction is necessary for the continuance of the life of the individual on the one hand and of the species on the other. Hull points out that the anticipation of the goal represents the concept of purpose, desire, or wish.[20]

"In the higher animal forms the equipment with organs of locomotion, distance receptors (eye, ear, nose), prehension, claws, jaws, etc., the activities of pursuit, fighting, capture, copulation, care of the young, and, negatively, avoidance and flight, together with the concomitant emotions of anger, hate, love, jealousy, ambition, exultation, and despair, are derivatives of the primary impulses, supporting them or reflecting organic agitations in the struggle for their consummation." [21]

Language and other symbolic mechanisms involved in what has been called reflective behavior or thought might from this point of view also constitute "internal" environment from the standpoint of the organism as a whole. From the standpoint of the reacting entity whether it be a single organ or a single neuron, that which excites it to reaction, whether it be glandular pressure or a symbolic mechanism, is environment as "external" as any other.

The nature of "motives" and "purposes" from the point of view here adopted should be specifically noted. Sociological and psychological literature is still full of statements to the effect that in the social, unlike the "physical" sciences, we must take "motives" and "purpose" into consideration. Whereupon "motive" and "purpose" are pursued as special entities and are usually found in some category which the investigator surreptitiously brings with him as a theory or as a faith. The motives assigned by some psychoanalysts, who pride themselves on thorough in-

vestigation of "motivation," are largely of this character. Data are forced into a theory of motivation as yet almost entirely unsubstantiated by systematic statistical analysis of verifiable cases, upon which the *scientific* validation of any theory must ultimately rest. The procedure is perhaps chiefly of interest as reflecting the stage of scientific development which requires the postulate of motives. They were once found equally necessary in the "physical" sciences. We no longer find it helpful to bother with the motives of tornados, bacteria, or even of the higher animals, except man. A description of the conditions under which phenomena occur is considered adequate although at first it seems to "leave something out"—namely, the words "motive" or "purpose." In the social sciences it is felt we must go "farther" (!). We must not only describe the interaction of the components of a situation but we must select (according to some preconceived faith) some *one* component and call it *the* motive. Practical jurisprudence, being among the most primitive of our ideological systems, relies heavily, of course, upon "Motives." It hardly needs to be pointed out that when a person murders his grandmother who happens to hold ("*because* she holds") a large insurance policy in favor of the murderer, the latter is assigned as *the* motive purely on the basis of the frequent recurrence of this and similar components in such situations.

We have already dealt with this elementary view of causation in science and shall return to it in later connections. Our language habits, involving as they do the idea of *the cause*, are so deepseated as to make it practically impossible to engage in general discourse or to talk, for example, to psychiatric patients without employing the whole paraphernalia of will, choice, purpose, and motive. It does not follow that we should engage in a futile search in nature for entities to correspond to these animistic words that happen to be part of our vocabulary. When the interaction of the observable components of a situation has been described scientifically, purpose and motive have also been described, and all scientific "purposes" have been served.

We shall use the word "environment," then, in the present volume, as it is used in the other sciences, namely, as that component or complex of components to which any other component or combination of components (configuration) is thought of as re-

sponding. In short, environment is *that* to which response is made. The following recent definition by a physiologist is illustrative of the inclusiveness of the meaning which should also attach to the word "environment" in sociology:

"Physiology is the study of all of the interactions between living cells on the one hand and the cell environment on the other. It includes the relationships between component cell parts and their intracellular environment, the interrelationships between the cell and the extracellular environment, and the interrelationships between masses or colonies of cells (including tissues of multicellular forms) and their intercellular and extracellular environment. It must constantly be borne in mind that the cell response is conditioned not only by the immediate environment of the moment, but by previous environments as well. Population behavior (or behavior of any kind) among bacteria is determined by the hereditary potentialities, by the past experience, and by the character of the immediate environment." [22]

Authors who write with much assurance about "similar" and "the same" environment might profitably reflect upon this definition. It should then be clear that environmental differences—tactile, electrical, chemical—exist, not only for different cells but even for different parts of the egg before fertilization and that such differences are as truly environmental differences determining the individual as are food, schools, and moral standards to which he becomes exposed after birth.

2. The Construct "Heredity-Environment"

What has been said above about the nature of the stimulus-response construct as a linguistic device useful in science for the description of behavior may also be said about a very much more shopworn construct, namely, heredity-environment. We may digress briefly at this point to indicate the implications of the viewpoint here taken as it affects this ancient thoughtway.

There is, of course, no objection to the use of the word heredity to designate pre-conception as contrasted with post-conception influences. Again, the word may be conveniently used to designate influences the nature of which we do not as yet know and in any case cannot control. Similarly, there is, of course, no objection to the type of study which regards the pre-conception factors in the case of identical twins as relatively constant and then

measures variations in traits of the twins and correlates these measures with properly controlled and measured variations in types of nurture. If it is desired to designate as hereditary those traits which show a minimum of variation under the types of variation in nurture which are considered, this involves no obscurities of the type here under criticism.

But heredity is still used extensively in a way which is compatible only with a theological or metaphysical view of causation, which is incompatible with the orientation of science, and which has been repudiated by competent logicians of science.[23] The notion of a cause as a relationship of one-sided dependence between two or more phenomena has been supplanted, as already noted, by the conception of interaction, interdependence, correlation, and typical probability-expectation.[24] It is quite impossible at any given stage of the development of an individual to attempt to attribute any specific part of his neuro-muscular patterns or other characteristics to *inherent* qualities of the germ plasm and others to cultural or other environmental forces.[25] At any stage of development the past responses of the protoplasm are an inseparable part of it and determine its capacities as well as its selective responses to new or old stimuli. Except for the habit of thought referred to above, there would be no compulsion to attempt to make this separation. Indeed, such a separation is not attempted with reference to the development of the organism in the more advanced stages, namely, those in which the process of development has been more carefully studied. At what stage the arbitrary introduction of "original nature" takes place, varies with the scientific sophistication of the individual. To most people birth represents the line of demarcation. That certain of his subsequent specific behavior is "caused" by heredity and others "caused" by environment is quite generally accepted.

If a term is desired to designate the characteristics of an organism at any particular point in its development in order to regard this place for some purpose as a starting point, there is, I suppose, no objection to the use of the term heredity for this purpose. But the postulation of a beginning may be made as logically at one point as at another—at birth, at the point of conception, at the age of ten, or any other stage. The method less confusing would be to substitute the concept of growth, physiological process, or

emergent evolution, and define it in terms of the interaction of two or more complexes of variables of different degrees of stability. The more variable structure and behavior, especially that which we know definitely how to condition, is usually thought of as being environmentally "caused." The variations which are relatively stable and which we do not yet know how to condition or manipulate are called hereditary. So understood and defined the terms may be of some use as blanket designations of the more and less stable characteristics of structure and behavior.

The statement that all of a child's characteristics at birth are "due to heredity" would still go unchallenged in many circles. The more informed, confronted by the growing mass of data regarding prenatal conditioning, as well as the logic of the situation, place the line at the point of conception. As far as the attempt to separate the influences of heredity and environment are concerned, there is no better logic in the latter position than in the former. For the individual at the point of conception has behind him just as truly the selective and conditioning influences of environment as at any subsequent time. The fact that in his later stages he becomes increasingly susceptible to a vastly increased range of environmental influences, notably the social, in no way changes the fact that the "accidental" combinations of genes is as truly the result of responses to environmental conditions as his subsequent selection of what college to attend.[26]

This point of view is frequently greeted with an avalanche of indignant questions: What about the chromosomes and the genes? What about Mendel's Laws? And above all, what about the Kallikaks, the Jukes, and a plethora of empirical data on the statistical frequency with which traits have been observed to reappear in successive generations?

These data are, of course, totally irrelevant to the question under discussion. The same is true of the voluminous statistical studies of Galton and others to which so much significance has been attached as bearing on the question of heredity. These studies demonstrate statistically the degree to which a wide variety of traits—physical, mental, and moral—recur in successive generations. The data throw very little, if any, light on the *method of transmission*, which is the principal question relevant to inquiries into heredity. This position has, of course, nothing

to do with questions of individual differences. The existence of such differences at all stages of the development of an organism, as well as their unchangeability by any technics known at present, is, I think, cheerfully admitted by all informed people. The peculiar thing is that whenever such differences are not clearly traceable to some cultural differential, it is regarded as proof positive that they are "hereditary," "inherent," "innate," in the sense of predetermined, fixed, immutable, "original" causation. To make a similar assumption regarding environment is, of course, equally fallacious. Cooley's comment and conclusion are perhaps a good summary: "Nothing that the individual is or does can be ascribed to either alone, because everything is based on habits and experiences in which the two are inextricably mingled. Heredity and environment, as applied to the present life of a human being, are, in fact, abstractions; the real thing is a total organic process not separable into parts. Which is stronger? Which is more important? These are silly questions the asking of which is sufficient proof that the asker has no clear idea of the matter in hand." [27] In short, there is no such thing as "the original nature of man" (i.e., it is an unprofitable postulate). We shall learn to get along without it in science pretty much as we learned to get along without the concept of God.

E. THE ENVIRONMENTS OF HUMAN GROUPS

Because the earth was undoubtedly here before life appeared upon it and because species come and go while the earth remains, we tend to think of the organism individually or in groups as determined by the environment as an absolute or preexisting state of affairs. We pointed out in the first chapter, however, that for scientific or any other behavioral purposes, only those things exist for a given organism to which it is sensitive or responds. From this point of view the sensitivity of the organism determines what its environment will be. Says George H. Mead: [28]

"The only environment to which the form responds is the environment which is predetermined by the sensitivity of the form and its response to it. It is true that the response may be one which is unfavorable to the form, but the changes that we are interested in are those changes of the form in an environment which

it itself does select and which it itself organizes in terms of its own conduct. It exists at a distance from objects which are favorable or unfavorable to it, and it measures the distance in terms of its own movements toward or away from the objects. That which affects it in its distant experience is a promise of what will happen after contact takes place. It may be favorable contact with food, or contact with the jaws of its enemies. It is such resultants which the distant experience is indicating; this is the way in which an environment exists.

"The things we see at a distance are the contacts that we shall get after we move toward the thing. Our environment exists in a certain sense as hypotheses. 'The wall is over there,' means 'We have certain visual experiences which promise to us certain contacts of hardness, roughness, coolness.' Everything that exists about us exists for us in this hypothetical fashion. Of course, the hypotheses are supported by conduct, by experiment, if you like. We put our feet down with an assurance born out of past experience, and we expect the customary result. We are occasionally subject to illusions, and then we realize that the world that exists about us does exist in a hypothetical fashion. What comes to us through distant experience is a sort of language which reveals to us the probable experience we should get if we were actually to traverse the distance between us and those objects. The form which has no distant experience, such as an amoeba, or which has such distant experience involved only functionally, has not the sort of environment that other forms have. I want to bring this out to emphasize the fact that the environment is in a very real sense determined by the character of the form. It is possible for us, from the standpoint of our scientific account of the world, to get outside of these environments of the different forms and relate them to each other. We there have a study of environments in their relationship to the forms themselves, and we state our environments first and then relate them to the form. But as far as environments exist for the form itself they exist in this selected character and as constructed in terms of possible responses."

It follows from the above that for any form of life which is constantly changing with respect to the extent and refinement of its sensitivity, the environment will be changing constantly.

Deafness and blindness, for example, immediately impose tremendous limitations upon the environment of the organism so afflicted regardless of its geographic mobility or its exposure to a variety of societal influences. Conversely, the invention and use of the telescope and the microscope, for example, enormously expand man's environment. The invention of language including all forms of spoken and written symbols is, of course, the most important of these developments by which the environment of man is transformed and which at the same time transforms man. For by these mechanisms not only do the immediate surroundings of his physical and organic habitat become objects of response, but events of the indefinite past and the possible future including imaginary realms of fiction, myth, and superstition become vital parts of man's environment without a consideration of which his behavior is quite inexplicable. These products of man's own behavior and interaction with his "physical" surroundings and his fellow-men together with his cumulative interaction with the products themselves constitute roughly what is called the societal or "cultural" environment or "culture." These are obviously not categories with any absolute or constant content susceptible of enumeration for all human beings because, as we have seen, environment is relative to the sensitivity of the reacting individual or group. The same stone may or may not "be" a "cultural" phenomenon according to whether the observer regards it as a club shaped by man or whether he regards it as the fortuitous formation of a glacier, of no relevance to human affairs. Failure to recognize this relativity of all knowledge has led to curious controversies over the "existence" of societal phenomena and their definition.[29]

In spite of the relativity of all environment to the entities environed, there are, however, various types of environment which are so universal in their influence on human groups that they profitably may be classified as a first step in the study of the correlation of these environments with various societal behaviors. The following classification by L. L. Bernard [30] is an excellent brief summary:

I. The physical (inorganic) environments.
   1. Cosmic, 2. Physico-geographic, 3. Soil, 4. Climate, 5. Inorganic resources, 6. Natural physical agencies (falling water, winds, tides, etc.), 7. Natural mechanical processes (combustion, radiation, gravity, etc.).

II. The biological or organic environments.
1. Micro-organisms, 2. Insects and parasites, 3. Larger plants used for food, clothing, shelter, etc., 4. Larger animals used for food, clothing, etc., 5. Harmful relationships of larger plants and animals, 6. Ecological and symbiotic relationships of plants and animals acting indirectly upon man, 7. Prenatal environment of man, 8. Natural biological processes (reproduction, growth, decomposition, assimilation, excretion, circulation, etc.).

III. The social environments.
1. Physico-social environments: (a) Tools, (b) Weapons, (c) Ornaments, (d) Machines, (e) Transportation systems, (f) Communication systems, (g) Household equipment, (h) Office equipment, (i) Apparatus for scientific research, etc.
2. Bio-social environments:
A. Non-human: (1) Domesticated plants used for food, clothing, shelter, medicine, ornaments, (2) Domestic animals used as a source of food, (3) Domestic animals used as a source of power, (4) Medicines and perfumes of an organic character, (5) Animals used as pets and ornaments, etc.
B. Human: (6) Human beings serving as laborers (slaves, etc.), (7) Human beings serving as ornaments, entertainers, etc., (8) Human beings rendering impersonal voluntary or professional service, (9) Regimented human groups, such as armies, workingmen, etc., (10) Men cooperating voluntarily through the use of language mechanisms.
3. Psycho-social environments: (a) The inner behavior (attitudes, ideas, desires, etc.) of individuals with whom we come in contact, (b) The uniformities of inner behavior occurring in collective units and perceived as customs, folkways, conventions, traditions, beliefs, mores, etc., (c) Externalized language symbols used to project the above types of behavior and to condition responses in ourselves and others, (d) Those inventions, primarily physical, which perform a similar service in conditioning psychic responses, but usually with less facility and completeness.

IV. Composite or institutionalized derivative control environments (derivative combinations of the various types of environments organized for purposes of social control).
1. General in character: The economic, political, racial, esthetic, ethical, educational, etc., environments.
2. Special in character: The American, Italian, Jewish, Scandinavian, New England, Southern, Argentinean, Republican, Democratic, Catholic, Buddhist, revolutionary, conservative, feminine, masculine, etc., environments.

In summary, it will be seen that the environment of a group as here defined generally consists of (a) the geographic, organic, and meterological features of its habitat—land, topography, organic and inorganic resources, and climate; (b) the *relations* (however manifested) between individuals in the group; (c) the relationships of sub-groups, i.e., groupings of individuals within the original group, to the group as a whole; (d) the *previous en-*

vironments (tradition, custom, memories) of any of the units included in (a), (b), and (c) insofar as these become manifest to and the occasion for response by the group.

The network of reciprocal responses between all of these factors gives some further idea also of what we mean by the word "interaction" in sociology. Environment we have taken to mean all those factors to which the responding unit responds. That is, the responding mechanism is always thought of as responding to things outside of itself (see pp. 219 ff.), e.g., if the organism responds to part of itself, that to which it responds is regarded as environment. From this point of view, the most remote, subtle, and imaginative operations of the mind are interpretable in the same frame of reference as other behavior and the as yet unsolved problems which they represent are to be approached on the same general hypothesis with which we approach other behavior. Modern psychology has, of course, already largely adopted this view.

There are obviously in the above list of environments a great many items which, *as items or subject matter*, might just as properly be classified under several other sciences. As we pointed out in the opening chapter, man himself, which is frequently considered the chief concern of sociology, may be (and is) as an object of scientific study an equally proper concern of other sciences, such as physiology or physics. It is the point of view from which phenomena are studied or, what amounts to the same, the aspect studied, not conventional folk-classifications of objects, which determines the delimitations of the various sciences. The delimitations of the respective sciences are themselves purely a matter of convenience for a profitable division of labor and the boundaries between them become less and less distinguishable as science advances. Accordingly we do not consider the above list of environments as in any way defining the problems or subject matter of sociology. Many or all of the items, as items, might also be included in a list of environments for other organisms or other objects. The list is merely suggestive of the great range of phenomena which we may need to take into consideration in studying societal behavior. Ultimately sociology (as well as all other sciences) can be defined only in terms of the problems which are studied by a certain group of workers in this case calling themselves sociologists. To the extent that these problems are unique,

sociology is a unique science. To the extent that its problems resemble or overlap with the problems which other scientists are studying, sociology merges with or synthesizes those sciences.

F. CONCLUSION

The first part of this chapter was devoted to a review of certain concepts which have been found convenient and useful as basic categories in terms of which the widely disparate types of behavior can be comprehended. These concepts have been reviewed because I believe they are also valuable in dealing with societal behavior. Science aims at increasing comprehensiveness and unity of knowledge with the greatest parsimony of concepts. "Explanation" and "understanding," in fact, consist of showing that new or badly understood phenomena are merely special cases of broader principles already well understood. We have proceeded here on the hypothesis that the broad principles of the transformation of energy, and the concepts of motion, fluctuation, equilibrium, stimulus-response, and organism-environment are such generally useful constructs. I have assumed that, although the uses of some of them have been most highly developed in other sciences, the words themselves are general categories of behavior not especially concerned with any particular subject matter.

I have no desire on the other hand to avoid the implication that societal phenomena are merely special types of activity within the physical cosmos. Sociologists usually concede this by more or less ample references to man's geographic habitat, his natural resources, and his technology. That is, sociologists recognize that societal activities are fundamentally forms of energy transformation, a process already well understood in its more general forms. It has not been our purpose here to develop the details of this relationship but, rather, to point it out as a basic point of departure for all science. At the same time, I think social scientists would do well to reflect upon Soddy's statement when he says: "The conversion of thermal energy into mechanical energy, first practically effected by the invention and perfection of the steam engine, has brought about in a single century more permanent change in the manner of living, *and even in the habits of thought* of the inhabitants of the world, than any combination of political,

social, or personal influences could have effected." [31] [Italics mine.]

Such a conclusion solves no sociological problems but it does indicate something regarding the frame within which societal phenomena necessarily occur. It suggests, furthermore, that because of the fundamental relationship of energy conversion and activity of any kind, societal activities may themselves in the last analysis be regarded as varied ways of energy transformation. Especially do we need to remember that, as suggested above, *thoughts* and *habits of thought* which social scientists are still so fond of taking as original points of departure if not as "uncaused causes" are themselves highly derived factors in a matrix of far greater comprehensiveness than that encompassing the human species and all its works.

Thoughts and ideologies, like other behavior, react upon the systems within which they take place. But as Veblen [32] and others have pointed out, different forms of industrial and technological energy transformation have profoundly affected human thoughtways. History affords ample illustrations of the phenomenon. Currently there is much excitement in scholastic circles over certain general trends in the western world toward so-called "totalitarian" or "dictatorship" forms of social organization and administration. That a certain pattern of social administration should be found most compatible with a certain type of energy transformation, communication, and technology is not surprising. It is accordingly not surprising that the principal framework of this pattern should make its appearance under broadly similar circumstances, although under widely differing verbalisms or ideologies superficially classified as Communist, Fascist, Democratic, etc.[33] These word-systems generate tremendous battles verbally and otherwise. To these ideologies, usually gathered around personalities, social scientists as well as journalists devote most of their time instead of analyzing the broad conditions (including, of course, the verbal) which make certain forms of societal organization compatible with and congenial to certain times, places, and circumstances of life upon the earth. This calls for a much wider orientation than the social sciences at present tend to adopt.

This view, and our general position regarding the desirability of a common foundation for all the sciences, does not mean, as

we have previously emphasized, that the specific categories and units of physics must be adopted in the description of societal phenomena. Physicists and chemists study only *certain* energy transformations. They have developed units and equations suitable for the description of these transformations. Sociologists are concerned with *other* types of energy transformation. We must develop whatever units, measurements, and equations describe societal behavior as we find it. But if we are to proceed on the general assumptions laid down in the first chapter, our position does mean that the logic and methods of the social sciences should be *compatible* with the framework of all other sciences.

To those who feel that after all the above analysis has relevance only in physics or at most in the "physical" sciences, it may be pointed out again that the words employed above are generalized symbols, in terms of which man has found it convenient to describe his sensations of the motion of *any* matter. It is a framework in no way dependent on particular subject matters. The words are *categories of behavior*. They are definable only in terms of measurements or operations of some kind. The units and instruments of such measurement have to be adapted to the nature of the behaving subject matter in every case and in every science. These units, and even their reference coordinates as, for example, social distance (space) as contrasted with geographic distance, must be developed by each science as convenience suggests according to the problems it sets itself. Why is it that in spite of the protestations of social scientists against the copying of other sciences, we nevertheless find such concepts as *change, equilibrium, normal, distance,* and their synonyms quite essential in sociological discourse? It is because these words designate in the English language certain aspects of behavior which are, from the standpoint of orderly study, the same regardless of the particular subject matter in which it is manifested. No one objects to the use of Cartesian coordinates, for example, in showing the fluctuations of the business cycle or the seasonal fluctuation in crime rates just because we also find these coordinates useful in describing the periodicity of pendulums of different lengths, or in describing the seasonal fluctuations in temperature. That is, a *generalized* linguistic framework or a given form of language such as mathematics cannot be regarded as in any way identifiable

with particular subject matter. In fact, the importance of such a tool as algebra lies in precisely this *general* applicability to *any* subject matter and any units. The units themselves and the continua of which they are units are constructed by each science to suit the behavior phenomena it studies. Equilibrium in a given situation in physics would be described in terms of a *ratio of units of a certain sort.* The nature of the units is determined by the inventor of the measuring instrument. Equilibrium in a given societal situation should be described in the same way. We are interested in determining the equilibrium in a physical system or the normality of an organ or an organism as a point or a range from which to measure degrees of disequilibrium and abnormality. All of these terms are merely designations of the state of a situation with reference to its natural range, sequence, and frequency of states from which the most likely next stage can be predicted.

Finally, we have stressed the necessity of regarding all behavior as *interaction*—the resultant of multiple influences within a closed system or field of force. In this connection, we stressed the purely analytical, correlative, and verbal character of such constructs as organism-environment and stimulus-response. The full implications of the concept of interaction displace the primitive notion of causation to which there is still a great deal of adherence in the social sciences. This adherence with its attendant handicaps will necessarily continue until sociologists develop or become more generally familiar with the symbolic technics of mathematics in terms of which perhaps alone the more complicated forms of interaction can be represented.[34] Although sociologists have in recent years especially given much attention to the vast influence of technological development upon societal behavior, they do not so frequently recognize the import of this fact as applied to their own science. In no department of societal affairs has technology wrought greater transformations than in science. The long delayed technological revolution in the social sciences is not likely to be less sweeping in its effects than it has been in other departments of societal activity. When that revolution comes some of the suggestions of this volume and of Dodd's *Dimensions of Society* will perhaps appear as very modest aspirations.

G. NOTES

1. I here use such terms as *motion, time, space, rate, energy, force, power, work,* etc., in their strict scientific sense and not with the various loose meanings which frequently attach to them in everyday speech. The following quotations from A. P. Weiss are good illustrations of the nature of operational definitions of some of these terms:

"*Motion.* In developing a definition of motion or movement we may proceed as follows: A demonstrator *A* points to an object on the table and arbitrarily declares to another individual *B* that this object (as it lies motionless) is in zero motion. *A* moves it toward the right and then defines this act as a *movement toward the right. A* then demonstrates movement toward the left, forward, back, etc. With ever increasing complexity *A* demonstrates movements that are long, short, up, down, regular, irregular, circular, elliptic, parabolic, sinusoidal, centrifugal, etc. All of this can be demonstrated without recourse to definition, or rather the definitions can be created *de novo* as new forms of behavior from the demonstration. *A* may now ask *B* to repeat the demonstration to another individual *C; C* then demonstrates to *D*, etc. The adequacy of the method as to uniformity is attested when successive individuals in turn take the place of demonstrator and the last individual repeats the demonstration to *A* exactly as *A* originally presented it to *B*. To the extent that the demonstration has gained or lost during transfer from one individual to another, has it been faulty, and to that extent is there what is known as a lack of understanding. Assuming that the above demonstration has been made and repeated until all the individuals involved respond similarly when asked to demonstrate sinusoidal movements, pendular movements, fast movements, etc., we can then by extension of the principle arrive at a definition of movement which gives it the properties of *rate* and *direction.*

"*Time.* In defining what we are to mean by *time* it is only necessary to more extensively differentiate fast and slow movement, which we shall assume has (through demonstration) been differentiated into slow, fast, sooner, later, etc. From this we develop the 'second' or physical time unit. When all the individuals are able to repeat the 'time' demonstration without error, the various persons are said to understand each other or '*to understand what time is.*'

"*Space.* Continuing with the behavioristic demonstration technique, the concept of space can be developed out of the demonstrations or reactions of right, left, up, down, forward, back, near, far, and gradually complicated into systems of co-ordinates and loci which result in the physical units of the centimeter, square centimeter, cubic centimeter, etc.

"*Rate.* The conception of rate may then be demonstrated as a particular relationship between space and time, and the conceptions of velocity, acceleration, etc., built up.

"*Time-Space.* For the behaviorist the 'time-space' problem loses much of its mystery when it is regarded as a form of behavior rather than a 'unique' something. When we recognize that science is only a special form of human behavior the question, 'Are time and space independent of human beings?' merely reduces

itself to the absurdity, 'Can special forms of human behavior occur without human beings?' The universe would have no *geodesic* in it were there no individuals who had acquired those responses that are classified as spherical geometry." (A. P. Weiss, *A Theoretical Basis of Human Behavior*, Second Edition, revised, Adams and Co., 1929, pp. 21–23.)

2. Weiss, *op. cit.*, pp. 27–28.

3. For a more refined definition of these terms, especially as they apply to societal behavior, see S. C. Dodd, *Dimensions of Society*, Ch. 11, especially Sec. 2. In Physics energy is defined as *force times a distance*, which in sociological terms would be *force times an amount of change* in some societal characteristic. Likewise, *force* in sociology means a time-rate of change ("velocity") times a population, divided by time to get the rate of change of velocity (which is "acceleration"). Energy may be looked at from three points of view—contemporaneously, prospectively, or retrospectively. Thus, *kinetic* energy is energy in the present, progressive tense—"a-doing." *Potential* energy is energy in the future tense—"will be done." *Work* is energy in the past tense—"already done." *Power* is the time-rate of doing work. For a more popular meaning of *power* in sociological discussion, see the quotation from Bertrand Russell in Ch. XII, Sec. B.

4. A conspicuous exception to this statement should be noted in the case of Edward Carey Hayes who, as early as 1907, warned against "The Social Forces Error" (*Amer. Jour. of Sociology*, XVI, p. 613, March, 1907) as follows:

"I wish to protest against the idea that we can explain social phenomena by referring them to various social forces. . . . The phrase is often equivalent to motives, but referring action to a motive does not constitute a sociological explanation; whether by that word is meant an idea, a desire, or a compound of both, a prevalent motive is itself a social phenomenon to be explained. . . . The most obvious, not to say superficial way of accounting for human action is to refer them to 'motives.' In this way 'feelings' and 'interests' are regarded by a large class of writers as 'social forces' or causes. According to the view which I represent this is an error. . . . Sociology . . . must adopt the method of the other sciences and account for its realities in terms of conditioning phenomena and relations between phenomena." (As quoted by E. E. Eubank in *Concepts of Sociology*, Heath, 1931, p. 180.

For a brief review of the literature of "social energetics" see P. Sorokin, *Contemporary Sociological Theories*, Harper, 1928, Ch. 1. The present approach differs in several fundamental ways from the systems there reviewed, largely on account of the development of physics, biology, and psychology during the present century. Consequently I feel that Sorokin's criticism of the theories reviewed are hardly at all applicable to the present approach. Compared to other formulations of the same period, furthermore, it seems to me that the works of such men as Fechner, Edgeworth, Walras, Winiarsky, and Pareto are likely to be accorded a place in the history of the social sciences long after the work of some of the more popular contemporaries of these men have been forgotten.

5. The general proposition that the so-called "higher" "cultural" phenomena tend to appear only after certain basic animal needs and securities have been

attained has been extensively exploited in sociological literature. Some interesting questions regarding variations in the "emotional expansiveness" of different individuals have been raised by J. L. Moreno (*Who Shall Survive? A New Approach to the Problem of Human Interrelations*, Mental and Nervous Disease Publishing Company, 1934, pp. 134–137). "In the course of Parents Tests, we observed, aside from the manner a housemother reacted towards the different children around her, that one housemother was able to attract the attention of more children than another, and also that some housemothers fatigued more rapidly in their interviews. After a few tests we could already rank housemothers roughly according to their expansiveness. . . . A housemother can embrace with her given emotional energy only a certain number of children. If the number of girls she embraces surpasses a certain limit a process of selectivity sets in. . . . This limit of expansiveness has, thus, an effect upon the organization of the group. . . ." (P. 136.)

6. For a comprehensive discussion of the meaning of this phrase in the "physical" sciences see A. J. Lotka, *Elements of Physical Biology*, Williams and Wilkins, 1925, Chs. 11 and 21.

Herbert Spencer (*First Principles*, Ch. 22) described the phenomenon as follows:

"Among the involved rhythmical changes constituting organic life, any disturbing force that works an excess of change in some direction is gradually diminished and finally neutralized by antagonistic forces, which thereupon work a compensating change in the opposite direction, and so, after more or less of oscillation, restore the medium condition. And this process it is which constitutes what physicians call the *vis medicatrix naturae*.

"This is a conclusion which we may safely draw without knowing the special re-arrangements that effect the equilibration: If we see that a different mode of life is followed after a period of functional derangement by some altered condition of the system—if we see that this altered condition, becoming by and by established, continues without further change, we have no alternative but to say that the new forces brought to bear on the system have been compensated by the opposing forces they have evoked." (As quoted by Lotka, *op. cit.*, pp. 283–284.)

P. Sorokin, *Social and Cultural Dynamics*, American Book Co., 1937, warns against the use of the concept of equilibrium in the social sciences (Vol. I, p. 176) but refers to some sort of "immanent logic of history" (Vol. III, pp. 250 ff.) or "principle of limits" and "immanent self-regulation" (Vol. II, p. 475) which seems of somewhat equivalent import. E.g., "As soon as the curve of disturbances approaches either the minimum or the maximum level a reaction sets in and sends its course in the opposite direction." (Vol. III, p. 481.)

I have no objection to Sorokin's criticism (*op. cit.*, I, p. 176) of the term equilibrium as used by some scholars who say that "a unit exists as long as it maintains its equilibrium." As he points out, this makes "existence" and "equilibrium" synonymous and such usage, I agree, renders the term superfluous. Clearly, this is a different understanding of the meaning of the word than that employed above, or as commonly used in science where equilibrium and dis-

equilibrium have very definite operational meaning. (See also Sorokin's paper "Le concept d'equilibre est-il necessaire aux sciences sociales," *Revue International de Sociologie*, XLIV, Sept-Oct., 1936, pp. 497–529, and other papers in the same symposium on this subject.)

For a contemporary view of the status of the concept equilibrium in economics see S. Kuznets, "Equilibrium Economics and Business Cycle Theory," *Quar. Jour. of Econ.*, XLIV, 1929–30, pp. 381–415. Also "A Commentary" by R. W. Souter on the same subject in the same journal Vol. XLV, 1930–31, pp. 40–93. Also S. Kuznets "Random Events and Cyclical Oscillations," *Jr. of the Am. Stat. Assn.*, XXIV, 1929, pp. 258–275. Also V. Pareto, *The Mind and Society*, Harcourt, 1935, IV, pp. 1433–1442. W. C. Mitchell, *Business Cycles*, National Bureau of Economic Research, 1930; H. L. Moore, *Economic Cycles—Their Law and Cause*, Macmillan, 1914.

7. C. M. Child, *Physiological Foundations of Behavior*, Holt, 1924, pp. 217, 218.

8. See pp. 21 ff. for further elaboration of this phenomenon. Accurate statement of these relationships can, of course, be made only in mathematical terms.

9. Practically every general sociological treatise of note from antiquity to the present has speculated upon pulsations, fluctuations, and cycles, and a large number have advanced definite theories on the subject. For a brief summary of the literature see P. Sorokin, *Contemporary Sociological Theories*, Harper, 1928, pp. 728–741. For a more comprehensive treatment see F. S. Chapin, *Cultural Change*, Century, 1928. P. Sorokin's *Social and Cultural Dynamics* contains extensive data on fluctuations in a large variety of societal phenomena. The most systematic and intensive work in this field has been on business cycles in which connection see H. L. Moore, *Laws of Wages*, Macmillan, 1911; *Economic Cycles—Their Law and Cause*, Macmillan, 1914; *Generating Economic Cycles*, Macmillan, 1923; W. C. Mitchell, *Business Cycles; the Problem and Its Setting*, National Bureau of Economic Research, Publication No. 10, 1927, pp. 199–354. In recent decades attention has turned extensively to similar efforts in other fields. See R. V. Bowers, "Differential Intensity of Intra-Societal Diffusion," *Am. Soc. Rev.*, III, Feb., 1938, pp. 21–31. H. E. Pemberton, "The Curve of Culture Diffusion Rate," *Am. Soc. Rev.*, I, Aug., 1936.

10. F. S. Chapin, E. Jacobsen, and Sarah Stone, "Predicting Relief Case Loads for Minneapolis by Empirical Procedures, 1932–33," *Jour. of Amer. Stat. Assn.*, XXVIII, Dec., 1933, pp. 414–422.

11. See an excellent discussion by S. Kuznets, "Random Events and Cyclical Oscillations," *Jour. Amer. Stat. Assn.*, XXIV, Sept., 1929, pp. 258–275:

"If cycles arise from random events, assuming the summation of the latter, then we obviously do not need the hypothesis of an independent regularly recurring cause which is deemed necessary by some theorists of business cycles. Indeed, if one can explain how in certain processes of economic life, the response to stimuli is cumulative, then the whole discussion of the cause of business cycles becomes supererogation. If the business economy runs at a certain high or low plateau level, and the conditions of business behavior are in such shape as to cumulate favorable or unfavorable random events, then we are bound to have

a cyclical up or down swing sooner or later. It is to be seen that the so-called institutional explanations of business cycles deal mainly with the economic forces that make for cumulation, with forces that explain why a given random event is not immediately cancelled by an opposite reaction but allowed to exert its influence for some time to come, an economic counterpart of the statistical mechanism of a moving average." (Pp. 274–275.)

12. For a brief review of the chaos that characterizes the literature on this subject see Mabel A. Elliott and Francis E. Merrill, *Social Disorganization*, Harpers, 1934, Chs. 1 and 2.

13. L. L. Bernard, *An Introduction to Social Psychology*, Holt, 1926, pp. 122, 143, 248.

14. Cf. J. M. Gillette, "An Examination of Criteria for the Determination of Normal Society," *Am. Soc. Rev.*, II, Aug., 1937, pp. 501–507.

"Speaking sociologically, in the state of marriage, coitus occurs according to the expected social pattern and is normal, while in prostitution, promiscuity, adultery, common-law marriage it is regarded as socially abnormal. But coitus is of the same nature wherever performed, not a different sort of organic relationship. It is the value judgment, our attitudes, sentiments, sanctions which here differentiate between the normal and the abnormal. So criminal conditions are not different sets of social action, or actions articulated in ways different from usual life. They are merely ordinary activities conducted in ways which social approval condemns. Manslaughter and murder are the same kind of physical actions as those performed in self-defense, or by the police, or by our most approved patriots in time of war. Stealing a hog is carting off a swine after the same fashion used in hauling him to market legitimately. Robbing a bank, simplest way, is taking money over the counter just as we would ordinarily if it belonged to us. Criminal actions are ordinary actions carried on under circumstances our society does not sanction." (P. 506.)

15. S. C. Dodd, *Dimensions of Society*, Macmillan, 1940, Ch. 5. Dodd's technical symbols have been omitted from the table.

16. See the brief description of a physico-chemical system in Chapter 3 of L. J. Henderson, *Pareto's General Sociology*, Harvard University Press, 1935, especially pp. 10, 15.

17. Henderson, *ibid.*, pp. 12 ff.

18. *Ibid.*

19. J. Dewey and others have emphasized that organism-environment is always a single situation which we separate into these conventional components only for analytical purposes. Says Dewey: "Only by analysis and selective abstraction can we differentiate the actual occurrence into two factors, one called organism and the other, environment." (*Psychologies of 1930*, Clark University Press, 1930, p. 411. See also *Logic. The Theory of Inquiry*, Holt, 1938, p. 25.) The same can be said of "stimulus" and "response." (Cf. A. P. Weiss, *op. cit.*, pp. 25–27:)

"The stimulus is to be regarded as one form of stress in the environment. The sense organs are also systems of stresses. The interaction between these two kinds of stresses (light waves and the chemical changes in the sense organs for

instance) are the antecedents of a third type of change known as a nervous process. Finally, a fourth type of change occurs, the contraction of a series of muscle fibers, which produce movements of the body or parts of the body. These movements in turn may bring about changes in the environment such as sound waves and speech sounds, which in turn may act as stimuli for the sense organs of other persons and release a similar cycle, *ad infinitum*. The distinction between stimulus, sense organ, nervous process, muscle contraction, is purely arbitrary. The energy interchanges and the successive equilibria that are established form a continuous series in the cosmic movement continuum whose origin is lost in the past and which will continue into the future forever, so far as we know. The quantum theory suggests that the movement continuum is actually atomic in structure. This affects the present argument only in the sense that the energy interchanges are quantal in character rather than continuus. The fact that the stimulus usually originates outside of the organism while the response occurs within it, has obscured the continuous character of the energy interchanges. The tendency has been to regard the stimulus as originating *de novo*, and the response as terminating the energy expenditure. If it is recognized that the stimulus has a regressing series of antecedents, and that the response has a series of subsequent effects, it will be easier to understand that both stimulus and response are merely episodes, as it were, in the constant flux of energy transformations in the universe and that the bodily phase is merely an acceleration or deceleration of the sensorimotor metabolic rate of a given locus (the individual) in the movement continuum of electron-proton changes."

Later (p. 58) the same author says:

"I wish at this point to call attention to the fact that I regard the stimulus-response category as a scientific fiction, of the same sort as the object-subject, mind-body fictions. Its advantages, however, lie in the fact that both stimulus and response are variables of the same systematic entity, viz: movement, and that of all possible entities, movement can be measured with the highest possible degree of accuracy and can be represented with a maximum degree of uniformity entirely beyond the range of such entities as are included under the terms mind, consciousness, etc."

20. C. L. Hull, "Goal Attraction and Directing Ideas Conceived as Habit Phenomena," *Psychol. Rev.*, XXXVIII, p. 505.

21. W. I. Thomas, *Primitive Behavior*, McGraw-Hill, 1937, p. 49.

22. R. E. Buchanan, "Population Behavior of Bacteria," Ch. I in *Handbook of Social Psychology*, Clark University Press, 1935, p. 3.

23. See the works of H. Poincaré, K. Pearson, B. Russell, and others. Poincaré, *The Foundations of Science*, The Science Press, 1913, Chs. 4, 11. Pearson, *The Grammar of Science*, Third Edition, Rev., Black, 1911, Chs. 4, 5. Russell, *Philosophy*, Norton 1927, Chs. 11, 14. See also in the present text Ch. II, note 37, and Ch. VII, notes 31, 32. For some purposes other views of causation are, of course, defensible. See S. P. Lamprecht, "Causality," in *Essays in Honor of John Dewey*, Holt, 1929. Also John Dewey, *Logic. The Theory of Inquiry*, Holt, 1938, Ch. 22.

24. Cf. Max Weber, *Wirtschaft und Gesellschaft, Grundriss der Sozialökonomik*,

III, 1921–22, p. 14; *Gesammelte Aufsätze zur Wissenschaftslehre*, 1922, pp. 420, 444 ff. Cited in Sorokin, *Contemporary Sociological Theories*, Harper, 1928, p. 42.

25. This relationship in one of its simplest imaginable forms may be expressed by a differential equation of the type

$$f(t)\frac{dy}{dt} + u(t)y = 0$$

where $f(t)$ and $u(t)$ are assumed to be *known* functions of t. To find the solution $y = F(t)$ of this equation, we must know the value of y at some previous time, say, $t = t_0$, as well as the values of $f(t)$ and $u(t)$ for all times after $t = t_0$. The influence (on the solution) of the value of y at $t = t_0$ will symbolize the influence of heredity. Let the functions $f(t)$ and $u(t)$ symbolize the influence of environment (which changes with time). At any given time y depends on both these factors, and it would be fallacious to speak of any part of y as being determined by one factor (y at $t = t_0$), and another part by the other factor ($f(t)$ and $u(t)$). (I am indebted for the above illustration to Dr. N. Rashevsky of the University of Chicago. See also his article, "Uber einige besondere Fälle von Hysterese-Erscheinungen in physikalisch-chemischen Systemen und über deren mögliche Beziehung zu einigen biologischen Problemen," *Zeitschrift für Physik*, 58 Band, 7 und 8 Heft, 1929, p. 539.)

26. This is not merely a theoretical and logical assumption, but a fact supported by experimental data. See *Chemistry in Medicine*, The Chemical Foundation, Inc., New York, 1928, Ch. 2 ("Heredity and Development," by Alexander Weinstein) especially pp. 33, 36–42, 65–72. See also H. S. Jennings, *The Biological Basis of Human Nature*, Norton, 1930, Ch. 5, especially pp. 122, 145, 209. E. B. Holt, *Animal Drive and the Learning Process*, Holt, 1931, is one of the very best expositions of the psychological position here adopted.

27. C. H. Cooley, *Human Nature and the Social Order*, Revised Edition, Scribners, 1922, pp. 15, 16. For a striking recent example of the type of assumptions here criticized, see "The Relative Influence of Nature and Nurture upon Mental Development," *27th Yearbook of the National Society for the Study of Education*, Public School Publishing Company, Bloomington, Ill., 1928.

We are concerned here purely with a question of logic, not with a question of fact. It is a question, not of data, but of that frame of reference we shall employ in interpreting the data. The Copernican theory of the universe in no way changed the observed facts of astronomy at the time. It will probably not be contended by anyone that the theory therefore was without significance in affecting our practical adjustments to the universe and the future course of investigation. The present discussion of the purely theoretical aspects of the doctrine of heredity, innate characters, and capacities has exactly the same justification. A glance at the voluminous controversial literature about the relative significance of heredity and environment suggests very positive gains from a solution of the problem. Strictly speaking, the problem as at present stated will never be solved. It will be abandoned. For it has no more meaning than the question as to which leg of a three-legged stool is the most important.

28. *Mind, Self, and Society*, University of Chicago Press, 1934, pp. 246–247.

29. See Ch. I, Sec. C, 3. See also an extensive review of futile attempts to define "culture" in the following series of articles by A. Blumenthal: "The Place of the Term 'Culture' in the Social Sciences," *The Sociological Press*, 1935. "The Nature of Culture," *American Sociological Review*, I, 1936, pp. 875–893. "Culture Consists of Ideas," Marietta College Press, Sept. 1937. "The Best Definition of Culture," Marietta College Press, Dec., 1937. "The Importance of the Most Useful Definition of the Term 'Culture,'" Marietta College Press, March, 1938. "The Relations Between Culture, Human Social Interaction, Personality, and History," Marietta College Press, June, 1938. In my opinion, the type of attack reviewed and represented by these articles can never result in scientific definitions of anything. (See Ch. V, note 32.)

The position taken in the present text is that of George H. Mead (see *Mind, Self and Society*, Introduction, by C. W. Morris, p. xix):

"The experienced world is conceived by Mead as a realm of natural events, emergent through the sensitivity of organisms, events no more a property of the organism than of the things observed. Philosophically the position is here an objective relativism: qualities of the object may yet be relative to a conditioning organism. A certain portion of the world, as experienced, is private, but a portion is social or common, and science formulates it. Private experience and common experience are polar concepts; the private can only be defined over against that which is common."

30. L. L. Bernard, *op. cit.*, pp. 75–76. For an extension and elaboration of this outline together with illustrations of attempts to study the operation of the various items in societal situations, see S. C. Dodd, *Dimensions of Society*, Macmillan, 1940, Ch. 3.

31. Frederick Soddy, *Matter and Energy*, Holt, 1912, p. 240.

32. T. Veblen, *The Place of Science in Modern Civilization*, Viking, 1932.

33. See an excellent summary of the similarities of Fascist and Communist regimes in J. F. Brown, *Psychology and the Social Order*, McGraw-Hill, 1936, pp. 409–410, e.g., "*The communist dictatorship like the fascist is the rule of a party in the interests of a class*," p. 410. [Italics his.] Brown then goes on to declare this similarity as of very superficial and trivial importance as compared with the "basic" difference, namely, that the two are allegedly in the interest of different classes. This is an interesting inversion of the practice we have found profitable in the other sciences. The scientist does not contend that the tornado which hits the Gold Coast is a basically different phenomenon from the tornado which hits the slum. That is, the classification of tornados according to the objects they destroy has not been found scientifically profitable in describing tornados. It is permissible to study also the incidence and amounts of the losses from the tornado, how different classes adjust to it, etc., etc. But these are *other* questions, perhaps well worth studying. In the same way, the effect of a given form of social organization upon different classes in different places *with reference to somebody's personal likes and dislikes* is a permissible and perhaps laudable undertaking. But it does not contribute especially to an objective description of the structure and functioning of the organization in question. For more extensive comparisons of contemporary political regimes see E. Hei-

man, *Communism, Fascism, or Democracy*, Norton, 1938; C. B. Hoover, *Dictators and Democracies*, Macmillan, 1937. See also below, Ch. X, Sec. E.

34. This is overlooked in such a suggestion as La Piere's (*Collective Behavior*, McGraw-Hill, 1938, p. 53) to the effect that the more than 200,000 words in the current edition of *Webster's New International Dictionary* are more than sufficient for the communication of all we know about collective behavior without resorting to "cabalistic symbols." It remains a fact that although these 200,000 words were also at the disposal of physicists and other scientists they found it advisable to resort to "cabalistic symbols" and, what is more, they made progress in their fields in direct proportion as they developed their "cabalistic" symbols. A more serious error implicit in the above position is the assumption that words are merely devices for the communication of knowledge *after* we have it. They are also tools by which we gain knowledge. The remedy for blunt and defective tools is not more such tools but sharper and more suitable tools. Nearly all of the words in the dictionary had their origin in and are adapted to primitive society. How can they possibly describe the new world which science reveals? A glance at some primitive languages, in which there is also no lack of *numbers* of words, will further emphasize the fundamental importance of the relation of *types of language* to reliable knowledge. For experimental data on the subject see, for example, A. Lehman, "Ueber Wiedererkennen" (*Phil. Stud.*, V, 1888, pp. 96–156), who showed that "if subjects were taught numbers for each of a set of nine shades of gray they could identify these grays with considerable accuracy, whereas in the absence of such verbalizations their success was but little better than chance." (Quoted in E. A. Esper, "Language," Ch. 11 in *Handbook of Social Psychology*, Edited by C. Murchison, Clark University Press, 1935, p. 456.)

Sorokin (*op. cit.*, Vol. I, p. 175) advances the interesting thought that "the terms, concepts, symbols, and other essentials of musical knowledge and theory are of invaluable help to any theorizer in the field of social processes. Hitherto social science has been using various curves and diagrams for the purpose of describing social processes. These as compared with the technique and symbols of musical composition are rude and inadequate." I do not regard the present symbolism of mathematics as of any magical or final efficiency and any time a superior symbolism *for doing the things that science wants to do* is invented I should favor its adoption not only in the social but in the physical sciences. From my point of view I see no reason to doubt that mathematics is *as* useful in the social as in the physical sciences. If musical symbolism can be demonstrated to be a *more useful* way of representing the correlations of phenomena which all science aims at, I should think it would be welcomed by everyone. In the meantime, the theory of the ancients regarding the "harmony of the spheres" will be remembered as hardly an encouraging attempt of this kind in physics.

Chapter VII

DYNAMICS OF BEHAVIOR—SOCIETAL PROCESSES

A. INTRODUCTION

Events are said to be reduced to order when our responses to them take place in some standardized sequence or manner. In proportion as the stimuli to which we must respond are vast in number and variety, increasingly comprehensive response categories become necessary. Categories, as we have seen, are blanket-symbols which we invent to stand for a multitude of individual events. We habituate ourselves to respond to an individual event or case with the category-response. Thus, the category *dog* becomes a symbol for an unlimited number of individual animals. That is, the symbol sets the organism in readiness for behavior appropriate for dealing with dogs. By conditioning ourselves to respond habitually to this symbol whenever we are confronted with an animal with characteristics within the range covered by the category we greatly facilitate the required adjustment. In short, a category is a symbol releasing a habit mechanism.[1]

Our adjustment possibilities are measured largely by the degree to which we can develop blanket-symbols comprehending increasingly large numbers and varieties of events with increasing precision and a minimum of violence to the details of the individual cases included under the general category-symbol. For this purpose various types of averages were invented with their coefficients of dispersion and probable errors. Ordering events, ordering our lives, and ordering our knowledge means, therefore, systematizing (habitualizing) in some way our responses to the multitude of phenomena to which we are sensitive. The most highly systematized and objectified of these habit systems is science.

Students of societal phenomena from the earliest times to the present have attempted to reduce the welter of societal events to some sort of pattern according to which events tend to recur. To have formulated a pattern or a sequence is of value in that events

can then be anticipated and the tensions of uncertainty, shock, or other wasteful ways of reacting may be avoided. That is, an expected or predicted event is symbolically referred to its class of events for which established (habitual) response-mechanisms already exist. The advantage of such preliminary "internal," experimental adjustments on a symbolic level prior to the events for which the symbols stand is too obvious and known to everyday experience to require elaboration. The attitudes of "readiness" which we assume when expecting a shock, and the innumerable "precautions" we take against expected events from carrying an umbrella to taking out life insurance are all in the nature of preliminary adjustments to an anticipated event symbolically present. Such preliminary preparation immeasurably facilitates our adjustment to the anticipated event when it occurs, because we have through the preliminary symbolic contemplation of the event actually habituated ourselves to the adjustment to it.

All philosophies of history as well as all social science are such attempts at generalizing societal behavior and thus bringing it within our already established and habitual response mechanisms. Sociologists, when surveying the thousands of accounts of the ways of primitive and civilized people, have accordingly sought categories into which all this variety could be classified in a meaningful way. A large vocabulary has resulted.[2] Most of it consists of folk-designations. Many of the terms are synonymous. Few of them have been accurately defined. From a total vocabulary of somewhat over fourteen hundred words at present characteristically used in sociological literature as of special significance in that field, Eubank, with the aid of a number of prominent sociologists, finally arrived at a list of 332 words.[3] These were felt to approach to some degree the requirements of scientific terms in that (1) they are always used in the same sense whenever employed, (2) they are reasonably precise, (3) each "contains only one cardinal idea" and (4) they are fundamental or essential to the complete interpretation of their particular field.[4] Now all of these criteria must be regarded as matters of degree. As we have previously remarked, very few sociological terms meet the requirement to a very high degree. It is doubtless true, however, that the abbreviated list meets these criteria to a relatively high

degree as compared with other words in the much longer list. In any case, these are the words at present used to designate in a comprehensive way societal phenomena. As such, hypotheses and problems for further study must necessarily be couched largely in these terms. Accordingly, we shall examine in the present chapter the more important designations of societal processes with a view to defining the present categories more objectively and thus discovering ambiguities, overlappings, and gaps in the sociological vocabulary.

In a list of over three hundred words currently used professionally by sociologists in a specialized sense to designate societal phenomena, some words will, of course, be used to designate very much more basic or elemental phenomena than others. The scientific quest for *common factors or processes* in events occurring under widely disparate times, places, and circumstances has produced in sociology as in all other fields words designating elemental forces or processes basic to all societal behavior. We considered in the preceding chapter certain terms which are of such general import that they are found useful in more than one science. Let us examine the basic concepts which seem to sociologists to designate elemental aspects of societal behavior.

B. SOME CLASSIFICATIONS OF SOCIETAL PROCESSES

To the reader who is interested in the history of attempts to select a list of words which adequately and conveniently designate the behavior considered within the field of sociology, we can do no better than to refer to Eubank's comprehensive listing of such words and word systems.[5] Briefly, that history consists of (1) each author proposing a list of such words; (2) defining them in terms of other words and sometimes citing illustrative cases of each kind; and (3) criticizing the word lists of other authors as incomplete, overlapping, or both.[6] These systems have been valuable (1) in calling attention to the variety of societal behavior and (2) in suggesting possible common factors underlying the large number of specific behaviors. We are interested here chiefly in the latter type of attempts. Accordingly, we shall review in the following sections some of the more important of the classifications of basic societal processes that have been proposed.

In undertaking this summary we shall not attempt to discuss all of the words in the sociological vocabulary. In the first place, many of these words are static terms referring to structures and groups rather than dynamic terms referring to processes, activity, or behavior. The static terms are, of course, in the last analysis also names of activities.[7] We shall here consider only a few of the words most generally used to designate societal processes in order to indicate the present impasse in their definition. We can then profitably inquire as to the nature of the solution of this impasse. As we shall see, that solution lies not in the further multiplication of words to designate each distinguishable variation in societal behavior but in formulating general categories in terms of the *gradation* of which all the variety can be described. Only the general approach to this solution will be here indicated, with references to Dodd's more complete treatment in his *Dimensions of Society*.

As an illustration of the type of attack upon the problem of societal processes which has obtained hitherto we may cite the list formulated by E. A. Ross[8] in 1905 based on the "intrinsic type" of the process designated.

SOCIAL PROCESSES

Genesis of Society
- Multiplication
- Congregation
- Conjugation

Association
- Communication
- Fascination
- Intimidation

Domination
- Exploitation
- Forcible assimilation

Opposition
- Class struggle
- Competition
- Discussion

Adaptation
- Toleration
- Compromise

Adaptation—Continued
- Amalgamation

Cooperation
- Mutual aid
- Division of labor
- Organization
- Regulation

Stratification
- Differentiation
- Segregation
- Subordination

Socialization
- Imitation
- Intercourse
- Education
- Social control

Alienation
- Estrangement
- Antagonization

Individualization *Crystallization*
Diversification of culture
Liberalizing of control
Dissolution of social bonds

Ten years later Blackmar and Gillin,[9] while adopting the above outline from Ross, refined his main category *Socialization* into the following processes, arranged in the order of their initial sequence:

1. aggregation
2. communication
3. association
4. cooperation
5. combination
6. organization

Still later Park and Burgess [10] further reduced the list to four fundamental types of interaction, to wit:

1. competition
2. conflict
3. accommodation
4. assimilation

One of the most detailed and thoughtful of lists of societal processes is that presented by L. von Wiese and H. Becker which is presented in part below: [11]

PART I. COMMON-HUMAN RELATIONS

A. Processes of Association
   (a) Advance
   (b) Adjustment
   (c) Accordance
   (d) Amalgamation

B. Processes of Dissociation
   (a) Competition
   (b) Contravention
   (c) Conflict

PART II. CIRCUMSCRIBED RELATIONS

C. Differentiation
   (a) Genesis of Disparities
   (b) Domination and Submission
   (c) Gradation and Stratification
   (d) Selection
   (e) Individuation, Separation, Estrangement

D. Integration
   (a) Uniformation
   (b) "Ordination," superordination, subordination
   (c) Socialization

E. Destruction
   (a) Exploitation
   (b) Favoritism and Bribery
   (c) Formalism and "Ossification"
   (d) Commercialization
   (e) Radicalization
   (f) Perversion

F. Construction
   (a) Institutionalization
   (b) Professionalization
   (c) Liberation.

In every case each list is accompanied by a full discussion of the kind of behavior each word was intended to designate. A good brief example of the nature of this discussion is Hayes' criticism of the categories of Park and Burgess. After declaring that assimilation should be omitted because it is a "result" rather than a process of interaction and advocating further analysis of accommodation, Hayes proceeds as follows:

"We are now obliged to observe that the two remaining items in the list of four proposed by Professors Park and Burgess *have not been correctly defined.* According to these writers the distinction between competition and conflict is that social contact and emotional excitement are present in conflict and absent in competition. They say: 'Competition, strictly speaking, is interaction without social contact,' while 'Conflict is contest in which contact is an indispensable condition.' 'Conflict is always conscious, indeed it evokes the deepest emotions and strongest passions.'

"Now, presence or absence of social contact is not the essential difference between competition and conflict. Neither is the presence or absence of excited emotion. Both social contact and excited emotion may be present in competition as well as in conflict. *There is a clear difference between competition and conflict, but it is not the one proposed, and to make presence of social contact and excited emotion the criterion of distinction between them is to miss the real point.*" [Italics mine.] [12]

The above will also serve as further illustration of a point we have previously touched (Chapter II) as to the nature of definitions. Hayes asserts with confidence that the definitions he is criticizing are simply *not correct.* He proceeds in several additional pages of brilliant and able theoretical discussion to develop the "true" definition of these categories. But at no point is an operational definition suggested or developed. The categories in ques-

tion have been extensively copied, defended, and criticized during the last twenty years. This has not been without value because in the course of the discussion many aspects of behavior customarily included under each rubric have been brought out. More and more intensive study of the categories and the behavior they are supposed to include has taken place. But the essential point, namely, agreement on exactly what to include under each category has remained undecided. Thus, a recent monograph regarding competition and cooperation says:

"Consider the situation involved in a football game. Certainly the game itself represents the glorification of competition between the two teams. But competition does not, cannot completely describe the event, for all twenty-two players are also cooperating. Every player has to agree to obey the rules and not combine with some of his teammates to slaughter the referee; he cooperates with ten men to compete against the other eleven. He is also assisting even the opposing team in staging a form of entertainment for the benefit of the spectators; and he is contributing to the support of the minor teams of his university every time he makes a tackle. Or again he may not really care whether his team is successful in the competitive enterprise or whether his own movements entertain or increase the gate receipts at future games. His primary motivation may be only to play brilliantly, in order to impress the coach, for by remaining on the first team he can retain his scholarship and, after graduation, secure a position with a good salary." [13]

Here is a complex which is regarded from at least five different points of view. This is equivalent to saying (according to the position I have taken in this book) that there are here possibly five different situations. If so, the complete futility of arguing whether *this* situation (actually five or more) *is* a competitive situation should be clear. Controversy proceeds on the assumption that each party is talking about the same aspect or situation. It is frequently considered unnecessary to determine this through operational technics because the assumption is that since all parties to the controversy are sitting in the same grandstand at the same time they are necessarily observing and talking about the same behavioral situation. The ball game has an indefinite number of aspects, cooperative, competitive, and others. Each observer selects an aspect which interests him, calls it by a word, and is shocked if someone else does the same regarding some other aspect. Although the ancient fable about the blind men and the

elephant has been retailed for centuries, its message has apparently not yet penetrated far into the thinking processes of social scientists. For they are not yet prepared to accept the scientifically necessary fact that whatever be our degree of blindness we can adjust to our world only if we assume that those *appearances* upon which we agree are the only objective *realities* we can ever know. By specifying the operations by which we see what we report, this essential agreement may be most nearly achieved.

One reason for the multiplicity and confusion of classifications of societal processes which have been proposed is the variety of viewpoints from which the classifications have been made. Thus, some classifications purport to classify phenomena upon the basis of (1) their "intrinsic nature";[14] others upon the basis of (2) the inherent "drives," "instincts," "interests," "desires," or "purpose" of the actor; and still others upon the basis of (3) the observable behaviors upon which observers can agree.

In previous chapters we have pointed out that all postulates about the intrinsic nature of phenomena are purely metaphysical assumptions and accordingly beyond the domain of science as far as verification is concerned. We have likewise pointed out that drives, instincts, interests, motives, and purposes are only hypotheses and as such are at best only a starting point for classification and correlation of societal phenomena.[15] Accordingly, we have adopted the third basis, namely, verifiable behavior, as the proper basis of scientific classifications. We are interested, therefore, in classifications of societal *behavior*. We are further interested in the question of whether the extensive and detailed word-lists that have been compiled to designate distinct societal processes can be reduced to order in terms of some common factors or components. Can we formulate common or general categories which, in various degrees, compounds, or sequences will adequately comprehend the multitudes of individual observations of societal phenomena? This is the goal all sciences pursue.

Considerations and difficulties of the sort just reviewed are largely responsible for the point of view adopted in the present work and elaborated more concretely in Dodd's *Dimensions of Society* where formulas for operational definitions of social processes are tentatively set forth. The concrete units in terms of which the formulas can be made practically applicable remain,

unfortunately, as yet largely undeveloped. Even systematic collections of concrete behavior situations to which the concepts of sociology are supposed to apply are as yet none too complete. Dodd's collection of some 1500 charts, graphs, and other descriptions of actual situations of as great variety as possible as a basis for, and a test of, his system of classification, is a conspicuous recognition of the need for exactly this type of approach. *A priori* word-systems are extremely valuable as hypotheses and must be developed *pari passu* as research advances. [16] But they must not themselves be confused with scientific conclusions. Before the exacting and prolonged task of developing these units and measures can or will be undertaken, the promise of its possibility and the results of its fulfillment must be envisioned as an incentive. That vision is the same as in any other science. The most that can be done in the present state of knowledge is to suggest these possibilities in a form susceptible to concrete test. To call attention to the theoretical considerations involved and to suggest the general approach is the purpose of this volume. We shall consider in the next section only the general framework with a few of its principal categories. The more comprehensive and systematic treatment together with the operational implications of the approach are set forth in Dodd's *Dimensions of Society*. We summarize here the theoretical foundations of that treatment as regards the more conventional designations of societal processes.

C. COMMUNICATION

We saw in the preceding chapter that the most elementary terms in which science finds it convenient to describe behavior is the construct of attraction-repulsion between electrons and protons. The more complicated operation of this attraction-repulsion phenomenon in any closed system we called interaction. We described and illustrated this phenomenon as it operates in any kind of matter.

The attraction-repulsion phenomenon has also been found generally convenient as a starting point in the description of societal phenomena. Likewise the concept of interaction is generally regarded as fundamental in societal behavior. But interaction among human beings is recognized as being in at least one respect

highly unique. It is unique in that it takes place by means of the mechanism of *communication through symbolic behavior*. This phenomenon is found as far as we know in only a highly rudimentary form among the higher animals below man so that for purposes of human sociology the attraction-repulsion and interaction phenomena consist almost entirely, if not entirely, of symbolic behavior. This is what many writers mean when they insist that human society consists of "inner" or conscious "psychic" interaction.[17] In short, all sciences study the interaction of the phenomena with which they concern themselves. Human sociology is concerned chiefly with the study of a special kind of interaction, namely, that which takes place through communication by means of symbolic behavior.[18]

We shall use the word communication, then, to designate interaction by means of signs and symbols. The symbols may be gestural, pictorial, plastic, verbal, or any other which operate as stimuli to behavior which would not be evoked by the symbol itself in the absence of special conditionings of the person who responds. Communication is, therefore, a subcategory under interaction, namely, the form of interaction which takes place through symbols. The processes of socialization described in the next chapter as well as all of the processes to be discussed below are in human society types of communication. It may be regarded as the means by which sociation takes place. Prior to the recognition of mind and thought as types of symbolic behavior societal communication was regarded as "mental," and true societal behavior as *psychic* interaction. We have already emphasized that mind and thought are social products.[19] Say Park and Burgess: "It is only when . . . the meaning that is in one mind is communicated to another mind . . . that social contact, properly speaking, may be said to exist." [20] From our point of view *societal* contact, mind, and meaning are included in our definition of communication. For the same reason, intercommunication is a redundant term.

In order to emphasize these societal components of communication and to keep it from being understood as merely having to do with certain conventional paraphernalia of telephones, telegraphs, and post offices, Bentley has invented the word *Dicaud* to designate the most elementary case of vocal conversation.

"The dicaud," he says, "is a specific observation which may be made where situations of vocal 'communication' are found. Communication shows itself as 'of,' 'by,' or 'between' men; but to observe the dicaud directly and impartially one must first strip off all control exerted by such grammatical devices as 'of,' 'by,' or 'between.' The dicaud is event; it is behavioral event; under selective observation it becomes 'object' or 'thing' of study." [21]

But the dicaud fails to include one element necessary in the full definition of true societal communication, namely, *that which* is communicated. "We . . . may, as we have done in the case of the dicaud, specialize our preliminary attention upon the two behaving human organisms plus the connective media. But in fully factual presentation a communication in which nothing is communicated is phantasmic." [22] Accordingly, Bentley proposes the name *dicaudane* for "this wider event, which includes not merely the speaker, hearer, and air, but also the embodied reference." [23]

"Dicaud" and "dicaudane," it will be observed, refer to the special case of spoken conversation. The general cases of the same phenomena are correspondingly designated *Communact* and *Communicane*. That is, the word *Communact* is used to designate "the general case of 'men seen in communication' in that specialized observation which provisionally defers examination of the 'what' that the communication is 'about.'" The word *Communicane* is used to designate "the general case of instances of communication, in which men are seen in 'communication about something.'" [24]

The *Communicane* as here defined (bearing in mind also the full meaning of communication as defined above) includes in full functional organization all the societal aspects of "mental" or "psychic" phenomena which it has been alleged removes or restricts societal phenomena from full objective observability. On the observability of societal phenomena as thus defined, it is impossible to improve on Bentley's remarks.

"The conversational remark, regarded as a 'whole,' has as much material texture, as much substantial construction, as much 'body' as a man himself. Vocal muscles, air, and ears make up the most prominent portions of this 'body.' Neurological, muscular, and other physiological extensions may be brought into ac-

count for its fuller presentation. It is just as possible, just as legitimate, to inspect the full conversational remark in this way as it is to inspect separately the speaking-man or the hearing-man, or the speaking or the hearing.

"The 'whole' which the conversational remark presents is one of 'event.' Speaking, separately considered, is an event; so also is hearing. They are events, first because they present themselves in durations, and second, because their study does not require the positing of 'material' or 'mental' substrata with respect to which they are, in an ancient form of expression, 'accidents.' Science offers us no dogmatic rule whereby the 'beginning' or 'ending' of 'an event' can be positively and permanently determined; what are to be taken as beginnings and endings must always be established provisionally for the purpose of each specialized inquiry. Where speaking and hearing are considered together in the conversational remark we extend the duration under consideration, and we have before us 'one event' for the whole, just as truly as we have 'one event' for either the hearing or the speaking separately. The behaviorist, in his time, extended the event under his observation by passing from a brain-cell or a 'mind' to the examination of a 'movement-segment' of space; but he has no authority to say that the process of extension must stop there. The extension to a space and time that includes two men is just as legitimate; all depends upon purpose and upon efficiency in inquiry.

"It is essential to any such extension, however, that it be, not arbitrary, but 'functional' in the sense in which that word is now commonly used. Exactly this is the case for the conversational remark. Each 'part' of it is a phase; each element in it, in whatever way we choose to analyze it, is before us with respect to the other elements obtained by the analysis. The functions and 'meanings' of each 'part' are developed and interpreted in terms of the other 'parts.' The conversational remark thus has extensions and durations directly as it is observed. It does not resist the practical operation of its separation into 'parts' for special purposes of inquiry; it resists only the dogma that any conventionally established scheme of presenting such 'parts' possesses absolute authority for all forms of further inquiry. All that it requires for its observation is release from such dogma. Its status of 'wholes' and 'parts' is comparable to that which physicist and

physiologist secure as tentative presentations for the needs of their own fields of inquiry; it has similar potential values and no other.

"Observation such as we have attained for vocal speech in the form of conversational remark is what I have called . . . 'Selective Observation.' It is acquired by focusing our attention upon a situation for which better understanding, and consequently better envisionment, is needed. It is not the seeing of what we *want* to see or what we are accustomed to see, but it is an attempt at seeing something that we *need* to see. It is a choice, a selection, a candidate for further development in observation. It is just such a choice or selection as the Newtonian physicist makes when he establishes a definite 'system' with respect to which he works in terms of 'force,' 'action,' or 'conservation.' " [25]

We have defined *communication* above as *interaction between organisms through symbolic behavior.* (See note 20 for important qualifications.) We have also pointed out that it is this special behavior as contrasted with *any* kind of interaction which is the distinctive interest of the social sciences. It follows, therefore, that all human societal behavior should be ultimately restatable in terms of *kinds and degrees of communication.* To describe kinds and degrees of communication, as defined above, sociologists have adopted or invented a large vocabulary the referents of which constitute societal behavior as far as known at present. We turn, therefore, to a consideration of these categories and the behavior to which they are supposed to refer.

D. ASSOCIATION AND DISSOCIATION

We have adopted the word communication to designate the most general and basic process involved in all human societal behavior or *sociation.*[26] The next most general categories into which it is convenient to classify behavior is, as we have seen, attraction and repulsion, which among human beings is usually called approach and avoidance, or *association* and *dissociation.* From our point of view, these categories are equivalent to degrees of communication. In this book we shall use (1) communication, and (2) association and dissociation to designate respectively (a) the most general common factor of societal behavior and (b) its two principal subcategories.

We shall use association and dissociation, then, to describe among persons and groups the process which is commonly designated as attraction and repulsion when manifested in matter in general. Association and dissociation, therefore, imply *a particular kind* of attraction and repulsion, namely, that involving *communication*, or the *symbolic* process.

The general fact of sociation or communication in society has been briefly described as follows:

"One can think advantageously of the whole problem of the emotional cross-currents of plus and minus sign which flow between individuals in terms of energy distribution. Complex patterns of social structure are built from simpler ones by increasing the number of individuals, increasing the qualities of interest which each has for the other, and so increasing in the final analysis the capacity for bringing about results of a social nature. These emotional cross-currents, as has already been indicated, may be attractive in their function or they may be repellent, so that every individual in the group feels the pull of the emotional interests of his fellows and the pressure of their repulsion. These currents not only flow as between individuals who are differently located and thus have a spatial pattern of distribution, but they also flow as between individuals of different degrees of development and thus have a temporal pattern of distribution. The quality of the interest differs in each instance. There may be a definite love attraction or an attraction based upon an emotional factor which is perhaps less positive, certainly is so in its description; for example, a likeness, which may be very mild and may refer to any one of many things. The same thing may be said of the repellent currents. They may run the gamut from hate to the simplest sorts of dislike, while, in addition, certain individuals may find themselves isolated because no currents of any sort move in their direction. There is an indifference of their associates to them. We therefore can vision an infinite series of possibilities: people who are held in high esteem and are much beloved by a large number of people, on the other hand individuals who are hated or feared or both, and, finally, a group who are isolated either by a preponderance of repellent emotions or by a general attitude of indifference." [27]

The details of the process by which association and the con-

sciousness of self arises in human groups will be further described in the next chapter. At present we shall content ourselves with merely a statement of what observation reveals as to the event itself. Moreno gives the following account of its appearance in babies:

"The babies were placed in close proximity in the same room in which they were and had been living since birth. The objective of the study was to ascertain what types of structures appear earliest in the evolution of groups during the first three years of life. The infant-to-infant relations were observed. The point was not whether the reactions of each individual were a really social response or not but primarily if group organization resulted from the accumulative effect of their interaction and what forms it took. The main lines of development may be summarized as follows: a stage of *organic isolation* from birth on, a group of isolated individuals each fully self-absorbed; a stage of *horizontal* differentiation of structure from about 20–28 weeks on, the babies begin to react towards each other, the factor of physical proximity and physical distance making respectively for psychological proximity or psychological distance, the 'acquaintance' beginning with neighbors first, a horizontal differentiation of structure; a stage of *vertical* differentiation of structure from about 40–42 weeks on, one or another infant commands disproportionate attention shifting the distribution of emotion within the group from the horizontal to a vertical differentiation of structure, the group which had been up to this point equally 'levelled,' develops more prominent and less prominent members, a 'top' and a 'bottom.' No one stage appears to function exclusively at any one level: there appears to be a 'hangover.' This phenomenon seems to account largely for the growing complexity of organization which one meets with at the higher chronological age levels." [28]

Moreno and others have further studied the development and changes in attraction and repulsion patterns among school children, adolescents, and other groups, together with the conditions that seem to determine such configurations. The characteristics and conditions which operate to draw people together and to draw them apart are doubtless of great variety and subtlety. The most general hypothesis on the subject would perhaps be to say that certain likenesses and differences in characteristics and *status* are the main factors. We shall deal more fully with this question in the next chapter. In the meantime we may say that a reliable generalized explanation of the attractions and repulsions between persons (i.e., generalized description of the conditions under which

the phenomena occur) would probably be at least as useful in sociology as the whole department of electromagnetism is in physics, and for essentially the same reason. Perhaps all systematic students of society have recognized in some terms or other the attraction-repulsion construct as a generalized common factor in societal behavior. A full functional description of this factor would therefore provide a foundation for the explanation of all concrete societal phenomena. From one point of view, of course, most of the sociological research work now being carried on may be said to be directed ultimately at this basic problem of association-dissociation. For all of these studies constitute data as to characteristics and conditions under which association and dissociation take place. The literature directed more or less directly on the point is considerable and we shall not even attempt to summarize it here.[29] We may, however, indicate some of the theoretical approaches that have been attempted and make some suggestions for further study.

In casting about for a basic explanation of human sociation, sociologists have advanced various theories. The simplest and most congenial solution for analysts trained chiefly in theology and traditional philosophy was to postulate a social "instinct" or "force," "interest" or "consciousness of kind," and then attribute the observed phenomena to this postulate as a cause. This solution frequently required considerable verbal ingenuity in tracing the tortuous path by which concrete specimens of societal behavior could be attributed to the postulated fountain head. It led to much recrimination, also, among the seers who chose to postulate different lists of instincts or forces or who could with equal ingenuity trace the same behavior to different instincts, or opposite kinds of behavior to the same instinct. But the systems, when once formulated and thoroughly memorized, had all the advantages of theology. That is, they were infallible, final, unchangeable, and could be constructed and verified from the armchair.

There is no doubt, either, that this approach has a much wider appeal, i.e., it is much more generally understandable and satisfying [30] than the relativistic, indeterministic (in the Schrödinger sense) probability view of modern science. This is not surprising. The instinctivistic orientation is very similar to the animistic and theological frame of reference which has up to the present

almost completely dominated the thought-patterns of the masses of men. What is more, the structure, phrascology, and vocabulary of the language which we have inherited (outside of symbolic logic and mathematics) is so completely adapted to the animistic, theological, cause-effect viewpoint that it is very difficult to communicate the other orientation in terms of this folk-language. It will doubtless be a long time before the thought-habits involved in these linguistic forms can be thoroughly modified.[31]

If we abandon the theory of a general instinct accounting for human sociation and special instincts of association, and dissociation, to account for particular forms of interaction, we are under obligation to account for these phenomena in some other way. The general outline of that other approach we have elaborated in previous chapters. Instead of a cause and effect sequence between two entities (1) we postulate a situation delimited by our adjustment *requirements* (problem, focus of interest, etc.) in relation to our adjustment *capacities*; (2) we regard that situation as a closed system consisting of (3) a field of force within which all phenomena interact; (4) we classify observed movements of phenomena under these circumstances according to convenient categories. Two of the broadest of these categories here adopted are association and dissociation regarded as degrees of *sociation* or communication. Later we shall consider a few others which have been extensively used in describing societal phenomena. We emphasize here merely the nature of the categories themselves as contrasted with the forces and instincts of traditional sociology.

It will be apparent from the outset that whereas the instinct explanation seemed to give a very satisfying answer to the much sought-after *why* of societal behavior, the orientation outlined above proposes to account only for *how* this behavior occurs. In science, of course, a generalized statement of *how* events occur is the only *why* we seek.[32]

Social scientists find some difficulty in adjusting themselves to this idea. Psychologists especially are fond of proclaiming that while the findings of sociologists may be interesting and practically useful, they unfortunately do not "help us to understand" the events that occur.[33] We have dealt with this illusion at some length in previous chapters and refer to it here only to point out

again that association and dissociation together with all other categories describing *societal (and psychological) processes can neither be defined nor explained except through generalized description of the conditions under which they occur.*

Very little systematic work on association and dissociation from this point of view has as yet been done. Moreno's report, mentioned above, on a large number of observations, chiefly on institutional populations, remains the most conspicuous recent contribution. On the theoretical side, Wiese and Becker have summarized "the three chief influences leading to association" and also "fundamental to every other associative process, whether advance, adjustment, or accordance" as follows:

"(a) Emotionally toned urges, vague affective tendencies, and sympathetic impulses that find their most satisfactory outlet in association. Examples are afforded by friendship, love, liking, and sympathy (as previously defined); some general processes to which they give rise are: *helping, inspiring, taking interest in, sharing another's joys and sorrows, being faithful or loyal,* and so on.

"(b) Interests which, although emotionally toned in some degree, usually are consciously recognized as conducive to the enhancement of self. Some general processes to which they give rise are: *acting as go-between, i.e., pandering, match-making, etc., making pliable or suggestible, imitating, urging, pressing upon,* and similar activities.

"(c) Objective factors (frequently in the realm of material culture) which make association virtually inevitable. Some general processes resulting are: *employing, acting as patron, customer, or client, having patrons, customers, or clients,* etc." [34]

The following remarks of the same authors upon this classification are also in accord with the point of view adopted in the present volume:

"The peculiar mixtures of the three typical influences (in widely varying degree) warrant some special attention. Frequently the combination is as follows: a particular situation makes the establishment of certain personal relationships objectively desirable, self-interest also exerts pressure toward establishment of these connections, but there is no emotionally toned urge or tendency sufficiently strong to overcome minor obstacles to the association. If the affective factors alone were decisive, probably the stage of advance would never be reached, but pressure exerted by the self-enhancing and objective factors is so strong that the step is finally taken. In terms of the above classification, the low intensity of component *a* is compensated for by the higher intensities of *b* and *c*, and the associative process begins.

"Now, every associative process must be analyzed with a view to determining the chief influences at work and their respective intensities if general sociological knowledge is to be achieved. All three components and their manifold sub-varieties must be considered, for if any one is taken as the sole or basic source of association, the door is open to the ever-present single-factor fallacy. No priority that holds good for all social processes can be assigned any of the three influences; the question as to whether social life is based upon emotionally toned urges toward association or upon self-enhancing interests cannot be answered." [35]

According to the same authors, the following conditions governing dissociation correspond to the conditions leading to association:

"(a) Emotionally toned urges, vague affective tendencies and antipathetic impulses that find their most satisfactory outlet in dissociation. Examples are afforded by enmity, aversion, and hatred; some general processes to which they give rise are: *maintaining exclusion, driving away* (and similar phrases using 'away'), *jilting, parting company, 'showing the door,'* and so on.

"(b) Interests which, although emotionally toned in some degree, usually are consciously recognized as conducive to the enhancement of self. Some general processes to which they give rise are: *dismissing, deserting, accusing, extorting, giving notice, quitting a job,* and similar activities.

"(c) Objective factors (frequently in the realm of material culture) which make dissociation virtually inevitable. Some general processes resulting are: *holding oneself aloof, withdrawing oneself,* etc." [36]

Now it might be argued that the "urges" and the "interests" mentioned in the above quotations are precisely of the order of "instincts" and therefore of the orientation that has been criticized above. In fact, this terminology and the statements that these postulated entities "find outlet in" or "give rise to" the concrete activities specified are the kind of statements to which our language habits strongly predispose us. Again, these are meaningful ways of speech in general discourse and there is no harm in using them *except for analytical purposes.* I think it is clear in the above quotations that the authors use "urges" and "interests" purely as generalized categories inferred from certain observed activities (designated, for example, by the words in italics) and not as *causes of those activities.* In short, the interests and the urges would be defined *entirely* in terms of the operations involved in a careful study of the conditions under which the var-

ious activities mentioned take place. The categories are not entities explaining behavior. They are postulates or hypotheses with which to categorize behavior taking place under somewhat similar conditions.

From the point of view we have adopted, any situation in which we choose to observe association or dissociation is regarded as a field of force or a closed system within which all behavior takes place.[37] These behaviors consist of movements of the components toward or away from each other. The systematic observation of this behavior in terms of suitable units, i.e., its measurement, constitutes the operational and scientific definition of sociation. Only within such a framework can we make adequate or accurate allowance for the fact that the components of the situation may at the same time be impelled toward both association and dissociation and that we finally name the behavior in terms of the *balance* of these impulses.

This is, of course, precisely as we proceed in other sciences. Gravity *is* what the physicists measure in units and with instruments suitable to the behavior studied, namely, the accelerating tendency of matter toward the center of the earth or other body. As gravity is always relative to the center of some mass in relation to other factors (e.g., distance) so sociation, association, and dissociation are always relative to some group and its (social) distance (or other relation) to other individuals or groups. Both terms fundamentally denote *measurement toward or away from a position.* That position, i.e., the position of a societal movement at any given moment we shall call *status.* We describe the movement we call sociation as association or dissociation according to the direction of the movement toward or away from any status-point we choose to select. "Toward" and "away from" are of course purely linguistic conventions in terms of which we agree to designate behaviors in opposite directions from any chosen point. In sociology the "position" and "direction" always refers to social rather than geographic space.[38] Both types can be conveniently represented on cartographic, Cartesian, or vector coordinates. The referents of these symbolic representations are always human behavior—e.g., the operations of going from one place to another geographically, or moving from one "position" to another, e.g., stenographer to manager, in an organization.

The latter consists of changing one's functional role and designating the direction according to *some standard* of measurement—*any* standard agreed on.

It is obvious that, from the above point of view, association and dissociation can be regarded as merely different degrees of the same process. That does not make the behavior designated by each any less unique or less important to distinguish. On the contrary we are proposing a device (a way of responding) by which not only can this uniqueness be more accurately specified but a great number of other sociological categories can also be given definite meaning.

Consider, for example, the following summary of some of the most generally used terms designating societal processes:

TABLE 3. CORRESPONDENCE BETWEEN ACTION-RELATIONSHIP AND STATUS-RELATIONSHIP [39]

(From Eubank)

1 These types of *Interaction-Relationship*	*2* Lead to one of these types of *Adjustment*	*3* In which one of these is the corresponding *Status-Relationship*	*4* Which is followed by one of these types of *Collective Action-Relationship*
I. Opposition →	1. Elimination → A − B	(Dissociation: Relationship dissolved)	→ (None)
	2. Subjugation → A > B or B > A	1. Inequality of status (Superordination-Subordination)	→ I. Co-action (Cooperation)
	3. Compromise A ≒ B		
II. Accommodation →	4. Alliance A + B; also, A = B	2. Equality of status	
	5. Integration → (AB)	3. Identity →	II. Corporate Action

With respect to the main headings of this outline, it should be observed that the first and the last headings are, viewed as behavior, probably for most purposes the same. That is, *interaction-relationships* probably always involve *collective action-relationships*

and *vice versa*, although the distinction may be useful in designating whether we are interested chiefly in the individual or the collective aspect of the behavior. Likewise, as regards the second and third main headings, *societal* adjustments always involve *status-relationships* and *vice versa*. That is, at any given moment, a *societal* adjustment consists of a status-relationship. If it is desired to use the word adjustment to designate a status relationship in process or, conversely, to use the word status-relationship to indicate the static aspect of an adjustment, there is, of course, no objection to doing so. The point to be emphasized is that these terms should not be regarded as mutually independent types of behavior but as *forms of sociation definable in terms of degree.* That is, the processes of accommodation (cooperation) are indistinguishable from those of opposition (conflict) except in the degree of their intensity as measured by some suitable unit. The *gradual* difference between *inequality* and *identity* is already rather generally recognized. *Elimination* might thus readily be defined as zero on a scale measuring degrees of integration.

Dodd (Ch. VII) has suggested the following arrangement of the above processes as they are evidenced among persons, nations, and business organizations:

	Examples		
a. *Association*	*Persons*	*Nations*	*Business*
(1) Unification	Marriage	Federation	Merger
(2) Alliance	Partnership	Allies	Trade Association
b. *Mixtures*			
(3) Independence	Acquaintance	Sovereign States	Competition
c. *Dissociation*			
(4) Subjugation	Exile	Rivals	Cutthroat Competition
(5) Elimination	Murder	Enemies	Bankruptcy

The *behavior-units* in terms of which we today undertake to set up such series as elimination—subjugation—compromise—alliance—integration—*must be defined somehow.* The practice today is for an author to assimilate under each category a number of cases drawn from anthropological literature, newspapers, or fiction, and with many reservations as to the overlapping of the

categories, try to induce other workers in the field to adopt his usage of the terms. The author may next test the objectivity of his categories by repeating his own classification of the same cases after a lapse of time, and noting the degree of agreement of his first and his second classifications. He may then ask other qualified students to classify his cases according to the categories he has adopted, and note their degree of agreement among themselves and with his own. To facilitate this process he may arrange the above categories in a horizontal line and merely ask others to indicate by a check the position on the continuum where, in the checker's opinion, a given case is properly classified. This allows for an indication of doubtful cases as, for example, half way between "compromise" and "alliance." To the extent that rigorous instructions or instruments can be furnished the raters which will sharpen the discrimination of their senses for the quality being rated, this will increase their agreement. It remains now only a formality (1) to assign cardinal numbers to different points in the scale, (2) to designate the units by some convenient word, and then (3) to describe the given case as characterized by so many units of the quality in question. As we saw in Chapter II, that is how present generally accepted measuring scales were first developed and that is how future scales doubtless will be developed. There is no magic, mystery, or revelation about them.

An empirical scale, of the type contemplated above, based upon the systematic classification of a large number of cases according to stipulated criteria would not only permit an objective definition of the categories employed. The construction of such a scale would also throw light on the hypothesis that all of these processes are interpretable in terms of different degrees of some common factor, such as communication. More refined measures of different degrees of communication or social distance might then be constructed, the results of which might permit a more objective set of categories describing societal processes. That is, certain degrees of communication or social distance or "psychologically affiliative contacts" between two groups might be designated as a state of cooperation, certain other degrees as competition, etc. If the categories represent gradations in sociation, then the task of science is to objectify the gradations.

A survey of the more thoughtful analyses that have been made

of societal processes reveals that while the above proposed solution has not been suggested, the fundamentally *gradational* nature of the processes designated by the various categories has been recognized. Thus, L. von Wiese and H. Becker in their *Systematic Sociology* find it desirable to add also a class of "mixed processes" to those of association and dissociation. These are processes that seem to have in them both elements of approach and avoidance. From our point of view which regards such words as association and dissociation merely crude designations of what is *always* a matter of degree of some common underlying process such as communication the "mixed" processes are merely those in the middle of the continuum. There are numerous suggestions in the excellent and thoughtful treatment of the above authors that they found themselves strongly drawn in the direction of the position here adopted. For example, competition is called "a process of dissociation *of the lowest power.*" [P. 249, italics mine.] Again, "*playing at games of chance, gambling:* this has as its basis community of interest and at the same time contravention." (P. 136.) This seems to me to be indistinguishable from competition (p. 249), which they classified as dissociation. Finally, there is this statement: "We would never place a process of accordance (Ac) among the B relations (dissociation) in our table, nor would contravention (Bb) be assigned to A relations (association). *Yet it is plain upon analysis—but only upon analysis—that traces of the opposite category appear in each relation.*" [P. 133, italics mine.] This is precisely the position I take and it is precisely this kind of analysis which would necessarily take place in the construction of reliable scales of the type here advocated.

The approach here suggested is not a substitute for analysis. It is a recipe for *systematic* analysis which, when completed, can be communicated and verified. In the course of its development, the analysis may involve the subtlest intuitions imaginable, as all profound scientific analysis does. But if anyone wants to gain scientific acceptance of his ventures into intuitional realms he must manage to leave sufficiently clear tracks so that others may trace them.

Nor is the apparent problem of mixed processes confined to societal behavior. When an iron filing is attracted to the stronger of two magnets we do not hesitate to call this process attraction

with reference to the stronger magnet although the same behavior might be viewed as repulsion with reference to the weaker magnet. Neither do we feel called upon to designate the process as mixed just because both magnets doubtless exercise attraction, although the observed behavior could be interpreted as repulsion with reference to the weaker magnet. As pointed out in Chapter V with reference to the behavior of an individual in a field of conflicting stimuli, we name his behavior ("decision") according to how it registers on some standardized scale, which is usually of the all-or-none type, due to the limitations of our observational technics and the necessity of the situation which requires the organism to adjust as a whole. But if we understand that the central portion of a scale represents precisely such a conflict in behavior-impulses, it becomes the only proper way of describing "mixed" processes. A carefully constructed scale of association-dissociation allows not only for a third category of mixed processes, but for an indefinite number of categories of degree.

Let us now turn to a consideration of other basic concepts to see if on analysis they too turn out to be most adequately defined in terms of degrees of some general process.

E. COOPERATION, COMPETITION, CONFLICT

Cooperation, competition, and conflict have perhaps received more discussion than any other words in the sociological vocabulary. They are recognized as types of association or dissociation but are felt to be special kinds or aspects of these more general processes. One or another of these words has been usually taken as the foundation of systems of sociology, and all sociologists have dealt with them in greater or less detail. But for all the attempts to distinguish them most treatises except the more superficial ones, soon find it necessary to recognize the gradational character of these categories. Cooley, for example, with his customary perspicacity, was one of the first sociologists to recognize explicitly and realistically this fact. Consider the following extracts:

"It seems that there must always be an element of conflict in our relation with others, as well as one of mutual aid; the whole plan of life calls for it: our very physiognomy reflects it, and love

and strife sit side by side upon the brow of man. The forms of opposition change, but the amount of it, if not constant, is at any rate subject to no general law of diminution." [40]

"Conflict, of some sort, is the life of society, and progress emerges from a struggle in which each individual, class, or institution seeks to realize its own idea of good. The intensity of this struggle varies as the vigor of the people, and its cessation, if conceivable, would be death." [41]

"The two [competition and cooperation] are easily seen to be inseparable in everyday practice." [42]

"Every one of us is a competitor in several or many fields, while at the same time a member of various cooperating groups; and—what seems somewhat surprising—we are likely to compete with the very persons with whom we cooperate." [43]

"The more one thinks of it the more he will see that conflict and cooperation are not separable things, but phases of one process which always involves something of both." [44]

If it is true that cooperation, competition, and conflict are present to some degree in most or all societal behavior situations, the practical task in their definition appears to be (1) the identification of the aspect represented by each word, and (2) the determination of the degree to which that aspect is predominant in a given situation. As a matter of fact, that is how the terms are now defined. That is, an author selects a large number of cases in which a group "works together" with relative "harmony" in some situation so conspicuously that very few people acquainted with the conventions of the language used would deny that this was an illustration of cooperation. He proceeds likewise in the case of competition, selecting striking cases of striving for some desideratum under circumstances in which whatever one party gains the other loses, but which does not extend to the total elimination of the other competing party. Other striking cases where the latter condition is conspicuously present are called conflict. As is usual with folk-language categories, a high degree of agreement as to their meaning is possible only in the extreme cases of each type, i.e., in cases where conflicting elements are conspicuously small or absent. Disagreement arises over the much more frequent "mixed" cases and especially the borderline cases. In this connection the need for scientific analy-

sis arises. It is possible, as we have noted above, simply to take a vote on concrete situations as to what is the consensus or majority opinion as to their classification and regard the spread of opinion as a distribution on a continuum with identification at one extreme and conflict at the other. Intermediate categories in any number may then be assigned to particular sections of the continuum. This is on the assumption that there is a common factor underlying the phenomena designated by the different words and that the different categories merely represent degrees of presence or absence of this common factor. Or if the different categories are thought of as representing *unique*, *essential*, and *exclusive* factors in terms of which each type of situation can be absolutely characterized, then the isolation of these factors enables us to identify a given specimen of behavior as cooperation, competition, or conflict according to whether the stipulated factors are or are not present. As a matter of fact, these methods are correlative and proceed *pari passu*. The very existence of separate words in a language indicates that the situation designated by each is regarded as *in some respect* unique and possessed of some essential and exclusive factor. Attempts to classify large numbers of cases according to the broad categories of folk-language soon reveal that the quality which was regarded as absolutely distinguishing one category from another may conveniently be regarded as a matter of degree. As sciences advance, therefore, the rigid dichotomies of such fundamental folk categories as life and death, organic and inorganic, plant and animal, are found to shade into each other. The scientist sees the welter of phenomena increasingly as a *distribution in many dimensions*, the different degrees of each aspect of which shade into each other by imperceptible steps. With this transition in viewpoint or manner of responding there takes place a corresponding transition in language forms. From the most primitive language with a definite word corresponding to each individual phenomenon there emerges class-words, then averages, then distributive and mathematical concepts. Thus the language structure of a people limits and determines their notion of the structure of their world, because that language constitutes their responses to that world. If their contacts are circumscribed, limited, or local, the words with which they describe it will be badly suited to the needs of those who,

through circumstances or through instruments for the extension of their senses, have contacts vastly more extensive. Thus it is that the scientist's view of the world is literally inconceivable to the nonscientist or to the child because the latter persons do not possess the words in terms of which alone it can be conceived. The requirements of the problem before us determine what aspects we select for designation by separate words. Convenience, in which parsimony is usually a major component, determines whether we deal with it as an aspect, as an exclusive category, or as a distribution.

While it may be true as Cooley suggests, that cooperation, competition, and conflict are designations of aspects of a process, all of which are always present in any concrete situation, this does not, as we have seen with regard to other scientific concepts, prevent us from separating them for purposes of analysis. What are the unique features commonly designated by each of these words?

A recent monograph formulates the following characteristics of competition as contrasted with cooperation.

"Postulate 5. On a social level, individuals compete with one another when: (1) they are striving to achieve the same goal that is scarce; (2) they are prevented by the rules of the situation from achieving this goal in equal amounts; (3) they perform better when the goal can be achieved in unequal amounts; and (4) they have relatively few psychologically affiliative contacts with one another.

"Postulate 6. On a social level, individuals cooperate with one another when: (1) they are striving to achieve the same or complementary goals that can be shared; (2) they are required by the rules of the situation to achieve this goal in nearly equal amounts; (3) they perform better when the goal can be achieved in equal amounts; and (4) they have relatively many psychological affiliative contacts with one another." [45]

The testing of the usefulness of these postulates obviously depends upon the measurement in concrete situations of the factors enumerated.[46] If the measurements when made enable us to classify with objectivity and preciseness different behavior situations with respect to the degree of cooperation and competition involved in each, the postulates may be regarded as warranted, useful, and "true." That is, they are then said to define or distinguish different types or degrees of sociation which we find relevant and useful in predicting societal events.

The next step is to determine whether some of the factors are

so highly correlated among themselves that the measurement of any one of the factors here given, *or some other factor common to those enumerated above,* will enable us to distinguish with sufficient accuracy a cooperative from a competitive situation. Such a generalized approach has been suggested by Dodd in his hypothesis that the behavior designated as cooperation and competition can be defined in terms of societal tension. Incidentally his formulation illustrates how folk-terms such as "desire" and "value" can be scientifically useful if they are objectively defined. Dodd points out that we can convert the stimulus-response formula (behavior is a function of the organism's internal states and the stimulus-response-situation) into folk-language by regarding the stimulus as a "value" and the response-condition of the organism as "desire." Letting P represent the number of people desiring a specified value, letting D represent their average intensity of desire, and V represent the amount of that value available, then the *tension* in such a situation is represented by $PD/V = E$, the societal tension. It should be noted that in this conversion we are not injecting a list of "Values" and "Desires" into the situation in order to explain the behavior as being "due to" this value or that desire.[47] "Value" as here used is merely a symbol used to designate anything with reference to which it is convenient to measure behavior. That is, we formally define positive value as *that toward which* people behave so as to retain or increase their possession of it; negative value, correspondingly, is *that toward which* people behave so as to decrease or avoid possession of it. It follows that, as Dodd has said, "values may be economic goods and services or political office, a mate, graduation, prestige, a 'clear conscience,' or any other tangible or intangible object of conscious or unconscious desire." Desire likewise is merely a symbol designating a tension or imbalance in an organism, with reference to which we wish to measure certain aspects of behavior.

From this point of view such categories as cooperation and competition can be expressed in terms of the degree of tension present in the situation. That is, we may consider conflict as a state of high or maximum tension, competition as a moderate degree of tension, and cooperation as a minor or minimum degree of tension, *within the group* characterized by each type of behavior. *As*

against outside groups and situations, the most intensely cooperating group may, of course, experience great tension, as for example in times of crises. In such a case it remains a fact that the tension exists because the *situation under consideration* (namely, the cooperative group *in its relation to other groups*) is not a cooperative one. From the formula given above it is obvious that the amount of tension will vary if any of the three factors P, D, or V is varied with the others remaining constant. It follows that a number of different combinations of circumstances, as represented by the variables in the equation, might account for a cooperative situation turning into a competitive or a conflict situation or *vice versa*, as well as all degrees of these situations. The implications and ramifications of this approach as regards a large number of societal processes are more fully set forth in Dodd's *Dimensions of Society*. He has also suggested possible measures of the variables employed. We are here interested mainly in the theoretical justification for the procedure.

The hypothesis mentioned in the preceding section as to the basic nature of communication in societal processes is, of course, quite compatible with the above definitions in terms of tension. Dodd's theory provides a method of meaningfully describing societal behavior on its own level which, as we have frequently pointed out, is for some purposes sufficient and in any case as scientifically sound as an explanation "from below," i.e., by reduction. On the other hand, we may also be interested in *how it happens* that under certain circumstances certain people show a lack of desire for a value (e.g., individual possession of a scarce good), which ordinarily arouses great desire. The above formula merely takes cognizance of the low degree of desire, as evidenced by some behavior, and the result upon the total tension in the situation. A further pursuit of the question as to how it happens that ("why") desire is small in a given case may reveal that communication is so facile among the members of the group as to cause each virtually to identify himself with the others and hence desire for them as much as for himself, thus making cooperative what might otherwise be a competitive or a conflict situation. This is also statable in Dodd's terminology, as follows: "The intensity of desire [for individual possession] is decreased. *People realize* that new values such as 'living together

peaceably' are more important. Some of the desire has been transferred from the former value, V_1, to a new cooperative value V_2 (which is in the realm described by another equation)." [Italics mine.] The same could be said of the self-regarding value which would be operative when we refuse to compete with people whom we identify with ourselves. Thus a balance of the various values that animate us determines our behavior as an organism, and that behavior becomes for practical purposes the basis for any estimate of the intensity of our desire. All of which is again translatable into the statement that any of our behavior is the resultant of all the discernible stimuli of a given system acting upon us at any given time.[48]

If our earlier hypothesis regarding the basic nature of communication in societal processes is correct, then the last of the criteria stated in the postulates of May and Doob may be sufficient to distinguish and explain cooperation and competition in their most general aspects. The number or amount or effectiveness of "psychologically affiliative contacts" are equivalent to the adequacy of communication as we have defined the term in the preceding section. That definition, it will be recalled, defines societal communication as a symbolic process by which each of the communicating parties are able to identify itself with the others' situations. It is "seeing the other fellow's point of view," "understanding" him, "knowing how he feels," etc. True societal communication consists of temporarily identifying oneself symbolically with the other as regards the particular situation involved in the communication. Cooley called it "primary communication or an entering into and sharing the mind of someone else. When I converse with a man through words, looks, or other symbols I have more or less intelligence or *communion* with him, we get on common ground and have similar ideas and sentiments. If one uses sympathy in this connection—and it is perhaps the most available word—one has to bear in mind that it denotes the sharing of any mental state that can be communicated, and has not the special implication of pity or other 'tender emotion.'"[49] This is, I take it, what is meant by "psychologically affiliative contacts" in the criteria of cooperation and competition quoted above, and if so, the validity of this criterion seems almost self-evident.

We have already expressed the view that communication as defined above may be regarded as the common factor the varying degrees of which we designate as association and dissociation. Now we have also taken the position that cooperation, competition, and conflict (as well as all the designations of more detailed gradations such as advance, adjustment, accordance, amalgamation, contravention, etc.) are types of association and dissociation. It follows that we, therefore, regard all of these designations of societal processes as fundamentally definable in terms of *degrees of communication*, perhaps measurable in terms of certain kind of tensions, as suggested above, or in any other objective way.

The final test of such a hypothesis waits, of course, upon the development of more adequate measures of communication and tension than now exist. In the meantime, attention may be called to some examples of the vast amount of data of an informal sort that might be assembled in support of the hypothesis. It is a matter of common knowledge that conflict and opposition is characterized by a suspension of communication (as here defined) between the opposing parties. Diplomatic relations are severed, cultural and commercial relations cease. Parties in opposition and conflict take pride in not speaking, not reading each other's books and newspapers, and in not consuming each other's artistic or commercial products. Conflict situations are characterized by ruthless suppression of any attempt to communicate with or understand the point of view of the opposing party. Fraternizing with the enemy is a major offense. Abstinence from communication is the essence of conflict situations. The contacts required for mutual extermination are clearly not communication in the sense defined above.

If we take the opposite extreme, namely, identification, amalgamation, or the most complete forms of cooperation we find that facile, continuous, and accurate communication is essential. Some families and betrothal pairs, namely, the "happy" or "ideal" cases, perhaps afford the best illustrations. The sensitivity of each party to the others not only in verbal communication but in facial expression, tone of voice, and all the subtler forms of communication, together with a corresponding facility in adjustment are the outstanding characteristics of the behavior of such groups. Conformity to the "rules" of cooperation is a matter of the degree to which the same type of communication obtains in any group.

The vividness of the symbolic process (communication) by which we identify ourselves with others will necessarily determine our cooperativeness because it is only as between self-and-other conceptions that competition and conflict can take place. Whatever reduces, renders identical, or obliterates the self-other feeling, therefore, as regards any situation, necessarily obliterates conflict and the dissociative processes. Again, this will always be a matter of degree. In short, the adage that "to understand all is to forgive all" really means that to understand all leaves nothing to forgive.

The above position is in no wise contradicted by the possible fact that the present century which has been characterized by an unprecedented expansion of what is generally called the means of communication (by which is usually meant transportation devices, telegraphs, telephones, etc.) has also been characterized by wars of unprecedented scope and violence. Increasing *contact* such as the means of transportation provide merely increases the need for societal *communication* as we have defined it.[50] The same may readily be true as regards the diffusion of news and other printed matter. The net result of such increased contacts is at first to call for adjustments on the part of millions of people who have hitherto had no occasion to react to these new and previously undiscovered worlds. The very advance of science itself and the diffusion of its findings frequently creates severe conflict between groups as witness the evolution controversy. These phenomena are rather examples of the results of a failure of communication to keep pace with new contacts. This is what has been popularly referred to as "the race between education and catastrophe."

While the discrepancy between communication and contact, i.e., between new situations and our capacity for facile adjustment to them will presumably always exist, it doubtless varies considerably from time to time. Periods rich in new discoveries, new ideologies, new and more rapid and facile means of contact, and diffusion of stimuli may conceivably be accompanied by accentuation of competition and conflict.[51] Periods relatively undisturbed by such developments may be characterized by a predominance of cooperative associative processes.

If this theory of the relationship of communication to associative and dissociative processes is tenable there appears to be no reason for a belief in any general trend toward cooperation or

"progress" as an ultimate destiny of society. This is true even if we contemplate an unlimited advancement of science. Science may be regarded as the most efficient instrument of communication yet developed. It may also be shown that in the fields dominated by this method conflict has been reduced to a minimum. Scientific societies are conspicuously free (as regards their purely scientific concerns) from the *kind* of controversy and conflict that characterizes most other departments of human endeavor. Scientists have developed a standardized method of procedure in controversial matters which lays bare all the steps or operations by which different parties arrive at their conclusions. The logical advantages and disadvantages of each and especially the practical implications of adopting one view as contrasted with others can thus be made clear. If this is demonstrably clear, disagreement at least on the conflict level tends to vanish because by this process issues become impersonal and afford little occasion for recrimination. That is, the parties understand each other by virtue of a relatively highly developed and adequate means of communication. For the same reason we find cultural barriers, provincialism, and other blockages of communication and resulting conflicts of the kinds that characterize other societal relations relatively absent from the scientific field. The occasion for such disagreements is not less frequent in science. But the existence of a standardized and generally admitted valid technic for resolving disagreements prevents them from ever reaching the stages of relatively overt conflict that characterize other societal relations.[52]

F. CONCLUSION

If it is agreed that science aims at a generalized description of the conditions under which phenomena occur, i.e., *how* they occur, then the reason for the above proposed refinement of definition of societal behavior should be clear. How can we fruitfully study the conditions under which, say, cooperation occurs unless we agree on *what kind of situations* to include under the word cooperation? It is quite possible—quite likely, indeed—that when we seriously undertake to define operationally the words in the above outlines, it will be found that they are today used to include behaviors of varied and contradictory nature. Accordingly, it will

be found advisable to substitute new words for the designation of certain homogeneous types of behavior revealed by our intensive study of the behavior today included, for example, under cooperation. We may possibly wish to retain the old term cooperation for *one* of the new classifications we arrive at. If so, it will doubtless be argued that, however objective may be our definition of this category, it *is not* cooperation. This usually means that the new definition rules out some of the content we are accustomed to include under the term, or includes some content not traditionally included. We have in previous chapters discussed at length this delusion that words have some necessary or intrinsic content.

The caution must be constantly repeated, because the objections to such a procedure as that advocated above reduce ultimately almost always to the refrain that opposition, accommodation, cooperation, etc., defined as suggested above, unfortunately *are not* opposition, accommodation, cooperation, etc. Of course they are not. Words *never are* what they *stand for*. Words are *symbols*. Social scientists have already spent too much time hunting for things in nature to correspond to words in their vocabulary. That vocabulary was invented for the most part by primitive and superstitious men. To be sure, the words in that vocabulary may be used to state *hypotheses*. But as in the case of all hypotheses, we must feel free to abandon them when they do not serve as profitable nuclei around which to correlate experience.

For the same reason I have not here proposed a new set of words with which to designate societal processes. As I have suggested above, that should be done, if at all, only after a comprehensive study of societal situations. If after such study, it appears that existing categories are ambiguous, inadequate, or otherwise defective, new words or new definitions of old words may profitably be introduced. In the meantime there is quite general agreement on certain broad categories such as association and dissociation. The basic process, two aspects of which are represented by these words, seems to be reducible to various subcategories representing sufficiently distinct types of behavior to be roughly definable by other terms such as cooperation, competition, and conflict. The refinement and objectification of such categories is unquestionably an inseparable part of the advancement of sociology.

This refinement and objectification of terms can be achieved most adequately, according to the view I have advanced in this chapter, by regarding the categories not as mutually exclusive but as gradations of a more general and underlying process common to all the subcategories. Communication has been suggested as such a common factor in the processes considered. The reader must here again be reminded that I am not raising the question as to whether cooperation, competition, etc., "really are" gradations of the same process. Throughout the book I have emphasized that science must not become involved in the metaphysical *is*. I am interested only in the question of what is a scientifically profitable way of looking at phenomena. Different ways are permissible and indeed desirable. Only when various ways have been tried can we feel relatively confident that one is more adequate.

The present volume has taken the view that for purposes of study the social universe must be divided into convenient sectors representing salient aspects of that universe. The sectors we have selected are societal processes, societal structures, spatial, and temporal aspects.[53] For each, appropriate scales of measurement must be developed. In the present chapter I have advanced the view that the numerous conventional designations of societal processes can be most adequately described as gradations of each other or of some common factor such as communication. I have suggested in this connection that perhaps by this approach the present confusion in sociological terms can be resolved. That is, each word at present employed to designate a process will be assigned to a portion of a scale representing a continuum of sociation extending from complete association or identification at one extreme to complete dissociation or isolation at the other extreme. As the units in terms of which these processes are measured become familiar the present vocabulary will probably fade into the background just as we find it more precise to speak of a twenty-dollar hat rather than a costly hat or a two-hundred-pound man rather than a heavy man. The number and variety of words designating individual and ostensibly unique processes will thus be reduced. They will be supplanted by a much larger number of *degrees* of determinable gradation of the phenomena to which the conventional vocabulary of today refers. These degrees will be expressed in numbers. But numbers are also merely symbols

for relationships. In terms of refined scales for the discrimination of such degrees of societal processes, many phenomena unobserved today will become observable, just as microscopes and telescopes have extended our powers of observation in other fields. Some of the types of scales needed for this program are indicated in Dodd's companion work. Their construction must be the work of many men through many centuries. But as a knowledge of the nature of our foundations and blue-prints of the contemplated structure are a necessary preliminary to systematic and economical building, we have no apology for the present rudimentary undertaking although we know that the blue-prints must change as the structure grows.

G. NOTES

1. For an excellent brief treatment of this subject see E. A. Esper, "Language," in *Handbook of Social Psychology*, Clark University Press, 1935, edited by Carl Murchison, Ch. 11. For a full treatment see L. Bloomfield, *Language*, Holt, 1933, and E. Sapir, *Language*, Harcourt, 1921; also Sapir's article on the same subject in *Encyclopaedia of the Social Sciences*.

2. See E. E. Eubank, "The Vocabulary of Sociology," *Social Forces*, IX, March, 1931, pp. 305–320.

3. E. E. Eubank, *The Concepts of Sociology*, Heath, 1932, pp. 39–43. See also the list in Table 2, pp. 717–730 of L. von Wiese and H. Becker, *Systematic Sociology*, Wiley, 1932.

4. *Ibid.*, p. 31.

5. E. E. Eubank, *op. cit.*, Chs. 5, 13.

Only a few types of societal interaction (processes) are considered in the present chapter as I am primarily interested in the approach to their study rather than in the collection of new instances or new classifications of them. For a comprehensive discussion of various types of collective behavior, see R. T. LaPiere, *Collective Behavior*, McGraw-Hill, 1938. Most of LaPiere's classifications are not mutually exclusive, however, and need further analysis and definition in terms of degree of some common factor or factors, if any, that may be common to all of them. LaPiere's book furnishes an excellent body of materials for the type of analysis proposed in the present chapter for cooperation, competition, and conflict.

6. See, for example, E. C. Hayes, "Some Social Relations Restated," *Amer. Jour. of Soc.*, XXXI, Nov., 1925, pp. 333–346.

7. See Ch. I, Sec. C, 2 and Ch. IX.

8. E. A. Ross, *Foundations of Sociology*, Macmillan, 1905, p. 98. Quoted in Eubank, *op. cit.*, p. 280.

For an excellent discussion of the use and misuse of the term "process" by sociologists, see Read Bain, "The Concept of Social Process," *Publication of the*

American Sociological Society, XXVI, 1932, pp. 10–18. I have retained the word in the present text for purely conventional reasons and for nontechnical purposes, as practically synonymous with "activity." For more rigorous scientific purposes, I advocate the adoption of Dodd's practice of using the verb designating a specific behavior with the *ing* ending. (E.g., assimilating, populating, socializing, etc.) See S. C. Dodd, *Dimensions of Society*, Macmillan, 1940.

9. F. W. Blackmar and J. L. Gillin, *Outlines of Sociology*, Macmillan, 1915, pp. 296–307. Quoted in Eubank, *op. cit.*, p. 280.

10. R. E. Park and E. W. Burgess, *An Introduction to the Science of Sociology*, Second Ed., University of Chicago Press, 1924, Chs. 7, 9, 10, 11.

11. *Systematic Sociology* (abridged from the authors' outline), p. 124.

12. E. C. Hayes, *op. cit.*, p. 337.

13. M. May and L. Doob, *Competition and Cooperation*, Social Science Research Council, 1937, pp. 3–4.

14. E. E. Eubank, *op. cit.*, p. 291.

15. See E. C. Hayes, "The Social Forces Error," *Amer. Jour. of Sociol.*, XVI, 1907, p. 613. See especially the passage quoted in notes 3 and 4 of Ch. VI, above. See also Read Bain, "Trends in American Sociological Theory," Ch. 2 in *Trends in American Sociology*, edited by G. Lundberg, R. Bain, and Nels Anderson, Harper, 1929, pp. 100 ff.

The following comment by Eubank (*op. cit.*, p. 180) on Hayes' criticism reveals, I think, the real source of the thirst for "forces," "motives," etc., among sociologists, namely, a surviving dualism of "mental-physical" and a resulting primitive notion of causation: "Since the *subjective motivation* is of necessity the starting point of any voluntary human action, it would seem to be a logical point upon which to concentrate in studying societary causation." [Italics mine.] (See also notes [17] and [30] below.)

16. One of the most valuable of these systems is L. von Wiese and Howard Becker, *Systematic Sociology*. These authors also do not overlook the importance of testing their system in terms of observed behavior. "We do not stop with mere scaffolding, however, although the systematics of action patterns is devoted to little else. There must be thoroughgoing analysis of concrete social actions." [P. 132].

17. This surviving dualism of the "inner," "psychic" phenomena as contrasted with "outer," "material" phenomena is perhaps the chief source of confusion and obstruction to scientific advance in sociology as in psychology. It survives because of an inadequate understanding of language as merely a form of behavior. The traditional attitude is to consider language rather as a "gift" with which to report so-called mental states or processes. On this assumption Wundt and his followers down to the present time erect such categories as "experience," "expression," and the whole mentalistic vocabulary as distinct from "behavior" and "communication." The position seems to me completely untenable in the light of practically all modern research into the nature of language. (See the excellent brief summary by E. A. Esper, *op. cit.*, and bibliography attached thereto. Also L. Bloomfield, *op. cit.*; E. Sapir, *op. cit.*; J. Dewey, *Experience and Nature*, Norton, 1925, pp. 166–207; Geo. H. Mead,

Mind, Self and Society, University of Chicago Press, 1934, pp. 68–72; G. A. De-Laguna, *Speech: Its Function and Development*, Yale University Press, 1927.) The following quotation from Esper, *op. cit.*, p. 434, is a good summary of the subject. This conclusion may be applied with equal validity to the whole catalog of instincts, wishes, desires, interests, purposes, and motives as explanations of human conduct:

"There is no advantage to be gained by referring to the infant's cries as 'expressing' various emotions or inner ('mental') states, as is done by most writers. When an observer reports that he can distinguish between an infant's cry of 'anger' and his 'sorrowful' cry, he is merely reporting that a cry of a certain acoustic quality accompanies a certain set of other bodily responses, such as flushing of the face, slashing with arms and legs, etc., and that this whole pattern of responses characteristically occurs under certain stimulating conditions, as when the child's movements are hampered; similarly, he has observed that a cry of a different acoustic quality occurs as part of a different response-pattern under different stimulating conditions. In neither case have any 'inner states' been observed, and the assumption of such inner states only leads the observer to neglect his real business, which consists in accurately and objectively describing the cry, the accompanying behavior, and the stimulating situation. Such descriptions will be improved by the omission of affectionate diminutives and question-begging adjectives. Recognition of these facts has appeared in the literature only in recent years. A brief account of the change in points of view, together with a bibliography of the subject of infant vocalizations, is given by McCarthy (1929). (D. McCarthy, 1929, "The Vocalizations of Infants," *Psychol. Bull.*, XXVI, pp. 625–651.) The older literature was impressionistic and more or less sentimental, based usually on casual observations under uncontrolled conditions. The birth-cry was frequently interpreted as expressing the infant's wrath or joy at entering the world. Crying was held to become differentiated to express various emotional states. All such observations are of course based merely upon the subjective interpretations of the observers; they are 'intuitive' observations in which there is no question of controlled analysis of physiological, environmental, or social factors." (E. A. Esper, *op. cit.*, p. 434.)

18. That is, sociology is not concerned, as is frequently mistakenly implied, with *all* interaction between human beings. Human beings interact like other matter according to the general laws of physics and in such cases the behavior is no less a proper subject for physics than is the interaction of two magnets. That is, a man may fall accidentally from a window, hit a man on the ground, and be killed by the impact. There is here interaction of human beings but not necessarily a societal phenomenon. Wiese-Becker's statement that "there is no sociologically irrelevant relation between human beings" (*Systematic Sociology*, p. 38) is, therefore, an overstatement, if by human being is meant merely *homo sapiens*, and if one considers here only the "physical" aspect of the situation. On the other hand, the assertion of these authors on the same page that "scientific sociology concentrates upon actions of approach and avoidance" (association and dissociation) is entirely in accordance with the view of the present volume. In a footnote on this subject the above authors offer the usual disclaimer of any attempt

to adopt "analogies" from physics and also anticipate that they will be charged with spatializing interhuman relations. I have dealt in a previous chapter with the justifiability of both practices. (See Ch. III, Sections D and G.)

19. See Geo. H. Mead, *op. cit.*, especially pp. 68–82. Also J. Dewey, "Social as a Category," *Monist*, XXXVIII, 1928, pp. 171–174.

20. R. E. Park and E. W. Burgess, *op. cit.*, p. 506. It is important to notice that this usage makes an important distinction between *communication* and mere *contact* or *interaction* whether on a verbal level or otherwise. I am using communication here in the sense which Cooley called "communion" and "sympathy." This excludes as true communication such phenomena as, for example, a great deal of the verbal interchanges involved in "quarreling," "misunderstanding," some warfare, etc. Cooley's usage, which is here adopted, would presumably set up as the criterion of true communication the question of whether the interaction resulted in a reduction of tensions ("understanding"), which would be inferred from and described in terms of behavior. (See notes 49 and 50 below and the text to which the notes are supplementary.)

21. A. F. Bentley, *Behavior Knowledge Fact*, p. 249.

22. *Ibid.*, p. 250.

23. *Ibid.*, p. 233.

24. *Ibid.*, p. 251.

25. *Ibid.*, pp. 210–211. Consider also the following observations on how certain old and familiar words attain a reality which newer constructs do not seem to possess:

"Compare the specific presentation 'Communicane' with another specific presentation, namely, 'dog.' 'Dog,' it is true, has been of active concern to men as a Communicane for some hundreds of thousands or millions of years, while 'Communicane,' as itself a Communicane, has no such long history. The presentation 'dog' has been sharply stamped upon perceptive and linguistic attention as 'substantively existential,' and it still maintains itself thus in many quarters—more particularly among small boys. Comparably sharp stamping cannot today be asserted for 'Communicane,' even in the attention of the smaller groups of specialists. However, the type of sharp outline, the 'substantively existential,' which 'dog' has had, and continues popularly to have, must not be confounded with scientific precision nor be assumed to furnish any final test for definiteness in knowledge. The 'dog' presentation of modern biology is vastly transformed from the 'dog' presentation of the cavemen, just as that latter was, no doubt, from more primitive human and sub-human reactions—all in one long continuous line of development. The 'dog' presentation in science today is more dependable, not less, than that of older days. The situation is not different for 'Communicane,' however different is the stage of presentation. Approximations to the Communicane, and defective presentations—'abstracts,' 'historicals,' 'psychologicals'—are to be found everywhere around us, their history and status easy to explore. Alike in both cases, those of 'dog' and of 'Communicane,' special direction and concentration of attention, and special training and discipline, are required for advancing knowledge." (*Ibid.*, p. 260.)

"Investigation of the Communicane and its identifiable phases must proceed

hand in hand with the researches of physics and biology; the Communicanes must have place beside the phenomena of these latter sciences as fellow members of a single system of knowledge. The fellowship must be that of an increasing factual definiteness and a developing coherence of understanding—never, of course, one of an assumed 'reality,' or of some perfect 'rightness' or 'truth.' Consider all serious scientific problems and enterprise; disregard only the slovenly 'mental' and 'material' presentations of the tatterdemalion psychologies and sociologies of the market-place." (*Ibid.*, p. 275.)

26. This term is used by a number of writers as the common category of which the more familiar words *association* and *dissociation* are the two constituent aspects. *Sociation* as a dynamic concept is equivalent to communication as I have defined it above. It is also equivalent, I think, to Bentley's *Communicane.*

27. W. A. White, "Foreword" to J. L. Moreno, *Who Shall Survive? A New Approach to the Problem of Human Interrelations*, Nervous and Mental Disease Publishing Co., 1934, pp. xii, xiii.

Indifference must be distinguished for some social purposes from the total absence of attitude, as when one person does not know of the existence of the other. That is, indifference is rather the minimum of positive or negative reaction.

28. Moreno, *op. cit.*, pp. 23–24.

29. See J. L. Moreno, *op. cit.* Also G. A. Lundberg and Mary Steele, "Social Attraction-Patterns in a Village," *Sociometry*, Vol. 1, Jan.–Apr., 1938, pp. 375–419.

30. The current popularity of the terminology of psychoanalysis is doubtless also in a large degree attributable to its relative compatibility with conventional linguistic notions of causation. "Instincts" of sex, life, and death as categories to which any or all behavior can by some reasoning or other be attributed, affords precisely the simple framework which traditional thinking requires. "Ego," "superego," "id," etc., serve much the same way. Psychotherapeutic devices must, of course, adapt their language to the thought-patterns of their patients, and every other therapeutic art also takes liberties of this kind. This is not to question the cases of cures or satisfaction afforded both patients and practitioners of psychoanalysis any more than I question the therapeutic value of the Catholic confessional, Christian Science, or the Grotto at Lourdes. The aversion of many of these practitioners to adequate clinical records from which reliable statistical conclusions could be drawn both as regards results and the validity of their theories, makes it impossible to appraise them adequately. Presumably psychoanalysts will in time develop such records. Detailed case records of the kind which they study would, of course, be most valuable clinical material if gathered in a form susceptible to scientific analysis. The realization of this end waits upon two highly important reforms: (1) the adoption of a terminology and a set of definitions compatible with scientific verification; and (2) abandonment of the notion that objections to their analyses have been answered by explaining how the objector happens to hold such views. These are common handicaps of all new theories and are, therefore, more pardonable in the case of psychoanalysis than, for example, in the case of Marxism which is also conspicu-

ously wanting on both of the above points. Fortunately, there is evidence that psychoanalysts are turning in a direction which absolves them from the above criticism. (See, for example, Karen Horney, *New Ways in Psychoanalysis*, Norton, 1939.) For a translation of the principal psychoanalytic concepts into terms of behavioristic and operational psychology, see C. L. Hull, "Modern Behaviorism and Psychoanalysis," *Transactions of the New York Academy of Sciences*, March, 1939, pp. 78–82.

31. While the word "instinct" has been quite generally abandoned in sociological explanation (largely as a result of the pioneer work of L. L. Bernard), another set of concepts equally objectionable (as explanations) such as wishes, desires, motives, etc., are still prominent in sociological literature. Consider, for example, the current preoccupation of psychologists and sociologists with "goals" and "motives." The following extracts from a recent monograph (M. May and L. W. Doob, *Competition and Cooperation*) illustrate the present confusion resulting from the same thoughtway that generated the large and futile literature on instincts. The authors begin by asking "four crucial questions" of which only the first concerns us here, namely, "Why do individuals compete or cooperate?"

Our position is that within the scientific framework we can only describe fully *how* people cooperate and then say that under these conditions cooperation takes place. This is the only answer to the question, "Why?" that science can give. In the social sciences, however, the notion persists that we must and can find something more final than this through a scrutiny of the individual psyche where "motives" lurk. To the credit of the above authors it should be noted that they immediately recognize what they are getting into in this connection as evidenced by the following passage:

"The first question is clearly one concerning motivation. Unfortunately there is no generally accepted theory of motivation, but a welter of conflicting theories. In psychology this topic is far from being a closed book; it is indeed a wide field in which every psychologist, if he chooses, may compete in a free-for-all combat. It is extremely unlikely that treatment of the subject will please any one except its author."

Despite these misgivings the authors nevertheless plunge into the mysteries of motivation. Motivation, they contend, is a function of the discrepancies between "the levels of achievement and those of aspiration" (p. 8). As a theoretical framework I see no objection to this statement. But we are interested in determining what these levels are in any given situation. I contend that the only way in which levels of achievement and of aspiration can be determined is through the observation of relevant behavior (including, of course, verbal behavior) and the analysis of these observations by the conventionally recognized scientific methods. (See S. C. Dodd, *Dimensions of Society*, Macmillan, 1940, Ch. 5.) With this statement in the abstract, at least, the above authors would probably agree. By the injection of words like "motive," "goal," etc., which are to be determined by a mysterious process called "psychological" analysis (p. 6), the authors manage to make out, however, that no mere analysis of behavior is sufficient. Thus they find the approach to competition and cooperation

on the "social level" "not very useful" by begging the question in the following magnificent *non sequitur:* "In the chapters that follow, moreover, it will be shown that practically all of the research on competition and cooperation has been performed on a social level; that the data, *therefore*, are inconsistent, incomplete, and not very useful; and that improvement in future research (*therefore?*) can be accomplished by working on a psychological level" (p. 16). [Italics and parenthesis mine.]

I have no objection whatever to this appraisal of the large number of studies of farm cooperatives and clubs which are subsequently reviewed. My only interest is in the so-called psychological analysis as contrasted presumably with the sociological. The former consists apparently of injecting "motives" and "goals" into the situation. From my point of view, motives and goals can be inferred only from behavior. When the variables in any situation, including of course all verbal and other symbols, have been selected, the result of their interaction at any moment may be regarded as the "goal" of any one of the variables. But how does this clarify the situation? Is not the statement merely reassuring by virtue of its conformity to an animistic language-pattern long since abandoned in the more developed sciences? In the same way, whatever happens in a situation may be designated as the "motive" of any of the variables in that situation. Our anthropocentric and "free-will" language and thought-patterns dictate that we select man as the "free" variable and that whatever happens, therefore, is "his" motive, especially if it conforms to a traditional pattern. See Ch. VI, Sec. D, 1. This also satisfies our traditional notion of causation, of which as Bertrand Russell has said, "the type is 'lightning causes thunder.'" If we apply the same language-pattern to the latter event, it is the "motive" and the "goal" of lightning to thunder! As a manner of speech on certain levels I have no objection to this or to the similar expressions about man in psychological and sociological situations. My point is that in scientific analysis this orientation is much too naive, and that if scientists preoccupy themselves with the "why," the "motives," and the "goals" of the behavior of one or a few factors in a situation they are likely to neglect a careful analysis of *how* the behavior takes place, i.e., a careful description of *the conditions under which it takes place and the probability of its occurrence under those conditions.* It would be interesting to see what evidence of this kind could be assembled by the specialists in "motive" research in support, for example, of the idea that a person's "attitude toward accumulating wealth started at the age of three years when he was cured of constipation by an over-solicitous governess" (p. 13). In justice to the above authors it should be said that they have serious misgivings about this type of motivation research at least as applied to groups. (See note, p. 9). The difficulties which bother them in this connection are doubtless the same that bother me also on their "psychological level." Incidentally the monograph referred to is a good summary of the research that has hitherto been directed on the subject of competition and cooperation. My criticism is directed only at certain theoretical points of which their Chapter 2 happens to provide some examples.

32. "In classical mechanics, and no less in the special theory of relativity, there is an inherent epistemological defect which was, perhaps for the first time,

clearly pointed out by Ernst Mach. . . . No answer can be admitted as epistemologically satisfactory, unless the reason given is an *observable fact of experience*. The law of causality has not the significance of a statement as to the world of experience, except when *observable facts* ultimately appear as causes and effects." (H. A. Lorentz, A. Einstein, H. Minkowski, and H. Weyl, *The Principle of Relativity*, Methuen, 1923, pp. 112–113.)

"But we are not likely to find science returning to the crude form of causality believed in by Fijians and philosophers, of which the type is 'lightning causes thunder.'" (B. Russell, *The Analysis of Matter*, Harcourt, 1927, p. 102.)

33. May and Doob, *op. cit.*, p. 38.

34. *Systematic Sociology*, p. 230.

35. *Ibid.*, p. 231.

36. *Ibid.*, p. 245.

37. If the conditions under which each takes place is adequately observed the correlation of these conditions with the observed movement of people toward or away from each other constitutes on this level both their description and their explanation. This does not mean that further study is not possible as to the *conditions which affect the conditions* the coincidence of which has already been established. This may go on indefinitely by a process of successive reductions. The correlation between the bite of a certain kind of mosquito and the incidence of yellow fever is on that level an explanation of yellow fever. It may be useful to pursue further the bacteriology and physiology of that event. But that pursuit will yield only a correlation between certain factors, e.g., between the number and virulence of the germs and the degree of the fever. This phenomenon lends itself to further inquiry in terms of chemistry and physics. In the case of phenomena where a good deal is known regarding the relations of successively underlying sets of conditions we have adopted the convention of saying that the set of conditions immediately underlying a given set of related phenomena *explains* the latter. But the explanation is merely another correlation of the same kind but of other conditions. Nor is the well-known fact that sometimes two highly correlated phenomena have no direct connection but are independently correlated with a third variable any contradiction of the above statement. The directness or indirectness of any observed correlations can itself be determined only by additional partial correlation, formal or informal. Accumulated knowledge, i.e., generally known or previously established correlations, is, of course, usually invoked in this connection to determine whether it is "reasonable" that an observed correlation indicates a "causal" connection. But these words should not deceive us as to the nature of the operations upon which they rest.

38. For an elaboration of this subject see G. A. Lundberg and Margaret Lawsing, "The Sociography of Some Community Relations," *Amer. Sociological Review*, II, June, 1937, pp. 318–335. Also Ch. III of the present volume (pp. 104 ff.). Also P. Sorokin, *Social Mobility*, Harper, 1927, Ch. 1.

39. E. E. Eubank, *op. cit.*, p. 325.

40. C. H. Cooley, *Social Process*, Scribner, 1920, p. 56.

41. *Social Organization*, Scribner, 1927, p. 199.

42. *Social Process*, p. 37.

43. Personal Competition, *Publications of American Economic Association, Economic Studies*, IV, No. 2, Apr., 1899. Reprinted in *Sociological Theory and Social Research*, Holt, 1930, p. 175.

44. *Social Process*, p. 39.

45. M. May and L. W. Doob, *op. cit.*, p. 17. Regarding the nature of a complementary goal the authors add this footnote: "A goal is considered 'complementary' when it is psychologically related to but not identified with the primary goal; e.g., when a workman cooperates with an employer, the primary goal is the accomplishment of the task and the complementary one is earning the wage."

These authors further define cooperation and competition on the "psychological level" as follows:

"Postulate 7. On a psychological level, an individual competes with others when: (1) there is a discrepancy between his level of achievement and his level of aspiration; (2) his knowledge of the goal that he seeks indicates that it is limited and cannot be shared at least equally by other persons in that situation; (3) his attitudes produce within him a state in which his attitude toward competing overbalances possible conflicting attitudes toward potential competitors, toward the rules of the situation, toward cooperating rather than competing, etc.; and (4) his skill is of such a nature that under the rules of the situation he has a reasonable chance of success by competing.

"Postulate 8. On a psychological level, an individual cooperates with others when: (1) there is a discrepancy between his level of achievement and his level of aspiration; (2) his knowledge of the goal that he seeks indicates that it can be reached by striving with others; (3) his attitudes produce within him a state in which his attitude toward cooperating overbalances possible conflicting attitudes toward potential cooperators, toward the rules of the situation, toward competing rather than cooperating, etc.; and (4) his skill is of such a nature that under the rules of the situation he has a reasonable chance of success by cooperating."

46. Some beginnings have been made toward the careful observation of the conditions under which, for example, children compete or cooperate. See May and Doob, *op. cit.*, for a good bibliography of such studies. See also Margaret Mead, *Cooperation and Competition among Primitive Peoples*, McGraw-Hill, 1937, pp. 458–511.

47. See S. C. Dodd, *op. cit.*, Ch. 5, Sec. E, for a full presentation of this viewpoint. The difference between this traditional use of such words as value and desire and that here proposed cannot be too strongly emphasized. After what has been said in this and previous chapters about the use of instincts, desires, wishes, motives, etc., it would appear to be the height of inconsistency to introduce them with approval at this point, unless the fundamental difference in the way they are here used is noted. I have no preferences or aversions among words as such, and at no time have I objected to the above words, as words, but only to the failure to define them and the tendency to use them as "causes" and escape our real obligation as scientists, namely, to analyze the conditions under

which phenomena occur. If the concepts of Father, Son, and Holy Ghost can be so defined and used as to be helpful in this quest, I have no objection whatever to the use of these or any other words.

48. This is not a concession to the crude idea of "multiple causation" by any or all components which may be operative anywhere in the cosmos. Causation can have scientific meaning only within a specifically circumscribed closed system. I am in general agreement in this connection, for example, with Sorokin's criticism of current discussions of the causes of war. "Suppose we take as the formula of multiple causation the following one: universal law of struggle for existence, instinct of pugnacity and herd, fear and lust for power, existence of wicked rulers, division of mankind into different nations, the sunspots, and some religious and economic factors. One can see that these factors belong to fundamentally different planes of reality [I should say "universes of discourse," G. L.], and as such are neither commensurable, nor comparable, nor generally capable of being united into any real unity." ("A Neglected Factor of War," *Amer. Sociological Rev.*, III, Aug., 1938, p. 478.) The statement should be qualified, however, with the remark that it is the lack of *mensurability* (at present) rather than *com*mensurability of these factors which prevent a scientific approach to their possible relationship. If each of the factors mentioned could be measured in any *units*, they could be correlated with war indices.

49. *Human Nature and the Social Order*, Scribner, 1902, p. 102. See also Chapter VIII of the present work.

50. It will be observed that I use the word "contact" in a nonsocietal sense not implying symbolic interactions for which the term communication is reserved. The two terms are frequently used interchangeably by sociologists. For a discussion of the term "contact" see Eubank, *op. cit.*, pp. 315–317.

51. Sorokin's conclusion regarding war seems to me quite sound in this connection. Within the sociological universe of discourse the conditions productive of war are "the stable or shattered status of the whole web of social relationships and of the system of cultural values of the parties involved." (*Op. cit.*, p. 484.) Sorokin has also compiled the most impressive historical data in support of this hypothesis. See his *Social and Cultural Dynamics*, Vol. 3.

52. This statement obviously does not mean that *other* (i.e., the nonscientific) relationships of *scientists* are necessarily different from those that characterize other groups.

53. These sectors correspond roughly to the four sectors of Dodd's *Dimensions of Society:* (P) population (structure); (I) characteristics (processes); (L) space (length) and (T) time.

Chapter VIII

SOCIETAL INTEGRATION AND STATUS

A. INTRODUCTION

Some of the categories in terms of which scientists have found it convenient to analyze behavior, especially societal behavior, have been reviewed in the preceding three chapters. In the present chapter we shall reverse the approach and describe the synthetic working and growth of the various elementary processes into larger and wider integrations. Just as some of the general processes described in the preceding chapter may be broken up into more detailed sub-processes, so the most elemental processes may be built up into vast integrations of national or international units of interaction. This process of societal integration has many significant aspects which we have been unable to recognize sufficiently in the preceding chapters. Accordingly, we turn now to a brief consideration of the synchronous interworkings of all these mechanisms and activities in their developmental aspect.

Societal origins, development, and disintegration can be studied on various levels—families, communities, states, or any other type of grouping. We shall confine ourselves chiefly to a consideration of the basic processes of socialization in intimate groups and the expansion of these processes to secondary groups, leaving to more specialized treatises the rise and fall of "nations" and "civilizations." The deepseated linguistic convention of referring to the behavior of groups in terms of "rise" and "fall," and of designating some as "above" or "below" others, indicates an aspect of societal life to which has been devoted a large literature regarding caste, class, prestige, leadership, and "social distance." We shall, therefore, conclude with a consideration of the phenomenon of societal position or status.

B. INTEGRATION OF HUMAN GROUPS

The process of societal stimulation and response by which an individual becomes an integral part of a group has been variously

called socialization, or amalgamation, or assimilation. The full details of these processes, i.e., the means by which an individual acquires all the habits of response which make him behave as a member of a group and which give him his distinctively human traits would very nearly encompass the whole content of sociology,[1] for it would be the full description of interaction in all its aspects as it relates to human beings.

We have become accustomed to regard some aspects of this behavior very much more objectively than others. Before a child is born, clothes and a crib are prepared for it, and numerous articles are accumulated and arranged as a sort of stage setting for the new individual. It is recognized that these preparations constitute environment which limits, constrains, and fashions the activities of the new individual and therefore conditions his habits. In addition to these "physical" preparations for the child's reception there is also an all-pervading societal environment to which he must adjust. This consists first of the whole system of attitudes of the parents toward children, the child-parent, sibling, and age-group relations. From the time that the advent of the new individual is definitely known, this social web for the child is spun very much more definitely around the symbol of a particular child rather than about children in general. The full details of the process by which this net is spun around the individual from the time his coming is first known throughout his life would constitute the full details of an individual's life history and all his societal relationships. The account would also encompass the basic subject matter of sociology and psychology. These societal factors are as "real," "physical," observable and determinative of behavior as the clothes, the crib, and all the "physical" surroundings of the child.

1. Socialization

When a child is born it does not possess those behavior mechanisms which in interaction with those of other persons make an individual a part and a member of any group.[2] It has no consciousness of itself or of others in the reflective or symbolic sense.[3] A new-born child does not therefore localize itself either in the "physical" or the "social" cosmos. It has no conception of where it begins and ends and where other people and things begin and

end.[4] In short, the child at birth is not conscious of any of the self-and-other relationships in which we soon become so completely involved that we take them for granted as having always existed. That these relationships—behaviors, constituting the societal personality and character of the individual, the person—are acquired in the same manner as all the other human equipment over and above mere animal qualities may now be regarded as sufficiently established to make unnecessary any further discussion of time-worn allegations regarding the "hereditary" or inborn character of these traits.

One of the ablest accounts of the origin of mind, self, and self-consciousness is to be found in the papers of George H. Mead. The following brief extract indicates his general position:

"Our contention is that mind can never find expression, and could never have come into existence at all, except in terms of a social environment; that an organized set or pattern of social relations and interactions (especially those of communication by means of gestures functioning as significant symbols and thus creating a universe of discourse) is necessarily presupposed by it and involved in its nature. And this entirely social theory or interpretation of mind—this contention that mind develops and has its being only in and by virtue of the social process of experience and activity, which it hence presupposes, and that in no other way can it develop and have its being—must be clearly distinguished from the partially (but only partially) social view of mind. On this view, though mind can get expression only within or in terms of the environment of an organized social group, yet it is nevertheless in some sense a native endowment—a congenital or hereditary biological attribute—of the individual organism, and could not otherwise exist or manifest itself in the social process at all; so that it is not itself essentially a social phenomenon, but rather is biological both in its nature and in its origin, and is social only in its characteristic manifestations or expressions. According to this latter view, moreover, the social process presupposes, and in a sense is a product of, mind; in direct contrast is our opposite view that mind presupposes, and is a product of, the social process. The advantage of our view is that it enables us to give a detailed account and actually to explain the genesis and development of mind; whereas the view that

mind is a congenital biological endowment of the individual organism does not really enable us to explain its nature and origin at all: neither what sort of biological endowment it is, nor how organisms at a certain level of evolutionary progress come to possess it. . . .

"It is true that certain contents of experience (particularly kinesthetic) are accessible only to the given individual organism and not to any others; and that these private or 'subjective,' as opposed to public or 'objective,' contents of experience are usually regarded as being peculiarly and intimately connected with the individual's self, or as being in a special sense self-experiences. But this accessibility solely to the given individual organism of certain contents of its experience does not affect, nor in any way conflict with, the theory as to the social nature and origin of the self that we are presenting; the existence of private or 'subjective' contents of experience does not alter the fact that self-consciousness involves the individual's becoming an object to himself by taking the attitudes of other individuals toward himself within an organized setting of social relationships, and that unless the individual had thus become an object to himself he would not be self-conscious or have a self at all. Apart from his social interactions with other individuals, he would not relate the private or 'subjective' contents of his experience to himself, and he could not become aware of himself as such, that is, as an individual, a person, merely by means or in terms of these contents of his experience; for in order to become aware of himself as such he must, to repeat, become an object to himself, or enter his own experience as an object, and only by social means—only by taking the attitudes of others toward himself—is he able to become an object to himself." [5]

". . . We are conscious when what we are going to do is controlling what we are doing.[6] . . . In defending a social theory of mind we are defending a functional, as opposed to any form of substantive or entitive, view as to its nature. And in particular, we are opposing all intracranial or intra-epidermal views as to its character and locus. For it follows from our social theory of mind that the field of mind must be co-extensive with, and include all the components of, the field of the social process of experience and behavior, i.e., the matrix of social relations and

interactions among individuals, which is presupposed by it, and out of which it arises or comes into being. If mind is socially constituted, then the field or locus of any given individual mind must extend as far as the social activity or apparatus of social relations which constitutes it extends; and hence that field cannot be bounded by the skin of the individual organism to which it belongs." [7]

One of the most lucid and convincing if somewhat subjective and figurative descriptions of the integration of personality and the rise of self-consciousness is Professor Cooley's analysis in terms of sympathy and imitation.[8] The child begins from the very first to imitate the behavior of the primary group [9] to which he is exposed, including vocal and verbal behavior, as well as facial expression and gestures of every kind. His interpretation of this behavior (i.e., his reflective reactions to it) with reference to himself becomes the basis of his self-consciousness and his estimate of himself. This is the self he sees reflected in the attitudes (behavior) of others toward him, or as Cooley has called it, the looking-glass of self. There is no way in which any of us can have any estimate of ourselves—self-consciousness, self-esteem, or other self-feeling—except through this imagined judgment of what others think of us. What others actually think of us is not of itself important in this respect. It is *what we think others think of us* which determines our estimate of ourselves, and our social attitudes, personality, and behavior. It follows, of course, as Cooley has said, that social consciousness and self-consciousness are inseparable, and that the primary group is the cradle and creator of human nature.

Numerous observers of children have noted the surprisingly early age at which a child becomes susceptible to even the subtler indications of approval and disapproval, such as facial expression and tones of voice, on the part of members of his primary group. Everyone is familiar with the assiduity with which a child will call attention to his behavior for the purpose of eliciting praise. He is equally observant of attitudes of disapproval. It is in this way that the primary group really becomes a series of social mirrors before which the child is constantly parading himself to see himself as others see him. His interpretation of what he sees reflected in the minds (behavior) about him will be his own

estimate of himself. As long as his social contacts are limited to this primary group there is no escape from its judgment. Thus the child who is constantly belabored by his parents (or who imagines such treatment because of secret or known organic inferiorities, dress, or personal habits) for being bad, dull, and generally inferior to other children has no choice, in the absence of other suggestions, but to accept this estimate of himself and behave accordingly. He develops an inferiority complex, which in its most aggravated form may become paranoia. Conversely, the child who receives excessive adulation will quite readily accept this estimate of himself—his social mirrors reflect him as a cherub in looks, a god in intelligence, and generally superior to other children. As a result, he behaves on this assumption. When in school or some other group he sees a different image of himself he will, of course, resent it and attempt to withdraw to the pleasanter environment and more flattering societal mirrors of his family. One of the virtues of objectivity of parents toward their children lies in the fact that the latter may thus be spared the disrupting experiences of disillusionment and a reintegration of the personality.

The process here described is, of course, operative not only in childhood but throughout life. It is, however, best described as it operates among children in a primary group because of the absence of complicating factors such as are introduced when the person becomes conscious of and sensitive to the broader primary groups and secondary groups. Especially is this true when the person has access to books, stories, and other channels through which he may come in contact with an imagined ideal society, which he may substitute for his immediate primary group as a source of social suggestion. Until the child learns of such escapes, the process we have described above is inevitable, namely, that he should accept as a true view of himself the self which he sees reflected in the minds of his primary group. Very frequently the "bad boy" in a community originates this way. By sheer accident, he may run afoul of some more or less serious social convention. He thereafter sees in the subtle suggestions of everyone an image of himself as a bad boy. If he has no recourse to some person or group, real or ideal, before which he can parade himself and see a different image, there is no way in which he can have

any other estimate of himself than that assigned to him by the community. The justice or injustice of the community estimate is entirely irrelevant as long as he has no outside frame of reference from which to gauge it. It is thus quite impossible for any of us to have any other estimate of ourselves than that assigned to us by the group to which we are socially sensitive. Fortunately, most adults have access to real or ideal groups (symbolically experienced or imagined) beyond their immediate physical associates. When our immediate associates abuse and revile us, we parade ourselves before other and more approving groups, which we seek out or imagine. In their minds we see approval. In this way and only in this way has it been possible for the reformers and martyrs to maintain their equanimity and self-respect when apparently everyone reviled them. They heard the applause of other galleries, whether of the heavenly hosts or other removed secondary groups, and were sustained. But their self-estimate was none the less really a societal product. In short, personality (behavior) is determined primarily by the character of the groups of which the individual regards himself as a member. For the same reason, personality may be expected to change as the individual's group identifications change.[10]

2. Sympathy, Altruism, and Selfishness

This view of the social self renders obsolete, of course, the old dualistic philosophizing regarding altruism and selfishness. As Cooley has said: "If we feel that we must give aid to another, it is because that other lives and strives in our imagination, and so is part of ourselves. . . . If I come to imagine a person suffering wrong it is not 'altruism' that makes me wish to right that wrong, but simple human impulse. He is my life as really and immediately as anything else. His symbol arouses a sentiment which is no more his than mine." [11] Whatever is done under such circumstances is for one's own relief as much as for the relief of the other person. It is a form of sympathy, in the sense of communion, or a sharing of the experiences of someone else, rather than in the popular sense of pity. It is fundamentally a response to the same stimuli to which the person we sympathize with is responding. As such it flows from our *understanding* of his situation, i.e., an ability to imagine ourselves in his place.

This analysis of the nature of "sympathy," "altruism," and other terms which are touchstones in the humanitarian, religious, and reform movements may well be reflected upon by those who are worried lest the application of the methods of "physical" science to man and society result in a disappearance of the "warm human touches" from social work. True sympathy, as we have seen, can come only with understanding, and as a technic of achieving understanding, it will probably be conceded that the methods of science are by far the most effective hitherto discovered by man.[12] In short, it is only the scientific attitude as the attitude of understanding which is truly humanitarian.

3. Summary of Socialization

Let us now summarize this process of socialization in more tangible and scientific terms. We have used in the above discussion such terms as "imagination," "sympathy," and "imitation" as if they were instincts or other ready-made mechanisms. As a matter of fact, these terms are merely blanket designations of more or less complicated stimulus-response habit complexes.

The earliest social stimuli to which a child is subjected are perhaps, as we have suggested, those which come from his mother or his nurse. He responds to these stimuli by imitating them.[13] He copies her acts of affection such as caressing with his hands, kissing, pressing his cheek against the mother's cheek, cooing in response to her cooing, smiling and even a little later responding to signs of fear and anxiety, the expression of anger, defiance, general emotional disturbances, such as nervousness, and the like, when the mother exhibits these before him.[14]

When a newly born child cries out in response, for example, to a hunger stimulus, its mother or nurse comes to it and feeds and manipulates it. Through this behavior the random movements and vocalizations of the child soon become conditioned to the new and organized stimuli which the mother's behavior supplies. This conditioning causes the child to anticipate attention when he cries out, and this anticipation constitutes the beginning of both self-consciousness and social consciousness. From the behavioristic point of view this anticipation is, of course, only a conditioned response in which hunger, crying, and the mother's response become associated, so that the child's own crying comes to

operate as a stimulus to himself and perhaps arouses the preliminary responses involved in the satisfaction of hunger, such as the flow of saliva. With repetition, the activity is further differentiated and organized. The mother probably accompanies her manipulation with certain words spoken in a certain tone of voice, with the result that this particular type of vocalization becomes associated with the hunger-satisfying complex and thus tends to touch off a vocal response in the child because of its similarity to auditory stimuli to which the child has previously been conditioned. Of course this process soon becomes tremendously complex in its interstimulation and circular-response operation. It is this behavior which, regarded from the outside, is popularly called imitation.

The process of imitation constantly expands to include the mother's more general behavior. As the child's contacts widen, imitation expands to include other persons with whom he has direct contact—father, brothers and sisters, servants, playmates, teachers, policeman, firemen, etc.

By reaching out from the more immediate and imperfect to the more remote and wonderful models of imitation as described above, the child gradually extends his realm of observation and imitation to include ideal models. This process begins in the first place as a response to adjustment needs, and therefore expands as these adjustment needs expand. As soon as the inadequacy of the adjustment behavior of the primary group models are perceived, and as soon as language symbols permit contact with imaginary characters furnished by stories, these more ideal and adequate characters begin to supplement the "physical" models of the child's environment. Stories of fairies, angels, and God are frequently the source of personalities to which imitation is extended to achieve the desired adjustments. The objection to such mythological models is that they frequently represent behavior so far beyond possible realization that the discovery of this fact exercises a disruptive effect on character. More desirable as models are the stories of "good" boys and girls and the ideal characters of history, because they represent types of behavior not wholly impossible of realization.[15]

This reaching out beyond our immediate physical environment for models to supply our adjustment needs is not, of course, con-

fined to children. Everyone is engaged in it to a greater or lesser extent. Taken all together, it constitutes both philosophy and science, the most abstract, ideal, and generalized adjustment technics developed by man. Says Smith: "Historically man's life has been a dreary story of lacks, of pressing wants, of unsatisfied desires. Now, the basic trait of the human animal is that given a lack he supplies it with a fancy. If emotional satisfaction is denied, the object or experience which would satisfy arises as an idea: hungry, one dreams of food; socially isolated under the pressure of glandular growth, one conjures up in imagination Ideal Maidens and Prince Charmings; pinched by penury, one fabricates scenes of golden grandeur. That man acts thus is a commonplace; but it is perhaps not quite such a commonplace to say that all our sciences and ologies are but the several deposits made at successive levels by the human imagination in its restless flight from nagging want." [16]

These "wants" consist at any given instant of tensions in the organism induced by the disparity between the relatively negatively stimulating conditions in which it finds itself and a symbolic set of conditions operating as a positive stimulus. The tendency to move in the direction of the positive stimulus under these conditions and thus reduce the tension and restore equilibrium in the situation may be regarded, as we have seen in a previous chapter, as a basic characteristic of all behavior. In addition to all the conditions which determine these tensions and their tendency toward equilibrium in the world at large, there is in human society a unique set of conditions which play a dominating role. This is the capacity of man to generate and respond to symbols. Social scientists must accordingly develop technics of dealing scientifically with symbols and symbolic worlds just as objectively as we deal with other phenomena.

4. Primary Group Attitudes and Their Expansion

By virtue of the fact that he has been conditioned to a particular primary group, the child will respond to this particular group in a different way than he responds to other groups. He will, therefore, develop emotions and attitudes toward this group which differ from his emotions and attitudes toward other persons and groups. The fact that he is conditioned to his own group will

make his adjustment to it pleasant as compared with the comparative unpleasantness of adjustments to an alien group. Thus, in their simplest form the primary group attitudes are probably chiefly hedonic. As they become increasingly intellectualized, these primary emotional attitudes develop into such sentiments and ideals as devotion, loyalty, truthfulness, fair play, and their opposites.[17]

Since these attitudes, sentiments or ideals have their birth in the social contacts of a primary group, they will, of course, be relative to that group. That is to say, a child will feel love, loyalty, and be devoted to the ideal of fair play only toward his own small primary group. He will not betray, cheat, or practice deceit on members of this group, for in his experience such conduct has been received with disapproval. But a different code of conduct is usually reserved for outsiders. Strange or "outside" groups frequently become "the enemy"—to be duped, defrauded, or exploited as occasion affords. These attitudes will develop in the child in proportion as they are present in his family or other primary group.[18] If his family is of the highly clannish type, always thinking of themselves and their interests, and if their group-consciousness has never expanded beyond the family group, the child will, of course, share this attitude. If, on the other hand, the family is cosmopolitan in its outlook and identifies itself with the neighborhood, the community, state, or nation, the child tends to identify himself with, and extend his primary group attitudes and ideals to, the larger and more remote secondary groups. However, his earliest loyalties will be to the immediate primary group. If he develops loyalty to larger and more remote groups—state, nation, humanity—it must be through a process of expansion of primary group ideals. This expansion becomes the problem of fundamental importance to social organization. For if the units of social organization are not coterminous with the units to which the individual has been socialized, such organization is arbitrary and nonfunctional and will not satisfy the adjustment needs of the group. A sort of social schizophrenia is the result.

Another illustration of the phenomenon for larger groups than the family is found in the following passage:

"*Ethnocentrism* is the technical name for this view of things in which one's own group is the center of everything, and all others are scaled

and rated with reference to it. Folkways correspond to it to cover both the inner and the outer relation. Each group nourishes its own pride and vanity, boasts itself superior, exalts its own divinities, and looks with contempt on outsiders. Each group thinks its own folkways the only right ones, and if it observes that other groups have other folkways, these excite its scorn. Opprobrious epithets are derived from these differences. 'Pig-eater,' 'cow-eater,' 'uncircumcised,' 'jabberers,' are epithets of contempt and abomination. The Tupis called the Portuguese by a derisive epithet descriptive of birds which have feathers around their feet, on account of trousers. For our present purpose the most important fact is that ethnocentrism leads a people to exaggerate and intensify everything in their own folkways which is peculiar and which differentiates them from others. It therefore strengthens the folkways.

"When Caribs were asked whence they came, they answered, 'We alone are people.' The meaning of the name Kiowa is 'real or principal people.' The Lapps call themselves 'men,' or 'human beings.' The Greenland Eskimo think that Europeans have been sent to Greenland to learn virtue and good manners from the Greenlanders. Their highest form of praise for a European is that he is, or soon will be, as good as a Greenlander. The Tunguses call themselves 'men.' Others are something else—perhaps not defined—but not real men. In myths the origin of their own tribe is that of the real human race. They do not account for the others." [19]

The degree to which it is necessary for family sentiments and ideals to expand will depend upon the conditions under which people live, chiefly the degree of contact and communication which obtains.[20] In a social order where the family is a self-sufficient socio-economic unit, there is little need for socialization beyond that group. Under other conditions it may be desirable to expand the family attitudes to include the whole kinship group if they live under primary group or face-to-face relationships. But too broad a social sympathy—i.e., too broad a socialization—may be as bad as too narrow group self-consciousness. For example, under social conditions where the family is a self-sufficient socio-economic unit, perhaps living on conditions of competition with other families, an extension of family group attitudes toward the members of other families who are less broadly socialized might result in the destruction of the family with the broader social consciousness, because it would lay itself open to exploitation. Thus it happens that such sentiments as patriotism and loyalty have always been highly esteemed as forms of behavior only to *a limited group*. The same behavior toward

members of other groups is treason and disloyalty, because to entertain such sentiments toward an outside group would weaken one's own group as against the outside group. The tribesman who waylays and kills without provocation a member of his own tribe is severely punished. But if he does the same thing to a member of another tribe he is highly honored for his conduct. Within what bounds such conduct may or may not be practiced is determined by the extent of the group's self-consciousness. Modern and so-called civilized peoples take exactly the same attitude. It is regarded as treasonable in modern war to believe, regardless of the evidence, that our own soldiers can be guilty of atrocities. To make such an admission would mean that national consciousness had expanded beyond these units and that we actually identified the enemy with our own group and included them in our sympathies. To the extent that we do this we weaken, of course, our own group as an opponent of the other group. It is fraternizing with the enemy.

Since primary group attitudes and ideals are the first to develop and since they tend to be in constant development they are usually the strongest. Furthermore, until modern times and perhaps until the development of modern communication, society has been organized from the beginning almost entirely on the basis of primary groups. Seers and philosophers from time to time have advanced doctrines of the brotherhood of man and other secondary group ideals, but the doctrine has never been taken seriously by the great masses of men. In fact, it has usually been found necessary to invent a Devil with his own cohorts as an outgroup with reference to which the "brotherhood of man" may define itself. Other species or even the inorganic environment might conceivably serve as such a point of reference. But it is not to be expected that a doctrine of human brotherhood in any practical sense could be understood by people whose group-consciousness had never expanded beyond primary groups. If these doctrines have received any attention hitherto they have been interpreted to mean the only thing they could possibly mean in a society undeveloped beyond primary groups, namely, brotherhood of men *within our group*. The fact that for hundreds of thousands of years man has experienced and had contact only with primary groups naturally means that practically our entire

social heritage consists of primary group attitudes and ideals, which therefore tend to be inculcated in their primitive strength into present generations although successful adjustment in the modern world is increasingly dependent upon the development of secondary group attitudes, patriotism, and loyalties. Tradition, custom, song, and story all celebrate primary group ideals. Our educational system is likewise organized to inculcate chiefly the attitudes and ideals of a bygone age.

Under the changed social conditions of our times, principally those due to the development of modern communication, the attitudes, ideals, and social consciousness of tribal society become the basis of widespread maladjustment.[21] The methods of expanding primary group attitudes into secondary group attitudes become, therefore, a primary practical concern as well as a matter of central scientific interest.

From the above analysis, it follows that if the child or any other unsocialized person is surrounded by the "right" (i.e., the socially approved) kind of social suggestion, he will develop the behavior patterns which are approved by his group, and he will therefore function harmoniously as a member of that group. He will furthermore develop that sensitivity and responsiveness to members of his group which cause him almost to anticipate their attitudes and adjust his conduct accordingly. This is the situation which we find in our most harmonious groups. It is perhaps found in its most highly developed form in a well-adjusted family, or other small and compact primary group. Each member by virtue of long and intimate familiarity with the others adjusts himself with spontaneous ease to each situation as it develops. This social sensitivity and spontaneity of adjustment technic, this ability to sense and interpret the more subtle facial gestures, intonations of the voice, etc., and adjust our behavior accordingly is called "tact," "diplomacy," "charm," and is in general the basis of personal approbation. When this sensitivity is so great as to be difficult to analyze—when it consists perhaps of ability to interpret merely the slightest hardening of a single facial muscle—it is called "intuition," "mind-reading," "mental telepathy" and other mystical names. In any case, social contact and association is greatly facilitated by the possession of this social sensitivity. On the other hand, insensitivity to social sug-

gestion of this kind is a tremendous handicap and is almost certain to make a person "difficult to get along with." To facilitate the acquisition of this technic, the proper behavior covering the more common social situations is codified into bodies of rules called etiquette. Habituation to these rules of adjustment technic tend to facilitate social intercourse and avoid friction.

Now all persons who grow up in a primary group tend to develop a satisfactory degree of social sensitivity to their respective groups. But when the standards of conduct within these primary groups do not correspond to, or even conflict with, the standards of the neighborhood, the community, or the larger secondary groups with which circumstances throw the individual into contact, maladjustment is inevitable. This situation is in fact the fundamental basis of all maladjustment. It is illustrated in its milder form by the predicament of the foreigner who comes to settle in an alien culture. Although he may have been highly socialized, in his native land "cultured," "tactful," and "charming," he may find himself, at least temporarily, a boor and a freak because of his unfamiliarity with the conventions of his new home. Consciousness of this shortcoming may have a very unfortunate and depressing effect on the personality in the way described earlier in this chapter. This form of maladjustment is still better illustrated by the child who spends his early years in a home of alien culture and at the age of six is sent to school where he becomes associated with a primary group with very different standards of behavior—a different language, a different code of etiquette, and perhaps a different ethical code. Personality conflict and group conflict are inevitable under such circumstances. For since the personality which is well adjusted in one group is badly adjusted in the other, conformity to the standards of either group means conflict with the other. Herein lies the central problem of socialization and of social organization. When we speak of maladjusted and antisocial individuals, what we mean is not necessarily that these individuals are devoid of sensitivity and loyalty to *any* group, but that they are lacking in these respects toward *our* group. From their point of view, therefore, we are in exactly the same position relative to their group.

Consider, for example, gangs and criminal groups. There is evidence that the highest ideals of altruism, loyalty, and group

solidarity frequently exist in a criminal gang. A very high degree of socialization obtains. In other words, "honor among thieves" is perhaps fully as common as honor among the groups interested in exterminating thieves. In fact, the persecution to which criminal groups are subject, frequently makes necessary as a matter of self-preservation a higher degree of solidarity and loyalty among the members of these groups than among socially approved groups. Criminal groups, in other words, are merely groups whose primary group ideals are at variance with the larger society or whose primary group ideals have never expanded to secondary group levels. Criminals, therefore, are persons who have not learned to identify themselves with the larger society. Nor do they represent a fundamentally different psychological and sociological problem than the tribe, state, or nation which preys on other tribes or other nations. An inadequate degree of socialization in the sense of an inadequate expansion of primary group ideals, standards, and loyalties explains both types of depredations.

It follows from the above point of view that a dynamic, heterogeneous, rapidly expanding, and mobile society will tend to have a far greater amount of criminality and maladjustment than a relatively static and socially homogeneous society. This theory is again amply supported by the facts. A rapid transition from primary group organization to secondary group—state, national, and international—organization is handicapped and accompanied by a vast amount of maladjustment, conventionally described by such adjectives as provincialism, selfishness, treachery, and corruption. The jargon of Christianity, internationalism, and nationalism is soon adopted by leaders as a smoke screen against the "enemy," i.e., secondary groups. But behavior patterns, emotions, loyalties, and ideals remain to a large extent undeveloped beyond their primary group level. That is, when primary-group adjustment-technics persist in situations demanding secondary group adjustments, or *vice versa*, severe tensions arise in the group or groups concerned. The former phenomenon is so conspicuous in the current social scene that it deserves some further analysis at this point.

The masses of men rely in all of their social adjustments on what they pridefully call simple common sense. The adjectives

are well chosen. By common sense they mean the rules of conduct which they have found to work in their personal primary group adjustments. Statesmen (by which I merely mean men charged with the management of public affairs) rely on the same technic. For one thing, most of them do not themselves possess any more refined method. If they did, they could not afford to use it for they could never explain their seemingly strange behavior to their constituents. So the statesman and his constituent both adopt for public affairs the technics they have found to work in horse trading or other neighborhood adjustments. There were men at the Versailles peace conference in 1919 who knew that the provisions of the treaty were impossible and absurd and that it must result in a subsequent situation of the general type which has occurred. But the technic by which they had to prove this to be so was and is a foreign language to the overwhelming majority of both statesmen and their constituents.[22] The symbols and the logic by which such sequences have to be proved go beyond primary group language mechanisms. The same phenomenon is even more strikingly illustrated by the greater reliance people attach to the attitudes of a small number of their own circle, regarding such a matter as, for example, the outcome of an election, as compared with scientifically conducted "straw votes." In short, the symbols and logic of sampling in large groups is not yet part of the equipment of most people, although the appearance of nation-wide "polls" is rapidly diffusing this equipment.

Another recent example of the survival of primary group attitudes in secondary group situations is provided by the question of war debts. Economists are unanimous on the proposition that the only way in which the debtor nations could pay their debts, if at all, was by sending goods to the creditor nation. To enable them to do so tariff walls would have to be removed or lowered. This can be demonstrated easily by the use of the economist's symbols and logic. Without going into details, it may be said that these symbols differ from those of common sense chiefly in that (1) they represent large numbers instead of individual cases, (2) they take into consideration interrelationships of an intricacy which goes far beyond the concrete life experience of any individual. Unfamiliarity, both on the part of statesmen and on the part of

their constituents, with this technology is exactly what prevents intelligent adjustment in such a case.[23] When confronted with the findings and the recommendations of the economists on this subject, what did conscientious citizens and their congressmen do? They referred the analysis to their primary group experience and found it preposterous. "Do you mean to tell me," they would say, "that if I lend money or sell a team of horses to my neighbor, John Smith, I cannot reasonably expect him to repay me unless he can do so with potatoes, butter, or wood?" (Note that the illustrations for purposes like this are usually drawn from the local *agricultural* economy from which we have just recently emerged.) It is unnecessary to complete the analysis because the audience laughs in derision at the very question. They have *all* had something to do with deals like that. None of them has had anything to do with the kinds of deals the economist talks about. But the statesman goes on with his analysis to the proper climax. "If John Smith does not pay in cash he is a crook and I'll put the police on him. If he and his ilk resist, the militia will soon bring them to terms. Isn't that what militias are for in a civilized and orderly country?" That is exactly what militias and armies are for in societies which have not yet become familiar with a symbolic technology through which the necessary adjustments can be worked out, or in which the population does not understand such a solution when it is worked out. In the absence of this more refined technic, the technic of force and its nearest relative, fraud, is of course inevitable and necessary. It relieves temporarily some of the tensions. So do other convulsions, earthquakes, fevers, etc. If one can't collect from John Smith, it relieves one considerably to denounce him as a crook and a scoundrel, a moral pervert, a religious heretic, and a wife-beater. If one can bring physical violence to bear upon him and preferably destroy or cripple him permanently, so much the better. In addition to the energy outlet it affords, it satisfies deepseated emotional patterns of "decency" and "justice" which we still have with us fresh from the jungle.

But it is unnecessary to draw upon hypothetical John Smiths for an illustration of the phenomenon. Nearly the entire content of all the books, magazines, and newspaper columns, purporting to analyze the current situation is concerned with personalities. Nearly all of it is irrelevant and absurd. We resort to personali-

ties in attempting to analyze social questions because, as stated above, it is the technic with which we are familiar in primary group adjustments, and the only one we know. Indeed, the time was when we also used personality concepts and logic to explain the events of chemistry and physics. Lightning struck trees from malice and Death with a capital "D" mowed men down with a scythe just as dictators demolish their opposition. This type of description was abandoned in other fields when other and more useful technics of dealing with the phenomenon were developed. These technics do not spring full-blown from anybody's brow, unfortunately, but have to be developed by long and undramatic labor by many persons over long periods of time. This is the proper task of social scientists. But it is not likely to be achieved as long as this fraternity preoccupies itself almost entirely with more or less enlightened commentaries on current events, chiefly to assess the praise or the blame and to point out the solution in dogmatic pronouncements whether of Jesus, Aristotle, Aquinas, or Marx. Again, there is no objection to anyone devoting himself to any of these evangelical enterprises provided he does not confuse himself or his followers by asserting that his conclusions are dictated by the canons of science. The technics and the knowledge that constitute science are obviously as useful for the exploitation and the destruction of the proletariat, for example, as for its liberation. When so-called social scientists therefore get the idea that social science, in contra-distinction to all other science, also is privileged to dictate the ends for which the knowledge is to be used, they merely mix up with their science, such as it is, something which has absolutely nothing to do with it.

A principal reason for this confusion among social scientists is, as has been pointed out in previous chapters, the nature of the terminology with which they try to carry on. The immediate data of all sciences are symbols of some sort representing human responses to whatever it is in the outside world or in ourselves that causes us to respond at all. To the extent that these symbols adequately represent the situations to which we have to adjust, we can behave in a way that is called intelligent as contrasted with mere squirming or trial-and-error groping. Except for the possibility of working out on paper and later in the laboratory

the formulae for high explosives, the tensile strength of steel, etc., most of the engineering adjustments on which we pride ourselves so much would be accompanied by widespread catastrophies. This paper work has lagged in the social sciences because we have cultivated instead the notion that it has been done once and for all by one or more of the aforementioned smart men, and that all *we* need to do is to continue to play with their words without ever bringing them to empirical definition and test. It is admitted that the phenomena of the social world are constantly changing, that they consist of an infinitely fine relation of characteristics, constantly interacting with each other. Yet the terminology with which we attempt to deal with them employs concepts emphasizing absoluteness instead of relativity and probability, stability instead of change, discrete instead of continuous variables, dichotomous categories instead of dispersions. Practically everybody is obsessed with a set of social categories which he strongly feels are eternal. Things are either true or false, right or wrong, just or unjust, good or bad. To abandon all these for vague new concepts representing probabilities, averages, dispersions, rates of change, etc., is too much for the masses of men at present. So they hold fast to the notions of their primitive ancestors about matters social and feel their feet are on the Rock of Ages. And so they are—but the ages are sometimes extremely remote. Since it is not considered necessary to define the words in terms of the concrete operations or behavior for which they are supposed to stand, everyone may read his own meaning into them. The conflicts that ensue even on the verbal level are in all essential respects like war. The victory is to the loudest voice, the largest vocabulary, and the greatest physical endurance. The defeated party also remains unconvinced. There are perhaps very few statements about man or society which can legitimately be made except in terms of an average, a dispersion, and a probable error. Nearly all statements that are made and acted upon are in terms of some chance individual case which happened to become conspicuous. The resulting adjustments are necessarily badly adapted to the situation a great deal of the time.

As we pointed out earlier in this chapter, the terms "primary" and "secondary" groups are merely crude and convenient designations of phenomena which for scientific purposes require more

adequate and refined definition in terms of gradations. So far we have spoken of the primary group in the sense of a face-to-face group, represented in its simplest form by the family. The reasons for taking the family as representative of the concept is first, that it is by virtue of physical proximity the first group with which the vast majority of children become associated and secondly, that historically it has also been the economic unit. To the extent that it is still the group through which subsistence is achieved it retains its priority as the pole and core of human association. To the extent that it is being supplanted as an economic unit its primacy as the pole of social consciousness and "we-feeling" may to a large extent be supplanted by the primary economic unit which will take its place. For example, if the members of a family quite early in life become engaged in diverse and competitive business enterprises, it is to be expected that they will soon come to identify themselves with their business associates, trade, profession, or functional group instead of with the group to which they happen to be related by quite fortuitous and sociologically unimportant biological ties. This is probably rapidly becoming true in our cities. If so, the primary group—that is, the group to whom we give first consideration, loyalty, and self-identification—our *gang*—will be the most positive and vivid pole around which our social consciousness will center. The "gang," or "party," united by a vivid sense of economic or some other self-interest, may then, at least for adults, largely supplant the family as the principal primary group. For example, it is reported that in Russia, members of "young Communist" groups are pledged to report even their parents for violation of state decrees. Under such circumstances, a group might develop with primary loyalties to a non-local, non-face-to-face group.

In short, the distinction between primary groups and secondary groups is one of the degree of integrative interaction which obtains. Up until the enormous development of the means of communication in recent times, integrative interaction has been a fairly invariable function of proximity in geographic space. As a result, the tendency has been to classify groups as primary or secondary on the basis of whether they are "face-to-face," "within the reach of a human voice," and other geographic criteria. The inadequacy of such bases in an era of radio and television will be

readily apparent. A more direct and generalized measure of integrative interaction and a corresponding gradation of groups rather than these dichotomous categories is, therefore, necessary. We need instruments for defining primary, secondary, tertiary, etc., groups in social rather than geographic space through some such technic as attitude tests and social distance measures. Some measure of the per capita volume of communication or social stimuli exchanged between the members of one group as compared with the volume exchanged with members of another may be the logical basis for the measure of the degree of primacy of one group as compared with another. We turn, therefore, to consideration of this subject.

C. SOCIAL DISTANCE AND STATUS

The preceding chapter pointed out that all behavior is in the last analysis observable as *motion* toward or away from a *position*. These terms merely indicate that human observation tends to structure and symbolize itself in spatial terms. The position of a societal component in a situation at any given time we have called its *status*. The meaning and validity of the concept of societal space, I have discussed elsewhere (pp. 104–109). It was pointed out in this connection that there is precisely the same justification in science for the use of societal space as there is for the use of geographic space. The former is as "objective," "real," and meaningful as the latter. Both are symbolic devices in terms of which man finds it convenient to respond to phenomena and to communicate these responses.

Sociology is concerned, as we have seen, with (primarily) human interaction by means of symbols. To observe this interaction (movement) is the first task of science. This interaction takes place, among the persons and other phenomena to which they respond, within a situation, or field of force, as we have called the segment which we abstract as a closed system for study. Each of the persons and other entities interacting may be thought of as having a position or status within the field. That position or status of any interacting entity will always be relative to the others and to any standards according to which we may want to rank them. These standards are habit-systems (folkways, cus-

toms, mores) according to which the individual or the group responds. They are, therefore, objective parts of a situation and as such are to be taken into consideration just like other components of the situation. Status always consists of a behavior relationship in a situation. *Ranking* of status is an evaluation of a given aspect of behavior, i.e., a complex serial set of responses according to whatever standard (habit-system) the person or group doing the ranking may be operating.

All societal behavior is by definition status-fixing behavior. That is, it involves movement and position in societal space. The sociological vocabulary contains, accordingly, a large number of words such as "rank," "position," "class," "caste," etc., which designate relative societal position. These designations of status are necessarily prominent in all sociological discussion, including descriptions of insect and other sub-human animal societies. Thus, the functional caste structure of ant and termite societies are well known. A well defined peck-order has been observed in flocks of domestic chickens.[24] The societal position or status of anyone in a situation is, then, merely the static aspect of his behavior (function) in that situation, or more especially, the group's appraisal of that function according to the standards which are accepted by the group.

An appraisal of the status of any individual or group will usually be influenced not only, or even mainly, by their actual position at the time of the appraisal, but perhaps primarily by the *degree of probability that this individual or group will in the measurable future attain a given position.* Alpert has neatly summarized this point as follows: "In a society in which the highest values are pecuniary, the operational test of social status is: what are the chances that a given individual will become extremely wealthy? In a culture in which the highest rewards are beautiful wives, the test is similar: what are the chances that a given individual will obtain very beautiful wives? From this point of view, a social class would be a group of persons having equal probabilities of reaping social rewards." [25] What constitutes a social reward will, of course, be determined by the standards (symbolized habit-systems) of the group.

The phenomenon of status is, therefore, an aspect of every societal situation. Since it is always relative, and since relative

status is in most if not all modern languages expressed in spatial terms, the term *social distance* [26] has been adopted to denote degrees of separation in status as indicated by the behavior toward each other of the groups under consideration.

The language habit of designating societal status in spatial terms is very ancient and widespread. References to the "high" and the "low," some being "far above" or "below" others, etc., is a very general and meaningful manner of speech. Likewise, the use of words denoting distance in the sense of relative positions in a status continuum is very common. Expressions such as "near and dear," "very close to each other," etc., indicate nearly equal societal status *with respect to the aspect of a situation under consideration.*

There is perhaps no such thing as status or societal distance in general. Every person may have a different status with respect to each aspect from which it is possible to consider a situation. The very qualities and functions which give high status in one situation give low status in others. J. M. Barrie in *The Admirable Crichton* has portrayed the complete transformation of societal status in a group as a result of a shipwreck, which suddenly places the members at the mercy of the capacities of their butler. It has frequently been pointed out that status and distance are not to be defined in terms of friendliness, frequency of contact or physical intimacy, as is evident from the frequently cordial relations and geographic nearness between master and servant. From our point of view, relative positions of people with respect to *any* of these criteria may conveniently be described in spatial terms. Again, father and child may be regarded by outsiders as of equal status as regards family prestige, caste, wealth, etc., but within the family they may have widely different status according to *other* criteria. It is possible to rank persons or groups serially and in spatial terms on the basis of any of the criteria mentioned above, and all of such rankings may have significance for various purposes. But to what extent these rankings correlate with each other and more especially to that subtle "feeling" or "sentiment" which operates as a restraint to free communication, that is a matter which must be determined in each case. *Any* criteria *may* be the basis of status-stratification. Free communication is itself perhaps always relative to the various roles which persons

assume in all their relations with others. We communicate with complete freedom to a business associate of equal *business* status *on business matters,* to a scientist of equal *scientific* status *on matters of science,* etc. We may regard this business man and this scientist as of radically different racial, economic, or family status.

The criteria of status and of distance lie in the habit-systems of the group in question. These habit-systems are the present balance of accumulated past experience of the group, as transmitted from generation to generation through language, plus the situation in which they find themselves at present, plus their anticipation of the future. The past and the future exert their influence through symbols and are, therefore, "present" for purposes of scientific study of the situation.[27] The whole literature of social origins, sociology, and social psychology is devoted to the details of the processes by which given customs, social attitudes, and other collective behaviors become what they are. We shall not here attempt to review that literature but shall confine ourselves to the question of reliable methods of observing and describing social status and societal distance in various situations.[28]

Failure to recognize this relativity of such terms as status and societal distance (a) to the standards of some individual or group and (b) to the aspect of a situation under consideration has resulted in apparent incongruities and inconsistencies in the usage of these terms. In the first place, the attempts to define the concepts on the basis of *other words* without clear operational implications of their own has been confusing. Thus, the issue has arisen as to whether societal distance should be defined in terms of "understanding and intimacy" *instead of* "the degrees of sympathetic understanding." [29] Fortunately, the attempt to define the terms by merely substituting other words has been largely superseded by the development of instruments of the type to be discussed below. These instruments or tests consist of expressions of attitude or other behavior and permit the definition of status or distance as *that which* the tests measure. If a given test does not include an aspect which someone believes is sociologically significant to the problem under consideration, the remedy is obviously to construct *another test* giving due weight to the neglected aspect, rather than to quarrel over whether that which

either or both tests measure "really is" status or distance. If the tests consistently, objectively, and reliably measure some behavior which correlates significantly with other phenomena which we wish to describe, the matter of naming the behavior or whether it corresponds to the content of traditional categories is of minor importance.

The relativity of status and distance concepts are, in the second place, frequently overlooked in connection with the undoubted facts that the distance of group A to group B may be different from the distance of group B to group A as estimated by each, respectively, or as measured by different scales. This does not in any way destroy the usefulness of both measures, for certain purposes. On the contrary, the determination of this difference of estimate or "social distance margin" between two individuals or groups is very useful with reference to some sociological problems. This variability in social distance relative to the group expressing the attitude upon which distance is determined is objectionable only if one feels that the term distance has some absolute or intrinsic meaning which demands that it be applied only to situations uninfluenced by the sensory equipment or position of the measurer. Such a situation does not obtain in any measurement although instruments may facilitate the correction of such disparities.

When instruments of sociological measurement become more highly standardized and generally accepted it will be unnecessary constantly to repeat the above reservations because they will be implicit in the measuring process and as such will be taken for granted by everyone. The same reservations regarding the relativity of measurement to the condition and position of the measurer and of his instrument also apply to the well established measuring technics in the other sciences. But these conditions have been so standardized and we have become so habituated to the use of these conventional measuring devices that it is no longer necessary to make explicit in their case the conditions which attend all measurement.[30] Because these conditions are seldom called to our attention in connection with, for example, yardsticks and pound-scales we tend to assume that the conditions governing all measurement, which thrust themselves prominently on our attention in developing new sociological scales,

apply only to the latter and are in some way due to the peculiarities of the subject matter measured. If we had a social distance scale to which we were as habituated as we are to a yardstick, whatever that scale registered would *be* the social distance in the situation. In order for us to *become* so habituated and give such universal acceptance to a social distance scale, the usefulness of that scale and its superiority in certain situations to our informal judgments would, of course, have to be demonstrated. This is a task that remains as yet largely unaccomplished.

So far we have confined our discussion to that type of societal distance for which the criterion is some one or more of the habits of serial response or ranking according to which we assign relative status to persons and groups. But societal distance may also be based on other criteria than those of status. That is, distance may be based on such a criterion as the degree of *felt interdependence* or *actual interaction* among persons and groups without status considerations of the type discussed above. Thus we have seen that the terms "primary" and "secondary" have been very useful in sociological description of the degree of "we-feeling," cohesion, or socialization of groups. Yet these terms carry no necessary implications of the kind of societal status we have discussed above. People of widely different prestige-status may be members of the same primary group and people of the same prestige-status may be members of very remote, secondary groups.

It will be observed that the application of the term social distance to the primary-secondary group gradation merely involves the introduction of *another* criterion, namely, we-feeling, degree of interaction, or whatever behavior is at present the basis of distinguishing the terms. Now the basis for the degree of we-feeling *may* be any of the prestige-criteria we have suggested above as well as any others upon which individuals or groups are ever ranked. On the other hand, the basis of the we-feeling may be merely the complementary or symbiotic nature or other characteristic of the relationship. But the ranking of groups as primary, secondary, tertiary, etc., on the basis mentioned obviously tends to structure itself in spatial terms just as does a ranking on the basis of wealth or physical prowess. As we have pointed out above, the basis upon which we rank groups and on which we assign them to relative status must always be specified. The appli-

cation of the concept of distance to gradations of we-feeling or degrees of communication between groups presents, therefore, no unique logical problems. Since we find all gradations of this phenomenon from complete identification to complete isolation, scientific analysis requires a more refined and objective definition of these gradations.

As we have seen in the preceding sections, primary and secondary groups are distinguished on the basis of the degree of adequacy, completeness, or facility of the communicative processes that obtain *for whatever reasons*, between the groups in question. In short, these terms merely designate degrees of association and dissociation and are to be similarly defined. That is, a group within which communication is relatively complete and facile has strong "we-feeling" and shows all the characteristics of a primary group. These characteristics also correspond to our notion of a high degree of association. A group within which a relatively incomplete degree of communication exists has the characteristics of a secondary group, and may be said to be relatively dissociated.

Now all observable societal behavior is subject to interpretation in terms of this fundamental attraction-repulsion, association-dissociation, primary-secondary characteristic. But these dichotomies are clearly only crude general designations of what more refined analysis indicates to be a continuous gradation. It is not surprising, therefore, that a great many major sociological problems converge upon the need for more finely graduated and objective measures of this basic phenomenon.

The central nature of this problem has brought forth a large literature ranging from laboratory studies of domination-subordination among individuals on the one extreme [31] to broad historical studies of social classes, castes, and nations on the other. Cooley [32] analyzed the primary groups in great detail, and Sumner [33] devoted much attention to "in-groups" and "out-groups" in which the factor of general status might or might not be a conspicuous factor. Veblen [34] portrayed with vast perspicacity the variety of behaviors and criteria upon which status depends among different peoples at different times and places. Sumner and Keller [35] place Self-Gratification (Ostentation and Prestige) on a coordinate level with Self-Maintenance and Self-Perpetuation

as one of the major facets of society. This literature provides a wealth of illustration and insight into the behavior in question and is, of course, of fundamental importance in the construction of instruments for the more refined observation of the phenomenon. We have previously referred (Chapter II) to scales for measuring socio-economic status on the basis of income, participation in community life, and material and cultural possessions.[36]

More recently attempts have been made to develop instruments for the measurement of the societal distance between groups through attitude tests. These tests have for the most part adopted prestige-criteria as their basis but the same technic could, of course, be used with other criteria such as "interdependence." [37] As an illustration of the present technic of measuring societal distance we shall use Dodd's test. This proceeds upon the assumption that certain common behavior, such as intermarriage will usually be desired (as indicated by verbal or other symbolic behavior) chiefly with groups of fairly equal or higher status, and that certain other attitudes, such as a desire to exterminate or to have no contact whatever with members of a given group, represent the maximum societal distance. Thus Dodd's social distance scale consists of five statements of attitude as follows: [38]

A. If I wanted to marry, I would marry one of them.

B. I would be willing to have [member of given group] as a guest for a meal.

C. I prefer to have [member of given group] merely as an acquaintance to whom one talks on meeting in the street.

D. I do not enjoy the companionship of these people.

E. I wish someone would kill all these individuals.

F. I know nothing about this group; I cannot express an attitude.

These five statements were applied to fifteen nationalities, eleven religious classifications, five economic levels, and three educational levels represented in the Near East.[39] The test was administered to 174 Freshman students in the American University of Beirut which has representatives of all the different national groups except the Chinese. This procedure yielded a numerical index of (a) the distance of each individual tested to members [40] of each of the designated national, religious, educational, and economic groups; (b) the mean distance of any in-group (i.e., the

members of any stated nationality, religious, educational, or economic class) to members of their own classification; and (c) the mean distance of any in-group to members of all other groups (out-groups). The first of these indices indicates the homogeneity or we-feeling existing in any given national, religious, economic, or educational group. To the extent that little or no distance exists among the members of a given group they are to that extent a "primary" group with respect to the interest, attitude, function, or status indicated by one of the four classifications. Other groups would be described as secondary, tertiary, etc., according to their societal distance with respect to the characteristic in question. If the mean distance of the members of a group toward their own religious group should actually be greater than toward some other religious group it would indicate the purely traditional, superficial, or formal nature of that religious designation. That is, if an individual or a group of Catholics actually registered a smaller distance to Moslems than to Catholics, such a group of Catholics would obviously be more properly classified, from any sociological viewpoint, as Moslems. In short, the social distance of these groups to each other and of the members to their own group, as classified, is a measure, within the limitations of the test, of the degree of religious sociation that obtains between the groups. On the basis of these gradations, different groups might be designated as primary, secondary, tertiary, etc., *with respect to the characteristic or interest under consideration.*

This definition will be disturbing to those who are habituated to distinguishing primary and secondary groups mainly on a geographic basis, in terms of face-to-face contacts, or according to the means of communication they employ. But as we have already pointed out, these are classifications of people on the basis of nonsociological criteria. Because *sociological* classifications of societal phenomena sometimes coincide with convenient *geographical* or *biological* classifications of people, sociologists have frequently adopted the latter classifications and attempted to use them in the classification of societal phenomena. Vast confusion has resulted.[41] We have already mentioned some of the effects of this confusion in the preceding section. We indicated there some of the results of societal organization based on nonsociological classifications.[42] The impossibility of an objective definition of pri-

mary and secondary groups in terms of "face-to-face," geographic proximity, or any other extraneous and nonsociological basis was also previously mentioned in the present section.[43] Only in terms of degrees of communication ("communion"), sociation, and distance do the designations primary and secondary groups take on sociological meaning. The objective definition of the terms waits upon the development of adequate description (measurement) of these degrees of symbolic interaction.

It is true that in addition to the simple classification of persons according to some single characteristic such as nationality, religion, education, or economic level and the measurement of their homogeneity or dispersion (distance) with respect to that characteristic, we may also combine two or more of these characteristics into compound classifications.[44] That is, we may classify into one group all the people who are Turks *and* Moslems *and* college graduates *and* have a certain income. The greater the number and intensity of their societal bonds the greater presumably will be their we-feeling as regards most situations that arise. Awareness of geographic contiguity, similar physical features, common odors, and any other factors, to the extent that they are the basis of *societal* bonds may also properly be included in such a composite index of sociation or societal distance. In fact, the term primary group is usually employed to designate a group in which a high degree of homogeneous or complementary characteristics exist on *all* the major interests, attitudes, and activities. The above analysis in terms of measured societal distance of people with respect to specific attributes is, of course, in no way invalidated by this fact. We are merely confronted with the problem of weighting each index in combining them. This is done informally by all of us in everyday adjustments. We have strong we-feeling (small societal distance), for example, with a group on account of their nationality, and considerable educational fellow-feeling, but find ourselves in a radically different economic class and detest their religion. What is our net or total societal distance toward such a group? If our religious interests are very intense we probably avoid the group on this count alone in spite of their attraction for us in other respects. We weight our attractions and repulsions in this way and our net balance is reflected in our actual general behavior toward the group in question. The

rigorous definition of primary and secondary groups must always indicate the aspect or combination of aspects with respect to which groups are declared to be near or distant.

We have simplified above, for purposes of analysis, a process which is usually very much more complex. Very few people, if any, could give an adequate account of all the conditions which determine their feeling of nearness or distance to other people or groups. The *fact* of attraction or repulsion is very much more readily determined. Thus Moreno,[45] by a system of sociometric tests, allowing each member of an institutional community to designate the degree of their attraction (e.g., first, second, third choice, etc.) to other members of the community succeeded in locating true primary, secondary, tertiary, etc., groups ranging from maximum attraction to maximum repulsion. The membership in each group and the distance between them was found to vary also according to the nature of the contemplated relationship. The social distance of a given person as a workmate might be very different, for example, from his distance as a housemate. Moreno's studies further reveal the fallacy of assuming that a group living with a housemother in a cottage ostensibly as a family, necessarily constitutes a societal primary group. A reorganization of the community on the basis of confidentially expressed choices, i.e., on the basis of true societal primacy, resulted in a striking relief from tensions and the attendant administrative problems.

Moreno's technic, as contrasted with the conventional social distance test has the obvious advantage that the former calls for a response to a total personality whereas the latter calls for a response to an aspect, such as religion, nationality, education, economic level, or any other. The problem of weighting these various aspects in a given case, as discussed above, is informally or unconsciously performed when a person expresses his degree of attraction or repulsion toward another. For purposes of further analysis, however, it is still desirable to study *the conditions that obtain in groups of various degrees of intimacy* (defined in some operational way) *after such groups have been reliably located.*[46] Only through a generalized description of these conditions, their various kinds and degrees, do we arrive at an explanation of societal attractions and repulsions—(the "causes" of human association and dissociation).

The remainder of this volume is accordingly devoted to a summary of the relatively well-established conditions that surround various types of human societal groupings and the status of each under different conditions. These conditions will consist largely of similarities and differences of characteristics, functions, and positions reacting upon each other. A large literature has already described the varied traits or attributes that have at different times in different places apparently determined the status of their possessors.[47] Physical strength, wealth, occupation, and a very large number of other traits have been frequently mentioned in this connection. But no list of traits *except in relation to the habit-systems of the group under consideration* can be said to determine either status or societal distance. Poverty has frequently been a condition of high status in religious groups. Physical strength in women would at some periods have been a mark of low status. The occupations rated as of highest status in one society are rated lowest in another even in contemporary and adjoining groups.[48] As for criteria like "beauty," "honesty," etc., their definition appears to be entirely relative to the habit-systems of the group. They are only words signifying approval (positive response) and may designate the widest variety of objective content. Only comprehensive and systematic study of all these conditions will enable us to formulate what *abstract common factor*, if any, is usually present in primary and various degrees of derivative groups or in conditions of high or low status. If, for example, our hypothesis regarding the basic nature of communication is a useful one, then among the conditions associated with high societal distance should be observable barriers to communication. Another hypothesis which suggests itself is *that degree of status may be defined in a given case as the degree to which the prevalent aspirations of the group have been achieved by an individual or a group relatively to others* or more especially the probability of such achievement. In short, primary and secondary groups, societal distance and status is to be explained not by attributing them to an "instinct" of gregariousness, a "wish" for prestige, or an innate urge for "class struggle." The explanation of gradations in group intimacy, societal distance, and status with their many concrete variations such as affection, authority, leadership, etc., are to be explained if at all only by a careful description of the

conditions under which stated forms of each occur. In order to describe the relevant data in the various degrees in which they are manifested, we shall need instruments of more discriminating observation so that co-variances in these phenomena and the conditions under which they occur can be more accurately observed. Dodd's *Dimensions of Society* suggests the type of scales which are needed for this purpose.

D. CONCLUSION

In this chapter we first described the processes by which an individual becomes part of a group. That is, we traced the interaction between people as a result of which those synergic behavior patterns develop on the basis of which we both define groups and determine membership in them. The groups in which these processes originate and in which they develop their early roots, we have called primary groups. The process as a whole we have called socialization. "All organized human society—even in its most complex and highly developed forms—is in a sense merely an extension and ramification of those simple and basic socio-physiological relations among its individual members (relations between the sexes resulting from their physiological differentiation, and relations between parents and children) upon which it is founded, and from which it originates." [49]

We next described the specialization and expansion of these patterns into secondary group relations. As we pointed out in this connection, the individual may belong to as many groups as he has interests (i.e., specialized and positive responses) and these affiliations may be of all degrees of intensity. The maladjustments arising from attempting to apply to secondary group relations the adjustment technics adapted only to primary group situations were described at length.

Finally we considered the phenomenon of relative societal position or status, and the use of the term societal distance to measure degrees of difference in status and in societal interaction. In this connection it must be noted that we used the terms status and distance to designate the relative position of individuals or groups according to *any* criteria whatsoever, whereas most writers limit the use of the terms to position according to *some* crite-

ria only. I should have no objection to the latter limitation if *the criteria adopted* were always definitely specified instead of being left to the context, to custom, or to conventional usage. In short, if anyone objects to using the expression societal distance to apply both to primary-secondary group gradations *and* to the master-servant separation, I am not at all interested in arguing the matter. To do so would be merely to retrace the barren philosophical wastes regarding what space and distance *are*. If, on the other hand, someone will provide a verifiable way (a set of checkable operations) of distinguishing and communicating the gradations (serial responses) which we now roughly indicate by such terms as primary, secondary, high, or low, I have only the mildest interest as to whether the phenomenon measured is called distance, space, ectoplasmic vacuity, or anything else.

The tendency in sociology to take for granted such matters as the criteria of status or distance, or to refer to such blanket-criteria as "the feeling of superiority or inferiority" is responsible for much confusion and futile argument. For example, Sorokin and MacIver agree that personal liking or aversion has nothing to do with social distance as applied to class distinction. That depends upon what is the basis of a given class distinction. One *may* rank all the people one knows on the basis of one's liking and aversion, and assign them to classes on this basis. If so, these criteria clearly have *everything* to do with the class distinction. "Social distance," says MacIver, "is the bar to free intercourse between individuals which arises from their belonging to groups rated as superior or inferior. It is hardly necessary to add that 'superior' and 'inferior' are here used with no implication of differences of character or intellect." [50] I should say that it is not only desirable to specify that character and intellect are not in this case among the criteria on the basis of which the ranking is made, but that it is also desirable to specify what *are* the criteria on the basis of which the groups are rated superior or inferior in status. Instead of limiting the term social distance to apply only to differences in rank-position according to *some* (specified or implied) criteria, I have proposed to use it to designate the difference in rank-position according to *any* criteria, always specifying the criterion or combination of criteria.

Theoretically it is possible to combine *all* the criteria and by a

weighting of a person's or a group's status under each, to arrive at a ranking which will represent that person's or group's status in general. This seems to be contemplated by Sorokin's definition: "(A) man's social position is the totality of his relations toward all groups of a population and, within each of them, toward its members." [51] Practically, it will be found, I think, that all designations of *status in general* contain more or less definite contextual implications as to the particular criteria upon which a given status is assigned.

The general definition of status and distance here adopted is also compatible and congruous with the use of these terms in nonsociological fields. In science generally, distance is defined entirely in terms of operations with a specified instrument. The term social distance will never take on definite and precise meaning until we define it similarly—in terms of specific operations with specified instruments. They will not be the same instruments as used in other sciences, nor will we use a scale for measuring socio-economic distance for measuring racial or religious distance. The construction of these various scales will call for all the ingenuity, intuition, imagination, and insight that we can muster. Their meaningful use will require the same discrimination which is required in all sciences as to which tools to use and when to use them. Even then it will still be true that we shall only be doing more accurately and objectively what men have always done informally, inaccurately, and by rule-of-thumb. But these considerations have not in other sciences deterred men from devoting their lives to the invention and perfecting of refined instruments for extending the reach and refining the discrimination of our senses as well as for objectifying and communicating our observations. Social scientists must turn a substantial portion of their energies to the same task.

E. NOTES

1. A voluminous literature on the integration of the personality might be referred to in this connection. Of the better general treatises may be mentioned C. H. Cooley, *Human Nature and the Social Order*, Scribner, 1902, and L. L. Bernard, *Introduction to Social Psychology*, Holt, 1926 (Chs. 22–24). For a more detailed treatment see J. F. Markey, *The Symbolic Process and Its Integration in Children*, Harcourt, 1928; Jean Piaget, "Principal Factors Determining Intel-

lectual Evolution from Childhood to Adult Life," Ch. 2 in *Factors Determining Human Behavior*, Harvard University Press, 1937.

2. Essentially the same process operates to make a group a part of another group.

3. The best contemporary account of the origin and growth of self and social consciousness is to be found in L. L. Bernard, *op. cit.*, Chs. 11, 12.

4. Cf. G. H. Mead, "The Mechanisms of Social Consciousness," *Jour. of Phil., Psych. and Sci. Meth.*, IX, 1912, p. 414. Also "The Genesis of Self and Social Control," *International Jour. of Ethics*, XXXV, 1924–25, pp. 251–277.

5. *Mind, Self and Society*, University of Chicago Press, 1934, pp. 223–225.

6. *Ibid.*, p. xxi.

7. *Ibid.*, p. 223. For a comprehensive summary of the literature on the subject here under discussion see C. J. Bittner, *The Development of the Concept of the Social Nature of the Self* (Ph.D. Thesis, 1932, Iowa City, Iowa). Published by the author.

8. It should be observed that while I find this description by Cooley entirely compatible with the position I have taken throughout the book regarding the nature of "mind" and "society," my own view on these matters is more nearly that of George H. Mead than that of Cooley. Mead's position may be summarized in the following extract:

"For social theory a great deal hinges upon the answer to the question whether society is itself psychical or whether the form of the psychical is a sort of communication which arises within primitive human behavior. Do the self and others lie within mind, or is mind itself, as psychical, a phase of experience that is an outgrowth of primitive human communication? Whether the question is stated in this form or not, it is evident that a great deal of recent social psychology has been occupied with an analysis of selves and their minds into more primitive forms of behavior. To this type of analysis Cooley's assumption of the psychical nature of society closes the door. And it commits him to a conception of society which is mental rather than scientific." ("Cooley's Contribution to American Social Thought," *American Jour. of Soc.*, XXXV, March, 1930, p. 706.)

"I think it can be shown that selves do belong to that objective experience, which, for example, we use to test all scientific hypotheses, and which we distinguish from our imaginations and our ideas, that is, from what we term psychical. The evidence for this is found in the fact that the human organism, in advance of the psychical experiences to which Cooley refers, assumes the attitude of another which it addresses by vocal gesture, and in this attitude addresses itself, thus giving rise to its own self and to the other. In the process of communication there appears a social world of selves standing on the same level of immediate reality as that of the physical world that surrounds us. It is out of this social world that the inner experiences arise which we term psychical, and they serve largely in interpretation of this social world as psychical sensations and percepts serve to interpret the physical objects of our environment. If this is true, social groups are not psychical but are immediately given, though inner experiences are essential for their interpretation. The *locus* of society is not in

the mind, in the sense in which Cooley uses the term, and the approach to it is not by introspection, though what goes on in the inner forum of our experience is essential to meaningful communication." (*Ibid.*, p. 704. See also G. H. Mead, "The Genesis of Self and Social Control," *International Journal of Ethics*, XXXV, No. 3, 1925.)

See also *Mind, Self and Society*, p. 224. Also L. L. Bernard, "The Evolution of Social Consciousness and of the Social Sciences," *Psychological Review*, XXXIX, March, 1932; G. H. Mead, "A Behavioristic Account of the Significant Symbol," *Jr. of Phil.*, XIX, pp. 157–163, 1922; J. F. Markey, "The Place of Language Habits in a Behavioristic Explanation of Consciousness," *Psy. Rev.*, XXXII, pp. 384–401, 1925; also his *The Symbolic Process and Its Integration in Children*, Harcourt, 1928, Ch. 10.

9. "By primary groups I mean those characterized by intimate face-to-face association and cooperation. They are primary in several senses, but chiefly in that they are fundamental in forming the social nature and ideals of the individual. The result of intimate association, psychologically, is a certain fusion of individualities in a common whole, so that one's very self, for many purposes at least, is the common life and purpose of the group. Perhaps the simplest way of describing this wholeness is by saying that it is a 'we'; it involves the sort of sympathy and mutual identification for which 'we' is the natural expression. One lives in the feeling of the whole and finds the chief aims of his will in that feeling." (C. H. Cooley, *Social Organization*, Scribner, 1927, p. 23.)

The use of the phrase "face-to-face" in this definition has been mischievous in giving the impression that the term is definable in terms of geographic space or physical proximity which, as the above quotation and Cooley's whole work clearly indicates, was not intended. To designate nonprimary groups, the phrase "secondary group" is commonly used which is also frequently but erroneously attributed to Cooley. (See E. Faris, "The Primary Group: Essence and Accident," *Amer. Jour. of Soc.*, XXXVIII, July, 1932, pp. 41–50.) "Secondary group" is similarly frequently defined in terms of geographic proximity or in terms of indirect communication involving mechanical devices such as writing, print, telephone, or telegraph. This type of definition is an attempt to define a societal relationship in nonsociological terms, i.e., to define the relationship in terms of geographic rather than social space, and as such, the definition is unworkable. As Faris has said (*op. cit.*, pp. 45, 46):

"If there be group consciousness, *esprit de corps*—a feeling of 'we'—then we have a primary group which will manifest attitudes and behavior appropriate and recognizable. The face-to-face position is a mere accident. Groups of friends and neighbors form primary groups, but the essential quality may be present in groups where spatial contiguity is lacking. The Woman's International League for Peace and Freedom has some hundreds of idealistic pacifists scattered over the world, most of whom have never seen each other. But they are comrades in the cause, are conscious of an enveloping sense of the whole group, think and speak and feel in terms of 'we,' and answer the definition of a primary group. We have shown, on the other hand, that many face-to-face groups lack this quality.

"If our reasoning be sound, it follows that not every family is a primary group and that a school group may or may not be so defined. A domestic tyrant with commands, threats, and punishments may conceivably assemble his subjects around a table thrice daily in a group that lacks the essential qualities of the primary group. Likewise, a teacher may sometimes be the leader of a primary group; but one who has alienated the children may be hated or may be treated abstractly as a mere outsider and functionary in a company where there is no feeling of 'we' and thus no primary group."

See also Section 3 of the present chapter for a further elaboration of this subject.

10. For a good description of personality in terms of membership-character in different groups see J. F. Brown, *Psychology and the Social Order*, McGraw-Hill, 1936, Parts II and III.

11. C. H. Cooley, *op. cit.*, p. 115.

12. Cooley's insistence upon "sympathetic insight" in social observation and research seems to have caused some of his followers to overlook that possibly the methods of physical science may become the finest method of achieving that understanding which is the primary condition of "sympathy." See C. H. Cooley, "The Roots of Social Knowledge," *Amer. Jour. of Soc.*, XXXII, July, 1926, pp. 59–79. See also G. A. Lundberg, "Quantitative Methods in Social Psychology," *Amer. Sociol. Rev.*, I, Feb., 1936, pp. 38–54.

13. The term "imitation" is used in this chapter purely as a concession to popular usage, and with a full realization that this term has little value as an explanation of behavior. It is, in fact, only a term which may be used to indicate similarities observed in behavior. It is recognized also that the responses which constitute the behavior called imitation are not innate or instinctive but are conditioned responses, the secondary stimuli of which are similar to the reactions. As Dashiell has said: "This secondary stimulus may originate either in the same or in another organism, so that imitation may be of self or of another. A child suffers pain, cries, hears himself crying, and the last becomes the stimulus of further crying." (Quoted in Bernard, *Social Psychology*, p. 323. See also J. F. Markey, *The Symbolic Process*, Ch. III.)

14. Cf. L. L. Bernard, *Social Psychology*, p. 342. For a good general discussion see E. B. Holt, *Animal Drive and the Learning Process*, Holt, 1931.

15. Cf. Bernard, *op. cit.*, Ch. 22.

16. T. V. Smith, "Philosophical Ethics and the Social Sciences," *Social Forces*, VII, Sept., 1928, p. 20.

17. For a more complete description and analysis of this process see L. L. Bernard, *op. cit.*, Ch. 27. The reverse of this development may, of course, occur in cases where the conditions in some outside group are deemed preferable. See J. H. Mueller, "Heterocentrism—Proposing a New Term," *Social Forces*, XVII, March, 1939, pp. 414–415.

18. Both Cooley's classification of primary and secondary groups and Sumner's out-groups and in-groups are, as we shall see in a later section, misleading in their rigidly dichotomous nature; actually these categories shade into each other by a gradation in the behaviors involved. (Cf. Brown, *op. cit.*, pp. 116–119.)

19. W. G. Sumner, *Folkways*, Ginn, 1906, pp. 13–14.

20. See Read Bain, "Cultural Integration and Social Conflict," *Amer. Jour. of Sociol.*, XLIV, Jan., 1939, pp. 499–509. Also "Our Schizoid Culture," *Sociology and Social Research*, XIX, Jan.–Feb., 1935, pp. 266–276.

21. The operational definition of maladjustment in purely statistical terms has been discussed in Chapter VI, Sec. C, 3.

22. In some cases the "statesmen" may, of course, have been aware of the consequences but as representatives of constituencies of the type here described, the pressure to act in a way more readily understood by such constituencies would still be the determining influence.

23. Of course, we take here the most charitable view of the situation in assuming that the recommendation of social scientists are tabled chiefly because statesmen and the public have little faith in them. Industry frequently finds it advisable to prevent the diffusion of valuable inventions because the inventions would, if exploited, disturb vested interests (themselves the product of primary group orientation) and profits in the present methods. This process is, of course, even more common in the social field.

24. Thorlief Schelderup-Ebbe, "Social Behavior of Birds," Ch. 20 in *Handbook of Social Psychology*, edited by C. Murchison, Clark University Press, 1935.

25. H. Alpert, "Operational Definitions in Sociology," *Amer. Soc. Rev.*, III, Dec., 1938, pp. 860–861. Alpert continues as follows:

"One recognizes here Max Weber's concept of *Lebenschance* and indeed, I am indebted to Max Weber for the train of thought leading to the definition proposed. The German sociologist, however, unnecessarily places his concept into too narrow an economic context. To him, *Lebenschance* pertains to the concern for the possession of economic goods alone and is related to the conditions of the market of goods and labor. Drawing on Max Weber's discussion, but taking *Lebenschance* out of its economic framework and applying it to social opportunity in general, T. H. Marshall, an English sociologist, has proposed that 'if we are thinking of a Social Class as a group based on a certain resemblance of its members, we must regard it as a group of persons with similar social chances. . . .'" (T. H. Marshall, "Social Class—A Preliminary Analysis," *The Sociological Review*, XXVI, Jan., 1934, p. 60.) (P. 861.)

26. The general use of this term in American sociology began with the Race Relations Survey of the Pacific Coast in which connection the term was conspicuously used by R. E. Park. It has been subsequently popularized through the writings of E. S. Bogardus and a large number of others writing chiefly in *The Journal of Applied Sociology*, and *Sociology and Social Research*. For the best critical review of the literature on the subject see H. Alpert, *Social Distance. A Problem in Sociological Measurement*, M.A. Thesis, Columbia University, 1935 (unpublished). See also W. C. Poole, Jr., "Distance in Sociology," *Amer. Jour. of Soc.*, XXXIII, 1927, pp. 99 ff.

27. The "present" is of course also effective on behavior largely through symbols.

28. For excellent general treatment of the subject see P. Sorokin, *Social Mobility*, Harper, 1927; T. Veblen, *The Theory of the Leisure Class*, Huebsch, 1919;

W. G. Sumner and A. G. Keller, *The Science of Society*, Yale University Press, 1927–29, Vol. 3, Ch. 60.

29. Alpert, *op. cit.*, pp. 21, 23. Alpert reviews various uses as follows: "Social distance sometimes refers to an attitude sometimes to a situation. It may claim kinship to likemindedness or it may refer to cultural similarity. It may be the criterion of social status, that is, of class distinctions or it may be that which sets off levels of achievement. It refers to degrees of intimacy existing between persons and groups, and yet it has reference not to intimacy, but to sympathetic understanding," etc. (Alpert, *op. cit.*, p. 37.) I think operational definitions would readily show that the contrasted categories are certainly not mutually exclusive and probably highly similar in content. Likewise, the question of whether "function" and "rank" vary in some concomitant fashion depends on our definition of these terms. If we choose to assign persons or groups to positions (i.e., arrange them serially—"rank" them) on the basis of function then obviously function and rank have a point-to-point correspondence. Likewise, if we choose to rank people or groups serially on the basis of how well we like them, this is a very *different* basis for designating distance and need not coincide at all with distance measured by other criteria. The important thing is *to specify* the basis used. The same is true for any criterion we select as the basis for the ranking. The terms position, status, and distance contain no inherent suggestion as to what the basis for their designation must be, although traditional usage frequently causes certain criteria to be understood as implied. But it is precisely here that the scientific usage of a word should differ from folk usage. That is, science should be *explicit* in its definitions.

Except for my emphasis upon the need for more specific and operational definition of the concept of social distance, I have no objection to the following definitions:

"(1) Social space is the universe of the human population; (2) man's social position is the totality of his relations toward all groups of a population and, within each of them, toward its members; (3) location of a man's position in this social universe is obtained by ascertaining these relations; (4) the totality of such groups and the totality of the positions within each of them compose a system of social coordinates which permits us to define the social position of any man." (P. Sorokin, *Social Mobility*, p. 6.)

"[Social distance] refers to the different degrees of sympathetic understanding that exist between persons, between groups, and between persons and groups." (E. S. Bogardus, *Sociology*, 1934, p. 75.)

"*Social* distance is the bar to free intercourse between individuals which arises from their belonging to groups rated as superior or inferior in status." (R. M. MacIver, *Society: A Text Book of Sociology*, Farrar and Rinehart, 1937, p. 173.)

30. It is not conventional at present to measure weight and temperature with a yardstick or with a pound scale. But the readings of both weight and temperature could readily be converted into centimeter or inch distance-units on a steel bar or on a glass tube. We should then have to specify in each case whether we meant temperature-centimeters or weight-centimeters, just as in social distance measures we now need to specify in each case whether we mean economic dis-

tance, religious distance, interdependence distance, or what not. As measuring scales of these phenomena become more common, we shall doubtless adopt the practice already familiar in other fields, namely, of calling the distance-units measuring particular phenomena by special names. Thus, distance-units on a thermometer are called degrees, on a weight-scale they are called pounds, etc. Already it has been suggested that economic distance-units on a certain scale be called "ammains" (adult male maintenance). (See E. Sydenstricker and W. I. King, "The Measurement of Relative Economic Status of Families," *Journal of the American Statistical Association*, XVII, Sept., 1921, pp. 842–859.) We are so habituated to certain measuring scales in the other sciences that it is not necessary to specify which instrument to use in different situations or to account for the instrument. Originally, the same kind of explanation and defense of these at present generally accepted instruments was doubtless necessary. All scales are merely standardized order-symbols in terms of which various kinds of responses of different degrees can be objectively expressed. Through long habituation we acquire the notion that distance, weight, etc., are *things* or qualities inherently associated with certain subject matter.

31. For a review of this literature see G. and L. Murphy and T. Newcomb, *Experimental Social Psychology*, Harper, 1937, Rev. Ed., 1937, Ch. 7, especially pp. 397–404. Also M. May and L. Doob, *Competition and Cooperation*, Social Science Research Council, 1937, Ch. 3, and the accompanying bibliography.

32. C. H. Cooley, *Human Nature and the Social Order*, Scribner, 1902.

33. W. G. Sumner, *Folkways*, pp. 12–15.

34. T. Veblen, *The Theory of the Leisure Class*.

35. W. G. Sumner and A. G. Keller, *The Science of Society*, Vol. 3, Ch. 60.

36. F. S. Chapin, *The Measurement of Social Status by the Use of the Social Status Scale*, University of Minnesota Press, 1933. Or see also the same author's *Contemporary American Institutions*, Harper, 1935, Ch. 19. For a bibliography and index of the large number of tests already available for the measurement of societal and psychological phenomena see O. K. Buros, *Educational, Psychological and Personality Tests of 1936* (including a bibliography and book review digest of measurement books and monographs of 1933–36), School of Education, Rutgers University, New Brunswick, N. J., 1937.

37. It might be argued that mutual or one-sided dependence or communication is itself a condition involving status and that, therefore, all societal distance measures are measures of status. This interpretation is entirely permissible under the present treatment of the subject as our main contention has been that any societal distance or status measure is ambiguous or vague unless it specifies with respect to what criterion the distance is measured. If it is found convenient to describe degrees of interdependence or communication in spatial terms, then differences of degree in these phenomena may also be termed a type of societal distance.

38. Dodd summarizes the construction application and results of the test as follows: "Five statements of attitude ranging from friendly to hostile were so chosen, from a set of thirty-nine statements by the ratings of sixty judges, as to secure (a) equidistance between statements, (b) minimal ambiguity, (c) maxi-

mal reliability. Four tests were constructed applying these five statements to fifteen national groups, eleven religious groups, five economic levels, and three educational levels in the Near East. On correlating the tests as given to 170 Freshmen with the results from a repetition after a month, the distances between groups showed reliability correlations varying from .70 to .96. Tables of the 174 distances between all pairs of groups and between in-groups and out-groups were computed. This technic yields possibilities of quantitative definitions of various sociological concepts. Economic groups desire to ascend but they prefer to remain in familiar in-groups rather than become too intimate with a very different out-group. An experimental attempt was made to modify religious distances through a college course. The greatest gain in friendliness was toward the Bahais and the Jews." (S. C. Dodd, "A Social Distance Test in the Near East," *Amer. Jour. of Soc.*, XLI, Sept., 1935, p. 194.)

39. "The educational grouping included three groups: illiterates, college graduates, and people with some intermediate amount of schooling.

"The economic grouping comprised five groups, defined as: (1) A person earning less than 25 Syrian piasters daily. (2) An unskilled worker earning between 25 piasters and one Syrian pound. (3) A skilled worker earning between 1 and 4 Syrian pounds daily. (4) A well-to-do person earning between 4 and 16 Syrian pounds daily, or between approximately 1,500 and 6,000 Syrian pounds annually. (5) A very wealthy person receiving between 16 and 64 Syrian pounds daily, or between 6,000 and 24,000 Syrian pounds annually. The income in each level is approximately four times the income in the next lower level.

"The fifteen national groups chosen were American, Armenian, British, Chinese, Egyptian, French, Greek, Iraqi, Italian, Jewish, Kurdish, Negro, Palestinian, Syrian, and Turkish.

"These represent all the important national or racial elements in the Arabic Near East. They insure securing distances between western and imperialistic groups and eastern or dominated groups, between majority and minority groups in each country, between Arabic-speaking peoples arbitrarily divided by national boundaries, between color groups, between highly friendly groups, and groups all of whom (excepting, perhaps, the Negroes) have been within the past twenty years expatriating, massacring, or at least officially at war with, some others in the list.

"The eleven groups in this religious grouping were Atheist, Armenian Gregorian, Bahai, Druze, Greek Orthodox, Jew, Protestant, Roman Catholic or Latin, Sunnite Moslem, Shiite Moslem, and Syriac. This list represents the chief religious groups in the region." (*Ibid.*, pp. 195–196.)

40. This reaction to *members in general* of a group is, of course, a response to a symbol such as "Turk," "Moslem," "illiterate," or "poor." To the extent that a given person (i.e., an individual with all his social connections) is classified under any of the above categories, the reaction to the class symbol is the same as the reaction to any member of the class.

41. Cf. P. Sorokin, "A Neglected Factor of War," *Amer. Sociol. Rev.*, III, Aug., 1938, p. 478. (Quoted in Ch. 7, note 48.)

42. See also J. L. Moreno, *Who Shall Survive? A New Approach to the Problem*

of Human Interrelations, Nervous and Mental Disease Publishing Co., 1934, Part IV, "Construction and Reconstruction of Groups."

43. See note 9 above.

44. This is not to suggest, of course, that such characteristics as nationality, education, religion, and economic level are intrinsically "simple" or "elemental" qualities. They are subject to further analysis to any degree desired. The combination of indices of the constituent behavior-elements in education, for example, would, of course, make education a composite index.

45. J. L. Moreno, *op. cit.*

46. See G. A. Lundberg and Mary Steele, "Social Attraction-Patterns in a Village," *Sociometry*, I, Jan.–Apr., 1938, pp. 375–419, for an attempt to determine some of these conditions.

47. See notes 34 and 35 above. S. H. Jameson has studied the same phenomenon as it applies to organizations. See his *Status and Social Welfare Organizations*, University of Southern California Press, Los Angeles, 1934.

48. See Jerome Davis, "Testing the Social Attitudes of Children in Government Schools in Russia," *Amer. Jour. of Sociology*, XXXII, 1927, pp. 947–952.

49. George H. Mead, *Mind, Self and Society*, p. 229.

50. R. M. MacIver, *op. cit.*, p. 173.

51. P. Sorokin, *Social Mobility*, Harper, 1927, p. 6.

PART III

THE PRINCIPAL SECTORS OF SOCIETY

¶"*The natural sciences did not start with a perfect technique and there is no reason to believe that sociology will not perfect its technique as it grows. . . . But in many fields of scientific investigation, the so-called foundations are less secure than the superstructure erected upon them. Scientific procedure, especially in new fields, can scarcely dispense with a certain amount of intuitive performance. . . . Scientific labor will, of course, never be satisfied with a vague and intuitive treatment of details, but science would be doomed to sterility in new fields if it had to wait for a completely formulated methodology and technique.*"—The Social Theory of Georg Simmel, *by N. J. Spykman. (University of Chicago Press, 1925, p. 78.)*

INTRODUCTION TO PART III

In Part II we have discussed those processes which are at present considered fundamental in the description of human societal behavior. We turn now to a brief survey of the more specific and detailed manifestations of these processes as they appear in the four principal sectors under which we have chosen to describe societal phenomena. We referred in Chapter III to the classification of these sectors as Folk, Work, and Place. Roughly corresponding to these categories, we have adopted "Groups" or "Plurels" (P) as our symbol for "Folk." We have broadened the category "Work" to include also other than occupational characteristics as "Characteristics" or "Indicators" (I). "Place" we take to include geographic, ecological or other spatial aspects (L) of societal behavior. To these sectors we have added explicitly the category Time (Change, T). We have at all times recognized that these sectors as well as any others that might have been selected are purely constructs of convenience. They are not "discoveries" of "necessary" or "inherent" classifications given in nature. We merely adopt them as convenient categories in terms of which to designate the major aspects of societal behavior from the point of view we have adopted.

The attempt to deal with some of the concrete content of these respective aspects of society within the space here at our disposal necessarily involved a high degree of selectivity. From the standpoint of a full and rounded treatment of the various subjects touched upon in Part III, the treatment will therefore appear sketchy, uneven, and inadequate. No one must expect, for example, to receive from Chapter X (Institutions) a complete account of the present status of economic and political science, not to mention a summary of the large literature on the family, religion, and other institutions. Nor should it be assumed that we have overlooked or that we regard as less important much of the subject matter which considerations of space and our present purpose have caused us to omit entirely.

The subjects we have selected for consideration in the follow-

ing chapters have been chosen primarily to illustrate some of the implications of the position we have taken in Parts I and II, as this viewpoint affects our approach to the current problems and subject matter of sociology. The more complete treatment of this subject matter must necessarily be left to the specialized treatises and monographs on the various subjects touched. The notes appended to each chapter refer with some fullness to this literature.*

* The student who is not already familiar with the general subject matter of the following chapters or the teacher who wishes to extend his course to a more detailed treatment of the subjects touched in Part III, may be referred specifically to the following sources as supplementary reading for each chapter:

Chapter IX (Types of Groups):

E. E. Eubank, *The Concepts of Sociology*, Heath, 1932, Ch. 8.

P. Sorokin, C. Zimmerman, and C. J. Galpin, *A Systematic Source Book in Rural Sociology*, University of Minnesota Press, 1930, Vol. 1, Ch. 6.

R. T. LaPiere, *Collective Behavior*, McGraw-Hill, 1938.

Chapter X (Institutions):

F. S. Chapin, *Contemporary American Institutions*, Harper, 1935.

Chapter XI (Demographic Aspects):

W. S. Thompson, *Population Problems*, McGraw-Hill, 1930.

F. Lorimer and F. Osborn, *Dynamics of Population*, Macmillan, 1934.

Chapter XII (Ecology):

R. E. Park, E. W. Burgess, and R. D. McKenzie, *The City*, University of Chicago Press, 1925.

E. W. Burgess, Editor, *The Urban Community*, University of Chicago Press, 1925.

Chapter XIII (Change):

W. F. Ogburn, *Social Change*, Viking, 1922.

F. S. Chapin, *Cultural Change*, Century, 1928.

Recent Social Trends, McGraw-Hill, 1933. Report of the President's Research Committee on Social Trends. Especially Vol. I, Ch. 3.

Chapter IX

TYPES OF GROUPS: (POPULATIONS—P)

A. A CLASSIFICATION OF HUMAN PLURELS

We described in Chapter V some of the mechanisms of organic behavior. Mechanism was taken to mean any arrangement or relation of parts or conditions which results in a given observable effect or event. From the dynamic point of view these effects or events are called "behavior" or "function." From the static point of view, we call these same phenomena "structure." A societal mechanism might be briefly defined, therefore, in terms of the type of group it produces. Conversely, a group may be defined in terms of the mechanism by which the group is produced. That is, structure is merely a *persistent* function and function is merely a series of changing structures.

When we turn to a discussion of societal structure, therefore, we are merely considering phenomena from a certain point of view. *Plurel, aggregation, group* and a large number of other collective nouns which we shall define below, are merely convenient designations of data according to similarities and differences among them, on the basis of any criterion or aspect that interests us. All the items that are sufficiently similar according to the criterion (aspect) adopted so that they may be regarded as the same (i.e., we respond to each item in the same way) are then said to belong to the same *class.*[1] The word *category* is frequently used to designate those symbolized selective responses to all-items-of-given-characteristics, *as a unit.*

We described in Chapter III the nature of selective responses and the resulting classifications and categories with which man symbolizes these responses. We showed in this connection that all our designations of "parts" of our universe are such selective responses. These responses are, in the first place, the result of the tensions ("interests," "purposes") of the organism at any given time in relation to its environment. The responses calculated to relieve this tension become, when generalized, habitu-

alized, and symbolized, the categories in terms of which we describe and deal symbolically with our world.

We have frequently referred also in previous chapters to the function of classification in general and of science in particular as a device for economizing our response energies by habitualizing them. Through classification, one habitual (conditioned) response will serve for a multitude of individual cases. Comte considered it as one of the functions of science to protect us from *consternation.*[2] We become free from this feeling of insecurity in proportion as we equip ourselves with a system of integrated response-habits in terms of which we can promptly respond to any new situation with facility. These response-habits when symbolized become our categories of classifications. Systems of classifications in their dynamic relationships constitute our ideologies, such as science or theology. A classification of societal groups, therefore, is an attempt to designate convenient generalized ways of responding to the static aspect of human interrelationships. Group designations, like other classifications, are not to be regarded as inherent divisions given in nature.

It follows that all *designations* of any *classifications* (*selective responses*) whatsoever are *categories*. But the *bases* of the classifications may be of any number and variety. We may again classify these classifications according to their bases. That is, the designations (1) "family" and "team," (2) "proletariat" and "intelligentsia," and (3) chance "aggregations," such as the people in an elevator, are all *categories* representing classifications. But for sociological purposes they may be conveniently distinguished on the basis of the degree or type of interaction which obtains between the members of the plurels designated by each category. On this basis, we use in the present volume the following designations of different types of classifications of human beings.

(1) *Plurel* designates "any plural number of things to which we respond as a whole, in contra-distinction from the single units of which the whole is composed." Plurel "has no other denotation or connotation. Its sole meaning is that of plural integers regarded as a collective entity. In numbers it may range from two to infinity." [3] Human plurel, therefore, refers to any plurality, collectivity, aggregation, class, or group of *homo sapiens.*

(2) *Class* [4] designates *any* assortment of people according to specified similarities and differences of the constituent members or their situation. Classes may be designated according to *any criteria whatever*, including degrees of *spatial proximity*, a given degree of which we shall adopt as the basis of *aggregation*. Likewise we shall adopt degrees of *interaction* as the basis of another special classification, namely, *group*. That is, the relatively "crowded" as well as the relatively "isolated" or "scattered," in a geographic sense, are classes just as truly as are the "proletariat," the "old," and the "intelligentsia." We use class, then, to designate plurels of *any* specified characteristics, whereas "aggregate," "group," and many other designations to be used below, are words designating plurels with a definite principal characteristic. Plurels with this principal characteristic, according to which the plurel is classified, may also, of course, have an indefinite number of other characteristics.

(3) *Aggregation*, as indicated above, designates, then, any plurel in which the constituent numbers are in *geographic proximity*. The latter is relative, of course, and would have to be defined in any given case in terms of some stated degree. In the absence of such stated degree, aggregation is used to designate plurels in which this aspect of relative proximity is relevant or of interest and when interaction to a significant degree is lacking.

(4) *Group*, as has also been noted above, is a word used in sociology to designate any plurel within which observable interaction is present.[5]

It should be clear from the above definitions of common sociological terms that (1) *all* definition and classification is a way of responding to phenomena according to some criteria of similarity or difference or other aspect and that therefore (2) no classification has any intrinsically greater reality or existence than any other. Take, for example, Eubank's statement that such categories as proletariat and intelligentsia are a way of designating that the items included "are merely *thought of* together. Between the objects themselves there need not be and frequently is not, the slightest degree of contact or even proximity. The basis of their being clustered in thought is that some point of similarity, real or supposed, leads the mind to include them in a common context." [6] This statement illustrates again a point we have fre-

quently stressed in preceding chapters, namely the fallacious assumption that some categories represent intrinsic realities while others "exist" only in the "mind." Obviously, proximity or the lack of it is just as truly a point of similarity or difference—a characteristic of a situation—as age, sex, or wealth. By virtue of a certain ready and immediate verifiability of the referents of certain categories as compared with others, the former are credited with an intrinsic existence which the latter are not allowed. Once "proletariat" is as definitely defined in terms of function or political belief as is "family" in terms of "those who live in a certain house," or "a group among which certain relations exist," the former is as "actual" or "existent" as the other. They differ as entities only in the criterion on the basis of which each becomes the object of a selective response. We shall return to this subject later in this chapter.

The basic and overshadowing importance of classification in all sciences requires no elaboration. Except for the selective responses which constitute classification and the categories with which we designate these classifications, the world to which we respond would appear to be completely chaotic. Events would be to us devoid of order, system, or predictability. Logicians, mathematicians, and scientists have accordingly always been concerned with the problem of developing symbolic systems and rules to facilitate and render more accurate this fundamental symbolic process. The tremendous importance of a classification such as Mendeléeff's Periodic Table of Chemical Elements, both as an orderly arrangement of known phenomena and an instrument of further discovery, can hardly be exaggerated. Linné's classification of plants enormously advanced the science of botany. Perhaps the most important aspect of Dodd's S-theory is its comprehensive attack upon the problem of classification of societal phenomena.[7] For a comprehensive treatment of the theory of classification, the student must be referred to more general treatises on methodology and logic. The work of Karl Menger, to which we shall return later, formulates an exact theory of societal groups and relations and is of special interest in the present connection.[8]

The problem which confronts us in the present chapter is only a part of the larger problem of classification of all societal phenomena in terms of some general common factors. We are here

interested primarily in a convenient classification of societal *groups*—a classification of societal *structures* or *organizations*—as at present identified and defined. From such a preliminary classification, the needs, justification, and possible bases for further extensions will appear.

B. TYPES OF ORGANIC PLURELS

A vast variety of types of groupings have been distinguished within the organic world. Fairly detailed and verifiable descriptions have been made of plurels of living organisms and of plants and the lower animal species. Such words as "colony," "herd," "hive," "swarm," "community," "association," and "society" are designations of kinds of plurels. Extensive classifications of such plurels have been worked out. Thus Wheeler says that "there are fully 10,000 species of social insects, each of which may be said to have its own peculiar pattern of social behavior."[9] This statement deserves especial attention on the part of those who are fond of calling attention to the staggering multiplicity of human cultures as evidence of the hopelessness of the task of social scientists. We are interested here not in developing equally complete or exhaustive classification of human plurels, but rather in suggesting a bases for such classification in terms of degrees of interaction. As a summary of the whole field, however, we may accept Wheeler's [10] seven-fold general classification of all organic plurels.

First, there are the loose and unstable aggregations of the same or different species which are assembled and kept together mainly by their tropistic or sensory responses to various local environmental stimuli or to interindividual stimuli or to combinations of these. Examples of these aggregates are very frequent among Protozoa, Invertebrates, and cold-blooded Vertebrates. The mating congregations of many insects, migratory swarms of locusts, the concentration of May flies about a light where they have been collected by forced movement as a result of their strongly positive phototropism, and other similar phenomena are examples of this type of social grouping.

A second class of aggregation is the compact and mainly nutritive con-sociations exemplified by the multicellular bodies of all

Metazoan animals, the zooidal colonies of many Coelenterates, Bryozoans, Annelids, etc.

"A third category comprises the peculiar 'food associations,' consisting of individuals of two different species, of which one may be a plant, and exhibiting various kinds and degrees of intimacy as in cases of predatism, parasitoidism, parasitism, commensalism, domestication, symbiosis, fungus-culture, the associations of mites, ants, and beetles with certain peculiarly specialized plants, and the vaguer phenomena of myrmecochory, mimicry, etc." These food associations are the subject matter of the special science of parasitology.

"A fourth category comprises the flocks and herds of the birds and mammals and include as their most highly developed examples the troops or bands of monkeys and Anthropoid apes.

"A fifth category would comprise the insect societies both temporary (sub-social) and permanent," which in their relations with their food-organisms or plants have also been listed in the third category above.

The sixth category is reserved for human societies.

Finally, the seventh category comprises those co-associations of animals and plants of various species including man, attached to particular ecological environments, such as the interdependent, faunal, and floral elements of a forest, stream, or sand dune. This last category is really equivalent in its fullest interpretation to the biosphere or "web of life," "the thin, more or less discontinuous film of living matter covering the lithosphere and pervading the hygrosphere of our planet." [11]

We shall be concerned in this book chiefly with the sixth of the above categories, namely, the behavior of groupings resulting from the interaction of human beings. Since this behavior cannot be studied except in relation to the surrounding environment we shall necessarily make constant references also to the phenomena of category seven. But we shall be concerned here chiefly with those products of *the interaction of human beings, individually and collectively, upon each other and upon the environment.* That is, we shall confine ourselves to the study of the behavior of *groups* as already defined, rather than with plurels or aggregates as a whole. From our definitions all *groups* and all *aggregates* are plurels; but aggregates and plurels may or may not be

groups. *Human interactivity,* chiefly the symbolic, is the aspect which interests us. In selecting this aspect, we recognize the arbitrary nature of the selection. We fully realize that the universe is a continuous and inextricably interconnected phenomenon. Limitations of our senses as well as specific problems and interests compel us to study one or a few aspects at a time. We select here as our central interest human interaction with each other as individuals or as groups and their interaction with the environment. This behavior and its products (usually called "culture") will be the chief object of our study. The more general exploitation of the biosphere must be left, as a necessary division of labor, to animal ecologists and other scientists.

C. THE PROBLEM OF CLASSIFICATION OF GROUPS

As we have frequently pointed out in previous discussions of selective responses, classifications, and frames of reference, the tension (the problem or "purpose") which we experience at a given time determines both the basis and the categories of a useful classification. Insofar as a classification serves its purpose, therefore, it is *ipso facto* justified. We shall not here attempt the colossal task of presenting all the possibly useful classifications of societal groups from all conceivable points of view. We shall not even catalog the numerous classification systems that various sociologists have proposed. New situations and new problems will call always for new classifications. More important from a scientific point of view is *a theory, a system, and set of categories* (preferably few) in terms of which exhaustive classification according to *any* practical purpose might be possible. Chemistry, for example, has such a set of categories and such a system of classification in its elements, its compounds, and its various measures of the degrees to which these basic components are present. Physics has a similarly complete and flexible set of categories and units. Other sciences have more or less adequate classification schemes, all looking in the same general direction.[12] Dodd's classification, mentioned above, starts from the premise that since all human groups consist of (1) *people* (population, plurels P) this is a basic common factor of all groups. What makes groups different are (2) characteristics represented by *indicators*

(I), of which (3) Time (T) and (4) Place or Length (L) are at present most objectively assignable. Other distinguishing characteristics of groups or situations are in the meantime designated by the units of whatever Indicators represent the significant characteristics in question. For the details of this classification the reader is referred to Dodd's *Dimensions of Society*. We shall concern ourselves here chiefly with the general problem of classification of societal groups rather than with a review of all existing classifications.

The various existing classifications are, of course, highly valuable material upon which new methods of classification will necessarily rely in large part. For example, Eubank has summarized from current sociological literature, some dozens of classifications of groups under seven general headings: (1) Ethno-anthropological, (2) general social, (3) cultural level, (4) structural, (5) functional, (6) according to extent of contact, and (7) according to the nature of the uniting bond.[13] Is it possible that some or all of these classifications have underlying common factors in terms of which each might be translated into the other? In order to explore and illustrate this possibility we shall select such categories as serve that purpose without pretending that they necessarily represent a complete system. This is not to imply that comprehensive and detailed classifications of human groupings are not important, just as Linné's classifications of botanical life were important in that field, or as classifications of metals are important in physics and chemistry. We do not attempt such complete classifications of human plurels in the present connection because we are primarily interested in more general phases of our subject. Furthermore, a comprehensive system of categories to embrace any field of phenomena are not to be worked out from the armchair or even through a sociological conference. They can be arrived at only through careful experimentation and testing in the course of empirical research. The nature and direction of such research is here my main interest.

D. TYPES OF GROUPS

Since the phenomena that are distinctively societal are the result of human interaction chiefly, the notion of a completely

isolated individual is regarded in sociology as purely hypothetical. Societal phenomena appear only when at least two persons interact. The individual comes within the purview of sociology only as a *socius* (companion) or a *person* (an individual with status). The person is an individual who by virtue of his symbolic equipment behaves to some extent (e.g., "in his thoughts") with reference to some other person or persons, however isolated geographically each may be. We traced in the preceding chapter the process by which this distinctively societal phenomenon develops.

The most elementary unit of sociology is, then, the person, that is, the individual *with his societal conditionings*. Spykman, following Simmel has called this elementary societal unit "The Monad." [14] Since the latter presupposes interaction between at least two individuals, a classification of human groups may practically begin with the *pair* or the *dyad*. From the historical point of view it is customary to begin with the primitive horde as the earliest and most elemental form of human society. It is thought of as a random, roving band of food gatherers varying in numbers and with loose and informal associative bonds. From this nucleus the more clearly defined and self-conscious community is believed to have emerged in response to more stable conditions of life. Other students prefer to regard the family as the original societal unit on account of its procreative function. These viewpoints are, of course, not necessarily mutually incompatible and undoubtedly correspond roughly with historical fact. For systematic theoretical purposes of classification, however, we may neglect the historical sequence, if any, in which types of groups developed in order to emphasize certain relationships and characteristics which may be of analytical importance without reference to order of development. We shall therefore proceed to characterize the types of groups most commonly recognized in current sociological analysis in order to appraise the completeness and adequacy of these classifications. More especially, we wish to discover workable criteria upon which a more comprehensive, parsimonious, and objective system of classification might be developed.

The sociology of the monad as represented by hermits and other isolated cases has been the subject of considerable litera-

ture, much of it of a biographical and imaginative sort. In addition to classical accounts such as that of Robinson Crusoe, there exists a large literature of case records of prisoners and other solitary characters.[15] Likewise, the pair or dyad, the triad, etc. are the subject of a vast case literature as well as considerable theoretical discussion. Thus, L. von Wiese and H. Becker have proposed the accompanying classification of the dyad.

TABLE 4. CLASSIFICATION OF DYADIC GROUP

(From L. von Wiese and H. Becker, Systematic Sociology, p. 509.)

I. Typical (Genuine) Pairs
   A. Sexual pairs
      1. Heterosexual
         a. Premarital and extramarital
         b. Marital
      2. Homosexual
         (The homosexual male or female groups are divergent types, of interest only in specialized sociological study; whether or not they belong in the field of social pathology cannot be decided here)
   B. Generation pairs
      1. Father-son group
      2. Father-daughter group
      3. Mother-son group
      4. Mother-daughter group
      5. Parental pair
      6. Sibling pair
      7. More general: adult-child group
   C. Friendship pair

II. Atypical (Derivative) Pairs
   (Only a few of the more important examples of atypical groups can be given here)
   A. Superior-subordinate (frequently but not always in pair relationship)
      1. Professor-assistant
      2. Captain-mate
      3. Physician-nurse
      4. Officer-orderly
      5. Political boss-henchman
      Etc.
   B. Aider-aided
      1. Physician-patient
      2. Supervisor-delinquent
      3. Pastor-parishioner
      4. Attendant-inmate
      5. Social worker-client
      Etc.
   C. Teacher-pupil

D. Pairs primarily conditioned by the economic order

1. Master-journeyman
2. Master-apprentice
3. Foreman-workman
4. Engineer-fireman
5. Mistress-maid
6. Guide-tourist
7. Executive-secretary

Etc.

As the classification indicates, this type of enumeration of actual possible pairs could be extended indefinitely to include all possible mutual relationships between two people. In addition, we need for scientific purposes a more *generalized* classification in terms of some *common factor present in all dyads* and in terms of which actual cases could be described and classified. The above authors recognize this in their perspicuous theoretical discussions of the dyad, the triad, etc.[16] We shall return to this problem below. In the meantime, it should be clear that inquiry into the numerous and intricate societal relationships existing in these elementary groups is a rich field for research.

The more detailed and objective studies of societal grouping on its more elementary levels have been up to the present largely confined to observations of the spontaneous groupings of school children and other institutional populations.[17] Thus, it has been observed, as we have noted in a previous chapter, that babies at ages from 20 to 28 weeks first begin to react noticeably toward each other, without selectivity, however, except on a basis of physical proximity. That is, societal proximity or distance correlates highly with physical proximity or distance. At ages from 40 to 42 weeks, babies begin to show signs of selective responsiveness on other bases than physical proximity. Other studies have dealt with the spontaneous assortive groupings of young children when turned into a school yard or into a play room. Among children sufficiently developed linguistically to make verbal choices, more complete studies have been made of groupings of school children based on mutual or one-sided attractions and repulsions.

The next step forward in studies of this kind has been taken by Moreno in undertaking to chart the attraction-repulsion patterns of an entire institutional community. Moreno asked all the members of the State Training School for Girls at Hudson, New York, to indicate their choices, in order from one to five, of the community with whom each would like to occupy the same house. The choices were confidential and it was definitely understood

that they would become the basis for a reassignment to different houses. This is a closed community with a population of between five and six hundred. The girls live in sixteen cottages each with a housemother. Tabulation of the choices of desired housemate, including housemothers, revealed an intricate set of sociological nuclei of five principal types.

(1) The most elementary and definite nucleus was the mutual first choice of two or more individuals among themselves. This might be represented by figures of couples, triangles, squares, circles, or figures of more intricate dimensions.

(2) Then there were the patterns most simply represented by chains of a non-mutual character, as, for example, when A chooses B, B chooses C, and C chooses A. Such chains might, of course, consist of any number of individuals.

(3) A third type of configuration resulted from a clustering of a large number of choices around a single individual, to some of which this "star" may respond by mutual choice, to others by indifference, and to others by repulsion. (This information regarding indifference and repulsion was secured through separate private interviews.)

(4) A fourth type of nucleation, of great practical significance, was the phenomenon of the powerful as contrasted with the popular individual, and the phenomenon of indirect influence. Thus, an individual may be the object of a large number of choices by people relatively isolated from the rest of the community. The center of such a cluster of choices may be very popular with his immediate group but may not have very much influence in the community because of the limited contacts of his admirers. On the other hand, an individual chosen by only a few may wield a powerful indirect influence by virtue of the extensive connections of the few popular persons for whom he is a center of attraction. Thus, Moreno cites one case, herself chosen by only four individuals, all of whose attraction she reciprocates. But these four are in their turn chosen by nearly one hundred individuals. This seems to be the sociological position of the "power behind the throne" and the "dark horse" who wields the real power through the personalities of popular nominal leaders. As Moreno has pointed out, "the distribution of power in large groups depends upon the intricate distribution of emotional currents. An individ-

ual who is in control and can steer the course of one of these currents can wield an immense potential influence out of all proportion to his immediate following." [18]

(5) Finally, there is the isolated individual, chosen by nobody, although he may choose some other persons. Such individuals are almost certain to be maladjusted and to cause maladjustment in any group with which they have to live. Sometimes, to be sure, such individuals, not chosen by anyone as housemates, may, however, be chosen as desirable work companions, so that isolation is always with reference to a criterion. The completely isolated individual would be one who was not chosen by anyone as an associate in any of the activities or relations of a community. Such an individual could not be very sensitive to the behavior standards of the community because he is cut off from the currents which constitute the pressures by which these standards become operative on the individual, and hence he would almost certainly be a social problem.

As was to be expected, Moreno found that a knowledge of the societal energy patterns of his community enabled him to explain events which occurred, such as a series of runaways, and, what is more important, it also enabled him to organize the community so as to relieve tensions and cause the virtual disappearance of certain types of maladjustment. He also suggests the applicability of these methods in the social as well as in the physical planning of other than institutional communities, for example, such as those projected by the Resettlement Administration.[19]

The five general types of grouping summarized above are, of course, subject to extensive variation, elaboration, and sub-classification. On the basis of their recurrence in actual studies of a population, Moreno has summarized, in the volume referred to, the more common types.[20]

Now the individuals attracted to another individual regarded as a nucleus [21] together with the individuals to which this nucleus is attracted, any or all of which attractions may or may not be mutual, may be regarded as a social atom [22] with reference to any societal behavior. Thus, each individual, provided he is not socially isolated, is the nucleus of one or more social atoms according to the number of relationships in which he is the center of attraction. He may at the same time be the nucleus of one or

more atoms and part of the electronic system of other atoms. These atomic structures may therefore overlap in a tremendous intricacy of interrelationship, each individual being at the same time part of numerous diverse structures, but in various degrees of completeness or intensity.[23]

In addition to the types of grouping here described and found to recur in an actual population, there are, of course, other theoretical and actual possibilities as well as very numerous possibilities of combinations of these elemental types into compound groups, the constituent members (groups) of which might be characterized by the same (and additional) relationships as have here been described between individuals composing the elementary groups. If we consider the number of possible relations between only two people (or groups) on the basis of some limited types or degrees of relationship, such as attraction-indifference-repulsion, or dominance-equality-submission, we find the following six possible combinations and nine group structures.

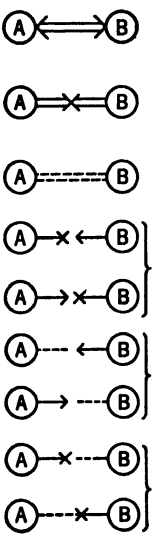


FIG. 5

Three types or degrees of relationship between two individuals (or groups) obviously make possible six types of pairs and nine structurally different societal group relationships. The two combinations given in each of cases 4, 5, and 6 may be regarded as structurally similar but not necessarily the same for all so-

ciological purposes. For example, if in these cases A represents a man and B a woman, or A represents a father and B represents a son, a daughter, or a wife, the two situations in each of cases 4, 5, and 6 might be quite different for some sociological purposes, although for other purposes these combinations may be regarded as structurally the same. Both the combinations and the group structures given in the above figure are, therefore, of sociological interest.

If another person is added to the group of two diagrammed above, the number of possible different relations between the members of the resulting group of three increases to fifty-six combinations.[24] As the number of persons in a group and/or the relations or relationship-degrees between them increases, the number of possible different societal groups becomes increasingly large. Empirical research will have to determine how many of these theoretically possible groups are to be found in actual situations and how many of them turn out to be significantly different sociologically. In the meantime, the importance of this kind of analysis is that it provides us with "a survey of all forms of organization conceivable in given situations."

Karl Menger has outlined in rigorous logic such a complete theory of groups and pointed out its practical as well as its scientific usefulness. A partial account of his procedure is given in the notes.[25] The following comments by Menger upon his own classification system are also a good summary of the problems and significance of the type of analysis given above, as well as a good statement of the relation and value of all theoretical scientific analyses to practical problems:

"More complicated are problems involving quantitative questions. There are cases in which the number of members in each group plays a role. The attitude of a man toward a group may depend upon whether the group does not contain less than a certain minimum or more than a certain maximum of members. Still more complicated are problems involving quantities which may assume a continuum of values. In the study of the relations of groups in questions of taxation or in the case of contributions to a common enterprise the amount of money is such a quantity. Some problems of this kind are rather complicated mathematically.

"Of the practical applications of a sociological theory one frequently expects advice as to what ought to happen and predictions as to what

will happen. Advice, I believe, cannot be obtained from any theory at all. A theory can at the best explain how to attain aims. . . . Predictions of more or less probability may result from some inductive sociological research but can hardly be expected from a deductive theory as outlined in this paper. What, then, are its practical applications?

"What such a theory does is to provide us with a survey of all forms of organization conceivable in given situations. It exhibits all divisions of a group into consistent harmonious groups. It may decide whether, in cases of incompatible aims of different subgroups, it is necessary to devise totalitarian measures valid for all subgroups but meeting with the resistance of some of them. It may also, in some cases, suggest other possibilities, such as measures to be applied only to certain subgroups.

"If we compare systematically the possibilities considered in the theory with social reality we shall certainly find that some of the theoretical possibilities do not at present exist. The reason for their nonexistence in most cases is likely to be that they displease everybody or almost everybody; but in some cases the reason may simply be that they had been overlooked as possibilities actually attainable. The practical applications of the theory lie here in pointing out new possibilities which may have been overlooked. Though naturally leaving to the will of individuals and groups the choice and decision as to which form of organization shall actually be adopted, the theory enlarges the field within which we may choose, and thus may eventually prove of considerable practical importance." [26]

The intricacy and overlapping of membership in various groups has rightly received much attention from sociologists. A common statement is that "institutions consist of persons but not of whole persons." The same statement would doubtless hold for nearly every societal group. G. H. Mead defined sociality as "the capacity of being several things at once." [27] Another common statement is that a person "belongs" to as many groups as he has "interests." We described in the preceding chapter the process by which the individual achieves membership-character in various groups. Membership consists of a certain kind of behavior toward members as contrasted with our behavior toward nonmembers. Any such "membership behavior" identifies us with the group toward which we practice this behavior, and makes us, sociologically speaking, a member of that group, quite apart from the formalities that are usually thought of as constituting formal membership. Affinities, friendships, and publics as well as "organizations," clubs, and fraternities consist of persons who behave a certain way with reference to each other, and this behavior

constitutes their *de facto* societal membership in these groups. It follows that the same person may belong to any number and variety of groups, including groups of contradictory characteristics, especially in the case of schizoid personalities. Chapin's diagrammatic representations in Figures 6 and 7 summarize the phenomenon with great clarity.[28]

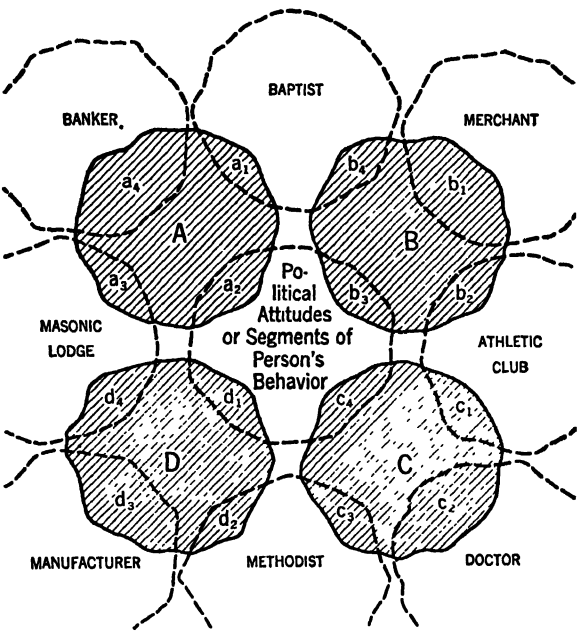


FIG. 6. Plurality patterns of four persons A, B, C, and D. (From Chapin.)

Figure 6 greatly oversimplifies, of course, what is the full societal web in which four such individuals are likely to be enmeshed. The figure depicts memberships in only occupational, religious, recreational, and fraternal groups. Innumerable informal friendships, affinities, and repulsions are in actual situations likely to cut across the simple structure represented in the diagram. In addition, these individuals will also usually be members of family, neighborhood, village, city, state, or other territorial, political, or cultural groups, awareness of which will influence their behavior in ways characteristic of membership behavior. Finally, these four individuals will usually conform to behavior standards of their sex, age-group, physical size, intelligence, income, *or any other characteristic* which operates as a standardizing influence

upon their behavior and upon the behavior of other people towards them. As we shall see in later chapters, the most general and basic behavior patterns in most plurels frequently derives directly or indirectly from their own demographic constitution, the rate of reproduction, and geographic distribution. Upon these foundations usually rest a tremendous superstructure of intersecting membership patterns the dynamic aspect of which is called *personality* in the individual, and *characteristic* or *function* in a group. The static aspects of these various membership-behaviors are called plurality patterns or societal structure.

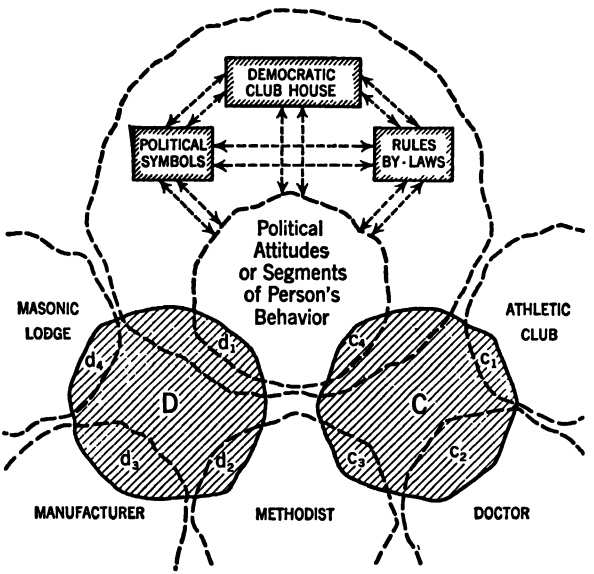


FIG. 7. How plurality patterns form the basic element in the four type parts of the configuration of a social institution. (From Chapin.)

The same type of analysis as is illustrated above for four individuals may, of course, be made of groups and organizations themselves. Thus, one-half of a given chapter of the American Legion may also belong to the Republican Club, and a tenth of them to the Bankers Association. This might be represented as in the accompanying figure on page 357. Individuals in area a_1 are both Bankers and Republicans; in a_2, Republicans and Legionnaires; in a_3, Republicans, Bankers, and Legionnaires; and in a_4, Bankers and Legionnaires. Just as the individuals in Figures 6 and 7 would be influenced in their be-

havior by their various memberships, so would the organizations in Figure 8 be influenced in their policy and behavior by their respective overlappings in membership. Groups could similarly be studied from the standpoint of their overlapping in some aspect other than mere proportions of their members. For example, the intensity or degree of their interaction or mutual influence as represented by some index might be represented in a similar way.

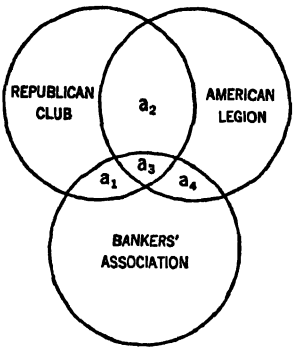


FIG. 8. Overlapping of groups through common membership.

Chapin has made an interesting contribution to one aspect of this problem in his study of the volume of social stimuli. The group memberships of the average student, A, the most active student, B, of a selected student group are diagrammed in Figure 9. Chapin comments on the chart as follows:

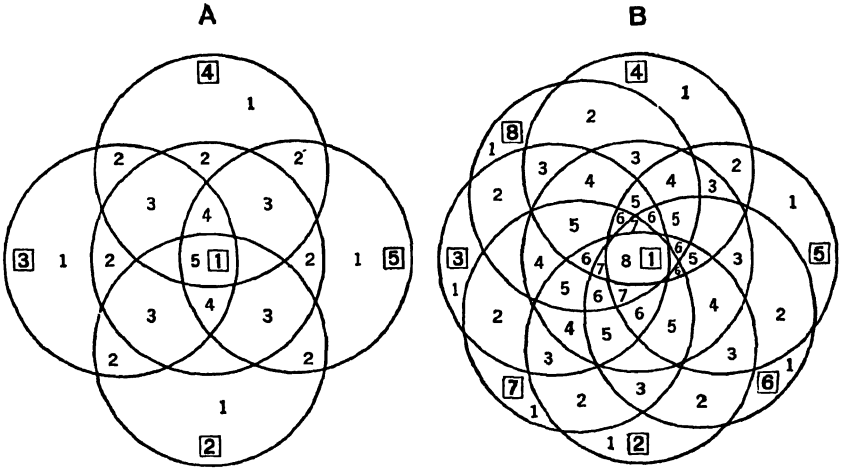


FIG. 9. Group setting of an individual. (From Chapin.)

"[Figure 9] compares the *group setting* of the average (modal) fourth year activities of the upper 50 (A), with the group setting of the most active person in the upper 50 (B). The large figures in small squares represent the different groups in serial number. The small figures represent the number of intersecting groups en-

circling that particular point on the diagram. For example, the central area is encircled by the whole 8 groups, about this center cluster irregular areas and arcs of intersecting circles including 7 different groups, and so on out to the marginal or peripheral region when but 2 circles overlap and finally to the extremity of 1 circle. The scale of the drawn circles was chosen to approximate as nearly as possible the actual situation indicated by the statistical facts. Each diagram represents the group setting of a definite group of persons or an individual in the intersecting group system of Smith College student activities. It will be noted at once that as the eye ranges from the center of the system (B) where one individual engages in 8 different activities as represented by the 8 encircling groups surrounding the central point, outward to the periphery of the system, that the concentration or density of overlapping areas diminishes as represented by the smaller numbers diminishing in size, but the areas enclosed increase in size. Thus this figure illustrates graphically the fact that few engage in many activities, and many engage in few activities. These observations lead to the following conclusions.

"The centrifugal dissipation of social energies in group activity is shown by the fact that the intensity of group activity diminishes with the distance from the center of the intersecting group system. The findings of this study suggest another method of measuring social distance, e.g., in terms of the intensity of group activity in an intersecting group system. Units of social distance would in this case be the number of different group activities in which an individual concurrently participated." [29]

From this brief summary, the nature of societal structure and function should be clear. The groupings described consist of classifications of observable phenomena according to some common societal behavior. Such classifications can be made according to economic, political, familial, criminal, religious, or any other specific type of group behavior. It is the general principles of such group behavior which is common to all the social sciences, and is, therefore, as we have seen in Chapter III, the special province of sociology. It is probable that most of our knowledge of the principles governing societal behavior in general are first formulated with reference to specific fields. At the present time, for example, economics and psychology are considered fairly well

defined fields of investigation. Other equally distinct types or complexes of behavior, such as criminal, religious, artistic, and familial are still considered as distinctly "sociological" as compared, for example, with economics. This division is, of course, purely the result of the fortuitous circumstances that have determined what problems first thrust themselves on man's attention, and regarding which he consequently first developed systematized knowledge. The same could be said regarding the origins and classification of the physical sciences.[30]

E. TECHNIC OF SCIENTIFIC DEFINITION OF GROUPS

It will be clear from the large number of types of groups which are possible and that have actually been identified in cases where only two people are involved that as larger numbers become involved a tremendous intricacy of societal structure may result. It is not surprising, therefore, that a considerable number of words have been invented to designate, however roughly and imperfectly, groups of special significance. Most of these terms appear to have a primitive geographic basis although in time most of them have taken on also other connotations. Many are perhaps practically synonymous so far as societal content is concerned. Perhaps all of them represent fundamentally an attempt to denote degrees of this basic societal factor. Consider the following partial list.[31]

monad, dyad, triad, etc.	neighborhood, community, society
family (kindred)	village, city, county, state, etc.
gang, club, association	sect
crowd (herd) (mob)	party
audience (assembly)	caste, class, etc.

A great deal of sociological literature is devoted to distinguishing between these various terms and giving examples of each. This has been valuable in calling attention to the variety of societal phenomena which need to be described objectively. Since it is the function of classification to separate phenomena into classes on the basis of their possession, nonpossession, or degree of possession of certain characteristics deemed relevant to the purpose at hand, the number of legitimate possible classifications is obviously indefinitely large. The ones given above are merely

some of the most frequently recurring, and all of them may in a given context be useful. But because of their conventional nature, it is frequently assumed that these "groups" have some "concrete" intrinsic existence which other and new classifications, especially the so-called "abstract" ones do not have. Thus, "the church" and "the state" not to mention "caste," "class," "proletariat," and "intelligentsia" are not regarded as "groups" from this point of view.[32] The reason assigned is, as we have pointed out in the first chapter and subsequently, that "definite empirical human beings" [33] seem to be involved in "groups" whereas "caste," "class," "the church," and other "categories" indicate "that the objects included are merely *thought of* together.[34] "Most of our legislation, for example, is directed *not at groups but at categories*. Mothers' Pension Acts are intended for all those mothers who fall within a certain defined situation, and not for a particular club or association of mothers." [35] [Italics mine.]

The error lies in assuming that some of these plurels necessarily have inherent characteristics which the rest do not have. All of them are *plurels* of *people* classified according to some *characteristic* or characteristics relevant to our purpose. The words with which we designate *any* of these classifications are *categories*. If we agree to make the presence or absence of a certain degree of *interaction* the characteristic according to which we designate some of these plurels as *groups*, then any and all of the plurels mentioned above must be tested for *that* characteristic before we can decide whether it is a group or not. We cannot declare it to be or not to be a group on the basis of some *other* criterion, e.g., our preconceived notions or verbal habits by which we named it one way rather than another, such as geographic proximity, number of people involved, etc. Thus, recipients of Mothers' Pensions *might* be a group. That is, receipt of the pension would perhaps inevitably cause this plurel to think of themselves, i.e., interact, as a special group, without any direct contact of all. They might also agitate formally or informally for more liberal allowances. Conversely, a biological family or kindred might *not* be a group if the members are scattered and maintain no communication.

Now the distinctively sociological basis for classification is *interaction*, and strictly speaking, this should be the sole basis of

sociological classification. When we use geographic proximity, biological relationship, age, color, etc. as the basis of sociological classifications, we do so because these obvious or relatively easily determinable characteristics are *usually correlated in a very high positive degree* with the factor in which we are sociologically interested, namely, interaction. Until we develop instruments which more directly select and designate sociological phenomena we shall, of course, rely largely upon nonsociological categories with which experience has shown the sociological to be highly correlated. But with the growth of communication and mobility, and changing bases of economic dependence, certain traditional geographic categories which have long served also as useful sociological designations (for reasons stated above) are becoming less and less satisfactory. The assumption of community of economic interest (sociological) because of common geographic locality is, for example, no longer valid. A great many *sociological* assumptions about the *biological* family such as relatively permanent face-to-face relations, economic dependence of members, stability of membership, etc. are likewise no longer valid to the degree that has been true in the past.

Nonsociological categories alone or in combination may, then, be useful as sociological classifications to the extent that they correlate to a high degree with the interactional phenomena in which we are primarily interested. To the extent that some of these nonsociological categories are the important conditions or correlates of certain societal phenomena, the former become, of course, phenomena which sociologists must take into consideration. The same is true of all phenomena of whatever character which in any way influence societal behavior. Age, sex, geographic location, etc. are, therefore, not themselves societal, but are conditioning phenomena greatly influencing societal phenomena.

We may, then agree to designate as a community any plurel which has a given minimum degree of geographic homogeneity *and* a given minimum degree and kinds of interaction. To these requirements we may add a given minimum degree of formal organization, i.e., technic or structure of interaction, before we designate the plurel as a village, a city, a county, or a state. Likewise, any one criterion does not adequately distinguish such

plurels as crowd, mob, gang, assembly, and public. We use the words rather to designate a configuration in which *several characteristics, each within certain degrees,* are present. For example, our designation of a plurel by one or another of the above words may be determined by its size, whether membership is "voluntary," "elective," or "compulsory," the formality of its structure, the degree of interaction *and* geographic proximity. If the geographic factor is an invariable condition of the essential societal phenomenon we wish to describe, the geographic factor is clearly a component of the sociological category.

It is not our purpose here to insist on one definition rather than another of certain plurels. That is a task which should be performed to suit the needs of empirical research as they arise. It is our contention that definitions are not dictated by the nature of data but by our adjustment needs. A great many of the proposed definitions of community, for example, are for different purposes equally acceptable and scientifically useful. If we agree that community is to be used to designate a plurel with temporal, geographic, and interactional dimensions of certain types and degrees, that is entirely satisfactory. The degrees of each component which distinguishes "community" from an adjoining category should be determined on the basis of practical convenience as research proceeds. Likewise, we may designate some plurels in only the geographic dimension. That is, for certain purposes it may be scientifically and practically useful to treat as a unit all the people living within a certain geographic boundary. From other points of view the time dimension of a plurel's existence and activity may be of interest. If so, the relative durations and changes in a plurel's activities with reference to its geographic or any other dimension become of interest. Plurels may on this basis be defined as stable, mobile, temporary, transitory, etc.

Likewise, *any* characteristic may be a dimension in terms of which a plurel may be described. Thus, aggregation, crowd, mob, assembly, association, and public are words applied to plurels that fall within various different limits (a) on a geographic continuum (b) on a time continuum (i.e., they have different degrees of permanence) (c) on an interaction continuum, and on whatever other criteria (characteristics) that are thought of as being distinctive of the plurel to which a certain one of these words are

applied. For example, the interaction dimension may subdivide into all kinds of indexes on the basis of which we infer or measure interaction, such as speech (common language), the presence of mechanical devices for communication, visiting, and all other group activity.

Chapin [36] has already made in Table 5 a substantial contribution to the approach outlined above. Across the top of the table are listed five dimensions or criteria according to one or more of which plurels are frequently designated by specific categories. In the first column are designated three degrees to which each dimension may be present. These degrees are, of course, subject to indefinite expansion as instruments or ways are developed for the measurement of each of the given dimensions (and possibly others). Such measurement would permit a scientific definition of any plurel in standardized units of each dimension. A given combination of these units in stated degrees would then accurately define all the types of groups now designated by the large vocabulary to which we have referred elsewhere in this chapter.

We may still retain the folk designations we now use for various types of groups, each defined in terms of standardized scale units of each dimension, just as, for example, "horse-power" has been so retained in physics. Or we may substitute terms without traditional meanings such as Alpha groups, Beta groups, etc. Doubtless both practices will be followed. For general purposes, many of the present designations will be used, but their specialized meaning in terms of degrees of stated dimensions will be understood. In more rigorous scientific work the formulas representing the exact degrees of each dimension will be used.

Periodically there is a demand within the sociological fraternity for a conference or a committee to recommend a standardized set of meanings for the sociological vocabulary. This is, of course, very desirable as a preliminary step toward the solution suggested above.[37] The dimensions in terms of which various phenomena are to be described would have to be decided upon and scales for their measurement constructed from the raw material of present data and usage.[38] I have been interested here only in pointing out the theoretical foundations upon which this work must proceed. Dodd, in his *Dimensions of Society*, has carried the neces-

TABLE 5. GROUP TYPES AS DIFFERENTIATED BY NATURE OF SOCIAL CONTACT

(From Chapin)

Type of Group	*Type of Sensory Contact*	*Frequency of This Contact*	*Emotional Intensity of This Contact*	*Means of Communication*	*Interdependence and Relationship*	*Specific Examples of Type*
Primary contact group (Intimate contact group)	Face-to-face, direct sense perceptions of auditory, olfactory	Repeated with same persons at many of same points of contact	Intimate and personal, informal	Oral language, gesture, posture, facial expression	Concrete perceptual elements in the social configuration	Family group, play groups, neighborhood groups
Intermediate group (Superficial contact group)	Face-to-face direct sensory perception, auditory, visual	Occasional contacts with different persons at different points	Superficial, formal	As above	Same as above, but concrete conceptual elements added	School-room class; audiences; local units of YMCA, YWCA, Scouts; church clubs, etc.
Secondary contact group (Artificial contact group)	Derivative or indirect sense perception, mediated by mechanical means	Contacts at infrequent intervals	Highly impersonal through artificial devices of communication	Telephone, telegraph, radio, printed materials	Abstract conceptual or symbolic elements in the social configuration	Headquarters of a national society, regional council, board of directors, executive committee, etc.

sary preliminary work a step farther by a comprehensive experiment in laying out a set of dimensions and implicit units, and testing his categories with applications to a large sample of societal situations. There remains the task of developing the scales and units in terms of which to measure the various dimensions or characteristics of groups and societal situations. This is obviously a task for extended research involving imagination, hypothesis, experimentation, revision, and testing. A great deal of sociological interest has turned in this direction in recent decades. It will doubtless be a major concern of sociology in coming centuries. After all, what alternative have we, if we are to continue within the scientific orientation?

F. CONCLUSION

The confusion in current discussion of the classification of human plurels, especially the distinctively societal plurels called groups, is traceable almost entirely to the two fundamental misconceptions which we have repeatedly mentioned in previous chapters. One of these misconceptions is that classifications of any kind and even the verbal categories with which we designate classes, are in some way given in nature rather than being constructs of our convenience. This fallacy is illustrated by the arbitrary assertions we have cited to the effect that, for example, the family or a club are "concrete" groups, while "infants," a caste, the proletariat, etc. are either "abstract collectivities" [39] or merely categories, "not a factual but a logical plurality. It exists only in thought." [40] It is assumed that the smaller units mentioned above with which we are very familiar, such as family and club as compared with proletariat and intelligentsia, are necessarily of a fundamentally different character as phenomena of scientific observation. My position is that as currently used, any or all of these designations may or may not be "groups," as we have agreed to call plurels in which societal interaction takes place. We have previously discussed the futility of the concrete-abstract dichotomy as an assumed attribute of data. (Chapter I, note 2.) To the statistician or the administrator of an agency devoted to the care of all children under the age of one year, *infants* is as concrete a designation as any family

or football team. The categories infants, proletariat, caste, etc., and the phenomena to which they refer have exactly the same kind of "existence," "reality," and "concreteness" as family, club, or football team. All are phenomena responded to as a unit by virtue of certain common characteristics of the constituent members. The categories are our verbal designations of these responses. "Family" and "proletariat" have the same status as scientific data and are amenable to the same kind of scientific treatment.

The second major misconception which has handicapped objective classification of human plurels is the assumption that dichotomous or discrete instead of gradational or continuous categories must be used to describe groups. This is the result of attempting to use a primitive folk language in scientific description. As we have pointed out in Chapter II and elsewhere, the advance of science has been characterized by the description of phenomena in *quantitative units of amounts of various qualities* instead of in dichotomous or other absolute terms assumed to represent intrinsic and exclusive properties or boundaries of natural events. Only in the abstractions or artificial isolations of the laboratory do we find the pure "elements" of chemistry or other basic components of science. We have ruled out as metaphysical the question as to whether societal groups "really are" of a fundamentally mutually exclusive "nature," or whether they "are" entities which may be designated by different names according to whether they possess more or less of certain characteristics. The only question with which science needs to be concerned is whether the results we seek are more perfectly and easily achieved by proceeding on the latter assumption rather than on the former.

This book is devoted largely to an exposition of the advantages of assuming that societal phenomena as well as all other natural phenomena can best be comprehended in terms of gradational and quantitative categories and units. Under this assumption we may still use the old folk-terms to designate segments of various continua arbitrarily agreed upon. But for accurate denotation we shall designate our categories in terms of the degree to which they possess the characteristic or characteristics on the basis of which we responded selectively to the given phenomenon in the first place.

G. NOTES

1. C. W. Morris ("Foundations of the Theory of Signs," *International Encyclopedia of Unified Science*, University of Chicago Press, 1938, Vol. I, No. 4, pp. 3–5), makes the following analysis:

"The process in which something functions as a sign may be called semiosis. This process, in a tradition which goes back to the Greeks, has commonly been regarded as involving three (or four) factors; that which acts as a sign, that which the sign refers to, and that effect on some interpreter in virtue of which the thing in question is a sign to that interpreter. These three components in semiosis may be called, respectively, the *sign vehicle*, the *designatum*, and the *interpretant;* the *interpreter* may be included as a fourth factor. These terms make explicit the factors left undesignated in the common statement that a sign refers to something for someone.

"A dog responds by the type of behavior (I) involved in the hunting of chipmunks (D) to a certain sound (S); a traveler prepares himself to deal appropriately (I) with the geographical region (D) in virtue of the letter (S) received from a friend. In such cases S is the sign vehicle (and a sign in virtue of its functioning), D the designatum, and I the interpretant of the interpreter. The most effective characterization of a sign is the following: S is a sign of D for I to the degree that I takes account of D in virtue of the presence of S. Thus in semiosis something takes account of something else mediately, i.e., by means of a third something. Semiosis is accordingly a mediated-taking-account-of. The mediators are *sign vehicles;* the takings-account-of are *interpretants;* the agents of the process are *interpreters;* what is taken account of are *designata.*

". . . Signs which refer to the same object need not have the same designata, since that which is taken account of in the object may differ for various interpreters. A sign of an object may, at one theoretical extreme, simply turn the interpreter of the sign upon the object, while at the other extreme it would allow the interpreter to take account of all the characteristics of the object in question in the absence of the object itself. There is thus a potential sign continuum in which with respect to every object or situation all degrees of semiosis may be expressed, and the question as to what the designatum of a sign is in any given situation is the question of what characteristics of the object or situation are actually taken account of in virtue of the presence of the sign vehicle alone.

"A sign must have a designatum; yet obviously every sign does not, in fact, refer to an actual existent object. The difficulties which these statements may occasion are only apparent difficulties and need no introduction of a metaphysical realm of 'subsistence' for their solution. Since 'designatum' is a semiotical term, there cannot be designata without semiosis—but there can be objects without there being semiosis. The designatum of a sign is the kind of object which the sign applies to, i.e., the objects with the properties which the interpreter takes account of through the presence of the sign vehicle. And the taking-account-of may occur without there actually being objects or situations with the characteristics taken account of. This is true even in the case of pointing: one can for certain purposes point without pointing to anything. No contradiction

arises in saying that every sign has a designatum but not every sign refers to an actual existent. Where what is referred to actually exists as referred to, the object of reference is a *denotatum*. It thus becomes clear that, while every sign has a designatum, not every sign has a denotatum. A *designatum is not a thing, but a kind of object or class of objects—and a class may have many members, or one member, or no members.* The *denotata are the members of the class.* This distinction makes explicable the fact that one may reach in the icebox for an apple that is not there and make preparations for living on an island that may never have existed or has long since disappeared beneath the sea."

2. "We must not, however, fall into the error of our time, of regarding Science chiefly as a basis of Art. However great may be the services rendered to Industry by Science, however true may be the saying that Knowledge is Power, we must never forget that the sciences have a higher destination still;—and not only higher but more direct;—that of satisfying the craving of our understanding to know the laws of phenomena. To feel how deep and urgent this need is, we have only to consider for a moment the physiological effects of *consternation*, and to remember that the most terrible sensation we are capable of, is that which we experience when any phenomenon seems to arise in violation of the familiar laws of nature." (A. Comte, *The Positive Philosophy*, trans. by H. Martineau, Trübner, 1853, Vol. 1, p. 20.)

3. E. E. Eubank, *The Concepts of Sociology*, Heath, 1932, p. 117.

4. Eubank uses "category" instead of "class" to designate this type of plurel described in this paragraph. He adds the following footnote: "Had the word 'class' not already been preempted for the special meaning indicated in the preceding paragraphs [a plurel with community of interest], it would be the preferable term to use in place of category." (*Op. cit.*, p. 157.) While recognizing Eubank's point regarding this special meaning of the word "class" in sociological discussion, I cannot adopt his solution for two principal reasons: (1) In science and logic generally "class" is defined as I define it in the text. This preempted usage with respect to all phenomena outside of human society seems to me a much more serious consideration than that which influenced Eubank's choice. (2) The type of plurel designated by the word "class" as indicated by Eubank and as used by sociologists is covered by the word "group" as I define it in the text. The "community of interest" which sociologists make the criterion of "class" is either adequately covered by my definition of "group" or is a sub-category under group, i.e., a special type of group, not a coordinate category with "group." This is apparently also the case in Eubank's usage.

5. The use of the word "group" as here defined, and without the adjective "social" (which is tautological under the definition) is in general agreement with current sociological usage except for the frequent insistence of sociologists that the interaction must be "psychic," "conscious," or "mental" in order to constitute a true group. For reasons which will be apparent from Chapter I, I cannot accept this limitation because of the *a priori* restriction which it imposes upon the methods permissible in sociology. The word "group" as defined will be used throughout the book as the basic *societal* unit, as distinguished from many other terms frequently used as synonyms of "group," e.g., society, aggregation,

class, category, plurel, grouping. A large number of other designations of types of groups such as association, organization, etc. will be defined when they are employed. An excellent summary of the large literature on this subject will be found in E. E. Eubank, *op. cit.* Ch. 8.

My basic objection to such categories as "psychic," "mental," and "conscious" is, of course, the present lack of definition of them. The use of such terms in science becomes the basis for unlimited misunderstandings and difficulties. One may agree with Eubank that "irrespective of the phenomenon [mind] itself, its existence is an observable fact which needs some locution by which to designate it." The verifiable "observable fact" (or facts) which the term today is used to cover is exactly what is wanting in its definition. Any "locution" which will definitely designate the fact or facts referred to will meet all my objections. The term is apparently gradually coming to be used as referring to those organic responses which involve symbolic or sub-linguistic behavior not involving the larger muscles. If so, this may be a useful distinction for some purposes. Whatever may be the more specific meaning of "psychic" or "mental" interaction, it is apparently intended to rule out as truly sociological the interaction of sub-human species, and especially of certain insects, which exhibit some of the most highly developed behaviors of the type in which sociologists should be, and are interested. To rule out the whole field of subhuman animal sociology and ecology on the ground that the interrelationship is not "psychic" or "mental" strikes me as in the highest degree arbitrary and prejudicial to the advancement of human sociology.

6. E. E. Eubank, *op. cit.*, p. 117.

7. This classification has been tested for reliability both as regards its inclusiveness and its objectivity. See S. C. Dodd, *Dimensions of Society*, Ch. 12. For an elementary treatment of the problem of classification see G. A. Lundberg, *Social Research*, Ch. 3. For more exhaustive treatment see any recent general treatise on Logic.

8. Karl Menger "An Exact Theory of Social Groups and Relations," *Amer. Jour. of Sociol.*, XLIII, March, 1938, pp. 790–798. The following account of classification in biology illustrates the nature of *systematic* classification:

"The basic classification in biology is the division of the organic world into the plant and animal kingdoms. A kingdom is generally progressively subdivided into phyla, subphyla, classes, orders, families, genera, and species. The scientific name of an organism is compounded of the names designating genus and species. Thus man is called *Homo sapiens*. He belongs to the species *sapiens*, the genus *Homo*, the family Hominidae, the order Primates, the class Mammalia, the subphylum Vertebrata, and the phylum Chordata of the animal kingdom. The natural systems of classifications of biology are designed to exhibit genetic relationships." "Procedures of Empirical Science," by Victor Lenzen in *International Encyclopedia of Unified Science*, Vol. 1, No. 5, p. 33.

9. W. M. Wheeler, "Animal Societies," *Scientific Monthly*, XXXIX, pp. 289–301, Oct., 1934. A classification by the same authority is shown in the table on page 370. (Reproduced from W. C. Allee, *Animal Aggregations*, University of Chicago Press, 1931, p. 35.)

TABLE 6. SIMPLIFIED SCHEMATIC ARRANGEMENT OF TYPES OF PLURELS

(Modified from Wheeler, 1930 and Allee, 1931) [a]

A. Aggregations [b] Loosely integrated, relatively unstable, and temporarily dependent on the reactions of individuals to environmental stimuli	1. Passively collected aggregations or agglomerations, e.g., wind collected	Homotypic or Heterotypic
	2. Actively collected aggregations or agglomerations, e.g., tropistically collected	
	3. Food chain associations (a) Predatory (b) Parasitic	
	4. Commensal associations	Heterotypic
	5. Mimetic associations	
	6. Symbiotic or mutualistic associations	
	7. Communities (biocoenoses)	
B. Groups: [c] More closely integrated, more stable, and permanent systems primarily dependent on reactions of individuals to each other	1. Persons (multicellular)	Homotypic
	2. Organically interconnected colonial organisms forming closed societies chiefly nutritive in function, e.g., sponges, colonial hydroids	
	3. Mainly reproductive societies closed, e.g., subsocial insects and social insects such as bees, ants, and termites	Homotypic or heterotypic; i.e., may be pure or mixed colonies of dominant animals; dominants may be accompanied by social parasites or by various other sorts of associates
	4. Mainly protective societies, closed and open, e.g., flocks, herds and schools	
	5. Anthropoid societies; group societies	

[a] W. M. Wheeler, "Societal Evolution," Ch 6, pp. 139–155, in *Human Biology and Racial Welfare*, edited by E. V Cowdry, Hoeber, 1930. Reproduced in W. C. Allee, *op. cit.*, p. 35, University of Chicago Press, 1931.

[b] The original uses "associations" to designate these plurels.

[c] The original uses "societies" for this division of the table.

10. W. M. Wheeler, *op. cit.*, pp. 290 ff.

11. *Ibid.*, p. 291.

12. See the excellent brief summary of the whole problem of systematic classification in Victor F. Lenzen "Procedures of Empirical Science," *Encyclopedia of Unified Science*, Vol. 1, No. 5 (Section III "Systematization").

13. E. E. Eubank, *op. cit.*, pp. 136–156.

It should be noted in passing that while we confine ouselves here to organic plurels, interactivity is by no means confined to the behavior of organisms alone. As Lester F. Ward (*Dynamic Sociology*, Appleton, 1883, I, Chs. 3–7), pointed

out, interactivity is common to all phenomena. "Drops of water colliding with one another in a race down the gutter and swirling in the pool at the bottom, cells of living tissue interplaying upon one another, a family in domestic conference—all these are collectivities whose members are severally reacting to one another." (Eubank, *op. cit.*, p. 118.) In human and other animal plurels, reciprocal behavior of this kind is, as we have seen, usually called *societal.* The word *group* will be used exclusively in the present volume to designate this particular type of human plurel, namely, any number of individual organisms between which interaction of the type relevant to our problem obtains. *Group* will, therefore, in this book always mean a *human societal* group, and it will be used to designate any collectivity, aggregation, plurel, grouping, or category designating a number of individual units varying functionally (i.e., by means of interaction) with each other in whole or part.

14. N. J. Spykman, *The Social Theory of Georg Simmel*, University of Chicago Press, 1925, p. 129. See also L. von Wiese and H. Becker, *Systematic Sociology*, Wiley, 1932, Ch. 8.

15. For a brief resumé see E. A. Ross, *Principles of Sociology*, Rev. Ed., Century, 1930, pp. 93–96. For references to literature regarding an example which has received considerable notice, see "Hauser, Kaspar" in *Encyclopedia Britannica.*

16. Consider, for example, the following statement: "There is a type of intimacy peculiar to the pair *as such* that is always present as a common element in all other types of pair intimacy, no matter whether they derive from love, friendship, family ties or common interest." *Systematic Sociology*, p. 512.

17. J. L. Moreno, *Who Shall Survive? A New Approach to the Problem of Human Interrelations*, Nervous and Mental Disease Publishing Company, Washington, D. C., 1934, 23 ff., 373 ff. See also, D. Thomas, A. M. Loomis, and R. Arrington, *Observational Studies of Social Behavior*, Institute of Human Relations, Yale University, 1933; Ruth Arrington, *Interrelations in the Behavior of Young Children*, Child Development Monographs, No. 8, Bureau of Publications, Teachers College, Columbia University, 1932; W. I. Newstetter, M. J. Feldstein and Theodore Newcomb, *Group Adjustment. A Study in Experimental Sociology*, School of Applied Social Sciences, Western Reserve University, Cleveland, 1938.

18. Cf. J. L. Moreno, *op. cit.*, p. 100.

19. See C. P. Loomis and D. Davidson, "Sociometrics in the Study of New Rural Communities," *Sociometry*, II, Jan., 1939, pp. 56–76.

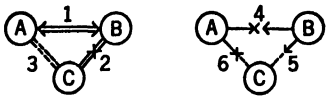
20. Moreno, *op. cit.*, pp. 115–116.

21. The nucleus is here defined merely as the center of converging societal currents.

22. Atom is here defined as in other sciences, namely, as the smallest *independent* behavior unit with which it is possible to deal (within a given frame of reference) in the existing stage of development of knowledge and technology. (See W. M. Malisoff "What is an Atom," *Phil. of Sci.*, VI, July, 1939, pp. 261–265. Also Ch. III, note 37, and p. 125 above.)

23. See F. S. Chapin, *op. cit.*, Ch. 16. Also, "Measuring the Volume of Social Stimuli," *Social Forces*, IV, March, 1926, pp. 479–495.

24. Using numbers to represent each type of relationship as indicated in the accompanying diagram (see key in the main text), the possible combinations for three people are as follows:



Mutuals	*Non-Mutuals*
111	444
222	555
333	666
122	455
133	466
211	544
233	566
311	644
322	655
123	456

Mutuals and Non-Mutuals	
114	144
115	155
116	166
224	244
225	255
226	266
334	344
335	355
336	366
124	234
125	235
126	236
134	344
135	345
136	346
145	245
146	246
156	256

For a generalized formula of this type of expansion for any number of persons and/or number of gradations of attitude, see S. C. Dodd, *Dimensions of Society*, Macmillan, 1940, Ch. 7.

25. Karl Menger, *op. cit.*, pp. 790–792: "We consider a group of men which we shall denote by G and to which we shall refer as the 'total group' of the case under consideration. G may be divided into two subgroups which have no members in common. Each member of the total group G belongs to one and only one of these subgroups, which we shall denote by G_1 and G_2 and call the two 'fundamental groups' of the considered case. For instance, these very general assumptions are satisfied if the total group consists of the inhabitants of a country, G_1 of the men, G_2 of the women; or if G consists of the inhabitants of a country, G_1 of the white ones, G_2 of the colored ones; or if G consists of the passengers of a train, G_1 of the smokers, G_2 of the non-smokers.

"Suppose now we had to divide the total group G into smaller subgroups. Each member of G will have a certain attitude toward the association with each other member of G. In what follows we shall consider the case that each member of G has a common (either positive or negative) attitude toward all members of the same fundamental group; that is to say, the case that each member of G who is willing to associate with one member of G_1 is willing to associate with every member of G_1; that each member of G who dislikes association with one member of G_1 dislikes association with every member of G_1; and that each member of G has also a common (either positive or negative) attitude toward the members of G_2. For example, a passenger of a train objecting to one smoker in his compartment objects in general to every smoker in his compartment, and a smoker admitting one smoker admits in general every smoker. Though exceptions are conceivable (a man who dislikes smokers in his compartment may never-

theless be willing to admit one particular smoker because he wants to talk to him), the assumption of a common attitude is in this case at least a good approximation to reality.

"By no means do we intend to state that for all divisions of a group into two subgroups a common attitude in the described sense can actually be observed. If G_1 and G_2 are the groups of the men and the women of a country, and if the association considered is marriage, then a member of G_1 will certainly not be willing to associate with every member of G_2 though he may be willing to marry a particular member of G_2. What we intend to do is merely to start with the study of those cases in which the assumption of a common attitude is satisfied, and we do so because these cases are comparatively simple.

"*In such a case* each member M of G has one of four possible attitudes toward the association with other members of G. Either M wishes to associate exclusively with members of G_1, or M wishes to associate exclusively with members of G_2, or M is willing to associate with everybody, or M dislikes association with anybody. The total group G is thus divided into four subgroups which shall be called 'groups of attitude': a group that shall be denoted by G_1, consisting of those who wish to associate exclusively with members of the fundamental group G_1; a group G_2 consisting of those who wish to associate exclusively with members of the fundamental group G_2; a group G^{12} consisting of those who are willing to associate with everybody; a group G^0 consisting of those who dislike association with anybody.

"This division of G into the four groups of attitude G^1, G^2, G^{12}, G^0 overlaps with the division of G into the two fundamental groups G_1 and G_2. The result is a division of G into eight groups to which we shall refer as the eight 'principal groups' of the considered case: (1) the group consisting of those who belong to G_1 and G^1—i.e., of those members of G_1 who wish to associate exclusively with members of G_1—this group shall be denoted by G_1^1; (2) the group consisting of those who belong to G_1 and G^2—i.e., of those members of G who wish to associate exclusively with members of G_2—this group shall be denoted by G_1^2, (3) the group, denoted by G_1^{12}, which consists of those who belong to G_1 and G^{12}—i.e., of those members of G_1 who are willing to associate with everybody; (4) the group, denoted by G_1^0, which consists of those who belong to G_1 and G^0—i.e., of those members of G_1 who dislike association with anybody. In an analogous way we define the four principal groups G_2^1, G_2^2, G_2^{12}, G_2^0. We can summarize the definitions of the eight principal groups in the following scheme:

	G^1	G^2	G^{12}	G^0
G^1	G_1^1	G_1^2	G_1^{12}	G_1^0
G^2	G_2^1	G_2^2	G_2^{12}	G_2^0

26. *Ibid.*, pp. 797–798.

27. G. H. Mead, *The Philosophy of the Present*, Open Court Pub. Co., 1932, p. 49.

28. F. S. Chapin, *Contemporary American Institutions*, Harpers, 1935, pp. 20, 22. See also a very important article by the same author, "Measuring the Volume

of Social Stimuli: A Study in Social Psychology," *Social Forces*, IV, March, 1926, pp. 479–495.

29. F. S. Chapin, "Measuring the Volume of Social Stimuli: A Study in Social Psychology," *op. cit.*, p. 493.

30. Cf. L. L. Bernard, "The Evolution of Social Consciousness and of the Social Sciences," *Psychol. Rev.*, XXXIX, March, 1932, pp. 147–164.

31. For a more complete list see E. E. Eubank, *op. cit.*, pp. 138–153. There is a large specialized literature dealing with most of these concepts. See, for example, R. T. LaPiere, *Collective Behavior*, McGraw-Hill, 1938; W. L. Warner, "American Caste and Class," *Amer. Jour. of Sociol.*, XLII, Sept., 1936, pp. 234–237; and the enormous literature on "community" and "state."

32. L. von Wiese and H. Becker, *op. cit.*, Chs. 38, 42.

33. *Ibid.*, p. 489.

34. E. E. Eubank, *op. cit.*, p. 117.

35. *Ibid.*, p. 157.

36. F. S. Chapin, *Contemporary American Institutions*, Harper, 1935, p. 162.

37. See, for example, the detailed treatment of various types of groups by R. T. LaPiere, *Collective Behavior*, McGraw-Hill, 1938, and the references that have already been made to E. E. Eubank, *op. cit.*, who summarizes most of the important attempts that have been made in this field. See especially the treatment of the subject in P. Sorokin, C. Zimmerman and C. J. Galpin, *A Systematic Source Book in Rural Sociology*, Univ. of Minnesota Press, 1930, Vol. I., Ch. 6.

38. For an illustration of this type of preliminary analysis see Dwight Sanderson, "Group Description," *Social Forces*, XVI, March, 1938, pp. 313 ff. This author suggests five major dimensions in terms of which groups may be described: I, Identity (Group limits, identification of members, etc.); II, Composition, III, Intergroup Relationships; IV, Intra-Group Relationships; and V, Structure and Mechanism. See also his "A Preliminary Group Classification Based on Structure," *Social Forces*, XVII, Dec., 1938, pp. 1–6.

39. L. von Wiese and H. Becker, *op. cit.*, pp. 652 ff.

40. E. E. Eubank, *op. cit.*, p. 118.

Chapter X

CHARACTERISTICS OF POPULATIONS: (INDICATORS—I): INSTITUTIONAL ASPECTS

A. THE MEANING OF "INSTITUTION"

We said in the preceding chapter that a societal mechanism or pattern might be described in terms of the type of group activity associated with it. Conversely, a group activity might be and usually is described in terms of the mechanism or pattern that constitutes it. Mechanism, it will be remembered, we have defined as any arrangement or relation of parts or conditions which results in a given observable event. In Chapter V we listed the principal mechanisms in terms of which it has been found convenient to describe societal as well as individual behavior. Those mechanisms of societal behavior which are characterized, within a given group, by a relatively high degree of stability, uniformity, formality, and generality we have called *institutions*.

In turning to a discussion of institutions we are merely turning to a dynamic aspect of the phenomenon, the static or structural aspect of which we called *group* in the preceding chapter. There is nothing scientifically incongruous in thus defining and discussing different aspects of a situation from different points of view. For example, a certain object may be regarded from different points of view as (a) a stone, (b) a club, or (c) an *object d'art*. In the same way, we may see from different points of view in an aggregate of people (a) an aggregate, (b) a group, or (c) an institution. In the preceding chapter, various types of groups were described. The stabler behavior patterns (institutions) of *any* of these groups may be described as *characteristics* of these groups. We respond neither to groups nor to institutions apart from observed interactional behavior of people. It does not follow that the two are the "same" as phenomena for scientific study, or that institutions are observable in all groups. "Group" is a general category by which we designate a plurel in which interaction takes place. "Institution" is a term we use to designate *some*

types of group behavior patterns. Thus, "the Catholic Church" and "the Italian state" are from one point of view *classifications of people.* The people so classified are *groups. Their behavior* with reference to religious and political matters can be described as *behavior patterns* of a kind we call *institutions.*[1]

We have perhaps elaborated sufficiently in previous chapters the fallacy of assuming that phenomena which we designate by such words as "stone," "man," or "group" have some higher order of "reality," "concreteness," or "tangibility" than the phenomenon designated by such words as folkways, mores, and institution.[2] Suffice it here to repeat that we mean by institution a type of human group behavior. We limit the term to *some* types, namely, the relatively stable, formal, and general, as contrasted with the relatively unstable and informal, which we have previously characterized as folkways, fashions, customs, etc. *Specific* institutional behaviors that impinge upon the senses are *generalized* by the same symbolic process by which we arrive at the general symbol "dog" to designate a large variety of individual animals. We then react to these symbols of generalized objects and behaviors in certain appropriate ways just as we react in certain situations to the individual items or experiences which are generalized by such words as "dog" or "institution." We may also react to these symbols in the conventional manner of our group although we ourselves have never reacted to a particular institution or example of institutional behavior.

The above general definition of "institution" as a word designating a certain broad type of group behavior pattern is clearly subject to extensive subclassification and more detailed description. Chapin [3] has contributed to this end by distinguishing first of all two broad classes of institutions: (1) Nucleated institutions, which possess definite locus and are specified in an area such as a local government, a local political organization, any local business enterprise, any family living together, any particular school, any particular local church, any particular local welfare agency, etc. (2) Diffused-symbolic institutions, which lack the above localized and circumscribed reference points in objects and behavior impinging directly on the senses, but which refer instead to symbols of a higher order of abstraction, designated by such words as art, ethics, science, law, etc.

It must be remembered, however, that this distinction is entirely a matter of degree. "*My* family" refers, under the conventions of the English language, to a particular set of stimuli. "The family" (as an institution) refers to a symbolic construct designating all the essential characteristics of a number or of all particular families. What are essential characteristics is determined by the uses which we wish the word to serve. If we wish the term to designate any or all relatively permanent groups united by certain relationships, then these are the essential characteristics to which the term must refer, although any degrees of other variations may be allowed in the phenomena covered by the term. As long as most or all people include under the term enough similar conditions to serve efficiently the communicative purposes aimed at, the definition in terms of these conditions is adequate. More refined and specific communication calls for more refined definition. "Science" or "law" likewise refers to symbolic constructs by which we wish to refer only to certain common and essential elements in a certain type of behavior pattern the individual cases of which may be of vast variety. All of these terms refer in the end, however, to observable behavior of human groups. Its "concreteness" and "tangibility" in a given case depends not upon intrinsic characteristics of the behavior but upon the objectivity of the response technics we have developed toward a given type of stimuli.

As we have often observed in the course of this book, our technics of objective response and communication is very much more highly developed with reference to some phenomena than to others. To indicate this difference, we have invented such words as "physical," "concrete," "tangible," "real," "matter," "objects," "behavior," etc. as contrasted with "mental," "spiritual," "verbal," "abstract," "intangible," "thought," "feeling," "intuition," etc. The nucleated institutions mentioned above are those which have a large aura of the "physical," "concrete," and "tangible" associations of an immediately verifiable sort as contrasted with those requiring a larger number of secondary, symbolic, and instrumental technics for their verification. Consider, for example, the following table (on page 378) of these characteristics of nucleated institutions as summarized by Chapin: [4]

TABLE 7. NUCLEATED SOCIAL INSTITUTIONS

(From Chapin)

Four Type Parts	*Family*	*Church*	*Government*	*Business*
I. Attitudes and behavior patterns	Affection Love Loyalty Respect	Reverence Loyalty Fear Devotion	Subordination Cooperativeness Fear Obedience	Workmanship Thrift Cooperation Loyalty
II. Symbolic culture traits, "symbols"	Marriage ring Crest Coat of arms Heirloom	Cross Ikon Shrine Altar	Flag Seal Emblem Anthem	Trade-mark Patent sign Emblem
III. Utilitarian culture traits (real property)	Home Dwelling Furniture	Church edifice Cathedral Temple	Public buildings Public works	Shop Store Factory Office
IV. Code of oral or written specifications	Marriage license Will Genealogy Mores	Creed Doctrine Bible Hymn	Charter Constitution Treaties Laws Ordinances	Contracts Licenses Franchises Articles of incorporation

The items listed in this table, especially under stubs III and IV, are phenomena with which great numbers of men have had first hand experience. The extension of this table to the diffused-symbolic institutions would involve categories none the less "concrete" to the artist, the lawyer, or the scientist, but which would appear extremely remote and "symbolic" to the masses of men. This fact justifies, of course, Chapin's distinction. We are here merely elaborating its basis.

Two other points regarding the definition of institution should be mentioned. In the first place, we have said that the only distinction between folkways, for example, and institutions is the relative stability, permanence, uniformity, formality, and generality of the latter type of behavior pattern. Since this is necessarily a matter of degree, the line separating institutions from other types of behavior patterns is one upon which we may arbitrarily agree whenever we have developed acceptable measures of the distinguishing characteristics mentioned above. In the second place, the term institution may be used with equal propriety under this definition to describe either a whole economic system or some

part of it, such as a bank. There is no necessary ambiguity in such usage provided the societal segment under description is definitely specified so that there is no mistaking which behavior pattern is being described. There is no reason why the stable and formal behavior pattern of a bank should not be called by the same general name as another pattern having the same essential characteristics but involving a whole economic system. The question as to whether the latter should be called "the economic institution" or "economic institutions" is hardly of scientific importance in general discussion. For scientific purposes, institutional patterns of great variety and gradations will necessarily have to be defined and designated with appropriate names for each if specific generalizations regarding each type are desired.

B. LATENT AND MANIFEST BEHAVIOR PATTERNS

Highly analagous to Chapin's distinction between nucleated and diffused-symbolic institutions is his distinction between manifest and latent institutional patterns.[5] Manifest patterns are those which are explicit or formally evident in the mores, law, elected and perhaps uniformed officers, public ceremony, and buildings serving as the stage for, and repositories of the records of this behavior. Latent patterns are those which are implicit or informally present in human actions, sentiments, and folkways. In the political field, they are frequently called by such derogatory terms as "invisible government," "the power behind the throne," etc. Latent patterns are, of course, equally common in other fields. Consider, for example, the public professions of religious belief in church ceremonials (manifest) and the actual beliefs (latent patterns) of the participants in these exercises. These two types of patterns may coincide to a high degree, and if so, a high degree of "adjustment" is likely to be declared to exist in the affairs governed by the pattern in question. On the other hand, the two patterns may be practically mutually exclusive. If so, the result may be open conflict, when both patterns attempt to function, or stagnation of one pattern at the expense of the other.

Such stagnation on the part of the latent pattern may amount to temporary or permanent obliteration. Stagnation on the part

of the manifest pattern may consist of the continued existence of a structure that has ceased to function vitally but which continues the formal activity, ceremony, and cant. These dormant or largely nonfunctioning patterns represent past channels of energy flow which may be either relatively stable or disintegrating. They are like the bayous and channels along which the river no longer flows, or flows only sluggishly or intermittently. These are frequently the established but nonfunctioning institutions, vested thoughtways, and the "material culture" in which they are enshrined. These grooves and channels of past energy flow are, of course, part of the situation which determines the present generation and flow of social energy. The scientific problem with respect to all these patterns, therefore, is the problem of formulating the laws of societal gravity or the description of how societal energy develops and distributes itself in space (both geographic and social) and time (astronomic or social).

We pointed out in the preceding section that the basic difference between nucleated and diffused-symbolic institutions is our degree of first-hand contact and familiarity with each. This is in the last analysis determined by the range of phenomena to which our unaided senses are capable of responding. The human ear, for example, does not hear sounds above and below certain pitches or frequencies. The same type of limits apply also to all other senses. Our knowledge of phenomena above and below these ranges is secured through instruments serving as extensions of our senses. To the person unaccustomed to such instruments and the interpretation of the phenomena they reveal, these data appear to be of a different order of reality than those he experiences through sensory mechanisms and symbols with which he is thoroughly familiar.

Herein lies the explanation of the feeling of greater "concreteness" and "reality" of the behavior patterns we have called nucleated institutions as compared with the diffused-symbolic. Patterns *below* the level of usual perception, i.e., the subtler societal patterns we have called latent are not immediately apparent to everyone. Likewise, not everyone is aware, especially from direct sense perception, of national and international patterns which may, nevertheless, greatly influence our daily lives. Just as accounts of both the *macroscopic* and the *microscopic* structure and

behavior of matter seem "theoretical," symbolic, abstruse, and "unreal" to the man uninformed about modern scientific instruments and findings, so accounts of societal structures and behavior patterns, both *above* and *below* the range of his own direct and superficial observation, tend to appear shadowy, "intellectual," and unsubstantial. This basic limitation of our unaided senses and our failure to recognize the limitation has led us to make absurd classifications of phenomena on the basis of their alleged inherent nature as regards the applicability of scientific methods to them.

From the above point of view the behavior patterns of a community could probably be arranged roughly in a hierarchy according to their obviousness to the senses of everybody, i.e., the combination of stimuli recognized by the most stupid and ignorant person as well as by the most intelligent and educated. At the top of the hierarchy (i.e., least obvious to direct sense impression) would stand the vague patterns designated by symbols such as "The League of Nations," and "The State," Capitalism, Catholicism (as contrasted with a particular Catholic church), Science, etc. Next would stand the patterns within the focus of most people's unaided senses: the geographic and demographic limits of the local community, the local government as represented by formal administrative machinery (court house, policemen, etc.) affecting almost everyone directly. On this level also, and probably even more in the focus of some people's senses would probably go the network of so-called private groups—families, religious bodies, clubs, fraternities, etc. These have a considerable degree of formal organization and permanence, but are usually thought of as relatively selective and "voluntary" instead of inclusive and automatic in their membership. Also, they are more limited and specialized in the type of interests which give rise to them. From some points of view, this level of community organization is regarded as less "tangible" than the formal political organization of the whole community. The feeling that these informal groupings are less tangible is due to the relative absence of objective and systematic information about them and the relatively unstable and shifting nature of most of them. Attempts to study and chart this level of community structure are, however, becoming increasingly objective.[6] This is notably true of studies of family structure, function, and behavior.

Finally, there is underlying these private and more or less "voluntary" social groupings the tremendously intricate and elementary network of informal and latent social nuclei which we describe in such terms as affinities, friendships, love affairs, cliques, gangs, etc. These are at present the least tangible societal patterns because of their informal, transitory, private, and frequently secret character, as well as their occasionally illicit and sometimes illegal nature. These patterns are not structurally enshrined in any of the objective forms usually accompanying other forms of societal organization such as written constitutions, buildings, and other "material" paraphernalia, and they are charged with no formal functions by the larger community. Yet the basic nature of these nuclei and their profound influence in determining especially the functioning of the more formal structures has always been recognized. The influence of these alignments is what we rely upon "insiders," "dopesters," and gossips to convey to us, since objective and official accounts of the behavior of the generally recognized social groups contain no mention of these underlying patterns. Yet it is admitted that the generally recognized behavior of a community can be adequately explained in a given case only if these basic alignments are understood. Behind all present objective explanations of community behavior, therefore, there is always an aura of data, at present largely in the form of gossip, because of its subjective form, which all informed people feel constitutes the "real" explanation of what takes place. In the same way, the clever leader knows that the success of any program must take into consideration the cultural, psychological, emotional, and other clique alignments, especially of "key" people, the existence of which may not be consciously recognized by the people concerned, and certainly not admitted by them. Failure to take these alignments into consideration is generally recognized as a tactical blunder, lack of tact, diplomacy, etc. The objective study of these elementary or latent social nuclei is, therefore, quite basic both to understanding and intelligent control of the community.

The exploitation of these subtle forms of social nucleation has thus far been left largely to novelists, journalists, and other artists. The intangibility of the phenomenon to be described, it has been felt, is such that only the allegedly subtler insights of the

artist can adequately appreciate and portray these intricate, personal, and hidden social currents of attraction and repulsion. Sociologists have also attempted to capture and portray the phenomenon through life histories, diaries, detailed case studies, and more general treatises of the type of *Middletown*. With all of this literature, from the most impressionistic poem or novel to the better sociological treatises of the type mentioned, the scientist has no quarrel. In the first place, he recognizes that science in its more remote reaches probably merges with art and in all its phases relies on many artistic technics. In the second place, the scientist is ever on the lookout for suggestions which may be formulated into profitable hypotheses for investigation by the formal, objective, and rigorous methods upon which science relies for the verification of hypotheses. It is this last step which is the *sine qua non* of science but not a requirement in art. To be sure, the artist too seeks a type of verification in the response of people to his product. Such corroboration in art consists of evoking in people the feeling that this artistic account "rings true." The trouble with this "feeling" as a verification of scientific fact is that it is subjective and that the novelist's account frequently rings true not to any demonstrable fact but to the current stereotypes of the reader or of the public. Hence it is that a large part of the social scientist's task must be to develop technics by which the allegations of artists and philosophers can be verified and objectively demonstrated or refuted.

Institutional patterns of behavior, because of their wide diffusion, their uniformity in broad outline, and their concern with the most vital aspects of group life have naturally become the logical basis for special social sciences. Thus economics and government have been considered for a long time as special fields of inquiry. Demography, criminology, and the sociology of the family are other departments subject to extensive specialized study. The relationship of these special social sciences to general sociology was discussed in Chapter III. We select a few institutions for brief discussion below, *not to attempt to summarize the data of these fields, but mainly to illustrate and to emphasize some of the preconceptions which have handicapped the scientific study of particular institutions.* The reader should be reminded in this connection of the limitations of our treatment which we empha-

sized in the Introduction to Part III. We refer to and discuss briefly below some special aspects of domestic, economic, political, and recreational institutions. This does not imply that we necessarily regard these institutions as in a class by themselves or basically different from other institutions such as education, science, public health administration, etc. Institutions are defined, as we have seen, in terms of the relative stability, uniformity, formality, and generality of certain behavior patterns designated by words like property, marriage, government, religion, education, etc. We are not here interested in an exhaustive discussion of any of these institutions. The discussion below is purely illustrative of some of the applications of a point of view to the type of phenomena with which this chapter deals. For a fuller discussion of the nature and content of these and other institutions, we have already referred to some of the relevant literature. (Introduction to Part III.) More specific references will be found in the notes to the present chapter.

C. FAMILIAL, SEXUAL, AND KINSHIP PATTERNS

We have already discussed one of the most universal and fundamental aspects of the family pattern in connection with the subject of socialization. (Chapter VIII.) We shall discuss in the next chapter the reproductive patterns of human groups. Both of these aspects are important parts of the somewhat broader set of behaviors generally included under the family as an institution. Around these two basic functions of the family pattern, namely, reproduction and the care and socialization of children are assembled a vast diversity of subsidiary functions varying with time, place, and circumstances. These form the subject of a vast literature.[7] In view of the fact that those aspects of this institution which are of greatest interest from the point of view of a general text have been treated elsewhere in this volume, we shall confine ourselves here to only a few observations on the more promising methods of studying this institution.

The bulk of the literature on the family up until recent times has consisted of historical reports of the various forms and relationships characterizing this institution in different places at different times. From these accounts some broad generalizations

have been drawn as to what type of family is likely to be found under given circumstances. As W. I. Thomas has shown, however, these generalizations are subject to a great many qualifications because of existing habit-systems which cause different groups "to define the same situation and pattern of behavior in precisely opposite ways." [8] One reason for the unreliability of the generalizations regarding familial patterns is that too many diverse elements are usually included under the term. That is, if several patterns without necessary connection are thrown together into a composite, reliable generalization for such a composite pattern becomes precarious in proportion as the components are uncorrelated.

In most discussion, familial patterns are usually taken to include at least four distinct subordinate patterns, namely, (1) sexual behavior, (2) child rearing, (3) kinship behavior, and (4) economic patterns having to do with subsistence and property rights. Now the first and second of these items, for example, have no necessary relation with each other, nor has the first any necessary relation with the last.[9] For purposes of scientific study, the loosely defined composite known as "the family" will probably first have to be factored into more clearly defined constituent patterns,[10] the generalizations regarding which will, however, always take into consideration the influence of all larger patterns of which specific sub-patterns are a part. Reliable generalizations regarding these more elementary patterns may then perhaps be synthesized so as to hold for the more composite patterns. We assume in short, that in the last analysis familial and all other institutional behavior is explicable in terms of the general basic processes discussed in Part II. This is not to say that institutional patterns may not be studied profitably on any level which yields useful results. We are merely saying that from the point of view we have adopted, familial patterns are in the end interpretable in terms of the same fundamental attraction-repulsion, association-dissociation phenomena in terms of which we would explain any other behavior.

From this point of view, recent attempts to study comprehensively a large number of factors in relation to the degree of their association with various types of families or family adjustment represents the most promising scientific attack yet made. The

work of Burgess and Cottrell in this direction has been mentioned in a previous connection.[11] (Chapter IV, Section D.) Theirs is, of course, only a special application to a particular field of a technic which is implicit in all generalization. It consists basically (1) of listing all the factors which hypothetically may be associated with different observed types of societal behavior and (b) determining to what degree, if at all, each of these factors is significantly associated with the occurrence of each of the patterns found. If comprehensively carried out, whether with reference to familial or other institutional behavior, such a procedure would yield the essential basis for generalization, within stated degrees of probability, as to the conditions under which any stated pattern of behavior is likely to occur.

This is not to say that a great many other types of inquiry may not also yield important scientific information regarding the familial as well as other institutional patterns. The hypothetical factors with which inquiry of the type described above necessarily starts, must themselves be secured from intensive observation of individual cases, from historical records, or from related fields such as biology, psychology, economics, etc. The more carefully the hypothetical factors assumed to influence an institutional pattern have been selected on the basis of such preliminary study, the more fruitful will be the comprehensive correlation of these factors in yielding the kind of results we seek regarding the conditions which determine particular types of institutional patterns.

D. ECONOMIC PATTERNS

1. The Assumed Priority of Economic Factors

The patterns concerned primarily with man's production, exchange, and consumption of the economic goods which support life and status have perhaps received more attention from social scientists than any other aspect of group behavior. Economic patterns are concerned in a fundamental and obvious way with the continued existence of the species. As such, they have been found convenient points of reference from which to study other patterns with which economic patterns largely overlap and the operation of which they condition. Although economic behavior is just as truly conditioned by these other patterns, the necessary

preoccupations of men with certain primary problems of subsistence have in the minds of many analysts given to economic conditions a priority of importance as "causal" factors.

From the point of view we have adopted, such assumptions of inherent priority of *any* component of a societal situation has been shown to be incompatible with the scientific orientation. Scientists take any variable or component as an "independent" variable and observe the fluctuation of others around it. They choose their independent variable on the basis of its convenience and relevance to the particular problem they have in mind and do not deceive themselves that this selection is dictated by an inherent "independence" or other characteristic in the "nature" of one factor as contrasted with others. Accordingly, such wearisome and futile questions as to the "truth" of "the economic interpretation of history" become obsolete in the scientific orientation, however appealing it may be as a viewpoint or an article of faith to those highly conditioned to see economic factors as independent variables. The "economic interpretation" of history has from the scientific point of view precisely the same validity as any other interpretation supported by an equal amount of relevant data. That is, the economic pattern of behavior of any group may be *taken* as an independent variable with reference to which the variations in all other behavior may be studies. The same may be said of any other pattern. Convenience and the results achieved by each approach will constitute its sole justification in any case.

2. The State of Economic Science

The prominence of economics as a social science has contributed toward making it a convenient point of departure for the study also of other aspects of societal behavior. There is no doubt that economics has received a major share of attention from modern thinkers about the social order. As a result, the ablest attempts at systematic scientific formulation of principles governing societal phenomena have also been made in this field. The technological development of quantitative units and symbolism which is an invariable concomitant of scientific development has likewise reached its highest development in economics. Within the more specialized fields there exists a body of highly reliable

and verifiable knowledge regarding the correlations of various types of economic behavior under stated conditions. The universe for which these generalizations hold are sometimes extremely circumscribed and conditioned upon the qualification "other things being equal." But this is no reflection on the value of scientific laws, as we have seen in a previous chapter (Chapter IV). All scientific laws depend for their practical usefulness upon the development of reliable measuring devises by means of which allowance can be made for the differences in particular practical situations and the particular conditions for which a generalization has been verified. Such methods of measurement have also been developed to a higher degree in economics than in other social sciences.

The wide variety of the phenomena today included under economics prevents even a summary of its contents in the present connection. For example, just as we found the term familial institutions being used to cover a vast complex of behavior patterns with some common elements, so "economic institutions" is today used to include such widely disparate phenomena as (a) the institution of property, involving mainly psychological habit-systems and legal symbols, (b) such highly specialized patterns as money and banking practices, and (c) any large industrial plant. We are interested in this chapter mainly in drawing from the field of economics a few illustrations of the kind of preconceptions and confusions we have discussed in Part I of the present volume. The existing state of knowledge about economic conditions and the considerable number of reliable generalizations regarding economic patterns must be left to general and special treatises in the fields concerned.

Nearly all of the preconceptions regarding the peculiarity of economic phenomena as regards the applicability of the methods of the natural sciences to them are still widely held in economics.[12] Our discussion in Chapters I and II of the alleged complexity, instability, and subjectivity of societal phenomena and the consequent difficulty or impossibility of approaching them by quantitative and other operational methods applies with equal weight to much of the literature of economics. It is not surprising therefore that the most notable contributions to systematic economic theory have been made by scholars trained in mathematics, psy-

chology, and other sciences.[13] Aside from these general misconceptions of the nature of scientific laws and the symbols in terms of which they are formulated, there is also considerable doubt in economics as to the nonethical nature of science and its obligation to make realistic analysis of the sequences of events in a complex, regardless of the analyst's attitude of approval or disapproval of these events. We shall confine ourselves to a few illustrations of some of these preconceptions in the course of a brief outline of the principal problems with which economists today concern themselves. It is not contended that all economists are laboring under the preconceptions here considered. Our discussion is rather directed at the type of economics which tends to find expression in contemporary public policy.

3. Major Aspects of Economic Patterns

The folkways, customs, and mores constituting economic patterns of behavior in primitive tribes have received extensive attention in the literature of anthropology, sociology, history, and economics. The patterns as portrayed for removed societies are frequently somewhat clearer in their essential outlines than those of the contemporary Western world. The circumscribed and primary-group nature of economic patterns of primitive groups may partly account for this fact. Perhaps the relative objectivity of descriptions of primitive patterns is further explained by the detached attitude of the student of this behavior as compared with the reports about economic patterns of which the students themselves feel very much a part, and on the "justice" of which they have pronounced views. In any case the scientific analysis of contemporary economic patterns is considerably hampered by the constant surreptitious injection of practical considerations of contemporary morals and politics.

The general framework within which economic discussion tends to be carried out usually reduces to two major aspects: (1) the combination of land, labor, and capital in the production of economic goods; (2) the diffusion, exchange, and consumption of the products of economic activity. The principal problems that arise in this connection and at which the bulk of economic discussion is directed are (a) the conditions or mechanisms determining what is to be produced, (b) the mechanism determining in what quan-

tities and qualities it is produced, and (c) by what mechanism and in what shares the product is distributed among a given population.

Production of economic goods by man is basically determined by the same type of organic tension which produces activity of any kind. In its most elementary aspects, the activity results in a release of the tensions, as when hunger results in a hunt which results in satisfaction of the hunger. The tremendous complications of this elementary process in time and space among men as a result of their symbolic equipment does not destroy its fundamental character. Economists have abstracted and generalized this basic phenomenon under the categories of supply and demand. Such abstraction and generalization is the essence of scientific procedure. Laws so formulated should not necessarily be regarded as descriptions of any concrete case. It is enough if such generalizations hold under the limitations the laws themselves stipulate. Their practical applicability depends upon the measurement of, and allowance for, the differences between actual situations and those stipulated in the law.[14]

Correlative to the economic wants of men at any given time, place, and standard of life is his capacity to satisfy these wants at a given time and place. If the capacity to satisfy wants is equal to the wants, tension disappears and economic activity ceases. To the extent that wants outstrip the capacity to satisfy them, economic tension exists. On certain levels this tension is called poverty, economic insufficiency, etc. Precisely the same disparity on other levels is called greed, avarice, and sometimes simply "unhappiness."

4. The Relativity of Economic Standards

Recognizing that such terms as poverty have objective meaning only in terms of certain arbitrarily chosen standards, attempts have been made to define these standards by specifying concrete items of budgets designed respectively to represent "minimum of subsistence" and "minimum of decency" standards.[15] This is, of course, a necessary and desirable way to proceed in any practical administration of relief or other attempts to equalize the distribution of wealth as far as the existing mores demand. But the "subsistence" and "decency" standards as currently used are

themselves highly relative to the culture for which they are formulated. That is, a "minimum of subsistence" budget as currently defined in the United States would provide a livelihood of great luxury to the Chinese peasant. The mere biological existence of man as an animal apart from any "cultural" standards would doubtless require much less than the most restricted "subsistence" budget now calls for.[16] That is, the current "subsistence" budgets also include a large portion of "decency" factors, if we take subsistence to mean merely animal survival. But a realistic and useful definition of subsistence clearly should include those "decency" factors without which the organism would suffer such nervous tension from living at too great disparity with the standards of his group as to break him down, and bring on disease and death in a reasonably clear sequence.[17]

This line of reasoning, namely, the recognition that conformity to a certain minimum of group standards undoubtedly is necessary to the *biological* survival of man, is not seriously questioned as it applies to the lower economic levels. Its applicability also to the higher levels is not so generally recognized on account of certain preconceptions and prejudices which are common against the upper income classes. The millionaire who shot himself because the market collapse in 1929 reduced his fortune to a mere quarter of a million dollars may be regarded as having died from the lack of a "minimum of subsistence" just as truly as the unemployed and destitute man who likewise disposed of himself. The same would be true if the latter had starved to death outright. The essential point is that *in their respective situations* both organisms were *unable* to survive—the evidence for this conclusion being that they *did not* survive. From this point of view it is irrelevant to moralize that the millionaire's standards were "acquired," "artificial," "ostentatious," "too high," etc., and to argue that he "could have" solved his predicament by simply (?) reducing his standards by an act of "will." An objective account of the phenomenon observed compels us to report that the conditionings of an organism to competitive standards of living are as much a part of that organism as the food requirements of an animal on other levels of the societal or biological scale. The latter are perhaps also largely a matter of conditioning, in the sense that a person accustomed to the food schedule of contem-

porary laborers in the United States, not to mention the "capitalist" classes, might find it quite impossible to survive on the fare of the Chinese peasant, all "social" considerations aside.

The above illustration is introduced here in order to emphasize a point to which we have devoted considerable space in previous chapters but which is still persistently ignored, overlooked, or treated as of subsidiary importance in most discussions of economic patterns. It is true that since Veblen, at least, a more realistic view of standards in the sense of cultural conditionings of people rather than inherent "wants" or "needs" has become common. But there is still a strong tendency to regard these "social" requirements as a thing apart from "natural" factors, the former being assumed to be largely subject to "will," "whim," and for the most part immoral anyway. Consequently there has been neglect of realistic study of these factors ("consumption") and a failure to develop for this purpose methods of studying consumption standards so that they can be properly measured and included in the picture of the whole economic pattern.

The result has been that most studies of the central problems of economics, namely, the production and especially the distribution of wealth has taken for granted that the desired equilibrium in this field is to be achieved only by an increase of income (increased production) and a distribution of a larger share of it to the population in the lower income brackets. This may very well be the immediately practical solution from the standpoint of current attitudes and available resources and technology. A scientific view of the problem, however, stripped of all considerations as to contemporary expediency and "democratic" preconceptions, is bound to point out that the same equilibrium can be achieved by a modification in standards of "wants." That is, if the disparity between wants and the power to satisfy them is the basic tension under consideration,

$$\frac{Wants}{Satisfactions} = Tension;\ or,\ \frac{Goods}{Demand} = Satisfactions$$

then the tension can be reduced *either* by *increasing* men's powers of satisfying wants *or* by *decreasing wants*.[18] The mere fact that the latter alternative is contrary to a philosophy of "bigger and better," itself the natural concomitant of an expanding economy,

does not make it any less a scientific fact. Which of these mechanisms will come into operation and to what degree in a given case will as a matter of fact be broadly determined by the resistance which the situation offers to the operation of each. In a situation where the state of technology and available natural resources make expansion of production and distribution relatively easy, that adjustment is likely to ensue. It is likely, furthermore, to be assumed to be the only "proper" or "progressive" solution. As resistance to further expansion of production and/or distribution (for whatever reasons) as reflected in greater unit costs increases, modifications in wants are likely to ensue. So strong are the preconceptions and current sentiments regarding the desirability of expanding income rather than contracting wants, however, that in practical application the principle is frequently overlooked.

5. The Preconception of a Constantly Expanding Economy

Modern economics has developed almost entirely during the past two hundred years. This period has seen an expansion of population, technology, and production hitherto unheard of. It is not surprising, therefore, that current economics has become, for the most part, a science based upon the postulate of the permanent continuation of such expansion. This point of view tends further to postulate the inherency in nature of certain relationships between the factors of production, namely, those which have obtained during the period of expanding economy. We may illustrate the operation of this preconception from a recent comprehensive study by well-known economists of the phenomenon of business depression in the United States.[19] This study found first, that the productive capacity of the country *under the conditions prevailing in 1929* was 20 percent greater than the capacity actually utilized and that "this proportion of non-utilization remained fairly constant over the thirty years preceding." [20] In arriving at this figure the authors properly included (implicitly, at least) in their reservation "under the conditions prevailing in 1929" all the folkways, customs, mores, and institutional attitudes regarding property rights, profits, and "democratic" social organization generally. These conditions were properly included because they are quite as relevant in determining productive capacity as are

the specific questions of natural resources, technical development, and labor supply. To be able to show that under radically different standards and forms of social organization this estimate might be greatly increased, is not therefore, a sound criticism of the estimate given above, however interesting may be the question of its validity for *other* conditions than those existing in 1929 or other stated time.[21]

The same study goes on in a second volume to inquire into "why is 20 percent of the productive capacity of the country habitually unemployed?" [22] After a careful consideration of this question the authors conclude that the "failure of the need to evoke the production and the failure of the production to satisfy the need were due to maladjustment in the distribution of purchasing power." [23]

In a third volume the ways of remedying this defect in the distribution of purchasing power are considered. Curtailment of production, shortening of working hours, and "share-the-wealth" schemes are brushed aside (and for the most part properly), as illusory panaceas. Serious and competent consideration is given to the question as to whether raising wages is a promising way to achieve the desired results. The obstacles to the operation of this mechanism in a competitive regime of private business is correctly pointed out. At best, the benefits of this method tend to accrue mainly to effectively organized groups, which constituted in 1930 less than 7 percent of the gainfully employed. The authors conclude finally that the best method of achieving equilibrium in productive capacity and consumer purchasing power is through *reduction in prices*.

It is in tracing the implications of this conclusion that the authors find their conventional preconceptions too much for their ability to accept the logical and practical implications of their own excellent analysis. They have shown the tendency for profits under existing prices to accumulate more rapidly than a sufficiently distributed purchasing power. These profits contribute to the expansion of productive capacity to the extent of 20 percent in excess of purchasing power. To absorb this excess, it is advocated that prices be so lowered as to enable present purchasing power to absorb the full capacity production. The crucial question of how such reduction in prices will affect profits is

next approached. Here the authors hopefully point out, giving illustrations, that corporate earnings *might* actually be *raised* by lowering prices, although a definite answer on this point is admitted to depend on the question of overhead costs.

Now certainly everyone should rejoice in the happy solution that present inadequacy in purchasing power and its attendant problems may be remedied by lowering prices and that this need not result in a reduction of profits. But if we are interested in a basic equilibrium between production and consumption rather than in the absolute level of either or both, then prices would actually have to be reduced *so that* the amount of profits used for further production would be adversely affected *relatively to* purchasing power, in order to prevent reinvestment and expansion of productive capacity *faster* than purchasing power will absorb the product.[24] If such disparity again occurs or is even increased as a result of reduced prices, shut-down and depression, albeit on a higher general level, must recur for precisely the same reasons as they occur today. Thus the proposal to reduce prices *sufficiently* to enable present purchasing power to absorb the full production of present capacity but to maintain (and if possible, actually increase) the present ratio of profits-resulting-in-greater-net-production to purchasing power represents what Veblen called a "furtive" or "overt breach of consistency" when the full implications of scientific findings bring us face to face with prospects which offend our romantic desire both to have our cake and eat it. The same attitude is implied in many discussions of depressions. There is unanimous agreement that depressions should be abolished but great reluctance to accept the fact that any effective remedy of depressions will probably also prevent booms.[25]

We have discussed this analysis at such length because it appears to epitomize a great deal of present economic analysis, especially as it affects what is undoubtedly its central problem, namely, the *adjustment* of production and consumption. Most theoretical and applied programs are directed at solutions which if realizable might conceivably constantly increase both production and consumption in their present ratio or even in a ratio accentuating the present disequilibrium. In short, if we merely wish to maintain the present disequilibrium on increasingly high

levels (i.e., bigger booms, more violent depressions, accompanied perhaps by increasingly adequate relief systems), there is nothing wrong with the analysis reviewed above. But if the remedy suggested aims at equilibrium between production and consumption, this calls (by definition and in terms of the analysis itself) for a fundamental change in the *ratio* of these factors, not merely in an increase in both.

Perhaps the matter can be summarized by saying that most of the present principles of economics must be qualified by the addition of the phrase "*in an expanding economy.*" The revision of these principles so as to apply to other types of economy will in many respects be fundamental. To point out this possibility is not to disparage the value of sound principles that have been formulated regarding an expanding economy. The latter rather is to be regarded as a special case of *general* economics, after the manner in which all scientific theory develops.

6. Preconceptions Regarding Money and Prices

Since all economic patterns of behavior consist of the activities involved in the production, exchange, and consumption of economic goods, economics consists of a description of the mechanisms or organization through which these activities are carried on.

These mechanisms are of great variety. They consist basically of those habit-patterns (folkways, customs, mores, and institutions) specifying the rules governing the behavior of production, exchange, and consumption under given circumstances. The relative merits of different proposed forms of organization for these purposes constitute a major part of the discussion of economic questions. These merits will necessarily always be relative not only to the results desired but to the whole complex of existing attitudes as to the *propriety* of various means. Thus, distribution may take place through robbery, private or individual begging, organized, semi-public begging, such as is carried on by private charities and community chests, indirect taxes, direct taxes, bankruptcy regulations, unemployment insurance, regulation of earnings in various ways, and perhaps by many other mechanisms. All of these are practiced in contemporary society but many of them are felt to be highly inefficient in achieving

their ends, disturbing to more deep-seated habit-systems, and otherwise undesirable from the standpoint of the existing mores. For example, it is customary and entirely compatible with the mores of contemporary American society for most women and children (including able-bodied adults) to the extent of about 60 percent of the population, to live in a state of dependency upon some receiver of income. The extension of this pattern to include unemployed industrial laborers (supported by "relief") is felt at present to be "abnormal" and fraught with highly undesirable consequences. Even the employment of such laborers by the government in productive occupations is enough of a departure from the conventional pattern of private employment to induce tensions in the whole community and to suggest that "basic" economic "laws" are being violated. In the sense that the above methods of dealing with the "relief" population is a departure from the customary methods, they are, of course, "abnormal" and give rise to widespread psychological and sociological tensions because they are unusual. These tensions in turn have profound effects on production and a great many other aspects of the current societal pattern.

A principal reason for much of the agitation that accompanies such departures in the ways of accomplishing certain ends that always have been achieved in basically similar but ostensibly different ways is the violence which it does to the symbolic patterns in terms of which we have become accustomed to think of the phenomena involved. Thus, if the government lends money to a city to build a *toll* bridge, this is regarded as relatively sound economics: The government will be repaid by the dimes or dollars collected from all who drive across the bridge. If the government builds the bridge and collects *no tolls*, but pays for it with tax money, considerable agitation ensues. The only difference is that in one case the bridge is paid for by that part of the population which happens to use it, whereas in the other case the general population or some special income group pays for it. But the symbols involved ("taxation," "government enterprise," etc.) are different and the feeling is that a fundamentally different economic phenomenon has taken place. Likewise, when a private corporation issues bonds and with the proceeds constructs a building, the liability represented by the bonds is balanced on

the books of the company by the value of the building as an asset. But when the government raises money in the same way to construct school houses and bridges with "relief labor" the cost appears only as a liability and a "deficit" in the government's budget.[26]

We have already shown (Chapter VIII) the confusions which arise from the projection of the meaning of special symbols and transactions of primary-group private business to the secondary group transactions of independent states. This confusion of symbols with actual or essential economic operations and mechanisms is perhaps most strikingly illustrated in the estimates made by financiers and economists regarding the collapse of a government at war because the daily expenditures will presently upset the "budget." What is overlooked is that if a government sets a population to work on the necessary productive and distributive enterprises no money whatever is necessary at any stage of the process. Outstanding indebtedness, if any, domestic and foreign, may be cancelled with impunity, especially if the military situation is favorable. The ability of a people to survive under such conditions is governed only by their natural resources and their technical ability to utilize them or develop substitutes for them.

The most conspicuous contemporary example of confused thinking due to a failure to comprehend the operational significance of money and prices is to be found in current discussions of technological unemployment. The fundamental absurdity of widespread, unsatisfied economic wants in a country with ample resources and technological devices to utilize these resources is a favorite topic of discussion.[27] Restricted production is practiced in order to maintain prices, in order to maintain profits, in order to maintain purchasing power to buy the restricted products at the higher prices resulting from restricted production, etc. As a device for restoring or achieving a certain desired parity as between two or more fields of production, one of which is already practicing the restriction of production to maintain the most profitable prices, the mechanism undoubtedly works after a fashion. The price system is, in fact, the mechanism which today determines the major economic question of *what* is to be produced and in *what quantities and qualities* it is

to be produced. One may disapprove of the results of the operation of this mechanism and contend for "production for use rather than for price or profit" as the current phrase has it. The more eloquent advocates of this doctrine, however, are frequently unwilling to face the fact that if the price system is to be abandoned as a device determining what and how much is to be produced *some other mechanism* will have to be established to fulfill that function. The more realistic of the opponents of the price system have faced this fact and have openly admitted that an adjustment in the desired direction calls for a complete reorganization of the present economic-political system.[28] That is, the reorganization calls for the substitution of some *authority*, perhaps a board of engineers who, on the basis of existing resources and technology plus their own views of what people want or should want, will make those decisions which the price system is now left to decide. This is a logically defensible position and its basic outline is indeed involved in any thoroughgoing remedy for the malfunctioning of the price system, in the respect here under consideration. The more popular view and the logically most incongruous one is that which hopes for the destruction of the price and profit system but the *retention* and the continued "free" operation of supply and demand even as at present restricted.

Everything that was pointed out in Chapter I regarding the results of becoming involved in a system of symbols for which the corresponding operations have never been clearly defined, applies with special weight to a considerable portion of economic discussion, especially that dealing with the mechanisms of control. From individual symbols, themselves undefined operationally, whole patterns of such symbols are constructed to which are applied blanket symbols like "capitalism," "socialism," "communism," "Fascism," "democracy," etc. The exact economic and political mechanisms involved in each of these complexes are never specified. Under a given state of technology they are likely to differ, if at all, only in matters of degree, or in superficial respects not necessarily connected with their main functional operation. In proportion as their operational meaning is obscure, the opportunity for each person to include under each symbol his own emotional likes or revulsions is large. That is, Fascism, for example, is defined by different people in any one or more of the

following ways: a form of organization which (a) persecutes Jews; (b) protects the interests of superior people; (c) destroys free speech; (d) abolishes unemployment; (e) serves the interests of large capitalists; (f) practices national socialism, all interests being subservient to the State; etc. It is usually quite impossible to unscramble from these implicit definitions and all the attendant verbiage the essential facts demanded for a scientific description of the economic and political mechanisms operating in different states. Yet on this basis voluminous and singularly meaningless discussions of economic and political problems usually proceed. Since this is the point at which economic questions become primarily political, we turn here to a brief discussion of political institutions as represented by the State.

E. POLITICAL PATTERNS—THE STATE

The modern state is so inseparably connected in its origin and development with the evolution of contemporary economic patterns that for our present purpose, at least, political patterns and economic patterns may be treated together. We shall not here digress to discuss the parallel history and development of these two aspects of national group life, each of which has become the object of a special social science, but with increasingly vague lines of separation. Political scientists have concerned themselves largely with the formal instruments of the organization and functioning of states. That is, they have devoted much time to the study of constitutions, statutes, and together with the allied field of law, the formal ceremonies attending the mechanism of social control. More recently and realistically they have turned their attention to basic *political behavior* and especially to the informal and latent patterns, discussed earlier in this chapter, which are often in politics the vitally functioning patterns.[29]

The two principal aspects of political patterns that call for scientific study are (1) the mechanisms by which decisions on public policy are made and (2) the mechanisms by which these decisions are carried out, i.e., the details of public administration including legal and judicial behavior. It is recognized, of course, that these are two aspects of a single functional pattern and that we separate them only for purposes of discussion. The mechanisms of

decision on public policy, which perhaps consisted originally of the subtle interactions of a primitive horde resulting in concensus, necessarily operate in any large group through the authority of one or more selected or delegated persons. The manner by which these persons come to exercise the functions of government, whatever they may be at any given time, has been one of the principal concerns of political science.

Unfortunately, this question has hitherto been discussed largely from the point of view of certain metaphysical and other assumptions regarding the "nature" of the "State," "Sovereignty," "Rights" of man, etc. From this point of view the persons charged with governmental duties have had their selection variously ascribed to God, or the superior qualifications of wealth, blood, tradition, ability, popular will, etc. Now the terminology and the approach of this type of political discussion quite clearly proceeds from other postulates about man and society than those which underlie modern natural science. This literature is, therefore, from the point of view we have adopted, simply obsolete. On the other hand, these studies which are concerned with the manner by which government officials come into power as it affects the *functioning* of these officials, are an important part of the second major aspect of political patterns we have mentioned, namely, the mechanisms of public administration. A generalized description of these concrete behaviors constitutes political science. These behaviors, broadly conceived, are also what we mean by government.

From this point of view, political problems are mainly technological problems.[30] Both the problems and their present solution will perhaps be found to be highly uniform in essential respects in all states of a somewhat similar degree of cultural and industrial evolution for the same reason that other technology tends to be similar in such states. In spite of the highly involved verbiage constituting so-called political and economic ideologies which appear as disparate as the poles, the governments of states of comparable degrees of economic development tend to assume relatively similar functions. Thus, the trend toward the assumption by the governments of the Western world, in spite of their widely disparate "ideologies," of functions traditionally exercised by individual, familial, local, and private organizations is recognized by all

observers. The day-to-day activities of administrative staffs involved in the performance of the functions of the state are, furthermore, almost necessarily highly similar. *The careful description of these uniformities under given conditions, and the measurement of their variations as conditions vary is the proper business of political science.* Diatribes representing some individual's emotional reaction to these patterns, or more especially to the verbiage associated with them, is not without value as literature, and as data for the social psychology of politics. But this literature should not be mistaken for scientific conclusions.

If the task above designated as the proper business of political science were thoroughly performed it should be possible, first, to make positive statements regarding the efficiency and results of having certain functions performed (a) by different types of administrative machinery, local, or national, and (b) by private individuals or organizations. In the second place it should be possible through a similar study of the behavior of public officials and civil servants to devise methods of selecting, training, disciplining, and controlling the personnel charged with public administration. It will be remarked that the definition of "efficiency" is itself relative to some set of "values" and "ends" sought. We have previously shown that "values" and "ends" are inferences from observed behavior and that therefore they are as objectively determinable as other observed phenomena. Now a group behavior pattern is itself evidence of *some uniformity* of "values" and "ends" on the part of that group. As we seek increasingly general "values" and "ends" we shall doubtless find increasing agreement among human beings as to what these values and ends are. For example, such values as "survival," "security," "new experience," and other general desires have been ascribed to man as universal. The conflicts over administrative systems, therefore, are likely to be over "means" rather than over "values" and "ends."

As science advances, its ability to chart convincingly the results of alternate courses of action should increasingly render obsolete present methods of settling the question of "means" such as violence, impassioned propaganda, and mass sentiment based on highly unreliable data. Such a development of the social sciences should, furthermore, increasingly absolve public officials

from the suspicion that their decisions represent merely personal, not to say corrupt, preferences. That is, a mature science permits the development of professional standards for the control of those who apply it. The public protects itself chiefly through the training requirements of these practitioners. That is, the physician and the engineer are required to subject themselves to a considerable period of standardized training which is supposed also to include a training in their societal responsibilities. The training consists in its most general aspects of (a) ability to read certain indexes or detect symptoms, and (b) *scientific knowledge dictating certain action* under the circumstances, if certain results are to be achieved. The decision of a physician as to what treatment to adopt or the action of an engineer in throwing certain switches under given circumstances is not regarded as a matter of whim or personal preference, but action dictated by *scientific knowledge of consequences*, there being usually general agreement as to ends sought. Where symptoms and circumstances do not clearly indicate one rather than another course of action, the same principle nevertheless applies to the degree that the scientist is skilled. This is not an infallible system. Occasionally members of the scientific professions engage in malpractice of the type alleged to be common among public officials, i.e., they make decisions favorable to their own or other private interests and detrimental to the public. In such cases we must ascribe their conduct (a) to defect in their training and the machinery of selection, or (b) conditions of work which give incentive to betrayal of public trust, or (c) both of these sets of conditions. The "ethics" which are usually thought of as a control outside and above scientific training is more likely to be *a part of* scientific training plus the compulsions of a societal situation. The more competent members of a profession have little or no incentive to malpractice. That is, they can gain more by loyalty to the community. The less able are more likely to have such incentive. Their relative incompetence makes it difficult for them to achieve legitimately rewards which they therefore resort to illegitimate methods to secure. Such deliberately "immoral" behavior is, to be sure, frequently indistinguishable in its results from malpractice due to incompetence and inadequate training. In either case, the state by virtue of its capacity to attract, if it so chooses, the ablest talent

in every field, can insure itself of a maximum of freedom from corruption.

From the natural scientific point of view, then, public and private morals are merely the standards of conduct that obtain in a group. These standards arise as a natural growth and obtain sanction through their utility—i.e., they are these forms of conduct that on the whole have been found advantageous to the group. Systematic study of the conditions under which given standards tend to arise, the conditions which modify them, and the formulation of generalizations making possible prediction regarding these aspects of behavior, might develop into another special social science of Ethics. That subject matter is now included in various parts of sociology and social psychology. In any case, ethics involves no mysterious "subjective" or "mental" phenomena not amenable to the same scientific approach as other societal phenomena. The problem of public protection against the abuse of delegated authority is the scientific problem of determining the conditions under which such abuse tends to take place and the generalization and verification of this knowledge. Such study should be a major part of the description of political behavior.

The implications of the above viewpoint as they affect traditional democratic procedures are obvious and will be disturbing to those who regard democracy of the early American type as the final and most desirable form of political organization under any or all circumstances. In the meantime, the course of events has already rendered that system obsolete, and has dictated considerable movement in the direction above described. Centralized power in the hands of the executive and administrative branch is a characteristic of all modern government, regardless of the name by which it is called. The dangers and the objections urged against this tendency may be admitted as true. That is, certain activities—a large number of them—traditionally left to the choice or discretion of the individual are rapidly being restricted by the government. In the second place, an increasing number of decisions and governmental actions which, under democratic systems at least, were submitted to the people directly or to their elected representatives are now decided by various public administrators. This trend is usually described as a movement

away from "Freedom." The particular type of freedom most endangered, according to this view, is freedom of speech.

The delegation of much power into the hands of one or a few men (or what amounts to the same, acquiescence in the seizure of such power) undoubtedly entails as a possibility all the dangers that have been urged against it. This admission is, however, without practical significance unless we consider at the same time the alternatives. We need not digress to review the conditions which have brought about the transition we are considering. The relevant fact is that, in so-called democratic countries, at least, (and I think also in the dictatorships), the transition has taken place with the full consent, or at least the acquiescence, of the overwhelming majority of the people. This suggests that in all practical situations perhaps the issue is not between "Freedom" and "Unfreedom" or "Slavery" as journalists so touchingly seem to believe, but between *freedom of some kinds for some people* and *freedom of other kinds for other people.* This is perhaps the only actual choice that exists in any large group and it is on this basis that the transition we are considering has taken place.

Those who, like the writer, have been reared under *certain* freedoms and who furthermore have an obvious vested interest in their continuance, will be inclined to deplore or resist any encroachments on present privileges. By virtue of belonging to one of the professions which, like journalism and the ministry, live by voluminous and in large part irresponsible speech, I am disposed to cling to this prerogative. It is easy to convince oneself also that an activity so essential to *us* must also be vastly important to *all* men. It may be. But scientific candor compels recognition of the fact that freedom of speech may not *appear* so important to men who either have nothing to say or who cannot afford to say it. That is, they do not possess the resources to publish a newspaper or pay for time on the radio. They cannot even afford to mount a soap box in the park for fear of being fired from the job on which they depend or for fear of not getting the job for which they hope. These are the facts to be considered in a realistic view of people's attitudes toward certain freedoms. Why should not people in the above predicament, and it applies to the overwhelming majority of all lands, trade this symbol "Freedom of Speech" for the promise of certain elementary securities

with which they have first-hand experience, such as essential necessities, a sense of group solidarity and significance, and even entertainment? In the face of such considerations, even the magnificent hypocrisy of the press will probably make little headway in its attempt to make out that it, as at present constituted, is a more jealous guardian of the public interest than the elected or accepted head of the government.

We have assumed that the central problem of political organization is how to insure that delegated authority will not be used to the disadvantage of the community whose interests it is supposed to guard. We have suggested that as a body of scientific knowledge accumulates regarding the adjustments to be made, professionalization of public administration becomes possible. The most feasible control of public servants in fields requiring technical competence of a kind not subject to direct check by the nonspecialist, has been found to lie in professional requirements calculated to sift out those who for any reason, if admitted to practice would endanger the public interest. This safeguard is not infallible. It merely appears to be the most feasible, and one which has on the whole operated with conspicuous success in the field of those professions where it is in force. As to the nature of the professional competence which will be required of the governors of men, it may be that it will consist broadly of (a) knowledge of and capacity to exhibit what alternatives of action exist and the consequences of each; (b) capacity to gauge what people under these circumstances want; [31] and (c) administrative capacity to satisfy these wants.

F. RELIGIOUS AND RECREATIONAL PATTERNS

A very large number of action patterns of the type we have defined as institutional could be found in most groups. We confine ourselves in this chapter only to the most universal. One of these is religious behavior. From a vast literature on the subject, we select the following thoughtful passages from Professor Sapir as to the fundamental nature of this pattern:

"Religion is man's never-ceasing attempt to discover a road to spiritual serenity across the perplexities and dangers of daily life. How this serenity is obtained is a matter of infinitely varied detail. Where the need for such serenity is passionately felt, we have religious yearning;

where it is absent, religious behavior is no more than socially sanctioned form or an aesthetic blend of belief and gesture. In practice it is all but impossible to disconnect religious sentiment from formal religious conduct, but it is worth divorcing the two in order that we may insist all the more clearly on the reality of the sentiment.

"What constitutes spiritual serenity must be answered afresh for every culture and for every community—in the last analysis, for every individual. Culture defines for every society the world in which it lives, hence we can expect no more of any religion than that it awaken and overcome the feeling of danger, of individual helplessness, that is proper to that particular world. The ultimate problems of an Ojibwa Indian are different as to content from those of the educated devotee of modern science, but with each of them religion means the haunting realization of ultimate powerlessness in an inscrutable world, and the unquestioning and thoroughly irrational conviction of the possibility of gaining mystic security by somehow identifying oneself with what can never be known. Religion is omni-present fear and a vast humility paradoxically turned into bedrock security, for once the fear is imaginatively taken to one's heart and the humility confessed for good and all, the triumph of human consciousness is assured. There can be neither fear nor humiliation for deeply religious natures, for they have intuitively experienced both of these emotions in advance of the declared hostility of an overwhelming world, coldly indifferent to human desire.

"Belief, as a matter of fact, is not a properly religious concept at all, but a scientific one. The sum total of one's beliefs may be said to constitute one's science. Some of these beliefs can be sustained by an appeal to direct personal experience, others rest for their warrant on the authority of such individuals as are known or believed to hold in their hands the keys of final demonstration. So far as the normal individual is concerned, a belief in the reality of molecules or atoms is of exactly the same nature as a belief in God or immortality. The true division here is not between science and religious belief, but between personally verifiable and personally unverifiable belief. A philosophy of life is not religion if the phrase connotes merely a cluster of nationalized beliefs. *Only when one's philosophy of life is vitalized by emotion does it take on the character of religion.*

"Some writers have spoken of a specifically religious emotion, but it seems quite unnecessary to appeal to any such hypothetical concept. One may rest content to see in religious emotion nothing more nor less than a cluster of such typical emotional experiences as fear, awe, hope, love, the pleading attitude, and any others that may be experienced, in so far as these psychological experiences occur in a context of ultimate values. *Fear as such, no matter how poignant or ecstatic, is not religion.* A calm belief in a God who creates and rewards and punishes does not constitute religion if the believer fails to recognize the necessity of the application of this belief to his personal problems. *Only when the emotion*

of fear and the belief in a God are somehow integrated into a value can either the emotion or the belief be said to be of a religious nature. This standpoint allows for no specific religious emotions nor does it recognize any specific forms of belief as necessary for religion. All that is asked is that intensity of feeling join with a philosophy of ultimate things into an unanalyzed conviction of the possibility of security in a world of values." [32] [Italics mine.]

We have previously (Chapter III) stated that a "philosophy of life" is merely that habit-system or frame of reference in terms of which we define our situation and react to it with some degree of consistency. Sapir, in the above quotation distinguishes the religious from other patterns by the criterion as to whether it is "vitalized by emotion." This is perhaps the most generally useful distinction, although it is frequently none too clear exactly what degree of emotion distinguishes religious behavior from that vitalized by other types of energy discharge. But it is a workable definition in that it selects a single essential element which if it is present justifies us in describing a vast variety of behavior patterns as truly religious. Who, for example, can read the following passages without being impressed with the genuinely religious character, as defined above, of the behavior described?

"And every evening, summer or winter, rain or shine or snow or bitter cold, as the hour of seven approaches, poorly clad figures may be seen moving with hurrying feet from every direction through the Red Square and forming themselves silently into an orderly endless line to wait without movement with an endless patience until the clock strikes and then move slowly down the steps of that marvelous dark mausoleum with its eternal guard of red soldiers, to file reverently past the great glass case where they may gaze for a moment on the mummified face and figure of the man who embodies for them the revolution and its spiritual meaning. And those who were still in the long line outside when the clock struck nine today will simply come again tomorrow, thousands on thousands each day paying their tribute of love and worship. In all the world there is no more impressive sight. Every day his words are read by multitudes, and 'Lenin said this' or 'Lenin taught that' is the last word to be said on any question. There was a time when Jesus was accorded a like reverence by his followers. . . .

"But communism has not only the inward faith and the surge of feeling that mark the great religions. It has also its body of doctrines and formulas. It has its saints, its prophets, and its martyrs. It has even its college of cardinals and its pope. And if its doctrine of infallibility is not exactly that of Rome, there is certainly no place in the world where

heresy brings more swift and sure excommunication than in Russia today.

"Like all the great religions, communism has embodied itself in a personality. In the face of all the manifold difficulties that twentieth-century knowledge interposes in the way of canonization, it has managed, in the brief span of a dozen years, to make of its founder not only a saint but a demi-god. 'I believe in no God, and Lenin is his prophet' might well be the motto of the Russians today. Nowhere else in the world, I believe, is there anything to compare in depth and sincerity with the worship accorded in Russia to the little man who from Smolny and the Kremlin in the short space of seven years made over the destiny of a tenth of the human race. Prominently placed in every city and town stands his statue, mostly in the familiar militant attitude, with hand upraised and thrust forward, in which he harangued the crowd. And in every school and club and theater and public gathering place, even in the little towns, you find a big bust of Lenin, very commonly accompanied by those of the two other members of the Communist trinity, Karl Marx and Friedrich Engels. And in the shop windows as one goes through the streets there are small Lenin busts, dozens of them, ready for the eager buyers who take them home to replace the ikons of older days. Literally millions of pictures of Lenin look down on the Russians wherever they go and whatever they do." [33]

This description could doubtless be duplicated for every other country and for other creeds at some time or other. The relative merits of the programs or the scientific justification for the hopes which generate this behavior is not here a relevant question. The overwhelming array of data of the same sort which can be assembled from every people and every age forces the conclusion (a) that the type of behavior involved is fundamentally congenial to human groups and (b) that in spite of the apparent decay of some traditional religions, it is very doubtful if religion, as here defined, is less common today than in the past. Nor is there any reason to expect as yet, at least, a decline of religion. We might assume that a scientific attitude toward the social order of the type that is already fairly general toward the physical universe might bring in its wake a decline of the type of behavior we have called religious. But there will always be the possibility of an emotional attitude toward the fundamental mystery of "that untravelled world whose margin fades forever and forever" as we move. In any case, the scientific attitude toward man and his affairs has as yet been achieved by too few to have a noticeable affect on any pattern so deepseated as religion. There is evidence

furthermore that even those who have achieved to a large degree a scientific orientation toward the social order nevertheless find religious behavior with reference to *some* department of life congenial in itself. It is in this sense that religious patterns may be classified as of a fundamentally recreational character.[34]

Recreational behavior is distinguishable from other behavior only by the degree to which it is an end in itself rather than a means to some ulterior end. The capacity of devout observances, ceremonial, music, and other arts to evoke emotional outlets of a most satisfying sort entirely apart from any magical efficacy of an ulterior kind they may have been believed at some time to possess, is too well recognized to require elaboration. As long as this is true, traditional behaviors that yield this type of satisfaction may be expected to continue and perhaps greatly expand with growing leisure. Recreational patterns such as the church service, the emotional lecture, the theatre, the dance, the concert, the art exhibit, sport, and institutionalized entertainment of every sort may be expected to continue to be major patterns of behavior. Science, the new and more effective magic, will probably continue to take over the traditional magical functions of the "fine" arts and devout observances as instruments of achieving practical results. But artistic activities serve as instruments for the restoration of equilibria of other types, which will presumably always be in demand. John Dewey sees in art the great integrator "which counteracts the disrupting tendencies of hard-and-fast-specializations, compartmental diversions and rigid segregations which so confuse and nullify our present life." [35] In an age of growing specialization and growing leisure, recreational institutions may be expected to absorb an increasingly large share of man's activity.[36]

G. CONCLUSION

We pointed out in Chapter V that it is customary in science to designate by such words as mechanism, organ, pattern, or organization that arrangement or relation of parts by virtue of which anything behaves. We quoted in this connection Child's definition of an organism as "a more or less definite and discrete order and unity, which not only determines its structure and the rela-

tions of its parts to each other, but enables it to act as a whole with respect to the world about it." [37] The same author also notes that while sociologists have been reluctant to recognize the applicability of this definition also to human groups, they have found it "very difficult to dispense with the term organization, simply because the term expresses better than any other certain processes and phenomena in society as well as in the organism." [38] We emphasized in Chapter V this essential similarity of all mechanisms of behavior and listed some of the principal conventional designations of the types of organic mechanisms such as tropisms, reflexes, habits, folkways, customs, mores, and institutions.

In the present chapter we have considered further the last of these mechanisms or types of organization, namely, institutions. We distinguished them from other patterns of group behavior on the basis of their relatively high degree of stability, uniformity, and formality within any given group, and their relatively general occurrence in most human groups. We pointed out that in a study of institutions as thus defined, we are merely studying the dynamic aspects of certain types of human groups the structural aspects of which we discussed in Chapter IX. That is, institutions represent the relatively stable, uniform, formal, and general dynamic aspects of groups. Institutional behavior may, therefore, be studied as attributes of human groups and, when reduced to suitable units, may be observed, tabulated, and generalized for scientific purposes like other demographic data.

If institutions are those behavior patterns which tend to persist over relatively long periods of time in all or nearly all self-sufficient groups or societies, they may be assumed to represent the adjustment technics by which the more general and recurrent equilibria in human groups are achieved. Or, as more commonly stated, institutions are the behavior patterns serving the more general and basic "needs," or "interests" of a society. For example, Phelps gives the following table (page 412) of "interests" with the corresponding forms of associations and institutions: [39]

These "interests," and therefore the corresponding associations and institutions, may change of course, from time to time, in their relative prominence and generality. Especially are the *forms* of the associations and institutions based upon these "in-

TABLE 8. INTERESTS, ASSOCIATIONS, AND INSTITUTIONS
(From Phelps)

Interests	*Associations*	*Institutions*
Economic	Business	Property
Political	State	Government
Sex and reproductive	Family	Marriage
Religious	Church	Sacraments and ritual
Educational	School	Educational systems
Aesthetic	Institutes for music, art, etc.	[a]
Scientific	Learned societies	[a]
Health	Hospitals, clinics	Medical and health systems

[a] These services are generally rendered by other associations and institutions.

terests" likely to vary widely according to the physical and social environments and traditions that operate upon a group. We have not attempted in the present chapter a systematic or comprehensive discussion of any of these institutions either as found in some particular society at a particular time or as general phenomena to be found in all groups. We have touched briefly on some aspects of domestic, economic, political, and recreational institutions. Our purpose in this treatment has been purely illustrative of some of the types of problems and other considerations that are likely to arise in the study of institutions.

A more detailed study of the "interests" or activities which are generally subject to some degree and type of social control requires the parallel study of a large number of societies not only with respect to similarities and differences in concrete actions but with respect to the meaning of these activities to the people practicing them. C. S. Ford [40] has made an ingenious attempt at a quantitative study of twenty-five societies from this point of view. A sample of his method of tabulation is shown in Table 9.

Commenting on this table, Ford says:

"This method of tabulation differentiates two aspects of behavior. Down the left-hand column behavior is defined in its elementary physiological aspects; horizontally across the page it is defined in terms of the meanings and sanctions which reinforce the rules. Thus, in one aspect, physical acts like eating and talking are forbidden under certain circumstances, and, in the other, these and other actions are prohibited if they are believed to bring harm to oneself or to others. The items entered along the

TABLE 9. A SAMPLE OF THE DATA TABULATED FOR THE KWAKIUTL

(From Ford)

	?	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
?																M		CM
Eat	cM	M	M		M	M	C	C	M				C	M				
Drink		M																
Suck	M														C			
Touch	M	M	M															
Strike	M															V		Sv
Shout																		
Wail								CM										
Talk	M		M		M					C	M	M	C	M	C			
Sing	C																	
Laugh	M			M														
Look	cM	M	M			M												
Sleep	M	M				M							C	M				
Urinate	CV																	
Defecate	CV																	
Perspire																		
Coitus																	M	
Give	C																	
Take	CM																	

KEY

C–Compulsion
M–Prohibition
S–Inferred Compulsion
V- Inferred Prohibition
Height of symbol indicates importance of compulsion or prohibition.

KEY TO COLUMNS OF TABLE 9

1. lest harm self
2. thus hindering food quest
3. thus hindering manufacturing processes
4. thus inviting bad luck
5. thus harming another
6. thus curing self
7. thus mourning
8. thus neglecting to mourn
9. thus protecting self
10. thus being intimate with others
11. thus insulting another
12. thus facilitating delivery
13. thus making delivery difficult
14. thus curing another
15. thus murdering another
16. thus committing adultery
17. thus killing animals

top of the page are not definable with reference to activity on the part of the human organism. Insulting another, for example, is not cross-culturally definable in terms of the actions which a person exhibits when insulting another. A comparative study of societies reveals that insults can be expressed in such diverse ways as thumbing one's nose, biting one's finger nails, staring, or turning one's back. If acts interpreted as insulting vary from group to group, the concept 'insult another' cannot be defined in terms of specific behavior." [41]

By this method it is possible to conclude (1) *which specific physiological activities* are the subject of control in a given society and (2) the percentage of all societies which exercise *some kind* of control over these activities. (3) *What kind* of control (compulsion, prohibition, inferred compulsion, or inferred prohibition) is indicated by the letter symbol entered in a particular cell. (See Key to Table 9.) (4) The size of the symbol indicates the relative importance of the compulsion or the prohibition. (5) The column in which the symbol appears indicates the meaning or significance of the behavior at which the control is directed. (See list of items accompanying Table 9.) Through such systematic study of actual societies, then, the criteria of stability (as evidenced from successive studies), uniformity, importance, and generality of a societal pattern can be determined. Whether it is to be classified as an institution or as some other type may then be determined on the basis of arbitrarily assigned degrees to which the various criteria obtain in a given case. More important than the possibility of thus arriving at an objective way of classifying group action patterns as folkways, mores, or institutions is the possibility of thus determining *the significant content, importance, and generality* of given behavior patterns.

Since institutional behavior constitutes a substantial portion of all societal behavior, everything that we have said elsewhere throughout this volume regarding the problems and methods of social research applies also to the study of institutional behavior. Institutions are not, therefore, especially unique phenomena. They differ from other behavior patterns only in degree, and their special study is chiefly a matter of convenient division of labor and the definition of problems of manageable proportions. Because of their relative stability and objectivity, however, the

study of institutions is one of the most convenient and fruitful avenues of approach to the formulation of laws of societal behavior in general. The reader has already been referred to the substantial work of Chapin and others in this field. Detailed study of particular institutions is, of course, the province of special social sciences, such as economics and politics.

H. NOTES

1. F. S. Chapin (*Contemporary American Institutions*, Harper, 1935) has illustrated the relation between structural patterns and functional (i.e., behavioral, e.g., institutional) patterns as follows:

"The relationship between the sequential pattern and the structural pattern may be explained analogically. Suppose we consider a talkie picture of a city council in session. The presiding officer sits above the council on the rostrum. He is spatially removed from his fellows both in physical distance and in prerogative (social distance). A speaker is recognized by the chair and presents a petition. There is animated discussion, gesticulation and debate. Individual members take sides and a vote is cast by roll call. In short, a sequence of spatial patterns (physical and social) is displayed. But any moment the run of the film may be stopped and a still photograph of that instant shows a pattern of static relationships. An instant later the pattern has changed, for the next still shows a different pattern of parts to the controversy. Thus we may conceive of the sequential pattern as a succession of static patterns of relationship, or, *vice versa*, we may conceive of the structural pattern as the static physical-social distance pattern of a given instant. In using the concept of "function," the temporal continuity of pattern occupies the center of attention to the immediate exclusion of considerations that relate to spatial changes among the parts of the pattern. It is chiefly a question of emphasis. In "function" the emphasis is upon a sequence of continuum in time of the essential pattern. In "structure" the emphasis is upon discontinuity among the parts." (Pp. 60–61.)

2. See Chapters I and V. F. S. Chapin, *op. cit.*, has patiently and painstakingly gone over the same ground with special reference to institutions. See especially his Chapter 16. Chapin's work is by far the ablest that has yet appeared on this subject and I consider my position is in full agreement with his. I have previously (Chapter V) discussed F. H. Allport's strictures upon the use of such terms as "group" and "institution." I consider his and D. A. Hartman's position on the particular point here at issue as entirely untenable. ("The Prediction of Cultural Change: A Problem Illustrated in Studies by F. S. Chapin and A. L. Kroeber," Analysis No. 22, in *Methods in Social Science*, edited by S. A. Rice, University of Chicago Press, 1931.) The argument is that societal phenomena such as institutions are known by "conceptual imagery" as contrasted with phenomena known in terms of "sensory experience." I have elsewhere (Chapters I, II, V) discussed at length the speciousness of this distinction. My position is that *everything* we *know* consists of *symbolized sense experience*. I take *knowl-*

edge to mean only *symbolized* sense experience. *All* sensory experience need not be knowledge, therefore, but all knowledge is symbolized sense experience. Chapin's discussion referred to above, goes over the ground in some detail showing exactly what sensory experiences are symbolized by the word "institution." One of the statements of his excellent discussion of this matter is, however, subject to misinterpretation: "The manifest patterns . . . consist of tangible property, material things that have symbolic value and written or printed codes. *All such things are known by sensory experience.* The latent pattern, by contrast, consists of a system of segments of behavior conditioned to the symbols, to the tangible property and to the code." [P. 338, Italics mine.] The italicized sentence should not be understood to imply that the "segments of behavior conditioned to the symbols," which constitute the latent pattern, are *not* known by sensory experience. The stimuli that impinge on our senses are different in the two cases, but both patterns are known through sensory experience. The context of Chapin's complete treatment indicates that this is also his view. See my Chapter I, Section 4.

3. F. S. Chapin, *op. cit.*, pp. 13, 16.

4. *Ibid.*, p. 16.

5. See note 11 below for an illustration of these terms as they apply to the family.

6. See Mirra Komarovsky, "A Comparative Study of the Voluntary Organizations of Two Suburban Communities," *Publ. Amer. Sociol. Soc.*, Vol. 27, May, 1933. Also, G. A. Lundberg, *et. al.*, *Leisure*, Columbia University Press, 1934, Chap. 5; F. S. Chapin, *op. cit.*, Chap. 18.

7. See for example W. I. Thomas, *Primitive Behavior*, McGraw-Hill, 1937. Chs. 5–9, 10. Also, Edward Westermarck, *The History of Human Marriage*, 5th Ed., Macmillan, 1921. For a good treatment of various aspects of the contemporary family with special reference to the United States, see J. K. Folsom, *The Family*, Wiley, 1934, and W. Waller, *The Family*, Cordon, 1938, W. F. Ogburn and E. R. Groves, *American Marriage and Family Relationships*, Holt, 1928.

8. W. I. Thomas, *op. cit.*, p. 8.

9. See the treatment of each of these aspects in separate chapters by W. I. Thomas, *op. cit.*

10. The contemporary American family, for example, has been found to vary as regards age-sex-kinship patterns (taking only groups with children) as follows:

	Percent of All Families
a. husband-wife-children pattern	41.4
b. husband-wife-children-relatives	15.3
c. women-children-relatives	3.0
d. woman-children	2.3
e. man-children	0.7

From Mildred Parten, "Social Background Studies," *Journal of Educational Sociology*, IV, May, 1931; also "A Statistical Analysis of the Modern Family," *The Annals*, CLX, March, 1932. Cited in F. S. Chapin, *op. cit.*, p. 93.

11. See Chapter 4, Section D and note 15 of that chapter. See also the excellent analysis by F. S. Chapin, *op. cit.*, Chs. 6 and 7. His pattern analysis of the contemporary city family in the following table is especially illuminating as to the meaning of latent and manifest patterns as discussed in the preceding section:

TABLE 10. PATTERN ANALYSIS OF THE CITY FAMILY

(From Chapin, *op. cit.*, p. 92)

The City Family		*A. Quality of Extension or Stretching Out in Space and/or in Time*		
		I. Spatial Patterns	*II. Structural Patterns*	*III. Sequential or Functional Patterns*
B. Quality of Intension or Visibility or Depth	I. Manifest Patterns	1. Family of rooming-house zone 2. Working-men's home zone 3. Residential zone 4. Commuter's home zone	1. Size of family 2. Age and sex composition 3. Home and equipment	1. Child bearing 2. Support of children 3. Training and education of children
	II. Latent Patterns	5. Ecological pattern of family disorganization 6. Indices of family relief, divorce, juvenile delinquency, etc.	4. Member roles 5. Patterns of equilibrium (1) equalitarian (2) authoritarian 6. The configuration of family status	4. Three generations from shirt sleeves to shirt sleeves 5. Rise and fall of family fortunes

12. See, for example, H. G. Moulton "Scientific Method in the Investigation of Economic Problems," *Scientific Monthly*, March, 1936, pp. 214–221. "And here I come to a statement of what I conceive to be the basic difference between economics and the natural sciences. While the underlying principles of economics are based upon natural forces, the economic system by means of which productive activities are carried out is constantly undergoing evolutionary change. The natural sciences, on the other hand, are concerned with the observation of physical forces which are practically permanent in character. The complex economic machine which has resulted from certain natural laws and the growth of human institutions has undergone a rapid evolution even in the course of our own life span. . . . In a dynamic world we must perforce have a pragmatic economics." This is a viewpoint which I have discussed at length in Chapters I and II.

13. Consider, for example, the outstanding work of Alfred Marshall, *Principles of Economics*, 8th Ed., Macmillan, 1925.

14. See Chapter IV for elaboration of this persistently overlooked point.

15. See, for example, the schedules in *Intercity Differences in Costs of Living in March 1935, 59 cities*, by Margaret L. Stecker, Works Progress Administration, Washington, D. C., 1937.

16. A sub-committee of the League of Nations Technical Commission on Nutrition are reported (*Time*, March 6, 1939, quoting the *Lancet*) to have specified the following menu as sufficient to "maintain life for an indefinite period of time, and prevent such serious deficiency diseases as scurvy, pellagra, anemia, rickets.

"Suggested for adults: 18 ounces (about one loaf) of whole wheat a day, for carbohydrates; two-fifths of an ounce of salt, for maintaining the water balance in body tissues; the same quantity of brewers' yeast, for vitamin B; one-twelfth of an ounce of cod-liver oil, for vitamin A; half a lemon twice weekly, for vitamin C. If two ounces of dried skim-milk powder are available, brewers' yeast can be omitted. Other corrections: growing children need more cod-liver oil and skim-milk powder."

17. That this is not merely a hypothesis is shown by the fact that it is *sudden change* in standards of living rather than the *absolute level* of these standards that is associated with ill health and other concomitants of "poverty." (See Josephine Roche "Cost of Depression in Health Revealed," *New York Times*, Sept. 15, 1935, IV, 10: 1.)

18. Cf. S. C. Dodd, *Dimensions of Society*, Macmillan, 1940, Ch. 5.

19. The Brookings Institution, H. G. Moulton, President, *American Capacity to Produce* (1934), *America's Capacity to Consume* (1934), *The Formation of Capital* (1935), and *Income and Economic Progress* (1935). Published by Brookings Institution, Washington, D. C. These works were summarized by H. G. Moulton, "The Trouble with Capitalism is the Capitalists," *Fortune*, XII, Nov., 1935. Reprinted in pamphlet form by the Maurice and Laura Falk Foundation, Pittsburgh, Pa. The page citations below refer to this reprint.

20. *Ibid.*

21. For example, most estimates of productive capacity greatly exceeding the figure here cited are predicated upon a complete reorganization of the present economic system including the most deepseated notions of property rights, profits, and "democratic" systems of control. There is no objection to such estimates of possible capacity under *other conditions* than those which at present obtain in a given area and population, just as there is no objection to estimates of what a country might produce *if* it possessed natural resources which it does not in fact possess. Such estimates may be called romantic, but they are possible. The nonexistence of the necessary attitudes for the renovation of an economic system is a factor which must in any practical estimate be considered just as truly as the nonexistence of natural resources. As for the relative degree of possibility of producing the required attitudes as compared with such factors as resources, this may also become an open question with the development of synthetic chemistry. We are not here arguing, however, that societal conditions

may not be more subject to modification. We are merely pointing out that they are factors *which must be taken into consideration* in any estimate of present capacity to produce. Most discussions of proposed substitutes for the present admittedly absurd system overlook that deepseated human attitudes regarding the *propriety* of the proposed reorganization may be a more serious obstacle than any shortcomings of the system itself.

22. *Op. cit.*, p. 10.

23. *Ibid.*, p. 16.

24. The "amount of profit used for further production" must, of course, be further qualified to take into consideration the rate of obsolescence of industrial equipment, etc. It is profits-resulting-in-greater-net-production which are here under discussion.

25. See Alvin Hansen, *Full Recovery or Stagnation?*, Norton, 1938. Also his *Economic Stabilization in an Unbalanced World*, Harcourt, 1932. Hansen's writings are notably free from the faults here criticised.

26. Cf. D. C. Coyle, "But Is There a Federal Deficit?," *Harpers Magazine*, CLXXVI, Apr., 1938, pp. 449–457.

27. For a good essay on this theme see H. P. Fairchild, "The Fallacy of Profits," *Harpers Magazine*, CLXIV, Feb., 1932, pp. 271–282.

28. The conspicuous economic reform movements of the day face in various ways the problem of substituting a mechanism to take over the functions today exercised by the price system. They all have the common element of a central authority, however constituted, to decide certain things now decided through the operation of the "profit motive" on any or all men. The details of the system proposed by the Technocrats have not yet been made very clear, but they have recognized the necessity for their system of discarding completely present political and economic institutions, whereas most attackers of the "price" or "profit" system also appear to cherish hopes of retaining most of our present institutions. (See *Introduction to Technocracy*, Technocracy, Inc., 155 E. 44th St., New York City, and the official journal, *Technocracy*.)

29. See, for example, H. F. Gosnell, *Machine Politics: Chicago Model*, University of Chicago Press, 1937.

30. See M. C. Hall, "Romantic Government versus Unromantic Government," *Scientific Monthly*, Nov., 1934, pp. 434–442. Some concrete suggestions for the type of organization which the contemporary situation in the United States calls for may be found in such books as L. Mumford, *The Culture of Cities*, Harcourt, 1938. For an outline of a proposed reorganization of state government, see, Read Bain, "Technology and State Government," *Amer. Sociol. Rev.*, II, Dec., 1937, pp. 860–874.

31. See George Gallup, "Government and the Sampling Referendum," *Jour. of the Amer. Statistical Association*, XXXIII, March, 1938, pp. 131–142.

32. Edward Sapir "The Meaning of Religion," *The American Mercury*, Sept., 1928, pp. 72–74.

33. Henry R. Mussey, "Russia's New Religion," *The Nation*, CXXXIV, May 4, 1932, pp. 511–512.

34. Cf. the following statement by a clergyman: "These pleasure-affording

devices [autos and movies] are now exercising in the lives of men the same function which the church once served and, some may add, ought still to be fulfilling. The circus and the theater answer the same needs as worship. Worship also is a kind of recreation, and differs from these others in being a higher and a more difficult though a more satisfactory form. Does not Jesus promise us exactly what Charlie Chaplin promises us, rest and restoration?" (Dudley Zuver, *Salvation by Laughter—a Study of Religion and the Sense of Humor*, Harper, 1933.)

35. John Dewey, *Art and Education*, Barnes Foundation Press, 1929, p. 72.

36. I have dealt more fully with this subject in another book, *Leisure*, Columbia University Press, 1934, Chs. 1 and 9.

37. C. M. Child, *Physiological Foundations of Behavior*, Holt, 1924, p. 1.

38. *Ibid.*, p. 269.

39. H. A. Phelps, *Principles and Laws of Sociology*, Wiley, 1936, p. 324.

40. C. S. Ford, "Society, Culture, and the Human Organism," *Jour. of Gen. Psychol.*, XX, 1939, pp. 135–179. See also the following excellent articles dealing with the statistical approach to anthropological data and "cultures": T. C. McCormick, "Quantitative Analysis and Comparison of Living Cultures," *Amer. Sociol. Rev.*, IV, Aug., 1939, pp. 463–474. Clyde Kluckhohn, "On Certain Recent Applications of Association Coefficients to Ethnological Data," *American Anthropologist*, XLI, July–Sept., 1939, pp. 345–377.

41. *Ibid.*, pp. 158–159. The concluding statement of this quotation is subject to misinterpretation. The concept "insult another" is, of course, definable in terms of specific behavior *in a context or situation.*

Chapter XI

CHARACTERISTICS OF POPULATIONS (INDICATORS—I): DEMOGRAPHIC ASPECTS

A. INTRODUCTION

In the present chapter we shall bring together the results of some millions of observations of some aspects of human society, (e.g., the records of individual births, deaths, and marriages) carried out informally and formally over some centuries by hundreds of thousands of people. We shall introduce in this chapter more concrete data than we have used in the other chapters in order to emphasize the type of analysis which becomes possible when observations have been recorded in this form. In recent centuries men have devoted themselves to a systematic collection and analysis of some of these data as contrasted with the random observations which practically all members of any community are likely to make from time to time. The rough generalizations from these observations gradually emerge as the folklore of demographic relationships. As the systematic collection of data on these subjects and their generalization by tested technics has increased, this knowledge has become increasingly useful to man in his adjustments to the conditions of life. This is already so well recognized as regards the type of data here under discussion as to require little elaboration.

The discovery of the orderliness and predictability of such a phenomenon as death, for example, has relieved man from a great many psychological tensions which accompanied the belief that death represented a personal, whimsical, and vindictive visitation as a penalty for disapproved conduct. More especially have these data enabled us to make intelligent provision for some of the predicaments which their incidence entails, such as insurance. Ability to predict future size of populations, age distributions, marriage and birth rates are obviously basic to any social planning of such facilities as housing, educational and recreational opportunities, and a great many other matters directly related to the

size and composition of the population. Altogether, the so-called demographic characteristics of a society and certain behavior-patterns that have been found to be associated with these characteristics are generally regarded as the department of sociological knowledge in which most progress has been made toward the goals at which science aims.

As a result of the superior development of sociological knowledge in the field conventionally called demography it is usually implicitly assumed that this is the result of some intrinsically greater "objectivity" or other scientifically advantageous characteristics of the data today included under the rubric "demography." Etymologically, this word refers to the study of any characteristics and behavior of population aggregates but it has become conventional to limit its use to "whatever quantitative statistical analysis can be made of the state and movement of population on the basis of fundamental census and registration data." [1] If one takes the view (which we have rejected in the first chapter) that certain data are intrinsically subject to quantitative analysis and that others are not, the extension of the methods which have been found so illuminating in demography to any or all other aspects of human behavior would be impossible. But perhaps few people would contend that only such data as are today conventionally included under demography are subject to systematic observation, recording, and quantitative analysis. We have here taken the view that *all* data are subject to such analysis and that the nature of scientific development leaves us no choice but to work toward that end.

In undertaking the present summary of existing demographic knowledge about human society the main purpose is not to make new contributions to these data. The object is rather to illustrate a type of approach and analysis which I believe can be extended also to all other characteristics of human beings and of human society. The general approach by which this may be accomplished has been our chief theme throughout this book, and will engage us in succeeding chapters. The general technics involved in this approach are further elaborated in Dodd's *Dimensions of Society*. In the present chapter we shall first review the more important existing demographic knowledge and in our conclusion appraise its importance from the point of view we have adopted.

B. GENERALIZATIONS REGARDING RATES OF HUMAN REPRODUCTION

A subject of fundamental interest both biologically and from the standpoint of its sociological implications is the question of what variables govern the rate of reproduction of the population. The most general statement of the phenomenon itself is perhaps Pearl's law. This law and its supporting data has been summarized by Pearl himself as follows: [2]

"First, that populations grow in size according to the same mathematical law that individual animals and plants follow in the growth of their bodies in size. This can be, and has been demonstrated experimentally for populations of such relatively simple creatures as the yeast plant and the fruit fly, *Drosophila melanogaster*.

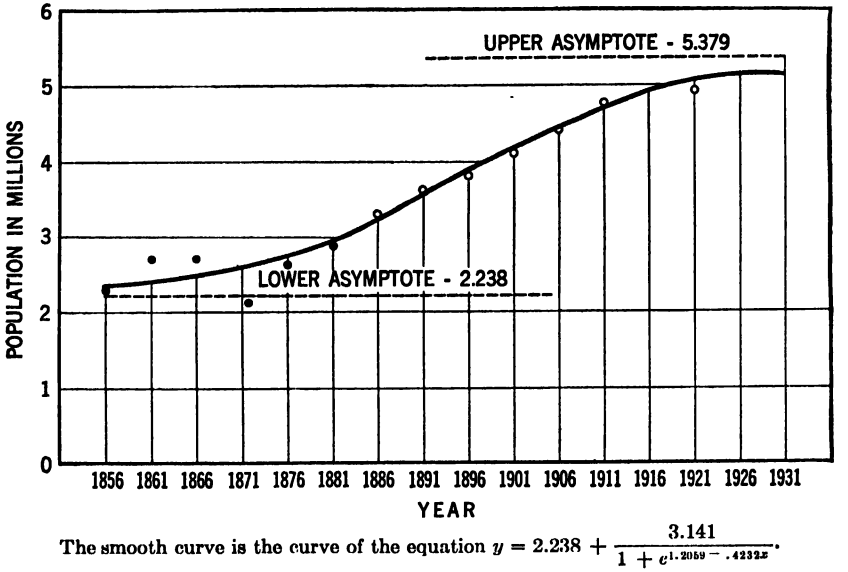
"Second, that human populations grow according to the same law as do the experimental populations of lower organisms, and in turn as do individual plants and animals in body size. This is demonstrated in two ways: first, in a great variety of countries all of the recorded census history which exists is accurately described by the same general mathematical equation as that which describes the growth of experimental populations; second, by bringing forward the case of a human population—the indigenous native population of Algeria—which has in the 75 years of its recorded census history practically completed a single cycle of growth along the logistic curve. [See Figure 10.]

"Third, that in the case of this native population of Algeria the trends, both of the birth rate, which is unaffected by the practice of contraception (birth control), and of the death rate, which on the evidence cannot have been significantly affected by the practice of public health measures, have been in recent years what would be expected on the mathematical theory of the logistic law of population growth, considering the position of this population on its curve at the time, and other relevant circumstances."

As to the biological causes influencing the shape of the logistic curve, Pearl further asserts:

"Fourth, that rate of reproduction or fertility is negatively correlated with density of population, in (a) experimental populations of flies, (b) experimental populations of hens, and (c) ur-

ban populations of human beings. This array of evidence indicates that in the direct and indirect biological effects of density of population upon reproduction exists one *vera causa* for the damping off of the growth of population as the upper limit of the logistic curve is approached.



The smooth curve is the curve of the equation $y = 2.238 + \frac{3.141}{1 + e^{1.2059 - .4232x}}$.

FIG. 10. The growth of the indigenous native population of Algeria. (From Pearl.)

"Fifth, that birth rate is negatively correlated with wealth (or positively correlated with poverty), and that the differential birth rate on this economic base constitutes one of the menacing features of human population growth, which, however, can possibly be met in some part by an entirely free dissemination of knowledge about birth control. [See qualifications of this statement in a later section.]

"Sixth, that the indirect psychological and social effects of relative poverty as contrasted with relative wealth express themselves definitely and clearly in the sexual activity of human beings, and through sexual activity to birth rates."

Sociologists are, of course, interested chiefly in further factoring out the social conditions which account for the interesting phenomenon described by Pearl. These conditions doubtless vary widely as between the various species studied by Pearl as well as

between different cultural groups of people. But if the logistic curve describes the actual manner of population growth, it is scientifically important regardless of whether the detailed conditions leading up to such a result are similar or not. The observation that water freezes at 32° F. at sea-level is not rendered unimportant by the fact that sometimes the freezing takes place at other temperatures at other altitudes. The criticism that "belief in such a law requires faith in some mechanism which automatically and independently of human will or social conditions predetermines the shape of the population growth curve" [3] is entirely unwarranted. All that is required is an hypothesis that perhaps "human will" and "social conditions" are natural phenomena and can be described in their influence on population increase by the same kind of symbolic representation that is useful in describing population increase in other species, not to mention change in other aspects of the universe. It is true that the necessary data for checking Pearl's logistic hypothesis in a large number and variety of human populations are lacking at present. It is also true that since the curve represents in its various parts all degrees of inclination, any population, except a declining one, would be found to coincide with some portion of the curve at any given time. Insofar as the logistic curve, broadly speaking, merely states that a slow rate of population increase tends to be followed by a period of rapid increase, which in turn is followed by a gradual decrease of the rate to a stationary level, the generalization represented by the curve may seem a bit too general.[4] But it does serve as an hypothesis with reference to which the actual growth of all kinds of populations and other phenomena may be depicted, and as an illustration of the type of generalization constantly sought in science. When a broad generalization, such as Pearl's logistic law, has been, however tentatively, laid down, our interest turns to the mechanisms which operate to produce the observed effect. In the present case, these have to do with the factors that appear to govern rates of reproduction.

The influence of the economic factor on the birth rate either through its influence on sex-activity or more directly, through birth control, is the principal societal factor that has been exploited. Although the influence of this factor has been pointed out from ancient times, doctrines regarding the relationship of

economic factors to population increase are today generally associated with the name of Malthus. In its crudest form this theory holds that population tends to increase up to the point where the supply of food necessary for mere biological survival is reached. Pearl and others, however, have shown that other checks, both in man and in other species, become operative before this point is reached. The extent to which these are correlated with the economic factor and with each other, remains to be determined when adequate measures of the so-called psychological and cultural factors have been developed. When the full interrelationship of all those factors is determined, this interrelationship, covariance or balance, will appear as a set of self-regulatory mechanisms of population growth accounting adequately for the changing rates of growth observed by Pearl and others.

A population with a high birth rate is necessarily a population with a high percentage of young people, that is, of child-producing ages and under. If a population has a very high proportion of young people at one period, this period will necessarily be followed by one in which the same population will have a high proportion of people above the child-producing age even if fertility and mortality conditions remain constant. At this latter period the *rate* of increase will decline because the base upon which it is computed will be increased. Since there is an upper finite maximum to fertility, determined as it is in the human species, for example, by the fact that each woman of a certain age group can give birth only once in nine months, it follows as a matter of statistical necessity that a period of maximum *rate* of increase would necessarily be followed by a period of declining *rate* of increase. In actual cases the same principle will hold whether the rate obtaining at any given time is the biological maximum as stated above or *any maximum as set by other conditions* such as economic income in relation to economic standards of living. If the *influence* of this factor of income-standards remains as constant as, say, the biological capacity described above, then any given rate of increase greater than is required to maintain a stationary population will be followed by a *decreasing rate* of *increase* up to a point where a stationary population is reached, i.e., one in which each generation produces only enough children to replace and maintain through their productive period a popula-

tion equal in numbers to the parental generation. If the *rate* of reproduction should keep on declining beyond this point, a decreasing population would follow, which, if it continued long enough, would result in the extinction of the species.

Kuczynski [5] has illustrated this phenomenon by estimating that the world's population at the period 1920–26 increased at the annual rate of five-eighths of one percent or an annual increment of 11,400,000, which would mean a doubling of the world's population in 110 years. Actually, of course, a constant annual *rate* of five-eighths of one percent increase would mean a constantly increasing increment of population each year, *provided* the birth *rate* remained the same. But the birth *rate* of a population is related to its age distribution, other conditions equal. Hence, paradoxical as it may seem, a population with a present annual rate of increase of five-eighths of one percent may, nevertheless, without any change in the number of children born per woman or any change in present death rates, decline in actual numbers. Kuczynski's illustration will further clarify the point: [6]

"Let us suppose the total present number of women from fifteen to fifty years to be 450,000,000 and let us suppose that they bear each year 24,400,000 children, say 12,400,000 boys and 12,000,000 girls. Let us suppose that none of those girls die before having passed through child-bearing age, that is, before having reached fifty years. We would then in fifty years from now have 12,000,000 females of fifteen years, 12,000,000 of sixteen years, etc., or altogether 420,000,000 from fifteen to fifty years. You will notice that even if none of the girls die, the number of women of child-bearing age will be reduced within fifty years from 450,000,000 to 420,000,000 or in the proportion of 100 to 93. If the fertility rate of the 420,000,000 is then the same as that of the 450,000,000 of fifty years before, they would not bear more than 11,200,000 instead of 12,000,000 girls, and after another fifty years the women of child-bearing age would number only 392,000,000. Those 392,000,000 would bear 10,450,000 girls only, etc. You see that even with no mortality whatsoever, the number of women of child-bearing age would constantly decrease and so would the number of births, if fertility remains the same.

"How is it to be explained that in the fictitious case which we have just considered, the population is dying out in spite of the fact that the present excess of births over deaths constitutes five-eighths of 1 percent of the population? The reason is that fertility was so low that the women of child-bearing age did not reproduce themselves; each 100 gave birth to only 93 future mothers."

The above hypothetical illustration is by no means uncorroborated by actual cases. Kuczynski continues: [7]

"The Institute of Economics of the Brookings Institution, in Washington, has recently published a volume on *The Balance of Births and Deaths in Western and Northern Europe.* It covers Great Britain and Ireland, France, Belgium, Holland, Switzerland, Germany, Denmark, Norway, Sweden, and Finland. This area in 1926 had a population of 188,000,000, that is, 10 or 11 per cent of the world's population, and had an excess of births over deaths amounting to five-eights of one per-cent, that is, exactly the same rate as we found for the world as a whole. Yet, notwithstanding the fact that there occurred 3,613,000 births as against 2,449,000 deaths, fertility was already so low that the population no longer reproduced itself but had a virtual deficit of about 7 percent."

Pearl's curve obviously needs to be supplemented by a similar generalized statement regarding populations actually declining in numbers. Actual data on human populations of this sort are, of course, difficult to secure, in view of the constant expansion during recent centuries of the population of those countries for which records are available. The same conditions which determine the characteristics of Pearl's curve for increasing populations would seem to hold for decreasing populations, that is, a gradual decrease would presumably be followed by a period of rapid decrease with the curve gradually flattening out as it approached zero, assuming, of course, a constant fertility and ratio of births to deaths. This result would be self-determined, as in the case of the increasing population, because of the interrelationship of the birth and death rates to the age-composition of the population. Extinction would occur at the point where so few female babies would be born that none would reach the reproductive age.

The above results are achieved, as has been repeatedly pointed out, on the assumption that throughout the entire cycle or any part of it, no change in the *number of children born per woman* nor any change in the death rate of any age group, would take place. Since social conditions in the human species unquestionably affect the actual fertility of populations and since social conditions would, of course, change drastically with any pronounced change in the population, the principle interest of sociologists in this question lies in determining how social conditions influence fertility. Such analyses as those of Pearl and Kuczynski are, in

addition to their relevance to the question of population growth, of great suggestive value as to the type of analysis which may also be applicable to purely societal behavior of all kinds. That is, sociological as well as biological processes are doubtless governed by self-regulatory mechanisms generated by the process itself within any field of force and always tending toward equilibrium. We turn, therefore, to this question.[8]

C. CONDITIONS INFLUENCING RATES OF REPRODUCTION

Changes in population are determined, in the absence of migration, by a changing ratio between births and deaths. Accordingly, any influences which affect the ratio of these rates affect the rate of population change. Among the principal conditions advanced by students of the field as influencing the birth rate are the following:

1. Space Effects

In the plant and lower animal world crowding has been shown to operate as a check upon reproduction. A large literature indicates the operation of self-regulatory mechanisms which cause the rate of reproduction to cease among most, perhaps all, species long before there is any shortage in food supply. The phenomenon has been observed in a variety of plants and animals including man.[9] Thus, yeast, paramecia, flour beetles, and many other insects will not reproduce beyond a certain density regardless of the food supply.[10] The same is true of various game birds which reproduce up to a certain number per acre and not beyond, although there is an ample food supply. In fact, the phenomenon is so general that most naturalists would doubtless agree with Nicholson's statement that "it is generally recognized that in nature few animals die as a direct result of starvation." [11] Finally, Pearl contends that not only is the phenomenon demonstrable for experimental populations of flies and experimental populations of hens, but also for urban populations of human beings.[12]

It is interesting to note in passing that sparseness of population as well as density seems to be related to the rate of reproduction apart from any question of subsistence. Thus Allee says: [13]

"It is easy to demonstrate that overcrowding lessens the rate of growth of organisms. More recently evidence has been accumulating

that undercrowding frequently has the same effect. Evidence is presented on this point in such widely different animals as mealworms, fishes, and mice. Similarly, with population growth the harmful effects of undercrowding have recently been found for protozoans, crustaceans, and beetles, as well as the ill effects of overcrowding."

Many of the mechanisms by which the effects of crowding operate as a deterrent on the rate of reproduction are, of course, known. The shading out of seedlings by adult plants is generally observable. In the case of yeast, the accumulation of ethyl alcohol produced by the plants themselves is the limiting factor.[14] The roots of some plants produce deleterious secretions which appear to be most toxic to plants of the same species.[15] Both paramecia and hypotrichs excrete substances toxic to themselves.[16] Certain insects will engage in eating their own eggs when the population reaches a certain density, although there is an abundance of other food. Infant cannibalism under similar conditions is known among mollusks, dragonflies, flour beetles, spiders, fishes, and salamanders.[17] Birds are known to desert their eggs on slight provocation and nonbreeding individuals are common in many species, especially in captivity.[18]

The mechanism by which crowding effects reproduction in man, if at all, remains to be demonstrated conclusively. The complexity and indirectness of the nexus, if any, waits upon (1) the development of quantitative scales for a large number of psychological and sociological factors and upon (2) some adequate method of factor analysis through which the influence of a large number of components can be unscrambled. We return now to the more generally recognized factors influencing the human birth rate.

2. Wealth

The influence of this factor on the rate of reproduction has been perhaps more fully exploited than any other. The general consensus of a large literature on the subject is that on the whole, for Western cultures, at least, increasing wealth operates as a deterrent on both birth and death rates but especially on the former.[19] In other words, the birth rate varies inversely with the means of "subsistence" in the sense of "physical" necessities. This relationship is probably not linear and is by no means with-

out exception.[20] The reverse of the stated relationship could probably be shown for the very extremes of the socio-economic scale, i.e., the very wealthy and the sub-dependent. In some European countries there appears to be a tendency for the lower socio-economic groups to be less fertile than the upper groups.[21] The mechanisms through which this result is achieved are numerous and intricate and in their ramifications cut across the whole field of sociology, involving especially the phenomenon of striving for status which is discussed elsewhere. Wealth is at present in most cultures the principal component in the next factor here enumerated, namely, varied outlets for nervous energy. But since it is conceivable that the conditions described immediately following might exist independent of individual wealth we consider it here as a separate factor.

3. Opportunities for Other Activities

Opportunities for a wide variety of outlets for nervous energy such as tend to accompany higher education, varied intellectual interests, and recreational facilities operate to retard the birth rate. There are a number of theories as to the mechanisms by which this result is achieved. Gini has advanced the theory that the conditions described above actually operate to reduce fecundity as well as fertility through certain subtle biological effects in the female on the conditions incidental to fertilization.[22] A more plausible and factually better supported theory is that the conditions described operate to reduce sex activity, and thus the probability of conception.[23] The evidence indicates that sex activity is highest for those groups for which the "intellectual content of life is the least varied and interesting and the outlets for nervous and emotional tension most restricted" and *vice versa*.[24] The most obvious way in which the conditions described operate to reduce the birth rate is in the opportunity costs of child rearing, that is, the restrictions on time and energy remaining to be spent on other activities as well as the threat of losing an achieved social status or the hope of rising in the social scale, which the economic burden of a family may entail. These, together with physical discomfort and inconvenience doubtless operate to restrict the birth rate among the groups concerned. The general availability of birth control knowledge and devices,

to members of these classes especially, provide the final mechanism of accomplishing the desired result.

4. Demographic Constitution of the Population

The demographic constitution of a population especially as regards sex ratio and age distribution obviously influences the birth and death rates.

a. *Sex Ratio.* This would appear to be a purely biological subject. However, sex ratio is not only an item of considerable influence on many aspects of societal behavior but may be itself influenced by cultural factors.[25] Furthermore, sex-behavior, as such, as well as the complicated set of behavior patterns constituting all the distinctive man-woman interactions are entirely sociological. The complex may, therefore, be approached through our framework of a societal field of force within which a large number of factors operate in addition to the biological imbalances within each organism motivating toward sex intercourse. Those societal influences so enormously condition all observed intersex behavior that the whole complex can be understood only in terms of a balance of all the factors in the field.

Whatever may be the factors in the biological field determining the fundamental characteristic of sex, they operate in the human species to produce a slightly larger number of males than of females. For large groups and for all countries for which statistics on the subject have been compiled, the number of males born averages somewhat over 105 males to 100 females. The sex ratio at conception is furthermore apparently even higher, namely, at least 108 males to 100 females.[26] The higher prenatal mortality rates for the male fetus accounts for the difference in the sex ratio at conception and at birth. It follows that any factors which operate to diminish prenatal mortality may tend to raise the sex ratio at birth. Since societal factors have been shown to influence the former, the subject of sex ratio comes at this point within the sphere of sociology as a factor influenced by societal conditions as well as a factor important in the description of much social behavior. The relevant societal differential affecting the rate of intrauterine mortality appears to be any cultural situation especially favorable to pregnant women. Economic status is in most cultures likely to be one of these conditions. Winston

has also suggested in this connection that the more general adoption of birth control technics may operate to increase the excess of male over female births.[27] This interesting possible by-product of birth control seems to result from the greater desire in most cultures for male offspring which operates to induce people to cease bearing further children when this objective is achieved. This theory seems to be supported by the preponderance of males in small families as contrasted with larger families and in the higher proportion of males among last children. Whatever may turn out to be the fact in this respect we do have at the outset a fundamental imbalance in human groups consisting of the discrepancy in the numbers of each sex.

To balance to some extent this observed disparity in the sex ratio at birth we find a higher death rate among males.[28] Again, the purely biological conditions, if any, in the sense of greater inherent viability of the female, have been inadequately established. The persistence of the lower rate among females in all age groups, except the 15 to 20 group suggests that the phenomenon is primarily determined by nonsocietal conditions, although there is, of course, a considerably higher mortality hazard in some of the occupations pursued chiefly by men. On the sociological level we are more interested in the fact of significant differentials in the sex ratio under different social conditions and some of the resulting societal imbalances and their ramifications. The following generalizations regarding conditions associated with unbalanced sex ratios find some support in the literature of the subject:

(1) Frontier areas or other areas of recent migration tend to have a large excess of males over females. Conversely, females are found in higher proportion in areas from which there is large emigration.

(2) Areas supporting principally occupations which at a given time in a given culture engage chiefly one sex, tend to have a disproportionate number of that sex. Thus we find a higher proportion of males in mining, cattle raising, and lumbering areas. Females are found in higher proportion in residence cities, where there is high demand for domestic service, and in cities where certain industrial occupations, such as textile manufacturing, are prevalent. For the same reason, cities tend on the whole to have a higher proportion of women than does the country.

(3) In cultures like the Orient, which place much higher value upon male than upon female births for economic and traditional reasons, especially when this attitude finds expression in infanticide of females, the proportion of males tends to be high.

(4) War [29] may temporarily disturb the sex ratio of countries in that it operates very selectively to reduce the number of men. Thus the sex ratio of certain countries changed during the decade 1910–20 as follows: [30]

	Males to 100 Females	
	1880	*1920*
England and Wales	94.8	91.2
France	99.5	90.7
Germany	96.2	93.7
Italy	100.5	97.3
Sweden	94.2	96.4

(5) A high proportion of males in a population is associated with a low proportion of males married and a high proportion of females married (within certain limits). Conversely, a low proportion of females is associated with a high proportion of females married.

(6) A disproportion of the sexes appears to affect also the forms of marriage, especially as regards the origin of different forms. Thus, polygyny tends to exist in areas with a plentiful supply of women, as, for example, among the Eskimos. Polyandry is more likely to exist in groups where women are relatively scarce, as among the Todas where female infanticide was practiced, though both of these tendencies may be cancelled by cultural or ideological considerations.[31]

(7) Among the conditions associated with imbalances in sex ratio for which less adequate measurements have been developed, as yet, and which therefore are supported with less adequate data, are such as the following:

Communities with high proportions of males tend, according to Ross, to be greedy, reckless, nonreligious, intemperate, and bored. They tend to be violent in their social controls as a result of comparatively undeveloped community law and public opinion. "On the other hand, in our mountain commonwealths, which suffer from a dearth of women, men pay chivalrous homage to women. They raise the 'age of consent,' protect their property

rights, give them the ballot, grant them facile divorce, open to them college doors, let them help manage churches and societies, and make them jurors, school directors, and trustees of charitable institutions." [32] However, the relative scarcity of women achieved through female infanticide among the Todas is subject to a different interpretation and indicates the tenuousness of such generalizations as that cited above. We need to substitute for the customary cause-and-effect reasoning, in this as in other multiple-factor fields, a more adequate frame of reference within which the loading or weighting of each factor according to its influence can be described. We shall return to this subject later in this chapter and elsewhere throughout the book.

b. *Age Distribution.* As in the case of sex, chronological age, measured in terms of astronomic time, commonly is thought of as an important biological characteristic of man which fundamentally conditions his behavior. But from the sociological standpoint we shall consider it as a factor in a societal field of force within which it exercises influences traditionally and frequently superstitiously associated with it, in addition to, and sometimes quite apart from its biological influence on individual behavior. The prominence of chronological age as a factor is partly due to the definiteness and general availability of our knowledge of it, as a result of the existence of reliable methods of measuring time. For this reason rather than because of its somewhat rough correlation with relevant behavior capacities, chronological age exercises much influence as a determinant of societal position and locomotion in most social fields. As more adequate independent measures of some of the factors today assumed to be associated with chronological age are developed, the latter factor will lose some of the weight today accorded it in the analysis of many social situations. For example, the present extensive civic restrictions upon minors and the survival of a primitive respect for the positions and opinions of elders may be expected to give way to more relevant measures of "mental" age as determined by intelligence tests, and other measures of physiological and emotional maturity, technical proficiency, and other factors directly relevant to functioning in a group. Thorndike has recently exploded the age-old myth regarding the superior learning capacities of children as compared to adults up to and including the middle-

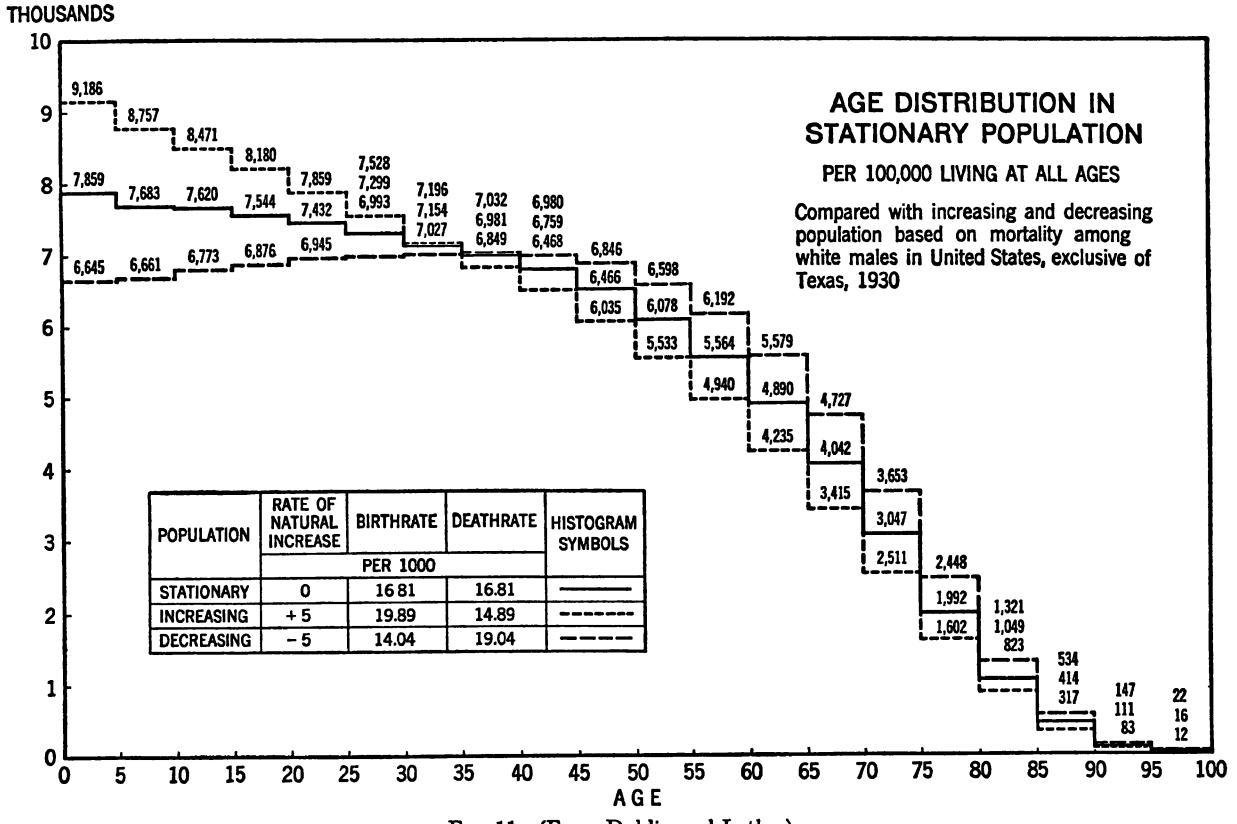


FIG. 11. (From Dublin and Lotka.)

aged. With this superstition should probably go the generally accepted notion of the greater adaptability of the young. Since adaptability is primarily a matter of technic, as is learning, adults up to the point of serious physiological decline might be expected to show greater adaptability than younger people, as is, I think, readily demonstrable. The development of a variety of measures of functional capacities should operate to revise radically the present age basis for legal and civic rights, retirement from industry, etc. In the meantime, the factor of chronological age remains an enormously significant factor in a great many societal fields.

The proportion of a population in each age group at any given time is, in the absence of migration, governed by the differential birth and death rates that operate upon the generations concerned. We have already noted some of the influences governing these rates and others will be treated below. Whatever may be all the factors operating to produce the age distribution found in any population, their total effect probably remains fairly stable for the human species as a whole. While the necessary data to demonstrate this point is lacking, the general pattern in a stationary population compared with the situation in increasing and decreasing populations is perhaps fairly represented by Figure 11.[33] A consideration of smaller areas would, of course, show very much more violent fluctuations. For example, the changes in age distribution of Negroes in Texas from 1880 to 1920 amounts to a decrease of about one third in the population under 10 years and an even larger increase in the percentage over 40 years. Figure 12 shows the variations in age distribution even in large populations. The various factors influencing the changing balance of birth and death rates in the Western world are the subject of a large literature the main conclusions of which are summarized in this chapter. The full intricacy of the relationship of these factors has as yet been only incompletely explored due partly to the lack of adequate and comparable data over long periods of time and more especially to a lack of an adequate mathematical technic for handling large numbers of factors of this kind.

In addition to the high birth rate which tends to be associated with a high proportion of the population in the child-bearing age groups, such populations also tend to show a low death rate. The high death rate of infants is more than counterbalanced by the

low rates for other age groups, especially in a population with a relatively small proportion of people in the upper age groups. Most of the other factors associated with a high birth rate and a low death rate tend to be associated with a high proportion of a population in the younger age groups.

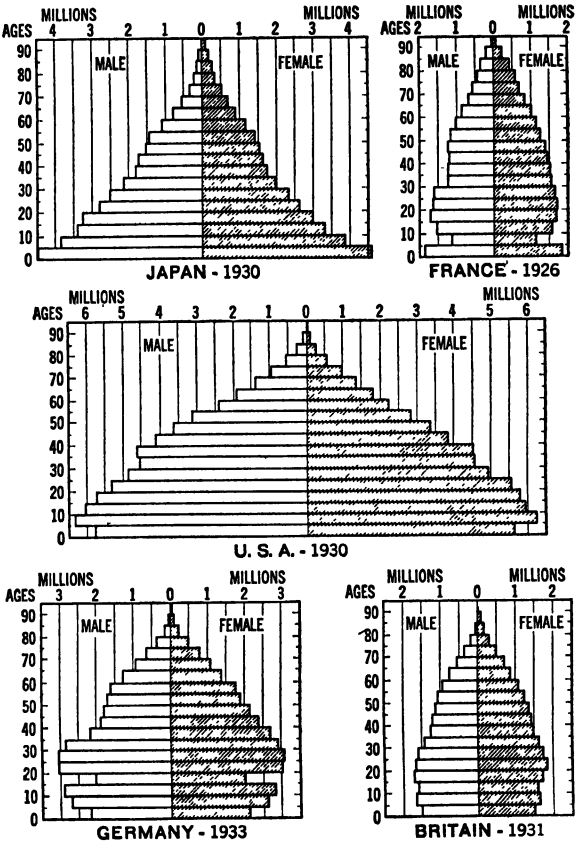


FIG. 12. The structure of population by age groups. (From Yano, T. and Shirasaki, K., *Nippon, A Chartered Survey of Japan*, Kukusei-Sha, Tokyo, 1936, chart 171, p. 445.)

In the face of the steadily declining birth rate in the Western world (Figure 13) and the resulting constant increase in the average age of these populations, much has been written in recent years about the possible effect of this change upon sociological, psychological, economic, and political traits and social behavior. The speculation has been advanced as to whether the indicated change

will not result in a greater general conservatism which is supposed to characterize the old as compared with the young, with attendant effects upon pioneering "progress," etc. In an older population, also, a larger proportion will be women on account of their lower mortality rate. The effect of an older population on present consumption habits has been considered from various angles.[34] A mail-order executive has pointed out that in the future the infants' wear department may become relatively less important than golf equipment. A population demanding relatively more con-

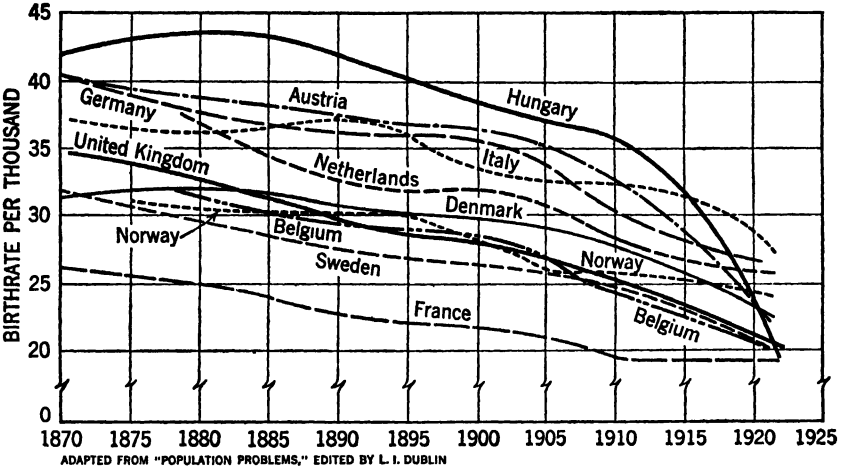


FIG. 13. The declining birthrate in Europe. (From E. A. Ross, *Principles of Sociology*, Appleton-Century, 1930, p. 25.)

sumers' goods and better prepared to enjoy leisure seems in prospect. From one point of view, a high proportion of children, since they are consumers without being also producers in the labor market, would appear to exercise a favorable influence upon labor conditions, other considerations equal. From another viewpoint, a stationary population with constantly improving technical equipment and management will require fewer workers, with resulting problems, at least within the present economic system.

The most important adjustment required by the trend toward a stationary population is a revision of those social and industrial policies which are based upon and derive their validity from the postulate of continuous and even increasing expansion of population. Because the last hundred years has been such a period, there is considerable tendency in present business theory and

practice to assume that this is a "natural," i.e., permanent condition. A declining or stationary population with compensatingly increasing standards of living and the means of satisfying these standards could, of course, produce precisely the same effect on consumption as that which we have beheld during the last fifty years or more. The ramifications of this phenomenon affect the entire social structure and will be referred to in numerous other connections.

The intricacies of these relationships call for the development of a more refined and facile set of measuring devices and multiple factor correlation than have thus far been developed. Especially is this true regarding methods of measuring attitudes and ideologies which are undoubtedly highly relevant and variable factors in the total situation. There appears to be no reason why such analytical technics should not be developed, however, and considerable progress in that direction has already been achieved. With such technology, it should be possible to arrive at relatively stable (i.e., standardized) and accurate laws as to the relationships and relative influence of the various factors, which would permit generalization and prediction.

c. *Mortality.* No aspect of demography has received more public attention in modern times than the phenomena of sickness and death. Humanitarian interests, the commercial interest of life insurance, and the advancement of medical science are among the factors that have resulted in the accumulation of a larger and more adequate body of information on the incidence of death than on any other demographic characteristic. We have already considered its general role, directly and by implication, in connection with our discussion of factors influencing the rate of reproduction. For a full discussion of the operation and interrelationship of this factor with social situations we must refer to the large literature on actuarial subjects, morbidity, and medical care.[35] The most general and best substantiated conclusions of sociological significance which may be drawn from the extensive sources available are the following:

(1) There is no evidence that the maximum life span of the species has within historic times changed perceptibly. It remains at about a century for all but a negligible fraction of any large and unselected population.[36]

(2) An impressive decline of the death rate of the populations of Europe and America has taken place during the last 200 years, especially during the last century. As a result, and in spite of a declining birth rate, the combined population of Europe and America multiplied about six-fold during this period.[37] The mean expectation of life during the last century increased in these countries by amounts varying from 10 to 15 years. The expectation of life in the United States at the end of the last century was 48 years for males and 51 years for females, representing a gain of perhaps 14 years in the course of the century.[38] This was further increased by over ten years by 1930. It is estimated by Dublin and Lotka that through the application of modern medical practice, public health methods, and sanitation, this figure could be further increased by another ten years, bringing the expectation of life at birth to the biblical three-score and ten.[39] A similar increase in the expectation of life has taken place in all the principle countries of Europe [40] and in Canada, Australia, and New Zealand. The expectation of life in these countries is probably more than twice as great today as it was in ancient Rome.[41] The evidence seems overwhelming that this result has been directly associated with a general rise in economic planes of living and especially with the expansion of the medical and sanitary sciences.

(3) The demographic factor which correlates most consistently and regularly with death rates is age. In the United States (1929–31), the death rate for white males was about 61 per thousand during the first year of life (it was 92 in 1919–20) as compared with the low point of 1.54 per thousand at the age of 10, after which it rises gradually to about 133 per thousand at the age of 80 and then steeply to a rate of about 270 at the age of 90.[42]

(4) The principal causes of death and their relative importance in the United States at present are depicted in Figure 14.[43]

d. *Morbidity.* The subtle, various, and extensive social effects of fluctuations in the condition and functioning of the human organism have never been adequately appraised. Many of the attributes of personality are doubtless directly or indirectly traceable to conditions of health and disease. When these conditions fall within categories well recognized by the public or at least by the medical profession they are designated as diseases and are regarded as misfortunes and are considered subjects for scientific

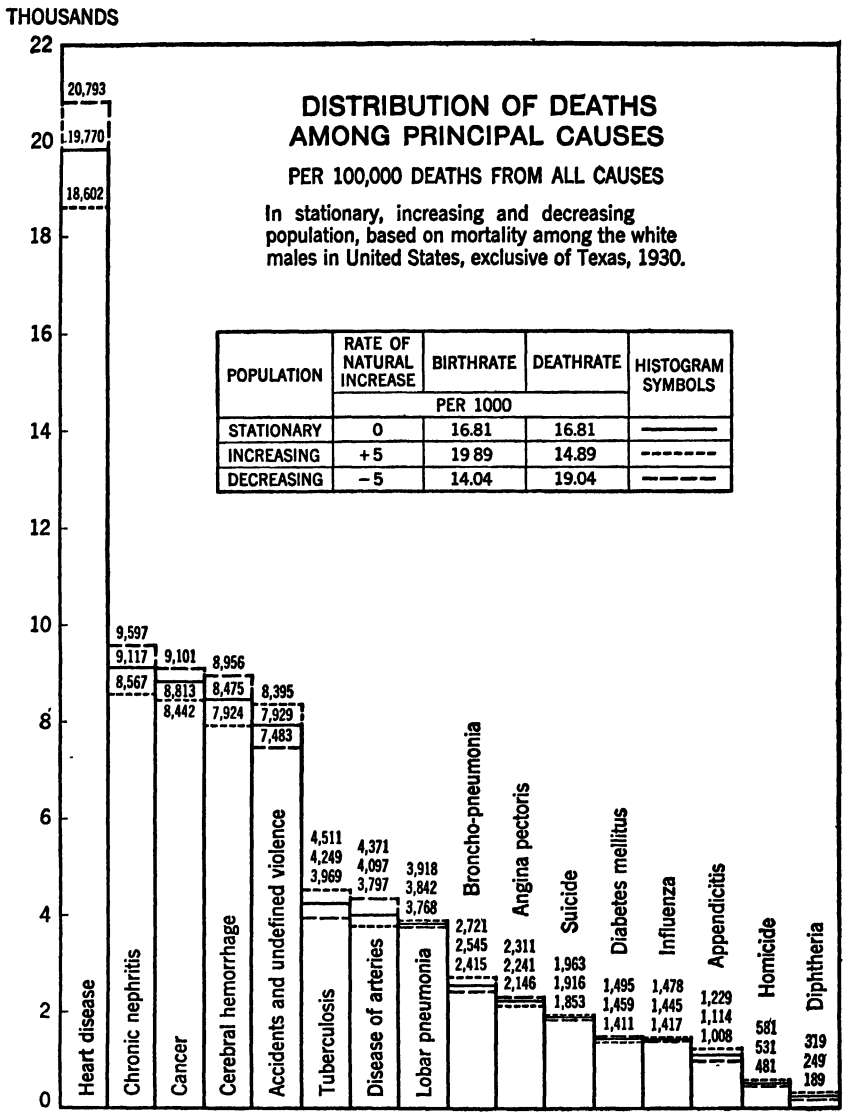


FIG. 14. The principal causes of death and their relative importance in the United States. (From Dublin and Lotka.)

treatment. Other disorders not yet thus recognized are, following a still surviving theological orientation, regarded as "moral" failings attributable to the devil or to equally mysterious sources, variously designated as "sin," "vice," "will," "immorality," "criminality," and so forth. Closely related to the latter type of

maladies and representing perhaps a transition view are a set of behaviors designated as "functional" as contrasted with "organic." What is meant by "functional" is merely that the abnormal behavior is not in the present state of knowledge traceable to observable structural variations. Any consideration of such disorders within the scientific orientation must, of course, regard them as "organic" in the same general sense that toothache or apoplexy is organic. Failure to recognize this elementary point has led to all kinds of mystical discussion of personality, criminality, and "mental" disorders, even by would-be scientists, accompanied by a primitive public attitude toward the less common mental disorders, criminality, and other variations in customary behavior in directions socially disapproved.[44]

The extent of morbidity in the broad sense indicated above, consisting as it does of all variations in organic and personal behavior deviating beyond socially approved limits, has never been appraised. A recent survey of the variations coming within the more conventional meaning of the term finds that "six million people in the United States are unable to work, attend school, or pursue other usual activities each day during the winter months on account of illness, injury, or gross physical impairment resulting from disease or accident. This estimate is arrived at by applying to the population of the whole country the results obtained in the National Health Survey (1935–1936) in which 4.5 percent of more than 2,300,000 persons surveyed in urban areas were reported as disabled on the day of the canvass. Applied to communities of varying size, this estimate represents some 200 persons sick each winter day in a town of 5000 population, 4500 sick in a city of medium size (100,000 population), and 22,000 sick in a large city of 500,000 population." [45]

The sociology of health, disease, sanitation, and medical care is already a highly developed special field to which we must refer for a more detailed consideration of the subject. As in the case of most social problems, the relevant existing scientific knowledge and technical training bearing on the problem of morbidity is only partially, indifferently, or chaotically applied at present on account of surviving individualistic notions which prevent an intelligent organization of the health services of the community. Research is rapidly expanding the horizons of our knowledge regarding hu-

man diseases, and it is undoubtedly only a question of a short time until the socialization of the medical profession will result in a wider utilization of this knowledge. It is true that science has as yet detected no remedy for some of the more general ailments. But the domination of the authority of science in this field as compared with most other aspects of the social scene makes it one of the more hopeful fields for development, especially as regards the extension of the scientific attitude to all fields of abnormal behavior.

e. *Marital Status.* This demographic aspect of human populations is perhaps the most objective index of its sex and reproduction mores. Human females between the ages of fifteen and forty-five are biologically capable of bearing children, with some extreme deviations above and below these limits. Males are capable of begetting children not only between the same ages but frequently for twenty or more years beyond forty-five. The mores governing the behavior, however, usually restrict the function much more narrowly, and prescribe a great variety of practices regarding it. Inasmuch as nearly all reproduction in the human species takes place within some form of marriage institution, the proportion of a population married, and especially the proportion of women of child-bearing age married, tends to be highly correlated with the rate of reproduction. A high proportion of young women married (i.e. from 15 to 30 years) is especially significant from this point of view. A custom of early marriage for women will, therefore, tend to be associated with a high birth rate. As marriage is in most societies heavily involved in economic and religious regulations, this institution undoubtedly exerts a considerable influence upon rates of reproduction.

As in the case of other demographic data no reliable figures on marital status are available for large populations outside of Europe and America. The rule among Eastern and so-called simpler peoples seems to be for all adults to marry "save deformed persons, saints, and prostitutes." [46] The very early marriage of women also appears to be common in these countries.[47] In the Western world, from approximately 40 to 60 percent of females [48] aged 15 to 44 are found to be married at any given time. The proportion of males of the same ages married is somewhat lower in most if not in all countries. It varies from about 36 to 57 per-

cent.[49] Only about 10 percent of all persons in the United States aged 45 years and over have never married.[50] The relationship between early marriage and the birth rate which most available figures today show is, of course, based upon the present close association in most cultures between marriage and procreation. Should birth control become especially prevalent during the first years or decade of married life, the association here noted might disappear.

The incidence of marriage and sex relations, marital customs, taboos, and folkways are the subject of an enormous literature which it is not our purpose here to review.[51] The great variety of conditions under which similar practices may obtain, and conversely, the variety of practices under similar conditions and the differences in interpretation and meaning assigned to similar practices by the practitioners themselves has been pointed out by W. I. Thomas [52] after a comprehensive survey of the relevant literature. As the vagaries and irregularities of local meteorological conditions have to be considered in making weather predictions, so these cultural conditions have to be taken into consideration, i.e., they have to be measured as they exist in a given locality at a given time, before valid generalizations governing reproductive behavior in any culture can be made. But as we have previously pointed out, cultural factors are not in this respect unique or different from other natural conditions that have to be taken into consideration in the formulation of any scientific law. There are doubtless common factors in the marital customs of different peoples. It is the function of science to discover these as norms from which to measure the variations that characterize individual cultures. Anthropology has already compiled a large body of raw material on the subject. It remains to generalize this material in the sense of formulating categories of sufficiently general import to embrace the common elements in the various marital customs of different peoples. Already such terms as exogamy, endogamy, polygamy, couvade, dowry, and so forth, are applied to behaviors which vary widely in detail and in significance to their practitioners. But the widespread recurrence of these patterns suggest that they are somehow congenial to or inherent in human society. Although they differ, we recognize something sufficiently common in all of them to desig-

nate them by the same word. These generalized categories will, of course, be arrived at and take their place among a large number of others representing other aspects of behavior. Thus cooperative and competitive behavior take a vast variety of forms in different cultures, but we feel that in all of them there is a common core which we designate by the generalized category. The rigorous definition of these common elements largely remain to be accomplished. The objective and comprehensive definition of the common elements in all cultures and their orderly arrangement is the central task of sociological science.

5. Religion and Other Ideological Factors

Ideological systems, usually religious or political, enjoining early marriage and prolific reproduction, and, conversely, prohibiting birth control may be influential factors in a high birth rate. On the other hand many sexual taboos, especially among primitive peoples, and the practice of celibacy by certain classes, as well as sanctions of infanticide, abortion, and birth control, operate to restrict population increase. Of contemporary religious and political movements, Catholicism, Mohammedanism, Buddhism, Fascism, and Naziism actively encourage prolific reproduction. While there are strong *a priori* grounds for assuming that these policies are influential, the statistical evidence in actual birth rates that can be safely attributed to these ideological factors are not entirely clear or conclusive.[53] The discovery of the net influence of this factor waits upon (1) the development of more adequate measurement of the extent to which this influence is exerted and (2) what part of an observed result can be attributed to this factor when others are held constant.

D. "QUALITATIVE" GRADATIONS OF POPULATIONS

Just as we have found in all known general populations certain gradations in age, fertility, death rates, and wealth, so we find certain gradations in what is commonly called the "quality" [54] of a population. By this term is meant the relative ability of different individuals to make certain adjustments considered important or desirable in a given group. Under the simplest conditions, mere survival ability constituted such a measure of "superiority." It was, and perhaps still is, the ultimate "intelligence"

test. As the objects of human striving become complex and more abstract and varied, the tests upon which superiority is postulated become varied and remote from the simpler kinds of adjustment tests. Consider, for example, the great value placed today upon the ability to read and write as an index to "superiority" in general.

It is doubtless true that in modern society the survival, not only of the individual but frequently of a whole group engaged in some highly synchronized activity, is obviously more dependent upon their ability to read an electric sign than their ability to swing a heavy sword, to run fast from a pursuing enemy, or to catch another animal for food. In other words, the tests of ability or quality of a population must change as the conditions of life change. It follows that the same groups which in one situation or in one stage of culture would be considered most superior might under other circumstances be the "defective" group and *vice versa*. Two questions arise in this connection: (1) Are there any tests of *ability in general* such that its possessors would tend to be best able to make adjustments under *any* circumstances likely to occur in human society? (2) Are these abilities transmitted through mechanisms of physical heredity relatively unaffected by surrounding physical and social circumstances?

The word used in current discussion to describe such a general characteristic is *intelligence*. The quest for a definition of it in terms of behavior has left in its wake an extensive literature on intelligence tests. Although still in its infancy and although, like all important movements, it has been frequently deflected by a large army of quacks and camp followers, it must nevertheless be regarded as a movement quite fundamental to psychological and social science. The postulation of such an entity as "intelligence" derives its logical justification from the same considerations which justify physicists in postulating physical forces in describing the movements of physical objects. When some individuals are observed to perform a significant adjustment with measurably greater facility than others, this performance may with the same justification be attributed to "ability" or "intelligence," provided it is always kept in mind that "ability" and "intelligence," like force, are inferences from observed behavior and not mysterious entities having an independent existence of some kind.

The presence of gradations in ability or intelligence as here defined in any large population is no more questionable than the presence of gradations in age, wealth, or fertility. It is generally observable and, while not yet as objectively measurable as some other population characteristics, the facts as available in a large literature need hardly be reviewed here. The importance (i.e., relevance) of these differences to various types of behavior in which we may be interested is another matter. But the same is true of other measurable characteristics of man and of populations. Chronological age is, as we have seen, a very definitely measurable characteristic, thanks to well-developed instruments for measuring time, in terms of which age is arbitrarily defined. But the relevance of that measure varies within wide limits in regard to most social behavior. In fact, the development of interest in such measures as intelligence tests was largely due to the need of devising more relevant measures of behavior such as is provided for example by the term "mental age."

The adaptation and adaptability of people of different observed gradations in "ability" and "intelligence" to specific social situations remains largely to be more accurately determined. The sweeping attempts to conclude from a single or a few intelligence tests as to the general educability, productive capacity, and hence the general "desirability" not only of given individuals and groups but also of their descendants may operate to bring the whole movement into disrepute. On the other hand, if tests can be devised which, however absurd and irrelevant the tasks they involve may seem, nevertheless correlate highly and reliably with social behavior of unquestioned relevance, such tests may be used as measures of gradations of ability or intelligence "quality" or "class" in a population with as much justification as any of the well-established measures of variations discussed in preceding sections. As such, also, their value is not affected by questions of either the genesis or the transmissibility of the observed qualities. These are interesting *additional* questions, highly important from some points of view. But they do not affect the value from *other* points of view of measures which reliably grade a population *at present* with reference to their special achievement abilities or their adjustment capacities in general.

We can and should take with respect to measures of intelli-

gence the same attitude as we take toward measures of fertility, death probabilities, longevity, and other accepted population measures. We do not know all the conditions influencing these phenomena, and the question of the degree to which they should be attributed primarily to a certain inherent viability on the one hand or to advantageous socio-economic conditions on the other is still open. In the meantime we find these measures of population characteristics and their predictability of great practical and scientific importance. The same would hold true for all "intelligence," "attitude," or any other kind of sociological measurements as soon as they are demonstrably reliable instruments for grading a population according to given relevant behavior characteristics.

From this point of view, also, the transmission of qualities, traits, abilities, and intelligence from parents to children is a socially and scientifically significant finding regardless of the mechanism by which such transmission takes place. That is, the question of biological heredity *versus* social transmission is of concern not in this immediate connection, although from other points of view it may become a matter of central interest. The view has already been expressed in an earlier chapter that this postulated dichotomy will itself be abandoned as an antiquated survival of a doctrine of causation incompatible with the scientific orientation. It will be recognized that from the operational viewpoint "environmental" influences are merely those which we have isolated and over which we have potential control, while "hereditary" influences are those which we do not as yet know how to control. The moment we know how to control them, the control would constitute an environmental "cause." For most purposes, "heredity" is a convenient category for designating a *prior* set of environmental influences, i.e., pre-conception, as contrasted with post-conception, influences. As such, the distinction may be practically of considerable importance as designating what influences are at a given time relatively subject to control.

The careful testing of the abilities of men and the recording of the degrees and proportions in which "abilities" and "intelligence" are transmitted from group to group and from generation to generation, and the conditions under which such transmission takes place will provide the only adequate or necessary answer to

the much agitated question of the quality distribution in human populations and the conditions associated with variations in their response capacities. When such facts are available, control of the rate of reproduction of each type of individuals according to their special fitness can then be undertaken through the same mechanisms of social control through which any society makes other deliberate adjustments, and according to whatever ends these adjustments aim. Science itself can never directly answer the question of "optimum" population either as regards quantity or quality, any more than it can provide absolute definitions of the Good, the True, or the Beautiful. Science should be able to specify what numbers and gradations of ability in a population are compatible with or conducive to any specified or desired conditions of life. Science does not presume to prescribe in this or in other fields what the inhabitants of the earth should want at any or all times and places. Through its ability to predict the consequences of different courses of social action, science can, does, and doubtless will continue strongly to influence what people will want. But the wants of an organism or a group, i.e., the conditions that will bring it into equilibrium with its environment, are determined in varying degrees by all of these conditions and conditionings of the organism. Science is only one of these.

The data on the gradations in certain human abilities (whatever the reasons for them) are extensive and show considerable agreement. There appears to be no reason to question their essential reliability as far as the facts are concerned. There has, indeed, been little controversy over the facts. The controversy has been over their interpretation in terms of mysterious "causes" and other outmoded frames of reference. Nearly all studies to which anyone would ascribe any validity whatever are agreed that "there are marked differences between occupational groups in their cultural-intellectual development as measured by intelligence tests. A great number of studies have been made on this subject, and, with a few exceptions, the results obtained are extraordinarily consistent. These studies often show a difference of twenty or twenty-five points in average intelligence quotient between the uppermost and the lowest of five main occupational groups. Classification by income or by other indices of social status usually yields somewhat similar results." [55] The growing

development of special tests of vocational abilities likewise demonstrate a considerable variation. There is, of course, much overlapping of intelligence and ability distributions among all classes.

The scientific significance of these facts in the explanation of much societary behavior has always been recognized. To these variations in human abilities as conventionally measured are perhaps attributed more societal events than to any other general characteristics. Any description or explanation of a societal pattern is likely to rely heavily upon data having to do with the variations in individual and group abilities. The correlations of these with other factors and especially the degree to which the observed variations produce or are produced by the social order in which they occur is the subject of a large literature of which only a small part, however, has any scientific validity. Closely related to this problem is the question as to the transmissibility of the observed gradations from generation to generation, and hence the possible future effects upon society of known differential rates of reproduction among various ability groups. We shall consider the latter question first.

A higher fertility rate has, up until recent times, at least, characterized population groups with the lower ability scores. Since this phenomenon has presumably been in operation for many centuries,[56] the progressive deterioration of the general level of the population must, one would assume, be quite serious by now, and must in the measurably near future result in a population of the moron level. Unfortunately we do not have comparable test scores for the population 100 or 200 years ago.[57] We can only point out that the question of whether the differential birth rates noted above indicate dire consequences or indeed any deterioration of the "inherent" quality of the human species is not subject to scientific determination until the terms "dire" and "deterioration" are defined. If these terms are objectively defined, science could doubtless accumulate over a long period of time the relevant data and answer the query *as defined.* Science could also answer the query regardless of how deterioration is defined. But science cannot define *deterioration* for it is a term that is entirely relative to human aspirations or ends sought. The moment we agree on some definition of quality we can make certain statements regarding the probable future prevalence of the abilities

on the basis of known facts. For example, if we agree that the ultimate test of quality lies in adjustment capacities to the environment in which the organism finds itself, including the capacity to reproduce, certain conclusions doubtless follow. The groups with the lower ability-scores seem under many circumstances more capable by this test than the upper groups, the important exceptions have been noted in a previous section. But that a given intelligence score in one generation would necessarily mean the same in terms of *adjustment ability* in another generation is clearly most dubious. Changing requirements and changing technology may greatly modify the adjustment-value of any ability. We are confronted here with the essential relativity of all measures of human ability. We can measure in standardized units the height, weight, and any other physiological properties of men, including those having to do with his nervous reactions and "mental" functioning. But it is impossible to show that an energetic 200-pound man is under all social conditions more capable of coping with his environment than a frail specimen of half that weight and energy. Likewise it is impossible to interpret intelligence scores in terms of human adjustment capacities except with reference to social situations. We readily recognize this fact in all other measures of human characteristics, but tend to overlook the same fact with regard to "intelligence" because of the still surviving metaphysical connotations of the term under which we attribute to it the meaning of "ability-in-general-and-under-all-conditions." These are attributes which no scientific term can have because scientific terms are always defined with reference to rigorously specified conditions.

All intelligence tests record the behavior of an organism to some situation. The attempt to attribute part of this score to "nature" and part to "nurture" seems to me as fantastic as any or all crude attempts to attribute some behavior or parts of an act to the reacting entity and part to its environment. All behavior consists of the *interaction* of these factors. In the physical sciences we have become thoroughly habituated to this point of view. That is, we do not argue or write learned books about whether an explosion is "caused" primarily by the firecracker or by the match.[58] Scientific study of that subject has been directed at determining *how explosions occur*, not what an explosion *is* or what

it is "caused by" except in terms of a description of the situation and the interaction of its components. When we devote ourselves to a systematic study of *how different grades and types of ability occur* and forget the metaphysical issues of what intelligence *is*, whether it is "caused by heredity" or environment and similar scientifically meaningless issues which still confuse the problem, we shall be able to deal with the intelligence distributions in human populations in the same orderly and useful way in which we handle other demographic data. These data will be the basis, also, for estimating within what limits controls are possible, and the technic of such control. In short, the question of variations in human ability should be approached in the same way as we have approached the questions of variations in birth rates, death rates, marriage rates, the incidence of disease, or any other variations in human behavior or in the nonhuman universe.

If the pursuit of a certain occupation is accepted in the construction of tests as the criterion of ability, then the results cited above regarding the differential abilities of different occupational groups as measured by these tests should cause no surprise. To be useful tests must be so constructed as to distinguish the more intelligent from the less intelligent. That is the purpose of a test. In other words, tests must be so constructed that the intelligent receive high scores on them, the unintelligent, low scores. What source must the constructor of a test use as a reference for this fundamental requirement? There can be only one. In prescribing the grading of the test they must rate high those responses which are considered intelligent for an organism to make in the prescribed situation. And how determine in the last analysis *which* of several responses are more intelligent under these circumstances? Why, observe what *the more intelligent* persons do in this situation. Thus the circle is complete. Since the very concept of "intelligence," not to mention superiority, is evaluative with reference to a situation (usually a social order) and since the test is avowedly constructed to discriminate between the better adapted and the less well-adapted reactors *to that situation*, how could the results of these tests come out otherwise than as reported above? If an instrument is designed to register a high score for heavy people and a low score for light,

I see no occasion for surprise if heavy people get a high score on this scale and *vice versa*. Inability to see that we take the criterion of intelligence from man's *behavior in some culture* [59] (usually the contemporary one) is an interesting evidence of how we still cling to the absolutes of recent biological mysticism in which Intelligence, Capacity, and Faculties vied with the Soul as regulatory mechanisms of man's behavior.

To point out that intelligence tests in common with all other measures are entirely relative to the universe for which they are invented is, of course, no reflection upon them. As instruments for standardizing observation, which is the chief value of all measuring instruments, intelligence tests are, to the extent that they achieve this purpose, as valuable as any others. The above discussion, far from criticizing intelligence tests, aims to protect them against the disrepute into which they must inevitably fall if their sponsors absurdly claim that in addition to the above they also measure metaphysical entities, such as "inherent capacities." In short, intelligence tests represent a highly important movement in the direction of the measurement of important human characteristics, and hence in the extension of the field of demography. This movement must not be permitted to fall into disrepute because of absurd assumptions as to the nature of the tests or of that which they measure. Intelligence tests are, like all other measures, merely orderly ways of responding to situations. When used as other measures are used, they are valuable instruments in predicting human behavior.

The facts regarding quality variations in the human species as known at present seem to be as follows:

A small fraction of the population are so defective as to be uneducable by any technics at present known for any functions in modern society. These are the feeble-minded, conventionally though somewhat loosely classified as idiots, imbeciles, and morons. Estimates vary as to the proportion of the whole population they represent, but competent estimates place the figure from one to five percent.[60] With the partial exception of the last class, all of these groups are unable to take care of themselves in the essential community functions and therefore represent a special social and economic burden upon the community responsible for them.

The conditions which produce the above group are as yet largely unknown. They are accordingly usually declared to be defective by "heredity." At present a substantial proportion of feeblemindedness and other mental defects is recognized as organic in the same sense that any other disease is organic. As such, it is approachable by the same scientific methods by which we approach other diseases. The doctrine that all mental defect of the type here under discussion is *ipso facto* a thing apart is gradually yielding to the attitude that, like other extreme variations in human behavior, the conditions which produce it are subject to scientific determination and possibly to control. The use of the term "heredity" to account for all cases which do not fit certain known categories is in any case unwarranted. In the first place, the origin of even the most generally accepted "heredity" cases needs to be explained. That is, the conditions which injure the germ-plasm are as proper objects of study as the conditions which are associated with a toothache. In the second place, nearly all the evidence adduced in support of hereditary explanations rests upon the mere observation that similar defects are more common in some families than in others. As we have pointed out in a previous connection, this constitutes in itself no evidence at all of defective germ-plasm, as a vast variety of behavior traits of known cultural antecedents not to mention various known congenital acquisitions are transmitted with great regularity from generation to generation without any claim that they are therefore hereditary in a genetic sense. As the same scientific attitude which characterizes, for example, our approach to gastronomic and respiratory disorders become more common also with respect to all so-called "mental" disorders, the present somewhat hysterical attitudes and programs on the subject may be expected to disappear and the feeble-minded will be regarded as merely another diseased or malfunctioning group. As in the case of other diseases, a certain percentage of the cases will undoubtedly be regarded as incurable. Where such is the case, provision may be made for the voluntary or compulsory extinction, or in cases of demonstrable genetic or congenital transmission, the sterilization of such patients. If competent studies show that certain types of feeblemindedness, for example, are not improved by any known manipulations of present environment, and it can

be shown further that such types are definitely correlated with preconceptional environment, i.e., "heredity," beyond our control, the prevention or reduction of such types if possible is certainly permissible. These are questions of social policy which science, as such, does not dictate, but for the accomplishment of which it provides the technic, regardless of the ends toward which such policy is directed.

Finally, it appears that the common assumption regarding the much greater fertility of the mentally defective groups has been grossly exaggerated. Much of the supposed evidence for the doctrine is of a type very common in the social sciences and notoriously unreliable. That is, it consists of striking cases, which no one denies, of feebleminded parents having large families. These are widely advertised by organizations who think they know the remedy for such situations. Others who hear of these cases recall similar cases which they themselves have known, and as a result the number of cases in support of the theory grows. As the current degree of statistical sophistication in popular circles does not call for a corresponding assembling of cases of the mentally defective who do not reproduce at all or very little *in comparison to normal groups*, the impression is quite general that all, or most, mental defectives and especially the feebleminded reproduce very much more rapidly than normal groups and that as a result this defective class become the progenitors of an unduly large proportion of the next generation, which would in its cumulative effect over a few generations quite obviously reduce the species to moron levels.

That there must be something wrong with the statistical basis for this dismal prospect suggests itself first from the fact that it has not already come to pass, although the alleged process has apparently been in operation for some centuries. When one considers the only reliable actual figures available on the subject, inadequate as they are, precisely the opposite process seems to be in operation. The defective classes *of all kinds* appear to reproduce *less* rapidly than the normal population, on account of higher death rates at earlier ages, failure to marry, and perhaps sterility or incompetence to procreate.[61] It is true that adequate data on exactly how rates of increase for defectives of various types compare with the rates for normal groups is lack-

ing and in the meantime the question necessarily remains open. But there is no question that the alleged supplanting of "superior" by "inferior" population types, if it exists at all, has been grossly exaggerated by popular eugenics propaganda.

The scientific attitude toward the mentally defective on the lowest levels may in principle be applied to all levels of gradation in human abilities. That is, those groups which are in any degree handicapped may receive special therapeutic or educational attention designed (a) to remove their handicap or (b) to afford them opportunities suited to their capacities. That there will always be gradations of this sort in any large population in which a varied environment and division of labor exists seems inevitable and desirable. Entirely aside from any question of intrinsic quality of their protoplasm (if, for purposes of discussion, we admit such an assumption), coal miners will doubtless always differ in their response capacities from professors, by virtue of the work in which each engages. There will probably also always be at any given time definite attitudes as to the relative desirability or prestige of different types of work, though these may be expected to vary widely according to different cultures. Such variations will doubtless continue to be the basis of social stratification and classes. Insofar as any advocate of a "classless" society contemplates the elimination of such strata, the idea may be dismissed as fantastic. What is usually meant, of course, by the term "classless society" is merely a society in which certain handicaps bearing heavily upon a certain class or classes at present would be removed. Frequently the program calls for the imposition of similar or even greater handicaps upon some other class, though this may or may not be the case. Such variations from time to time in the relative status of various groups, whether its basis is occupation, birth, prowess, or any other, and great changes in the freedom of locomotion between groups will doubtless continue to occur within indefinitely wide limits. Such readjustment constitutes, in fact, a major societal process. The conditions which determine it are to be studied within the same framework as are other phenomena governing the constant tendency toward equilibrium which is evident in all segments of nature.

E. CONCLUSION

We have seen that in any population there are present patterns of characteristics which correspond to patterns of behavior. Behavior (function) is, in fact, merely a series of changing characteristics (structures), while a characteristic (structure) is merely a persistent form of behavior [62] (function). The principal demographic elements of these patterns are perhaps present in varying degrees in all societies, i.e., in all large and relatively self-sufficient groups. There are, for example, no self-sufficient societies consisting entirely of children, of the aged, or of either sex, alone. Furthermore the proportion of the population in the different age groups, the sex ratio, the percentage married, the birth rate and the death rate conform, within broad limits, to a recognizably standard pattern. This *uniformity* in characteristics and corresponding behavior of human groups is, of course, the sole basis for a social science. By concentrating our attention upon the uniformities and treating the differences as measurable deviations from the adopted standard we achieve the generalizations of science and the basis for their practical applications.

As an illustration of the transition by which vital population characteristics which were until recently regarded as wholly "qualitative" gradually move into the quantitative and therefore into the "demographic" field, we have discussed above the rapidly developing technics for measuring human abilities, by which we mean adjustment-facility or adjustment-adequacy. These measures are not as yet as standardized or reliable as measures of height, weight, age, or perhaps even of degrees of health or morbidity. There is an increasing tendency to register the latter and to classify it on crude scales ranging, for example, from total permanent disability to perfect health.[63] Educational institutions have for some time maintained complete and systematic registrations of intelligence quotients which are found to be more relevant demographic data for many purposes than is chronological age. It is only a question of time until these "qualitative" data, together with many other indices of vital importance in the understanding of social behavior, will be accorded a full place in demographic analyses. The less obvious and less aggravated mental

deficiencies and disorders will undoubtedly sooner or later come under the same type of supervision by public health authorities as the more serious disorders already are. It may be advantageous for administrative purposes to keep the better established and more highly quantified fields of sociological inquiry more or less separate from those which are in process of quantification or which are still in a completely unquantified state. But we will not long deceive ourselves that the latter are therefore of an inherently different order. We take here the view that all characteristics at present regarded as quantitative are merely amounts of some quality, and that any qualitative characteristics may be stated in terms of amounts or degrees of that quality.

In short, there is no reason why we should not extend "demographic" data to include income, scores of socio-economic status, occupational status, and possibly social expansiveness, social participation, personal or group "magnetism," intensity of desires for different desiderata, etc. All of these behaviors may some day be interpretable in some common general terms like energy-generation and output. In the meantime they are certainly quantifiable in less general terms. We call attention again in this connection to our basic theory that all social situations and behavior can be described in terms of *characteristics* of *people* in *space* and *time*. Professor Dodd's study illustrates the tremendous variety of quantified situations which are already subject to analysis in these terms. He also provides a technic of designating in the same symbolism those aspects of the situation which are not as yet quantified. The latter must be gradually translated into fully accredited "demographic" data by the process through which "qualitative aspects" of populations are now rapidly taking their place among recognized demographic data in the form of IQ's and other intelligence and special aptitude scores.

The next step is the construction of scales designed to measure whole complexes or configurations of demographic data such as, for example, Chapin's scale for measuring socio-economic status. It is constructed from four major components, namely, effective income, material possessions, cultural possessions, and community participation. These characteristics might in turn be made up of numerous indices or traits. The more complete and comprehensive instruments of this sort we develop, the more accu-

rately can we designate the relationships which it is the task of every science to describe.

The general scientific approach to problems of adjustment is to reduce the situation to factors or components which can be separately observed. When the factors upon which a situation seems to depend have been located the problem is to discover their covariances, correlations, and all their significant relationships. When this has been done we can infer from a few factors what the whole situation is, predict its next most probable state, and make our adjustments accordingly.

In this attempt to reduce situations to separately observable factors, the following characteristics and conditions have for some time been the subject of more or less systematic observation:

1. Age distribution
2. Sex ratio
3. Birth rate
4. Death rate
5. Morbidity rate
6. Marriage rate
7. Family size
8. Illiteracy
9. Occupational distribution
10. Wealth distribution
11. Crowding (density)
12. Migration [64]
13. Intelligence distribution

The adequacy of the data on each of these factors varies greatly both as regards quantity and quality. Fairly comprehensive and comparable figures are available only on the first eight, and only for the western world. But quantitative measures of the other five have also been worked out and their use is being gradually extended. These thirteen types of phenomena include roughly what is today considered demographic data.

Other characteristics and conditions, however, in addition to those listed above, are equally amenable to the same kind of systematic observation and quantitative treatment which has yielded such substantial results in the field of demography as at present defined. For example, there is no reason why we should not add to the above list of demographic characteristics such items as (1) the distribution of socio-economic status in a population which, although it would include wealth distribution as conventionally measured today, would also include such a factor as social participation; (2) housing adequacy according to some standardized norm; (3) the whole field of human attitudes and mores on various subjects involving the ideological status and attitude trends

of populations; (4) perhaps some index of social expansiveness and other personality traits; and finally, (5) the same general approach may be adopted with respect to groups and institutional patterns—cities, governments, etc.—as has already been attempted with notable results.[65]

Here, as elsewhere in this book, we recognize fully that in order to invent the measuring instruments which we advocate, in order to select factors, and in order to discover the interrelationships of these factors, we must have hypotheses as to what *may* be significant factors and as to what *may* be their interrelationship. The source of these hypotheses may be any human experience or observation whatever, any dream, imagination, or intuition. The ideas and behavior of the primitive magician, the artist, or the philosopher are all possible sources for the "leads" which we may find it profitable to follow in that cold, rigorous process of verification which distinguishes science from other knowledge. Especially valuable, of course, in this connection will be the large descriptive literature of ethnology and sociology including the speculative theories of the penetrating intellects that have devoted themselves to a deep, if informal, study of man's social relationships. Thus, the factors and relationships considered above represent only a small fraction of all that have been suggested by various writers and observers. For example, Ross has pointed out that in some cultures, at least, such characteristics as greed, intemperance, nonreligiousness, physical violence, recklessness, and boredom vary directly with a high sex ratio.[66] All the other factors in our list are also the subject of a large literature ranging all the way from local folklore to fairly well-substantiated generalizations by qualified observers. This lore must not be confused with scientific fact. But it is the most fruitful source of hypotheses, and as such must be given careful consideration by all sociologists. It is true that at present the collection of random observations, anecdotes, and folklore and speculation about them rather outstrips the process of scientific verification. Hence we are devoting ourselves in the present book rather to the latter than to an attempt to summarize or add to the vast amount of anecdotal sociological data. But it must not therefore be assumed that we overlook the importance of the folklore, academic and other, which today constitutes the bulk of

sociological subject matter. Neither must we confuse this folklore with science.

The data in this chapter have been introduced not so much to summarize some fairly well known facts as to emphasize that the approach which has yielded this relatively reliable body of knowledge regarding this aspect of human society must be extended also to other aspects regarding which our knowledge is comparatively meager and chaotic. For the same reason, we have not attempted to offer a complete summary of everything at present known about this subject. We have summarized only enough of the field to serve our purpose of illustration. In the second place, we have introduced these data and these generalizations to emphasize that while they are, as compared with some other societal phenomena, relatively adequate, both the data and their analysis are still subject to great improvement and extension.

The next step in generalizing these data is to measure the relative weight of the factors selected in numerous concrete situations. To the extent that (a) the weight of each of these factors can be measured and (b) any consistencies or uniformities in their co-variances can be established, (c) prediction of the characteristics and behavior of any specified group considered can be made with measurable accuracy from *fewer than all of the factors here enumerated.*

It is this parsimony implied in the last requirement which is the *sine qua non* and principal justification of science. When a large number of components of any event can be shown to recur in certain sequence, proportion, relationship, or other order we call it a pattern and react to it as a unit instead of to its individual parts. When generalized this pattern becomes an ideal construct which subsumes a whole class of individual events or situations, which are thought of as examples of the generalized construct. An average is one type of such ideal constructs, which for certain purposes are thought of as *representing* the individual data from which it is derived. Abstract *types* of any kind serve this purpose of minimizing mental effort in responding to aggregates, groups, or constellations of events which it is beyond the power of human sense mechanisms to respond to individually. Thus, in the illustration given above, it must be possible from sufficient study of the interrelationship of the factors enumerated

to arrive at a *generalization* regarding their relationship, from which a *full* description of some group can be made although *less than* the thirteen components given above are known. In short, the generalization is without scientific significance unless a measurably accurate statement can be made about some as yet incompletely observed group on *all thirteen* points from definite data on *less than all thirteen.* If there is any field which cannot be so subsumed under increasingly general constructs, that field is assuredly not amenable to scientific attack. As Thurstone has said: "It is the faith of all science that an unlimited number of phenomena can be comprehended in terms of a limited number of concepts or ideal constructs. Without this faith no science could ever have any motivation. To deny this faith is to affirm the primary chaos of nature and the consequent futility of scientific effort. . . . The convincingness of a hypothesis can be gauged inversely by the ratio of the number of degrees of freedom to that of the phenomena which it has demonstrably covered. . . . The laws of science are not immutable. They are only human efforts toward parsimony in the comprehension of nature." [67]

One of the basic problems of the social, as of all other sciences, therefore, becomes to invent increasingly adequate technics by which the large number of components in increasingly large segments of social behavior can be reduced to comparatively few, which, in their proper proportion or relation will nevertheless for practical purposes serve as adequate guides to necessary adjustments toward individual concrete complexes in their full detail. To this problem Professor Dodd's volume is primarily devoted. We leave to him and to others the elaboration of those technics which if introduced here would tend to destroy that continuity of theoretical and introductory treatment at which the present volume primarily aims.

F. NOTES

1. A. B. Wolfe, "Demography," *Encyclopedia of the Social Sciences*, V, pp. 85–86.

2. Raymond Pearl, *The Biology of Population Growth*, Alfred A. Knopf, 1925, pp. 208–209. I am here using this law merely as an illustration of the type of generalization which is desirable if possible, not as an established scientific law upon which the validity of any conclusions in this or other chapters depends. See the next note.

3. A. B. Wolfe, "Population," *Encyclopedia of the Social Sciences.* See, on the

other hand, the excellent critical remarks of H. Woolston on this subject. ("Raymond Pearl, The Biology of Population Growth," *Amer. Jour. of Sociol.*, XXXV, Nov., 1929, pp. 403–410.) I quote a few passages:

"All social groups do not grow in that way. If seven or more census returns for states and cities in this country be considered adequate to locate their curves of growth, then some of these populations apparently do not conform to the logistic principle. For instance, the curve for Virginia breaks downward after 1860, due to division of her territory. Wisconsin has maintained a practically constant increment since 1840, probably because of a steady stream of agricultural immigration. The curve for Omaha shows a marked sag in 1900. That for San Francisco bulges *upward* from its base in 1880, and *downward* in 1900, reversing the logistic. In some cases the curves have no well-defined point of flexion, so that a parabola describes the data quite accurately. (See Bowley, *Journal Royal Statistical Society*, 1925, pp. 76–80.) Professor John H. Cover has found that a Gompertz curve ($y = ab^{c^x}$) fits the trend of population in twenty-five American states and twenty-eight cities. Hence from a pragmatic standpoint, as well as from that of pure reason, Pearl's 'law of growth' leaves much to be explained. This the author admits, and tries to adduce further evidence toward solving the problem. . . . Pearl proves to his own satisfaction that rate of increase diminishes with density. This he does by correlating births per thousand married women fifteen to forty-four years of age, with persons per acre within the limits of 132 American cities. He then finds partial correlations of birth-rates with total population, wealth per capita, percentage of population aged eighteen to twenty attending school, and persons per dwelling. Finally, holding the combined effect of these last four variables constant, he arrives at a net coefficient of inverse relation between births and density represented by $r_{BA.\ PWSD} = -0.175 \pm 0.057$. This seems rather tenuous.

"In making these calculations, Pearl uses as a measure of density persons per acre, which has doubtful significance especially in large cities. (See Stevenson, *Journal Royal Statistical Society*, 1925, pp. 67 ff.) Persons per room is a more accurate criterion. Moreover Pearl finds that the correlation of birth-rate with wealth per capita ($r_{BW} = -0.381 \pm 0.050$) and with percentage of persons eighteen to twenty in school ($r_{BS} = -0.351 \pm 0.051$) is closer than that of either wealth or schooling with density. This suggests that social conditions may be more important for human beings than mere physical proximity.

"The chapter on differential birth-rate virtually establishes such inference. There is a clear negative correlation between birth-rate and per capita value of wealth in twenty-four states, when their populations are held constant ($r_{B.WP} = -0.615 \pm 0.086$). This certainly implies more than crowding as a condition of diminishing fertility among wealthier people. We are told that the latter have a more comfortable environment. It is the cramped poor of the city who breed most rapidly. What, then, is the meaning of 'density'? Perhaps the term has psychological connotation."

See also Vito Volterra, "Population Growth, Equilibria and Extinction under Specified Breeding Conditions: A Development and Extension of the Theory of the Logistic Curve," *Human Biology*, X, Feb., 1938, pp. 1–11.

4. Cf. Enid Charles, *The Twilight of Parenthood*, Watts, 1934, pp. 156–157.

5. *Population*, by C. Gini, S. Nasu, O. E. Baker, and R. Kuczynski, Univ. of Chicago Press, 1930.

6. *Ibid.*, pp. 292–293.

7. *Ibid.*, pp. 294–295.

8. Cf. Ch. VI on pulsations, cycles, rhythms, etc. Also Chs. XII and XIII. See especially Figs. 21 and 22 of Ch. XIII.

9. R. Pearl, *op. cit.*, p. 209.

10. W. L. McAtee, "The Malthusian Principle in Nature," *Scientific Monthly*, May, 1936. This article summarizes a large literature bearing on the general subject here under discussion.

11. A. J. Nicholson, *Journal of Animal Ecology*, II, May, 1933, p. 166.

12. R. Pearl, *op. cit.*, p. 209.

13. W. C. Allee, *Proc. Cambridge Phil. Soc.*, IX, Jan., 1934, p. 42. See also the same author's *Animal Aggregations*, University of Chicago Press, 1931. .

14. G. F. Gause, *The Struggle for Existence*, Williams and Wilkins, 1934, p. 75.

15. L. L. Woodruff, *Jour. Exp. Zool.*, XIV, May, 1913, pp. 575–582.

16. O. Schreiner and H. S. Read, *Bull. Torrey Botany Club*, XXXIV, June, 1907, pp. 279–303.

17. W. L. McAtee, *op. cit.*, p. 452.

18. *Ibid.*, pp. 452–453.

19. R. Pearl, *op. cit.*, pp. 158–163. F. W. Notestein, "Class Differences in Fertility," *Annals of the American Academy of Political and Social Science*, CLXXXVIII, Nov., 1936, pp. 26–36.

20. L. S. Cottrell, Jr., "Research in Causes of Variations in Fertility: Social Psychological Aspects," *Amer. Soc. Rev.*, II, Oct., 1937, pp. 678 ff. See also Enid Charles, *The Twilight of Parenthood*, Watts, 1934, Ch. 5.

21. K. A. Edin and E. P. Hutchinson, *Studies in Differential Fertility in Sweden*, King, 1935. A. M. Carr-Saunders, *Economic Journal*, Dec., 1927; A. J. Barnouw, "The Differential Birthrate in Holland," *Birth Control Review*, XVI, March, 1932, pp. 81–82.

22. C. Gini, *Nascita Evoluzione E Morte Delle Nazioni*, Libreria Del Littorio, Rome, 1930, pp. 37–38.

23. This relationship is as yet unestablished from actual statistics. See R. K. Stix, "Research in Causes of Variations in Fertility: Medical Aspects," *Amer. Soc. Rev.*, II, Oct., 1937, p. 675.

24. R. Pearl, *op. cit.*, pp. 203–204.

25. S. Winston, "The Influence of Social Factors upon the Sex Ratio at Birth," *Amer. Jour. of Sociol.*, XXXVII, July, 1931, pp. 1–21. For an exhaustive and able recent review and bibliography of the subject see Antonio Ciocco, "Variations in the Sex-Ratio at Birth in the United States," *Human Biology*, X, Feb., 1938, pp. 36–64. Ciocco finds no evidence for the relationship noted by Winston and others.

26. A. Ciocco, *op. cit.*, p. 58. Some studies show a very much higher ratio.

27. S. Winston, "Birth Control and the Sex Ratio at Birth," *Amer. Jour. Sociol.*, XXXVIII, Sept., 1932, pp. 225–231.

28. J. A. Thomson and P. Geddes, *Life: Outlines of General Biology*, Harper, 1931, p. 568. This is true for all age groups in the United States and for all except the age group 15 to 20 in England and Wales. See A. Newsholme, *Vital Statistics*, Appleton, 1924, New Edition, pp. 204–205.

29. Lowie points out that also among people carrying on a strenuous hunting life as, for example, the Eskimos, this effect is noticeable. *Encyclopedia of the Social Sciences* ("Marriage").

30. W. S. Thompson, *Population Problems*, McGraw-Hill, 1930, p. 55.

31. R. Lowie, *op. cit.*

32. *Principles of Sociology*, Century, 1930, pp. 7–8.

33. L. I. Dublin and A. J. Lotka, *Length of Life*, Ronald, 1936, p. 122.

34. *Ibid.*, pp. 268 ff.

35. A good general summary will be found in L. I. Dublin and A. J. Lotka, *op. cit.* For a comprehensive account of the current situation in the United States see *The National Health Survey*, U. S. Public Health Service, Washington, 1938. See also *Medical Care for the American People*, Committee on the Cost of Medical Care, University of Chicago Press, 1932.

36. Between one and two percent reach the age of 94 in the United States today. (Dublin and Lotka, *op. cit.*, p. 15.) Prospects of an indefinite extension of this span have been discussed in W. M. Malisoff's, *The Span of Life*, Lippincott, 1937.

37. Dublin and Lotka, *op. cit.*, pp. 30–31.

38. *Ibid.*, p. 57.

39. *Ibid.*, p. 193.

40. *Ibid.*, p. 48. The figures here referred to do not include Russia.

41. *Ibid.*, p. 36.

42. Dublin and Lotka, *op. cit.*, p. 74.

43. *Ibid.*, p. 124.

44. Cf. Ch. III on the meaning of "normal" in science.

45. *The National Health Survey*, U. S. Public Health Service, Washington, 1938. See also *Medical Care for the American People*, Committee on the Costs of Medical Care, University of Chicago Press, 1932; E. Sydenstricker, *Health and Environment*, McGraw-Hill, 1933.

46. E. A. Ross, *Principles of Sociology*, Century, First Rev., 1930, p. 36. (Professor Ross refers to India in this passage.)

47. Pearl, *op. cit.*, Chapter 5.

48. Figures for United States and Sweden respectively, 1920. W. S. Thompson, *op. cit.*, pp. 62–63.

49. *Ibid.*

50. Ogburn and Groves, *American Marriage and Family Relationships*, Holt, 1928, p. 331. This source also analyzes in some detail the relationship between marriage and death, crime, insanity, and pauperism, employment and income. See Ch. 10.

51. The student who is not already familiar with this literature will find an excellent summary of it as regards primitive groups in W. I. Thomas, *Primitive Behavior*, McGraw-Hill, 1937, Ch. 10. A detailed factual analysis of the con-

temporary American situation will be found in E. R. Groves and W. F. Ogburn, *American Marriage and Family Relationships*. The reasons for basic attractions and repulsions between different types of personalities is here a relevant and almost untouched question. "The actual workings of sexual selection in man is an almost completely neglected field." (S. J. Holmes and C. E. Hatch, "Personal Appearance as Related to Scholastic Records and Marriage Selection in College Women," *Human Biology*, X, Feb., 1938, pp. 65–76.) See also C. Gini, "Beauty, Marriage, and Fertility," *Human Biology*, X, Dec., 1938. Also C. Grillenzoni, "I Caratteri del Vestire come Fattori Demografici (Physical characteristics and dress as demographic factors), *Metron*, X, No. 3, 1932.

52. W. I. Thomas, *op. cit.*

53. Cf. Enid Charles, *op. cit.*, Ch. 5, pp. 180 ff. Also, S. A. Stouffer, *Journal of the American Statistical Association*, XXIX, Sept., 1934, pp. 295 ff. S. A. Stouffer, "Trends in Fertility of Catholics and non-Catholics," *Amer. Jour. of Sociol.*, XLI, Sept., 1935, pp. 143 ff. This study shows that for the place and period studied, fertility among Catholics has dropped more rapidly than among non-Catholics.

54. The use of the word quality as opposed to quantity is, of course, misleading inasmuch as quantities are always *quantities of some quality*. For example, what is generally meant by the quality of a population is the *degree* or *amount* of some generally desired characteristics which it possesses. The characteristic "intelligence," "ability," etc., is no more intrinsically qualitative than is age, literacy, wealth, family-size, or any recognized demographic characteristic. We find it convenient to regard some of these as two-point variables, e.g., sex is either male or female, persons are either married or unmarried. This is, however, arbitrary as all classifications must be. For other purposes we rank sex characteristics from masculinity to extreme femininity in a series of gradations. The extent of interrelationship of the sexes from complete avoidance to the most intimate and prolonged association could undoubtedly also be ranged on a much finer scale than the all or none, married-unmarried attribute. Such gradation would, furthermore, greatly illuminate all discussion of marital relations. (See S. C. Dodd, *Dimensions of Society*, Ch. 3, for a good discussion of this subject. The terms quantitative and qualitative are, as previously pointed out, not inherent characteristics of data, but different ways of responding to them. See Ch. I.)

55. F. Lorimer and F. Osborn, *Dynamics of Population*, Macmillan, 1934, pp. 175–176.

56. W. S. Thompson, *op. cit.*, p. 113.

57. The nearest thing to a comparable measure of intelligence in previous centuries is perhaps Professor L. M. Terman's posthumously derived scores of historical personages. His results are not applicable here even if one attaches some significance to them. (See *Genetic Studies of Genius*, Vol. 2, Stanford University Press, 1926.)

58. This does not mean that profitable studies of the relationship between the "amount" (force) of the explosion and the amount of the powder in the firecracker as compared with the invariable influence of the spark cannot be made. For the same reason, profitable statistical studies can be made of the distribu-

tion of abilities in groups of different measured variations in the preconception and postconception factors.

59. For a recent example of the conception of intelligence here under criticism, see M. May, "Ten Tests of Measurement," *The Educational Record*, April, 1939, pp. 205–206. For the most serious attempt to construct tests of response capacities irrespective of different cultures, see S. C. Dodd, *International Group Mental Tests* (Ph. D. Thesis, Princeton University, 1926); see especially pp. 6–8.

60. See the summary of numerous studies on the subject by E. H. Sutherland, "Mental Deficiency and Crime," Ch. 15 in K. Young, et. al., *Social Attitudes*, Holt, 1931.

61. "There is a widespread belief that one of the characteristics common to defectives is abnormal fertility. This is not borne out either by the inquiry or by such other statistics as we have been able to collect. . . . The supposed abnormal fertility of defectives is, in our view, largely mythical." (*Report of the Departmental Committee on Sterilization*, His Majesty's Stationery Office, London 1934, p. 18. Cited in A. Meyerson et. al., *Eugenical Sterilization*, Committee of the American Neurological Association, Macmillan, 1936.) See the latter volume for a large amount of other data indicating the same conclusion. The available data are far from satisfactory, however, for sub-average types above the lowest grades. To the extent that dysgenic trends of any type are subject to control by selective propagation nothing in this review of the subject should be interpreted as opposition to such a program. Here also, however, the practical prospects seem to have been greatly overestimated. H. S. Jennings says: "It has been computed that if the proportion of feeble-mindedness in the population is one per thousand, to decrease this proportion to one per ten thousand will require about 68 generations, or two to three thousand years, if it is done merely by stopping the propagation of all feebleminded individuals." (*The Biological Basis of Human Nature*, Norton, 1930, p. 242.)

62. Cf. A. Carrel, "The New Cytology," *Science*, XLXXIII, March 21, 1931, p. 298. Also, G. E. Coghill, "The Neuro-Embryologic Study of Behavior-Principles, Perspective, and Aim," *Science*, XLXXVIII, Aug. 18, 1933, p. 137.

63. No nation-wide survey of intelligence comparable to the recent survey of health (The National Health Survey, 1938, *op. cit.*) has as yet been undertaken, and while school records are increasingly adequate in this respect, there is as yet no comprehensive application and registration of intelligence scores for the whole population or for reliable samples of the whole population.

64. This subject is treated in Chapter XII.

65. See, for example, E. L. Thorndike and Ella Woodyard, "Individual Differences in American Cities: Their Nature and Causation." *Amer. Jour. of Sociol.*, XLIII, Sept., 1937, pp. 191–224.

66. E. A. Ross, *op. cit.*, pp. 7, 8.

67. L. L. Thurstone, *The Vectors of Mind*, University of Chicago Press, 1935, pp. 44–45.

Chapter XII

SPATIAL ASPECTS OF SOCIETY (L): HUMAN ECOLOGY

A. INTRODUCTION

The principal sectors of society as adopted in this volume have each been the subject of considerable individual study. The study of certain demographic characteristics of populations, for example, is already practically a special sociology. Likewise, the geographic, spatial, and ecological aspects of societal phenomena have been the object of extended special study. The same is true of the temporal aspects of societal events, usually designated as "social change," especially as affected by technological developments. It is obviously not the function of a general theoretical treatise such as the present one to review or even attempt to summarize adequately all the methods and findings of these special studies. We deal with these subjects in the present volume only for the purpose of illustrating how they fit into the general framework and approach which it has been our chief aim to elucidate.

In turning to a brief consideration of geographic space and astronomic time as related to societal phenomena we do so primarily (1) to emphasize again the manner in which these influences are taken into consideration in the framework we have proposed, and (2) to emphasize that these traditionally "real" and "tangible" dimensions of society are merely coordinate with, not more "fundamental," "intrinsic," or "real" than other dimensions such as societal space, societal time, or the technological and other so-called "cultural" characteristics of populations.

It happens that the most serious attempt to interrelate these factors after the manner contemplated in this volume has been made by a group of writers calling themselves human ecologists. We shall accordingly summarize briefly their principal contributions in furtherance of our main purpose, namely, the exposition

of how societal behavior may be regarded as the resultant of all relevant factors in a field of force,[1] which is the basic scientific framework within which other natural phenomena are explained. Measurement of the degree to which each component in a situation influences the observed behavior is from this point of view the principal task before the social sciences. Before this task can be intelligently undertaken, however, approximate and non-metrical representations in terms of diagrammatic or topological constructs as well as verbal analysis in folk-terms may be helpful in defining problems for more refined study.

B. THE INTERRELATIONSHIP OF THE DIMENSIONS OF SOCIETY

The geographic distribution of men upon the earth's surface has always been recognized as a major factor of significance in many societal situations. Geographers and ecologists have found it convenient to regard this component as the independent or basic variable around which other components can be most easily assembled and their fluctuations exhibited. The geographic interpretations of Buckle,[2] Le Play,[3] and of contemporary human ecologists [4] have had and are having a profound influence upon the direction of sociological investigation. Nearly all sociologists accord the factors of geographic habitat and man-land ratio a leading place in the interpretation of human group behavior. In adopting the geographic space relationships of man as a basic dimension or component of societal phenomena we are, therefore, merely following the precedent of some of the very ablest students of the past. The results achieved through study of societal phenomena from this point of view are also among the most impressive and promising in present day sociology.[5]

One reason for the attention which this component has received is doubtless the apparent logic and historical propriety of a consideration of the geographic matrix which originally produced man himself, which continues to provide the means of his animal subsistence and which has undoubtedly exercised and still exercises a major molding influence upon his societal activities. Indeed, the most objective interpretations of human culture were perhaps originally explanations from this point of view.

Contemporary ecologists are also the most promising group from the standpoint of finally divesting themselves of the philosophical preconceptions which have hitherto hampered the transition to an objective study of societal phenomena. The mere basic idea of regarding societal products and behavior as produced by man's interaction with aspects of the earth exerts a liberating influence upon minds still heavily weighed down with anthropomorphic assumptions.

With this point of view has naturally gone the increasing attention to the instrumental adaptations of man to his geographic environment. Much attention has accordingly been turned to technology, and notably to those technologies through which the influence of the spatial component of societal affairs has been fundamentally changed, such as, for example, the development of means of communication and locomotion. The temporal aspect of these developments gives rise to that large number of sociological problems which are concerned with societal change. Thus the interaction of man (P) and the spatial aspect of his geographic environment (L) by means of his technology and other characteristics (I) in Time (T), in their full functional relationships, is the general problem of the social sciences. We have touched on all of these factors implicitly in the preceding chapters although to an unequal degree and without sufficient emphasis upon their relationship. In the present chapter we shall attempt to show their interrelationship in that full synthesis which corresponds more closely to the synchronous interaction of people which is broadly called human society.

Let us review briefly the above fundamental concepts and relationships as they are used in the present volume. We stated in Chapter VI that we would regard all behavior as one or another form of energy conversion. We defined energy as *amounts of change in relationships*, which is also the definition of this term in physics. Bertrand Russell has recently stated the same point of view in somewhat more popular form as follows:

"The fundamental concept in social science is Power, in the same sense in which Energy is the fundamental concept in physics. Like energy, power has many forms, such as wealth, armaments, civil authority, influence on opinion. . . . Power, like energy, must be regarded as continually passing from any one of

its forms into any other, and it should be the business of social science to seek the laws of such transformations. . . . Power may be defined as the production of intended effects. It is thus a quantitative concept: given two men with similar desires, if one achieves all the desires that the other achieves, and also others, he has more power than the other." [6]

All observed events are thus regarded as merely the present aspect of energy passing from one of its forms into another. The next most probable state of any energy system we have called a state of *equilibrium* or *balance*. For practical purposes time is always an important factor in this definition, as we shall see in the next chapter. While this process of a moving equilibrium in time [7] involves the entire cosmosphere, the limitations of man's sensory equipment (and hence our adjustment-needs), makes it possible and necessary for us to respond only to a segment of the whole at any one time. This segment which is thus regarded as a closed system, we have elsewhere called, as in science generally, a *field of force* or (in sociology) *the situation*. In the present chapter we shall, in conformity to current sociological and ecological usage, call this same unit a *region* when it is desired to emphasize the geographic aspect of a segment. A region, in other words, is a particular type of field of force or situation, namely, one in which it is desired to emphasize influence of the geographic factor. Mukerjee has made the following excellent statement as to the nature of the ecological region:

"Perhaps the most important contribution of ecology is the idea of the region as an intricate network of interrelations. The region exhibits a complex pattern of adaptations between the environmental factors and the plant and animal communities, including human societies.

"The mutuality of adaptations, which are endless and ever shifting, gives us the picture of the total situation as a configuration like the *Gestalt* of Wertheimer, Koehler, and Koffka. The change of any factor of the environment, such as a spell of drought or a cold winter, gradual transformation of landscape due to maturity of the river system, and change in drainage and texture of soils, brings about a complete change in the milieu, in which plants, animals, and humans find a new equilibrium through natural biological processes. Each new mode of adjustment,

whether the change of the type of vegetation from woodland to shrub and bush, or the succession of wet by dry crops, or, again, the construction of wells and canals, implies an entire transformation of the situation in which man, with the rest of nature, undergoes a change in life. Similarly, when man introduces new cultivated plants, animals, or insects into the region, or exterminates the carnivores and allows the rodents to multiply as in every old human settlement, or, again, changes from shepherding to agriculture and from agriculture to industry, he remakes the region and revises its organic constitution.

"In the older sociological speculation man was treated as a part of nature, but in a frankly deterministic fashion; *his plans and endeavors were conceived more as extraneous forces than as phases of the ecologic complex interwoven with the rest of the environment. Man is part and parcel of the process by which the balance of the region is maintained or shifted.*" [8] [Italics mine.]

Some sociologists who accept this general viewpoint, unfortunately, have failed to accept the full implications of the concluding sentences of the above passage and hence have laid themselves open to unnecessary criticism. Frightened at the thought of accepting the full implications of this position as regards man's "mental" and "spiritual" characteristics, they have attempted to maintain a dualism in this respect, with resulting incongruities of which their critics have, of course, made capital. The writings of even some of the ablest spokesmen bristle with incongruities resulting from unnecessary assumptions about the "internal" (at other times the "external") nature of human societal relations, their "conscious," "psychic" nature, etc., as compared with other components of a region.[9] As a result, this ecological approach often results only in the location of societal events in an external geographic frame, while retaining for the societal events all the "super-organic," "vitalistic," "psychic" characteristics of a completely different and incompatible framework.

The position of the present volume on this subject should by now be sufficiently clear. Suffice it here to say that *in our conception of a region all of man's "mind," "thoughts," "soul," "spirit," "culture," and "ideas" usually observed in the form of signs and symbols (which must be considered as real entities or objects) are regarded as inextricably interwoven with all the other components of*

a region, and are to be studied in the same way. Only for analytical purposes do we abstract some elements according to the problems that at the time interest us. In such analysis, other dimensions of societal space-time are coordinated with geographic space to provide a framework within which a complete description of societal events is sought which shall be of the same basic character as the descriptions that constitute the other natural sciences. In such a region the hopes, aspirations, wishes, and will of man in the form of words and other symbolic behavior have as real and objective existence and influence as the mountains, the rivers, the streets, and the buildings.

McKenzie has most adequately recognized the true scope which human ecology must adopt if it is to serve as an adequate framework for the interpretation of societal behavior. He classifies ecological factors under the following four general heads: "(1) geographical, which includes climatic, topographic, and resource conditions; (2) economic, which comprises a wide range and variety of phenomena such as the nature and organization of local industries, occupational distribution, and standard of living of the population; (3) cultural and technical, which include, in addition to the prevailing condition of the arts, the moral attitudes and taboos that are effective in the distribution of population and services; (4) political and administrative measures, such as tariff, taxation, immigration laws, and rules governing public utilities." [10]

The essential unity of the geographic and other factors is further correctly emphasized by the same author in the following passages:

"In society physical structure and cultural characteristics are parts of one complex. . . . Location, as a geographic concept signifies position on the earth's surface; location as an ecological concept signifies position in a spatial grouping of interacting human beings or of interrelated human institutions. . . . A community, then, is an ecological distribution of people and services in which the spatial location of each unit is determined by its relation to all other units." [11] Elsewhere the same author defines human ecology as "the study of the spatial and temporal relations of human beings as affected by the selective, distributive, and accommodative forces of the environment." [12] In its fullest implications, that is also the general task of the social sciences as

we have conceived it in the present volume. It calls for the full functional description of the characteristics (I) of societal behavior of human groups (P) in a framework of time (T) and space (L), either social, astronomic, geographic, or any other that proves useful.

C. TYPES OF REGIONS

The regions with which human ecologists are concerned are usually horizontal areas on the earth's surface. This is not the only way in which ecological areas may be designated, however. The full content of the biosphere (excluding man) from the standpoint of *vertical* layers of geographic space has been illustrated for a forest area in Panama by Allee as follows:

"6. The air above the forest which can be occupied only by flying animals such as birds, bats, and insects.

"5. The tree tops which have a distinct bird population.

"4. The mid-forest, again distinguished by its birds.

"Many animals do not recognize the distinction between these two strata and are known as the animals of the mid and upper forest. Thus the monkeys and sloths, forest lizards, birds and insects range through the mid and upper forest strata but are only rarely seen, if at all, in the lower levels.

"3. The lower forest stratum. Through this stratum flit the low flying insects and birds; prominent among them are the great *Morpho* butterflies and several species of humming birds. Into this stratum mount many animals more commonly found on the ground, such as the *Anolis* lizards mistakenly called chameleons; while everywhere ants are found similar to those of the forest floor rather than to those of the upper forest.

"2. On the forest floor are to be found turtles, ground dwelling snakes, lizards that cannot climb, and the non-climbing, non-burrowing mammals such as the peccary and the tapir.

"1. Burrowing forms of the subterranean stratum include earthworms, and many termites and, in the dry season at least, the interesting worm-like anthropod, *Peripatus*.

"To many animals dwelling in the tropical rain-forest even this simplified stratification has little or no meaning. Some, such as *Nasua*, a relative of our raccoon, range indifferently from the forest floor to the tree-tops; others, like the armadillo belong to

the underground and the ground strata. Insects also may or may not recognize the existence of these strata. Even in one group, the termites, there are forms that are limited to one level and others that burrow in the ground and range to the tree-tops. Here as in all phases of human and non-human sociology the general principles stand out plainly, but there are many exceptions." [13]

By virtue of his technological development man has broken down these barriers which used to confine his sphere both vertically and horizontally, until today he ranges from the tropics to the poles and from the bowels of the earth to the stratosphere. But the surface of the earth is still the main scene of man's activities. Accordingly, human ecology concerns itself at present mainly with horizontal regions. The energy relationship of these regions is here again our point of departure.

As has already been noted, the concept of a natural area or region is a segment of the universe selected on the basis of two principal criteria, namely, (1) geographic homogeneity and (2) at least one and usually several other unifying elements. Among the latter, the following most frequently receive consideration from human ecologists: (a) lay of the land—topography, etc.; (b) soil quality; (c) climatic conditions; (d) mineral resources; (e) commercial relationships and economic interests; (f) needs of common service; and (g) metropolitan planning.[14]

The ecologist's concept of a region, however, involves much more than a mere presence of common elements in a geographic area. The interaction of these elements in a highly interdependent and organic way is the essential sociological aspect of the components included. We pointed out in Chapter V that the organic concept in its most general definition is as properly applicable to groups as to individual organisms.[15] In accepting this view (sometimes with unnecessary apologies) the ecologists have come close to providing a really profitable scientific framework. As we have already noted, the principal shortcoming of this approach in the past has been a failure objectively to gear into this scheme phenomena which are now regarded as somewhat above or apart from such treatment, namely, the "psychic" and "cultural" aspects of societal behavior. That is, in addition to the vertical and horizontal distributions of organisms in geographic space, their relationships may also be meaningfully represented as ver-

tical and horizontal distributions in societal space.[16] We have already dealt with this subject in previous chapters (Chapter III, Sec. F, 1; Chapter VIII, Sec. C). To discover what correlation, if any, exists between the position of groups in geographic and in societal space as well as *within* each type of space is part of that comprehensive description of societal relationships at which sociology aims.

Human ecologists have been wise in adopting an approach which accepts as its fundamental assumption the *coordinate interdependence* of *all* aspects of any segment of the universe rather than the dominance of "mind," "class struggle," instincts, or geographic conditions. This approach consequently recognizes that its main problem is a technological one, namely, as Thomson and Geddes put it, "to decipher the patterns in the web of life." The same authors also noted that "as the inquiry is being pursued with precision and penetration it is becoming plain that the intertwining of the vital threads is even more intricate than was supposed by the old-fashioned Natural History with all its scrutinizing insight." [17] The successful pursuit of our goal, therefore, means constantly refined instruments and technology.

One of the best introductions to the social sciences from this point of view would be a study of plant and animal ecology, especially those portions dealing with the delicate balances that exist between the various species and the far-reaching effects of a disturbance of a small and apparently remote factor in this equilibrium.[18] The assurance and faith which many social scientists and social reformers attach to superficial and short-sighted programs of societal renovation indicates a complete oversight of the broad interrelationships of factors in societal situations. A realm which includes in addition to a geographic habitat, the so-called "cultural" affairs, is likely to be even more intricate and sensitively balanced than are the components in any other field of force. The major oversight is, of course, the failure to recognize these "cultural" items as ecological factors to be taken into consideration with the same objectivity and the same methods as the so-called "physical" parts of the complex. Thus, social psychology is nothing but the ecology of symbolic behavior [19] and in a full functional integration of societal behavior should be geared fully into the whole ecological picture.

For example, ecologists have noted that certain organisms promptly die in certain "unconditioned" environments. When a sufficient number of such organisms have died in a given place, however, it may become a hospitable environment for other members of this species.[20] Sociologists have noted that the death of martyrs frequently results in converting a hostile societal environment to an environment compatible with or friendly to people with exactly the same ideas as those of the martyrs. The scientific problem is to describe fully the mechanisms by which the transformation in each case takes place. These mechanisms will not be the "same" in terms of "concrete" elements or specific factors. But the principles of inclusiveness and parsimony dictate that science should seek to state the *process* involved in sufficiently *general terms* to cover both cases.

Some progress has, of course, already been made in what is essentially an ecological treatment of socio-psychological data. It is significant that words of spatial connotation, such as mobility, distance, segregation (in the sense of *social* isolation), fluidity, locomotion, permeability, etc., have also gained currency in sociology with reference to entirely societal, nongeographic phenomena. We have already pointed out (Chapter VIII, Sec. C) that the concept of social distance is as defensible and useful in sociology as is the concept of geographic distance in any science.[21] *All* societal and "psychic" (thought) behavior may likewise be regarded as movement (position, from the static point of view) in a sociological or psychological field. (See Chapter III, Sec. F.) These movements may then be described in a number of ways. (a) Movements (or positions) may be represented by nonmetricized diagrams of any kind, e.g., the type that most teachers draw spontaneously at times to help communicate a sociological, psychological, or philosophical fact. (b) Movements or relationships may be indicated by topological constructs which represent positional relationships independent of direction or distance; e.g., a point (person) may be represented as within two concentric boundaries (state and nation), a relationship which remains constant regardless of transformations in size and shape of the boundaries. (c) Movement and position in social space may be represented by points or curves on conventional Cartesian or other coordinates. This is already common practice with respect to some societal

phenomena. For example, it is common to represent in this way fluctuations in income with corresponding degrees and types of consumption or "social" activity. Given the necessary units of measurement, such fluctuations (called "rising" and "sinking" "socially") may be accurately represented by a common graph.

It is already conventional to refer to changes in status in spatial terms, and hence we feel a certain intrinsic propriety in such expressions as socially high or low, "near and dear," etc. The phenomena referred to obviously consist of societal behavior. We are here pointing out that it is just as legitimate to express also other societal and "psychic" phenomena in similar terms and that ultimately their representation in metrical spatial units may be the most convenient and accurate method possible. Some illuminating applications of the approach to societal phenomena have been made by J. F. Brown, whose work should be consulted for further elaboration.[22] If and when societal or "psychic" phenomena, however recondite, are measured, are reduced to rates or otherwise are rendered comparable, and are related to definite geographic areas, these societal phenomena are obviously just as suitable for inclusion in an ecological account as are any other phenomena now recognized by ecologists.

Today a certain mysticism still attaches to our approach to symbolic behavior, and the traditional view that it is a realm apart from other natural phenomena dies hard. With the growing objectivity of social psychology, it is only a question of time until these phenomena will take their place in the ecological framework which represents in biology and sociology the same basic theoretic construct as the field of force represents in physics. We turn now to a brief summary of some of the work that has already been done in human ecology.

D. DISTRIBUTION[23]

If we look at any inhabited part of the earth's surface from an airplane perhaps the first human aspect that would attract our attention would be the distribution of population. That is, we would observe its varying *density* (*concentration, dispersion*), *specialization, centralization, segregation, and succession.* A very large sociological literature has appeared dealing with the societal con-

comitants of these different distributive processes. Ecological distribution is usually distinguished from purely fortuitous or aggregative presence of people in a given place in that the former has a known functional relationship to other parts of the complex, such as, for example, economic or professional classifications. These societal groupings may or may not be located homogeneously in geographic space.

Distribution may be of various types. The actual number of persons per square unit of area, or *density* (concentration, dispersion) has become the most common and most easily recognized criterion of two types of regions each of which have received extensive specialized treatment, namely, the *urban* and the *rural.*[24]

"Concentration in one region usually implies dispersion in another. Steam transportation, by increasing the fluidity of commodities, ushered in a new epoch in regional concentration; motor and electric transportation, by increasing the fluidity of people, is now producing a new era in dispersion. Whatever retards the movement of commodities limits concentration, and whatever facilitates the movement of people makes for dispersion. The forces at work during the past few years have been favorable to dispersion. High freight-rates, high taxes, and labor costs are forcing many industries to disperse or relocate. On the other hand, the automobile and rapid-transit lines are permitting the concentrated urban populations to spread out over adjacent territory." [25]

Density is only one type of distribution. *Specialization* of activity may sharply distinguish areas of equal or of varying densities. This specialization is usually associated with special age, sex, and cultural characteristics of the population. The specialized activity may be correlated with an indefinite number of other characteristics. In its temporal aspect, for example, it is the basis for the ebb and flow of population to and from certain areas at certain times of the day and the night.

Centralization is used in human ecology to designate a pattern of distribution which consists of a grouping of population or activity around some center of common interest or functional relationship. The market place or retail shopping center rather than church, school, theater, or other center of interest is found in most contemporary communities to be the most powerful centralizing factor.[26] The resulting pattern has also been the subject of

a very large and important literature. The elaboration of this pattern has resulted in highly revealing studies bearing on such aspects as the following:

(1) The relationship between the conditions of communication and transportation, on the one hand, and the distance from the center to the periphery of the unit of centralization on the other, with its numerous societal consequences, has been extensively studied. Prior to the advent of the automobile, for example, the "team-haul" (the distance a team of horses could go and return in the same day) tended to govern the distance of the center to the outer limits of the trade area.[27] With the development of convenient and rapid means of transportation, the pattern has undergone rapid transformation in this respect with the resulting increase in the size of the units of centralization and the disappearance of many smaller centers. Decentralization and recentralization are the temporal aspects of this process.

While the trade center is perhaps the most important determinant of centralization it is not the only one. Centralization is itself subject to specialization. For example, trade centers for special goods or services such as groceries and automobile repairing may spring up within larger and more general trade centers. An unlimited number of communities *with respect to different interests* may exist concentrically or in various overlapping ways. (See Figure 15.)[28]

(2) A second and most important type of study of urban patterns has been the determination of gradients of societal phenomena within the centralized pattern. The growing adequacy of statistical and other information regarding the demographic and other characteristics of populations by small areas or census tracts has made possible the computation of gradients of various societal conditions in relation to the centralized pattern. Burgess has defined a gradient as "the rate of change of a variable condition like poverty, or home ownership, or births, or divorce from the standpoint of its distribution over a given area." [29] As more adequate quantitative data of a variety of psychological and sociological characteristics become available, the correlation of rates of incidence of these characteristics with each other and with the position and relationship of given areas will provide exactly the type of generalization about human communities which is today

wanting or at least highly unreliable. The concept of the gradient has been adopted from physiology and its relationship to metabolic processes in that field has been followed as a hypothesis by the ecologists in their analysis of regions of varying activity, dominance, and subordination in human communities.[30] A

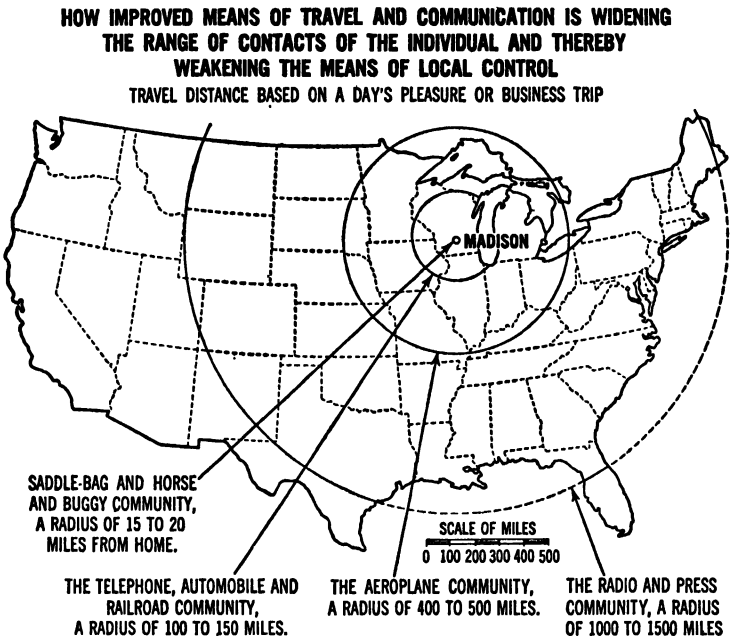


FIG. 15. Community boundaries defined by communication facilities. (From Gillin, Dittmer, and Colbert.)

full exploitation of the hypothesis has not been possible as yet on account of the dearth of adequate data. But the studies in this field must be regarded as among the more promising from the standpoint of yielding the kind of generalization much needed regarding human communities for both scientific and practical reasons.[31] (See Figures 16 and 17.)

These studies represent the beginning of metricization of the geographic, diagrammatic, or topological constructs upon which sociologists have hitherto relied for representations of societal areas, communities, etc. The establishment of gradients for the leading characteristics of any group permits a refinement of definition of societal units in terms of degrees to which certain characteristics obtain, rather than by arbitrary and mutually exclusive

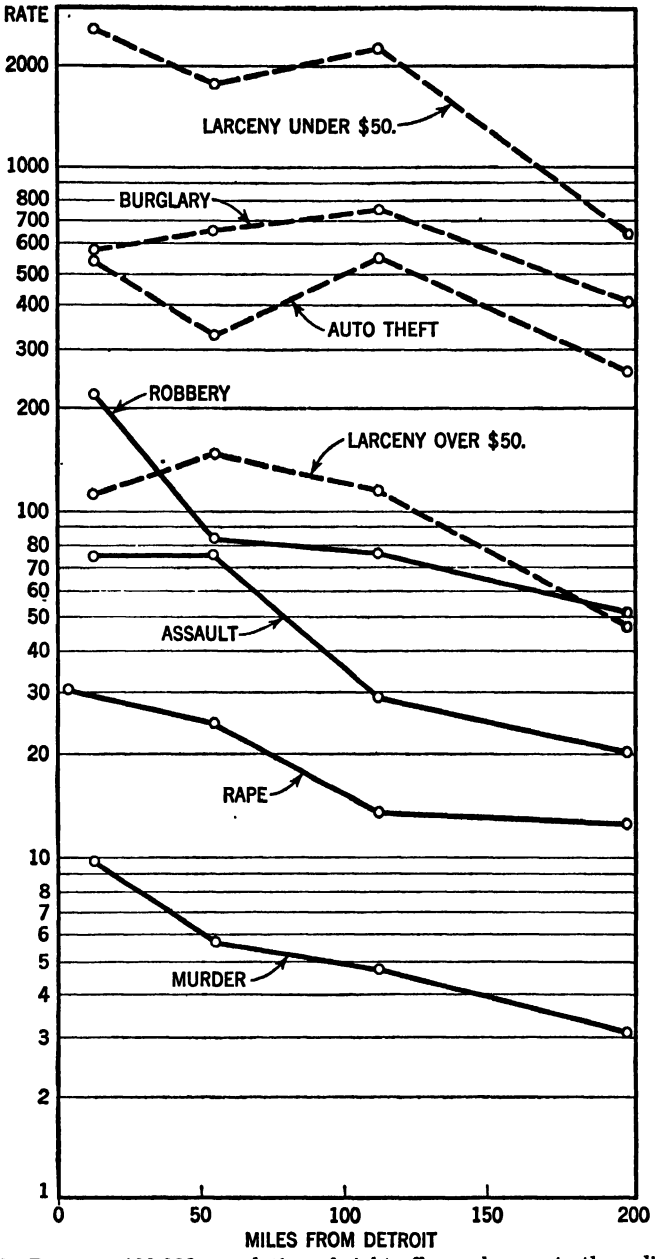


FIG. 16. Rate per 100,000 population of eight offenses known to the police for the Detroit metropolitan district and seventeen Michigan cities of over 10,000 inhabitants, 1932 and 1933, plotted in zones by miles highway distance from Detroit. (From Lottier.)[32]

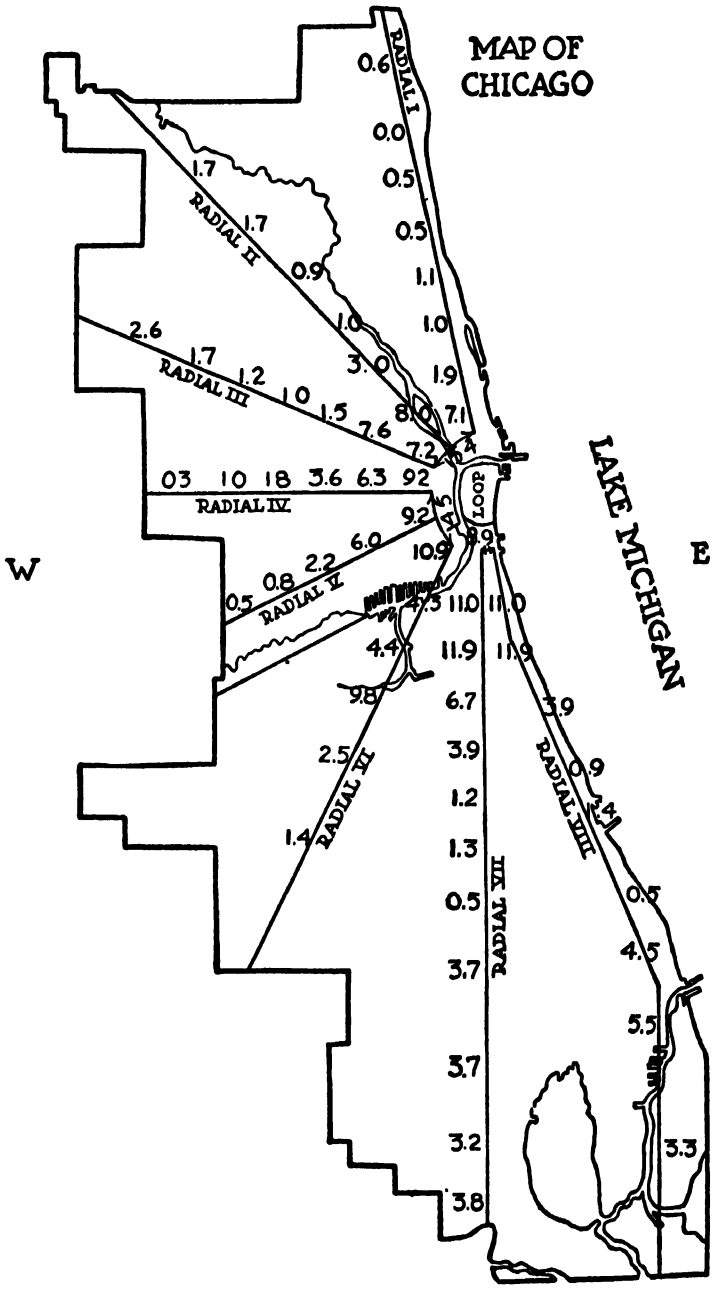


FIG. 17. Rate of school truants based upon 5,159 male school truants, by square-mile areas along eight lines radiating from the Loop. (From Shaw.)[33]

geographic areas. That is, it will be possible to represent an indefinite amount of overlapping of different areas according *to some specified characteristic* and thus avoid the present absurdities of both scientific study and administrative policy which proceeds on the assumption that if an area happens to be geographically contiguous or homogeneous it is also culturally homogeneous in all important respects. With societal gradients well worked out for an area it will be possible to connect points of equal rates with isopleths representing the true relationships of areas in terms of specific characteristics.[34] (See Figures 18 and 19.)

Segregation refers to the selective operation of community influences by which special population types or services become separated or relatively isolated from other groups, either in societal or geographic space or both.[35] The most common basis of segregation in contemporary urban communities is perhaps economic status. Other bases such as language, race, function, or other cultural traits may be operative within, or more or less independent of, the economic segregation. Again, the segregation may set up groups highly heterogeneous in all respects except the one determining factor, such as vice or gambling. Thus, the slum is homogeneous only or mainly with respect to economic status. At the opposite extreme, segregation is usually on the basis of a *number* of criteria, such as birth *and* wealth *and* "respectability."

Succession is used in human ecology to designate the order of stages in which an area changes, whether cyclical or otherwise.[36] The time factor is obviously a component of prime importance in the consideration of this phenomenon and we shall accordingly return to the subject in the next chapter. McKenzie has briefly described spatial and ecological aspects of the phenomenon of succession with special reference to urban areas as follows:

"In human and plant communities change seems to take place in cyclic fashion. Regions within a city pass through different stages of use and occupancy in a regularity of manner which may eventually be predictable and expressible in mathematical terms. The process of obsolescence and physical deterioration of buildings makes for a change in type of occupancy which operates in a downward tendency in rentals, selecting lower and lower income levels of population, until a new cycle is commenced, either by a

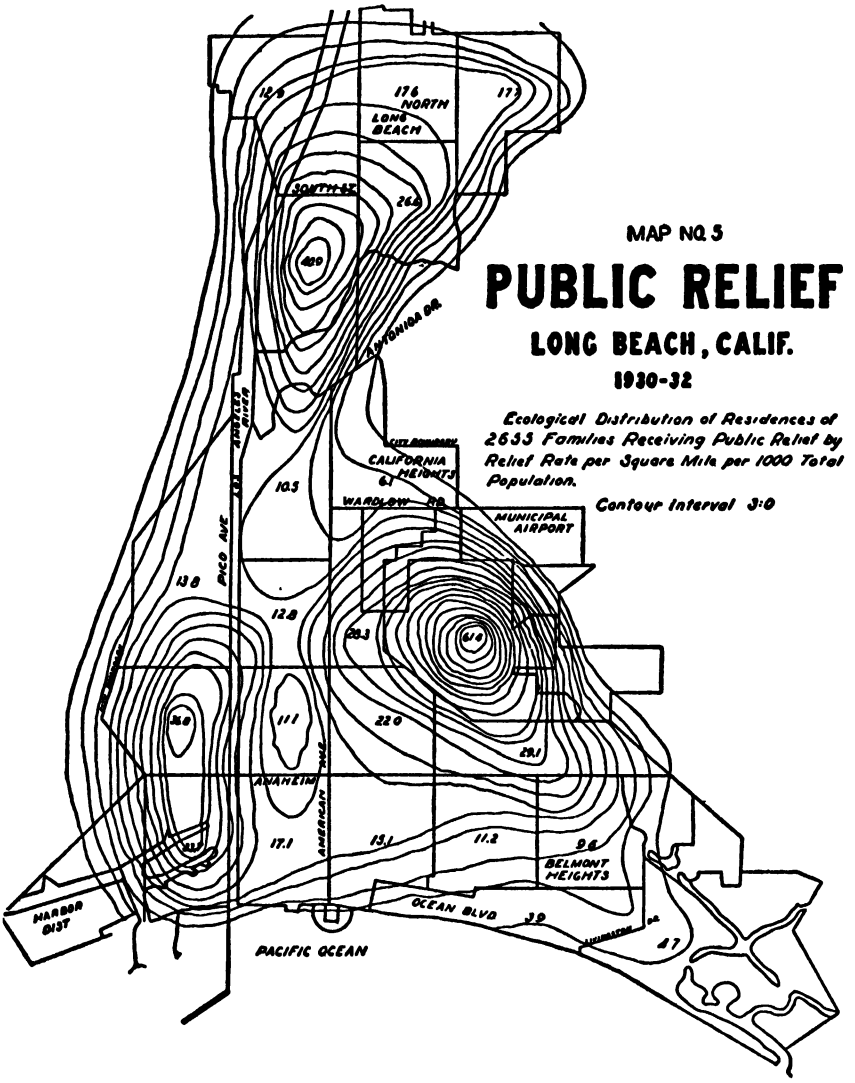


FIG. 18. Geographic distribution of public relief in Long Beach, California, 1930–32. (From Longmoor and Young.)[37]

complete change in use of the territory, such as a change from residence to business, or by a new development of the old use, the change, say, from an apartment to a hotel form of dwelling.

"The thing that characterizes a succession is a complete change in population type between the first and last stages, or a complete change in use. While there is not the intimate connection between the different stages in a human succession that is found between the stages in a plant succession, nevertheless there is an economic continuity which makes the cycles in a human succession quite as pronounced and as inevitable as those in the plant succession. Real-estate investigators are beginning to plot the stages in use succession by mathematical formulas.

"The entire community may pass through a series of successions, due to mutations of its economic base affecting its relative importance in the larger ecological constellation. The population type usually changes with the changing of the economic base, as, for instance, when an agricultural community changes to a mining or a manufacturing community." [39]

Mobility and *fluidity* are words used by human ecologists to designate processes closely related to and involved in such other processes as centralization, segregation, and succession. The word mobility without any qualifying adjective usually means geographic mobility such as is involved in a change of residence or a change in the geographic location of any business. McKenzie has summarized the relationship of these two types of mobility as follows:

"Mobility must be distinguished from fluidity, which represents movement without change of ecological position. Modern means of transportation and communication have greatly increased the fluidity of both people and commodities. Increased fluidity, however, does not necessarily imply increased mobility. In fact, it frequently produces the opposite effect by making residence relatively independent of the place of work; also by extending the territorial zone in which the individual may seek the satisfaction of his wishes.

"Fluidity tends to vary inversely with mobility. Slums are the most mobile but least fluid sections of a city. Their inhabitants come and go in continuous succession, but, while domiciled within a given area, have a smaller range of movement than the

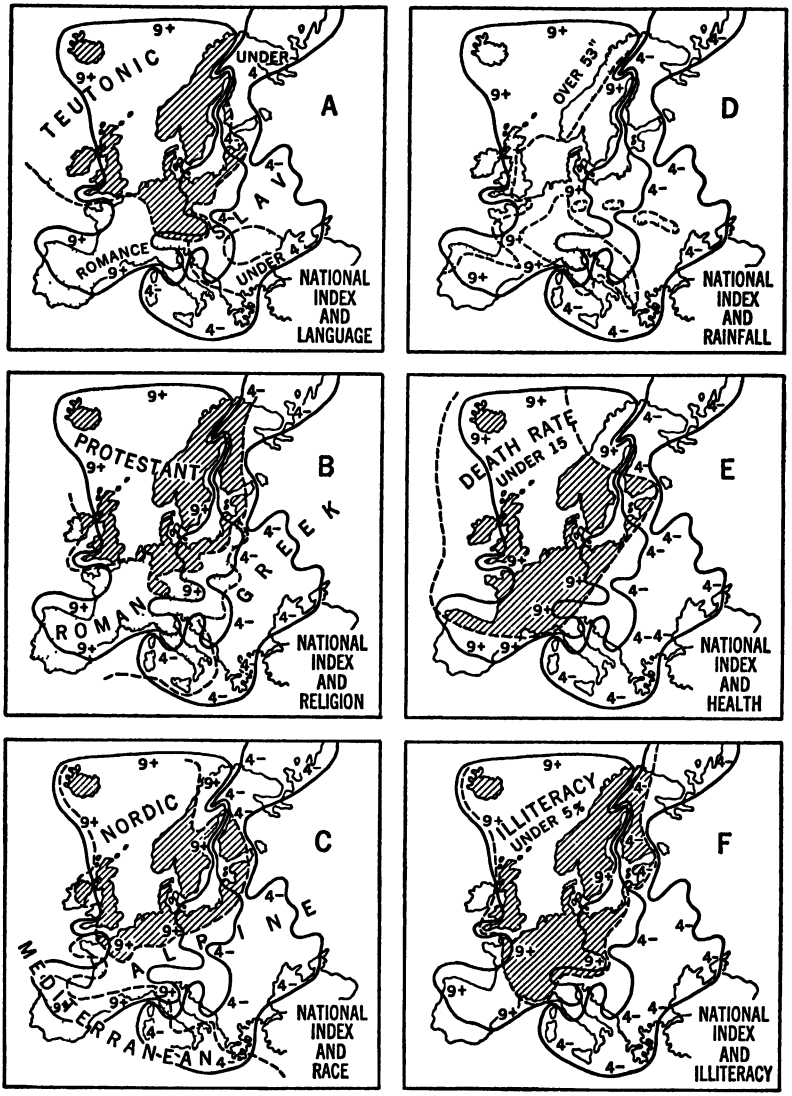


FIG. 19. Correlation of national index in Europe with language, religion, race, rainfall, health, and illiteracy. (From Taylor.)[38]

residents of any of the higher economic districts. The unequal fluidity of different districts of the city and of different individuals within the same district is an important factor in the processes of segregation and centralization. Youth tends to be more fluid than old age or childhood, giving rise to characteristically different centers of interest and varying regions of experience for each age group." [40]

Migration is a general word used to designate relatively permanent change of geographic location of individuals and groups. This phenomenon has always been of great general interest to all students of societal behavior. The great historic migrations, for example, are frequently used as milestones of history. The conditions that determine migration, the selective factors determining who migrates, and the effects of migration on the communities *from* and *to* which migration takes place is the subject of a large literature which cannot even be summarized here.[41] We shall not here take up the broad questions of national and international migrations such as those associated with cataclysms of nature, changes of climate, mass expulsions, and military conquest, and their attendant societal upheavals. More relevant to our present purpose is the shifting of populations within individual countries and regions. This is a phenomenon with profound effects on all aspects of society especially in modern times on account of the increasing mobility made possible by facile means of communication. One of the principal contemporary aspects of this internal migration is the movement between rural and urban areas. The merely quantitative aspects of this migration is crudely established from periodic censuses. But some of its major societal implications are concerned not only with the actual numbers moving from country to city and *vice versa* but with the *selectivity* of the movement as regards so-called qualitative attributes. It is this aspect of migration which is perhaps of principal sociological interest. In spite of the large literature devoted to the subject, no very reliable conclusions are available. For, as Dorothy Thomas has remarked after the most exhaustive inquiry into the subject that has yet appeared, "although the field is old with respect to speculation, it is new with respect to empirical research. That out of the mass of recent researches, we were able to find five which seem worthy of extended repetition (with, of course,

improvements in certain respects), and a dozen or so others which are promising, is reason for encouragement. That so much of the recent empirical research seems trivial and inept may be attributed partly to the newness of any research at all in the field, and the lack of adequate data and techniques, and perhaps, also, partly to a reaction of the 'fact finders' against the conflicting and unfounded claims of the speculators that migrants were 'better' than, or 'worse' than, or both better and worse than, or not at all different from non-migrants." [42]

The same author has also made the following summary of the present status of research on the subject of rural-urban migration:

"There is abundant evidence that internal migration has had a marked effect in redistributing population. How far this spatial rearrangement has resulted in a qualitative sifting has, up to the present, been less clearly demonstrated. Lack of clear-cut evidence has not, however, operated as a check upon speculation about selective migration. Examination of the literature reveals four apparently conflicting hypotheses as to the direction of this selection, in so far as it concerns cityward migration from rural areas:

"(1) Cityward migrants are selected from the superior elements of the parent population;

"(2) Cityward migrants are selected from the inferior elements;

"(3) Cityward migrants are selected from the extremes, i.e., both the superior and the inferior elements; and

"(4) Cityward migrants represent a random selection of the parent population." [43]

After reviewing the evidence that has been adduced in support of each of these hypotheses, the author concludes:

"We have, then, evidence of a sort that migration selects the better elements, the worse elements, both the better and the worse, and also that it is unselective. Even though we may decide that the evidence cited is tenuous, it is not improbable that selection does operate positively, negatively, and randomly, at different times, depending on a variety of factors that, up to the present, have not been adequately investigated.

"In the first place, the possibility that any observed differential merely reflects an underlying demographic selection must be taken into account, and the operation of migration as selective in

terms of age, sex, and civil status needs to be investigated in a more direct way than has been possible with existing American and English data. In the second place, it should be remembered that migration streams are not one-directional from country to city, and that while the net result of two opposing currents may be of slight significance from the point of view of selection, the differential between the incoming and outgoing streams may result in a major selective redistribution. In the third place, country and city, or rural and urban, are oversimplified classes for determining differentials. Much more detailed subclassifications, based on sociological and economic criteria, are needed if selection is to be adequately determined. In the fourth place, temporal factors need to be better controlled, for it is evident that the strength of selection may vary with time and it may even happen that the direction of selection may be reversed. But not only should long time trends be taken into account but short time variations corresponding to the phases of the business cycle are important. It is highly probable that apparently conflicting selective tendencies observed by different investigators are due to fortuitous timing. In the fifth place, distance spanned in migrations should be viewed as a possible modifier of the strength of selection. Finally, selection cannot be clarified unless more care is taken to determine the stage in migration experience at which the observed differentials appeared: Are migrants already differentiated from the parent population at the time of migration; do they become differentiated in the process of migrating; or do they become differentiated in the process of assimilation or adjustment in a new environment?" [44]

The above represents, of course, only some aspects of one general type of migration. Mass movements of entire cultural groups or communities either as a result of military conquest, persecution, or planned relocation such as has been undertaken to some extent by the United States Resettlement Administration are other types of migration of profound sociological interest. Doubtless the future of international peace is to some extent dependent upon the redistribution of territory and populations by diplomatic agreement. The most objective aspect of these societal movements is the shifting of populations in geographic space, hence our consideration of the subject in the present chapter. But inseparable from this movement in this dimension are correspond-

ing changes in all the other dimensions and aspects of society which we have previously considered in this book. A comprehensive sociological study of migrations would undoubtedly involve all the phenomena of association, dissociation, cooperation, competition, conflict, assimilation, etc., as well as the ecological processes discussed earlier in this chapter. All of these ecological processes could, of course, with equal logic have been treated in Part II together with association, dissociation, cooperation, competition, conflict, etc. The processes discussed in Part II are in fact also present and basic to the ones here considered. The processes here described are rather special names for geographic and temporal aspects of the association-dissociation manifold described in Part II. We have discussed them here separately because they involve conspicuously and explicitly the dimension of geographic space.

Explicitly or implicitly present in the study of the phenomena treated in the present chapter are also always the plurels (P) whose behavior constitutes these processes. The processes may accordingly in some situations be conveniently considered as attributes (I) of the behaving plurels, as we saw in the preceding chapter. In the present chapter we have been especially interested in the geographic (L) aspect of these processes. In still other situations the different stages of the same behavior *in time* (T), usually called *change*, may be in the foreground of our interest. We turn, therefore, in the next chapter to a consideration of this same basic association-dissociation phenomenon from the standpoint of its temporal aspect which constitutes societal change.

E. CONCLUSION

We have not attempted in the space here available to give even a summary of the intricate interaction of all the animate and inanimate components that constitute the full web of life. The large literature on plant and animal ecology presents a fairly well developed system of interdependence of components in a region. Students of human ecology have succeeded to some extent in gearing the societal activities of man into this general picture. They have in this connection made profitable use of such ecolog-

ical concepts as Natural Areas, Dominance, Succession, Competition, and Symbiosis.

These concepts and this method of analysis have been used hitherto chiefly with respect to economic, commercial, and the so-called "material" aspects of societal behavior. We have here taken the view that the processes mentioned above are equally observable in the symbolic behavior and products of man, which is usually called "culture." This viewpoint has not as yet received adequate consideration in the social sciences. Consequently, another frame of reference, namely, a "psychic" and mentalistic orientation, incompatible with the field-of-force framework, has been introduced to account for a major part of man's societal activities. The resulting incongruities have been noted throughout the book.

The point of view adopted in this volume calls for the full synchronization of man's "culture" and "mental" activities with the other components of a region, a situation, or a field of force. We have used these terms to designate successive degrees of generality of the segment of the universe selected for study. Many writers have called attention to the interdependence of ideologies and the geographic and technological matrix in which "cultural" and "mental" phenomena manifest themselves. We have here reviewed only a few aspects of this relationship as designated by a few of the major concepts that have been found useful in ecology. Our main interest has been to suggest that this same framework and approach is equally valuable as regards the supposedly purely "cultural" phenomena, either in relation to the geographic component or in relation to purely "cultural regions," defined only in terms of societal space. That is, "natural areas," "dominance," "competition," "succession," "symbiosis," etc., may be discerned also in the realms of symbolic ("ideational") phenomena.

The approach suggested throughout this volume, namely, the objective treatment of symbolic behavior operating within its own field of force, with only implicit reference to geographic factors is, in fact, a kind of cultural ecology. All those parts of this book which have dealt with the objectivity, the visibility, and the "reality" of societal phenomena and their interaction in fields of force have been an argument for the application of

the ecologist's framework also to man's most "psychic" and "spiritual" behavior. Our interest is to combine these cultural and geographic fields of force, in order to indicate that the same selectivity of responses which delimits any part, classification, situation, or region also allows the abstraction of fields, situations, or regions in which the "material" and the "mental" can be considered in full functional interrelationship. All the phenomena today designated by mentalistic terms are best describable in the same manner as other demographic data, namely, as rates of prevalence of attributes or characteristics of populations. As such, these "mental" or "cultural" phenomena can be related to whatever geographic units are deemed relevant and can then be included in a full ecological account on the same basis as the data now well recognized as subject to ecological treatment.

F. NOTES

1. A simple illustration of the concept of a field of force as used in the present book is offered by A. J. Lotka, *Elements of Physical Biology*, Williams and Wilkins, 1925, pp. 343 ff.

"Chess as a Conventional Model of the Battlefield of Life. A game of chess is a succession of physical events. How is its course determined?

"The elements that determine this course are as follows:

"1. A topographic map, a chart of geometric constraints, the chess board.

"2. Movable upon this chart, a number of movable points (chessmen), each the *center* of a *field of influence*, defined for each movable point in relation to the geometric constraints. So, for example, the field of influence of a pawn extends to the two squares diagonally in front of the pawn.

"3. A law restricting the time-rate of advance of each moving point (moves alternate from white to black).

"4. A law defining the influence upon each other of two points *in collision*, i.e., two points whose fields of influence have interpenetrated to a prescribed extent. An example of this is the rule that a chessman arriving upon a square occupied by a hostile piece, throws the latter off the board.

"5. A law restricting the movements of the points when not in collision, i.e., when outside one another's field of influence. So, for example, a bishop may move only diagonally.

"6. The elements enumerated so far place *restrictions* upon permissible changes (moves). These elements alone cannot, evidently, *determine* any occurrence of any kind: Absolute immobility, for example, or any random move that did not violate the rules of the game, would equally satisfy the conditions enumerated.

"7. In addition to the elements, 1, 2, 3, 4, 5, there must therefore be in opera-

tion some positive principle (tropism) which not merely restricts possible occurrences, but which determines actual events. In chess this principle is furnished by the effort of each player to bring about checkmate. Each move is so *aimed* (with greater or less *accuracy* and breadth of view, *versatility*, according to the skill of the player) as ultimately to force a checkmate.

"From the battlefield of chess we now turn our eyes on the scene of the great biological contest: Before us is a topographic map, over which move those organisms that are by nature gifted with motion. We may think of each such organism as a moving point, the *center* of a *field of influence*. As the chessplayer must accustom his mind's eye to see, radiating out from each chessman, its field of influence upon the board, so we, in envisaging the battleground of organic evolution, must see each organism carrying around with it, as if rigidly attached to its body, a field, or a target, of zones, of the following character.

"A. Zones of Influence. In general the motion of the individual will be determined by laws too complicated to be readily analyzed, and therefore will be described as *random*. But there will upon occasion be a rather abrupt break away from such random movement, according as a certain feature of the environment lies without or within certain zones. For example, the movements of a fly wandering about on a window pane are, presumably, in all cases physically determinate. But in a homogeneous field (uniform illumination, etc.), the motion will assume, on the whole, a random character. We may suppose that, in first approximation at any rate, the migrations of the individual will follow some such law as those developed, for example by Sir Ronald Ross (*Prevention of Malaria*, 1922, Second Edition, pp. 179, 700), by Pearson and Blakeman (*Drapers' Company Research Memoirs*, III: XV, 1906), or by Brownlee (*Proc. Roy. Soc. Edin.*, XXXI, 1910–11, pp. 262–289) for random migration. But, bring some particle of food within the field of sensuous observation of the fly, and the law of motion instantly changes from random to more or less clearly directed. Of other references related to this subject the following have been noted: F. Y. Edgeworth, "Entomological Statistics," *Metron*, 1920, I, p. 75; W. H. Cole, *Science*, 1922, LXV, p. 678; W. B. Hardy, *Nature*, Dec. 30, 1922, p. 866. (*Twelfth Report of the Development Commissions*, 1922.)

"We may, then, construct about each individual a sort of target of zones of influence. The ideal would be to draw this target on a quantitative plan, according as a stimulus of strength s exerts a directing influence d at a distance r. In practice there may be difficulty in constructing these zones, but we may at least conceive them as drawn.

"We may say that a given organism is 'in encounter' with a given point (e.g., a feature of the topographic chart) when that point falls within its field of influence. Similarly we may say that two organisms are in encounter when the one falls in the field of influence of the other. This encounter is mutual or one-sided according as each is within the other's field, or as only one is in the other's field, but not conversely, for example if A sees B, but B does not see A; or, to take an example from chess, a bishop may threaten a pawn, though the pawn does not threaten the bishop. Zones of influence may extend over millions of miles, as in the case of a traveller steering his course by the stars.

"B. Zones of Mobility. We may stake out around each organism a target of zones indicating the distance which it is physically capable of travelling in 1, 2, . . . n units of time. These zones also we shall think of as attached to the organism and carried round with it in its wanderings through the landscape.

"It is clear that the fate of the organism, and the history, the evolution of the system as a whole, will depend, first, on the character of the zones of influence and the zones of mobility; and second, on the nature of the correlation, the law of the *aimed* movements, established through these zones. We may seek to establish analytical expressions for this dependence.

"Let q be a parameter defining the character or 'pattern' of a target of zones of influence or of mobility of the organisms of species S. Thus, for example, q might be parameter, or one of a set of parameters, defining visual acuity, measured on some suitable scale, at a distance of 5, 10, 15, . . . feet, under standard conditions. Or, q might be a parameter defining the minimum time required for the organism to reach a point 5, 10, 15, . . . feet from his actual position, under standard conditions. (Isochrone charts of essentially this character, relating to travelling facilities, were, according to Darmstaedter, first suggested by K. Richter in 1833 and actually prepared by Sir Francis Galton in 1881. L. Darmstaedter, *Handbuch zur Geschichte der Naturwissenschaften und der Technik*, 1908, p. 792.)

"Analytical Statement of Problem. We may now enquire:

"1. What will be the effect upon the rate of growth of the species if the parameter q is increased by a (small) amount dq? If r is the fractional rate of increase of the species S, can we establish an expression for the partial derivative $\frac{\partial r}{\partial q}$?

"A glance at the chess analogy will help to make clear the nature of the question thus raised. In chess we might ask: What would be the effect upon the course of the game if, other things equal, we were to modify in some stated particular the rules limiting the permitted moves of a given piece, for instance by allowing a pawn to move *two* squares, instead of the conventional *one*?

"2. A second enquiry of peculiar interest relates, not to the character (pattern) of the zones of influence and mobility, but to the form of relation established, through these zones, between the action of the organism and his environment. For it is hardly necessary for us to be reminded that two individuals or species with the same visual activity, for example, may react in very different manner on seeing the same thing.

"Here again the chess analogy is helpful. The corresponding enquiry with regard to chess is: What would be the effect upon the course of the game, if, with unchanged rules as to the moves of the pieces, a given change were made in the method, or the ability, of one of the players?"

2. H. T. Buckle, *Introduction to the History of Civilization in England*, New and Rev. Ed. by J. M. Robertson, Dutton, 1904; H. Semple, *Influences of Geographic Environment*, Holt, 1911.

3. P. F. Le Play, *La Constitution essentielle*, Expose de l'humanité, Tours: Alfred Mame Fils, 1893, 2nd Ed.

4. See, for example, R. E. Park, "Succession, an Ecological Concept," *Ameri-*

can Sociological Review, I, Apr., 1936, pp. 171–179; R. E. Park, E. W. Burgess, and R. D. McKenzie, *The City*, University of Chicago Press, 1925; R. D. McKenzie, "The Scope of Human Ecology," *American Journal of Sociology*, XXXII, July, 1926, pp. 141–154; R. Mukerjee, *Regional Sociology*, Century, 1926; Griffith Taylor, *Race and Nation*, University of Chicago Press, 1936; L. Wirth, *The Ghetto*, University of Chicago Press, 1928. See also the bibliography by Wirth in Park, Burgess, and McKenzie, *The City*.

5. See, for example, the literature cited above and in the notes that follow.

6. Bertrand Russell, *Power. A New Social Analysis*, Norton, 1938, pp. 12–14, 35.

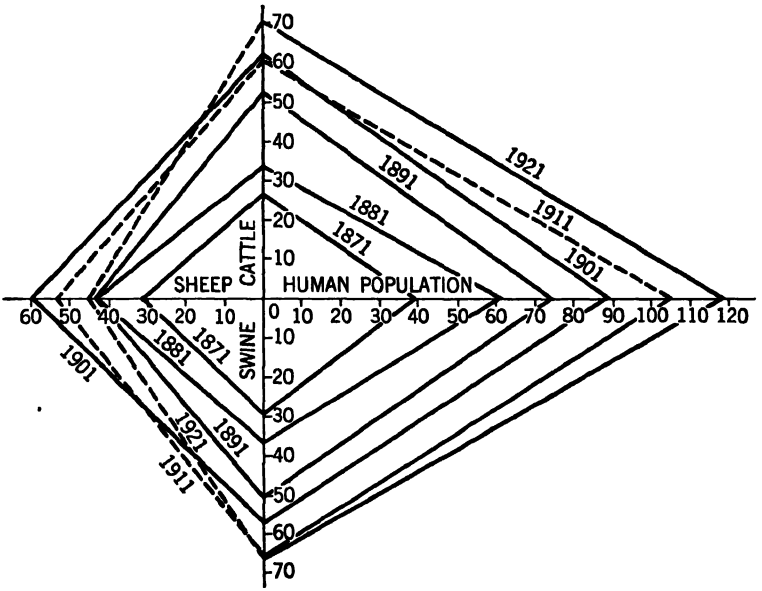


FIG. 20. Equilibrium polygon for the human species and some of the species on which it depends for its food supply. Scales read in millions. (From Lotka.)

7. Lotka illustrates a moving equilibrium as follows:

"Of moving equilibria in the organic world, data are most readily available for the system comprising man and his domestic animals. Here the human race acts as the controlling factor, drawing its dependents after it in its growth. The equilibrium polygon for the principal items of animal husbandry in the United States is shown in Figure [20]. The geometric similarity of successive polygons is in this case only approximate, the proportion of the several components varies somewhat; except in the case of the sheep population, however, the variation is moderate over the half-century from 1871 to 1921.

"Aside from the features for the express illustration of which the diagram Figure [20] was drawn, it also serves to point once more to the fact already emphasized, that the concept of evolution, to serve us in its full utility, must be applied, not to an individual species, but to groups of species which evolve in mutual

interdependence; and further, to the system as a whole, of which such groups form inseparable part.

"It would be conveying a false impression in a very essential respect, to exhibit the example illustrated in Figure [20], without a comment in emphatic reservation. Although, in a roughly approximate way, it is true, as shown by the polygon diagram, that in its relation to certain staples of agricultural production, our population has advanced in a succession of moving equilibria; yet the progress of modern industrial civilization on the whole is essentially the very antithesis of a moving equilibrium conditioned by and following upon the changes of a slowly varying parameter. Quite on the contrary, the development of this age is rather of the nature of a rocket-like ascent with a speed altogether unparalleled in all previous history of organic evolution, and at the cost of rapid depletion of capital resources." (*Elements of Physical Biology*, pp. 276, 277, 279.)

8. R. Mukerjee, "The Regional Balance of Man," *Amer. Jour. of Sociol.*, XXXVI, Nov., 1930, pp. 455–456.

9. Thus R. E. Park speaks of symbiosis as being "biological *rather than* social." [Italics mine.] "William Graham Sumner's Conception of Society," *Chinese Social and Political Science Review*, XVII, p. 439. Again, Park and Burgess refer to community ties as "physical and vital *rather than* customary and moral" (R. E. Park and E. W. Burgess, *Introduction to the Science of Sociology*, University of Chicago Press, 1924, p. 165). "The members of a plant community live together in a relation of mutual interdependence which we call *social* probably because, while it is close and vital it is not biological. It is not biological because the relation is a merely external one and the plants that compose it are not even of the same species. . . . There is no conflict between them because they are not conscious." (*Ibid.*, p. 506.)

10. R. D. McKenzie, *op. cit.*, *Amer. Jour. of Sociol.*, July, 1926, p. 145. These categories probably overlap to a considerable degree and require further definition and elaboration.

11. *Ibid.*, pp. 141, 142, 143.

12. *The City*, by R. E. Park, E. W. Burgess, and R. D. McKenzie, University of Chicago Press, 1925, pp. 63–64. For a criticism of this position see Milla Alihan, *Social Ecology*, Columbia University Press, 1938, Ch. 9, especially p. 246. While this criticism seems to me on the whole superficial, one valid point in it should be recognized, namely, the attention called to the ecologists tending to introduce into their framework a part of the old mentalistic orientation, which necessarily results in contradiction as do all mixtures of frames of reference. (See above, pp. 472–474.)

13. W. C. Allee, *Animal Life and Social Growth*, Williams and Wilkins, 1932, pp. 24–25.

14. Cf. Shelby Harrison, Round Table Discussion on "The Implications of the Regional Concept," *Publication of the American Sociological Society*, XXIV, May, 1930, pp. 257–258.

15. Able statements of this position will be found in C. M. Child, *Physiological Foundations of Behavior*, Holt, 1924, and Corrado Gini, *Prime linee di pato-*

logia economica, Milan: Dott. A. Giuffrè, 1935, 4th Edition. See also Benoy Kumar Sarkar, "Social Metabolism in Its Bearings on Progress," *Social Forces*, XVI, Dec., 1937, pp. 169–177.

16. Any number of additional dimensions are, of course, also possible according to the classifications of phenomena it is desired to represent. We have already (Ch. 8, Sec. C) designated status as vertical social distance. Any classification of people by societal characteristics but without implications of status is here considered horizontal classification in social space. That is, to use Sorokin's (*Social Mobility*, Harper, 1927, p. 7) illustration, people may be classified as Roman Catholic, Republicans, and Americans. The same population may also be classified either within each of the above categories or in general as rich or poor, clergy or parishioners, etc. The former represents (in the scheme here proposed) distribution in horizontal, the latter in vertical, societal space. Sorokin's remarks (*op. cit.*, p. 9, footnote) upon the inadequacy of the ecological approach point out limitations in its present use which I have already mentioned in the main text. These shortcomings are not inherent in the approach as I conceive it, however, and I have accordingly advocated its extension to meet the objection that it does not provide an adequate framework for purely "social" (symbolic) behavior.

A crude attempt to correlate horizontal geographic and societal space is found in the concept of "culture area" to designate a homogeneous geographic area within which "cultural" homogeneity in some respect also prevails. Among isolated groups a high degree of coincidence of geographic and cultural areas can be found. But cultural homogeneity depends upon communication and under modern Western technological conditions communication is highly independent of geographic homogeneity. Under such conditions the cultural homogeneity frequently assumed by administrative and political agencies on the basis of geographic location simply does not exist. Hence, the need of measurement of the degrees of these relationships.

17. J. A. Thomson and P. Geddes, *Life. Outlines of General Biology*, Harpers, 1931, I, p. 215.

18. The student not already familiar with such works as W. C. Allee, *Animal Aggregations* should read it in connection with the present chapter. See, for example, the brief paragraph in Thomson and Geddes on the possible effect of tar-macadam and asphalt roads upon animal, fish, and insect life in an area. *Life*, I, p. 214. Also W. C. Allee, *Animal Aggregations*, pp. 83 ff. for a summary of S. A. Forbes' "The Lake as a Microcosm" (*Bull. Peoria Acad. of Sci.*, 1887).

19. R. Mukerjee ("The Concepts of Distribution and Succession in Social Ecology," *Social Forces*, XI, Oct., 1932, pp. 1–7) seems to have this idea when he says: "As in the life-community in a region there develops a complex interrelationship among the various organisms and a balance and rhythm of growth for all, so in the culture of a human community which is woven within the framework of the ecological area there is found a great complexity of interrelations among the social, economic and other institutions and traditions, establishing some kind of equilibrium for the whole community or culture. Thus, like the ecological community society or culture develops as a whole maintaining a bal-

ance for its different institutions and traditions, all interlaced with one another, as culture progresses, in finer and finer patterns of correlation and solidarity." (P. 7.) Elsewhere the same author says: "Land, water, tree, and man are by no means separate and independent factors, for by reciprocal influence they form a natural equilibrium, parts of which can be understood only in terms of the other." (*Sociol. and Soc. Res.*, XVII, May–June, 1933, p. 405. See also his *Regional Sociology*, p. 230.)

Thomson and Geddes (*Life*, p. 199) have also suggested that "the concept of purposive endeavor, which is suggested by a study of the higher animals, and is consciously verified in man, does not grip in the plant world, but that is not to say that it is irrelevant. We must think of the plant as if it were continually sending out tendrils which feel for support and often find it. Whence it begins afresh. This is the ecological picture."

20. W. C. Allee, *Animal Aggregations*, p. 354.

21. For further elaboration of this viewpoint, see G. A. Lundberg and Margaret Lawsing, "The Sociography of Some Community Relations," *Amer. Sociol. Rev.*, II, June, 1937, pp. 318–335.

22. J. F. Brown, *Psychology and the Social Order*, McGraw-Hill, 1936, Appendix B; also Chs. 3, 4, 6–12. For applications of this viewpoint to psychological data, see K. Lewin, *The Conceptual Representation and Measurement of Psychological Forces*, Duke Univ. Press, 1938.

23. For the best summary of the ecological position see R. D. McKenzie, "The Scope of Human Ecology," *Amer. Jour. of Soc.*, XXXII, July, 1926, pp. 141–154. Also the same author's contribution by the same title to *The Urban Community*, University of Chicago Press, 1926, edited by E. W. Burgess. I have drawn largely on the former source in this section. For an early example of this approach in American sociology, see C. H. Cooley, *Sociological Theory and Social Research*, Holt, 1930, Ch. 2. ("The Theory of Transportation," first published in 1894.)

24. The terms "urban" and "rural" as at present defined in administrative terms or even in terms of density are for most scientific purposes too crude and irrelevant to be useful. The same is true of the resulting attempt to establish separate disciplines of "rural" and "urban" sociologies on such a foundation. As Dorothy Thomas has suggested, these categories will have to be redefined "into types of communities defined in accordance with such economic and sociological criteria as types of industry, age-and-sex-specific demands for labor, degrees of occupational mobility, wage differentials, spread of income, cultural and recreational facilities, and various other indexes of 'plane of living.' There should, of course, be an allowance for change of type with the expansion or contraction of any of these factors." (*Migration Differentials*, Social Science Research Council, New York, 1938, p. 165.) See also Louis Wirth, "Urbanism as a Way of Life," *Amer. Jour. of Sociol.*, XLIV, July, 1938, pp. 1–24. Also National Resources Committee, *Our Cities: Their Role in the National Economy*, Government Printing Office, 1937.

25. R. D. McKenzie, "The Scope of Human Ecology," *Amer. Jour. of Sociol.*, XXXII, July, 1926, p. 148.

26. *Ibid.*, pp. 148–149.

27. W. H. Wilson, *The American Town*, cited in McKenzie, *op. cit.*, p. 149.

28. J. L. Gillin, C. Dittmer and R. Colbert, *Social Problems*, Century, 1928, p. 35.

29. E. W. Burgess, "The Determination of Gradients in the Growth of the City," *Publication of the American Sociological Society*, XXI, 1927, p. 178.

30. See C. M. Child, *op. cit.*, Chs. 4, 6, 7–9, 16, 17. The whole book is excellent collateral reading for the present chapter.

31. For excellent examples of this technic see Clifford Shaw et al, *Delinquency Areas*, University of Chicago Press, 1929; E. Mowrer, *Family Disorganization*, University of Chicago Press, 1927 (gradients of divorce and desertion); R. Clyde White, "The Relation of Felonies to Environmental Factors in Indianapolis," *Social Forces*, X, May, 1932, pp. 498–509. This study also shows correlations between the distribution of felony rates, family welfare cases, percentage of land used for business and mortality rates. Stuart Lottier, "Regions of Criminal Mobility," *Jour. of Criminal Law and Criminology*, XXVIII, 1937, pp. 657–673. "The Distribution of Criminal Offenses," *ibid.*, XXIX, 1938, pp. 37–50. "Distribution of Criminal Offenses in Sectional Regions," *ibid.*, pp. 329–344. These articles are based on a doctoral dissertation at the University of Michigan, 1936, by the same author. Mapheus Smith, "Relief Intensity Gradients," *Social Forces*, XVI, Dec., 1937, pp. 208–223; H. Earl Pemberton, "Culture Diffusion Gradients," *Amer. Jour. of Sociol.*, XLII, Sept., 1936, pp. 226–233.

See also E. W. Burgess, "The Determination of Gradients in the Growth of the City," *Publications of the American Sociological Society*, XXI, 1927, pp. 178–183. Attention should be called in this connection to a very important article by C. C. Peters, "Note on a Misconception of Statistical Significance," *Amer. Jour. of Sociol.*, XXXIX, Sept., 1933, pp. 231–236. This article corrects certain misconceptions in an article by F. A. Ross on "Ecology and the Statistical Method," *Amer. Jour. of Sociol.*, Jan., 1933, pp. 507–522, relating to the unreliability of the statistical gradients revealed in certain studies of this phenomenon. Ross's article is, of course, valuable in calling attention among other considerations to the need of testing the statistical significance of differences in rates found in gradients. Peters calls attention, however, to the fact that Ross's use and interpretation of certain tests to disprove the statistical significance of the examples introduced in his paper are not valid. Specifically, Peters calls attention to (1) the common error of insisting on a critical ratio of three or more before assuming statistical significance, (2) failure to recognize the increased reliability of small differences in individual comparisons provided they are prevailingly in the same direction, and (3) the need of taking into consideration the possible influence of correlations among data in computing standard errors.

32. Stuart Lottier, "Distribution of Criminal Offences in Metropolitan Regions," *Jour. of Criminal Law and Criminology*, XXIX, p. 45.

33. C. R. Shaw, *Delinquency Areas*, University of Chicago Press, 1929, p. 46.

34. See Elsa S. Longmoor and E. F. Young, "Ecological Relationships of Juvenile Delinquency, Dependency, and Population Mobility," *Amer. Jour. of Sociol.* XLI, March, 1936, p. 608.

35. Cf. the opening sentence of Louis Wirth's article on "Segregation" in the *Encyclopaedia of the Social Sciences:* "In sociology segregation represents that form of isolation in which social distance is based upon physical separation." This seems to me to be a contradiction of a statement made a few paragraphs later in the same article, which agrees with my definition as adopted in the present text: "Race, culture, religion, morals, status, language, caste, class, wealth, occupation, sex, physique and mentality, talent, taste, attitude, interest, in fact any set of characteristics in which the members of a group may be similar to one another and different from outsiders may become the basis of segregation."

36. R. E. Park, "Succession, an Ecological Concept," *op. cit.*

37. Longmoor and Young, *op. cit.*

38. Griffith Taylor, "Environment and Nation," *Amer. Jour. of Sociol.*, XL, July, 1934, p. 30.

39. R. D. McKenzie, *op. cit.*, pp. 153–154.

40. *Ibid.*, p. 144.

41. For a summary of the historical aspects of these movements see the *Encyclopaedia of the Social Sciences* under *Migrations.* For other aspects see *Emigration* and *Immigration.*

42. Dorothy S. Thomas, *Migration Differentials,* Social Science Research Council, 1938, p. 161.

43. Dorothy S. Thomas, "Selective Migration," *The Milbank Memorial Fund Quarterly,* XVI, Oct., 1938, p. 403.

44. *Ibid.*, pp. 406–407.

Chapter XIII

TEMPORAL ASPECTS OF SOCIETY (T): SOCIETAL CHANGE

A. THE TIME CONCEPT

Implicit in every process is the dimension of time. Thus, all of the processes discussed in Part II of this book imply *successive positions* of some behavior. Likewise, such a characteristic as age denotes that an organism has existed during a certain number of specified astronomic events. The impact of successive positions or *change* of a phenomenon, if it impinges upon the senses within certain limits of frequency, is called *movement* or *motion.* (See Chapter VI, pp. 203 ff., and note 1 of that chapter.) As we saw in Chapter VI, the alteration in the pattern or system of symmetry of the electrons and protons is called the transformation of energy, in terms of which we account for the different characteristics of matter as well as for motion and change. The continuum of experience produced by successive responses we call *time.* As such, time pervades more or less conspicuously all descriptions of behavior, because of the susceptibility of the human senses to different positions of phenomena. Hence it is, also, that this dimension or point of reference was one of the earliest of which man became aware and which he therefore is inclined to take most for granted as an intrinsic phenomenon of the universe.[1] The degree of awareness of this dimension of events depends of course upon the possession of symbols for the designation of successive positions. Our awareness of time grows in refinement as symbolic and mechanical instruments are invented [2] to sharpen the ability of our senses to detect and report small and rapid alterations in the positions of phenomena. Our capacity to discern long intervals of time likewise depends upon the availability of symbolic system in terms of which events distributed over thousands and millions of years can be inferred.

The time component of societal situations has been, as we have noted above, implicitly or explicitly treated in connection with

the discussion of all the processes previously discussed in this book. This sector of our subject is also treated with particular fullness in Dodd's companion volume.[3] We shall therefore deal here only with certain theoretical aspects of time and change, merely in order to elucidate its relation to other aspects of group behavior and to the methods we have proposed. For the same reason, we shall not here attempt to deal with the multifarious forms of social change designated by such words as reform, revolution, fashion, fad, craze, etc. Since the temporal sector is the prominent aspect in societal change, and since a great deal of sociological literature is concerned with change, it is desirable, however, that we should conclude with a consideration of how this aspect appears from the point of view we have adopted.

B. TECHNOLOGY AND CHANGE

We have said that change is merely a continuous view of the successive positions which the components of a field of force occupy at successive intervals. If so, all that we have previously said regarding methods of observing, recording, and generalizing behavior applies also to the phenomenon of change. That is, change is adequately described by periodic reports of successive observations. The periods may be only of instantaneous length, or they may be days, years, decades, or centuries, according to the problem or the phenomenon in which we are interested. Beyond the problem of accurate observation of situations at successive intervals, the problem of societal change introduces no new theoretical or practical difficulties in the approach we have adopted. But the conditions which govern the length of the intervals within which observable or significant societal modifications occur, is of major practical importance to man in the prediction of events. The time factor in prediction is therefore also of major importance in determining our ability to make these preparatory adjustments which are of such vast importance to survival and which we designate as "planning" and "social control." A consideration of the conditions most conspicuously operative in societal change generally is, therefore, here our main interest.

We have said that the basic postulate to which we attribute

change is the transformation of energy. This transformation is, as we saw in Chapter VI, for some purposes most conveniently observed in the form of certain rearrangements of the positions and sequences of matter which we call mechanisms or technics. We traced the development of these mechanisms as found in various biological organisms and in groups. We saw that some of the more complex mechanisms are vastly more effective in achieving adjustments than are some of the simpler ones such as the tropism or the reflex. Most revolutionary in this respect among the mechanisms developed by man are language and the symbolic mechanisms. For by virtue of them a high degree of unified action by groups became possible. Furthermore, these mechanisms provide a method by which man's experience through successive generations is made *cumulative* in tradition and custom. With the development of written language, the scope and accuracy with which the past experience of the species can be transmitted is incalculably increased. Now the growing accumulation of experience in the form of knowledge (symbolized experience) becomes the foundation for the invention of so-called extra-organic instruments and tools. These greatly extend the reach of man's senses and all his powers of adjustment both to his primitive world and that new world revealed to him through his instruments and in part created by him through the use of these instruments.

This process proceeded at first by imperceptible interactions between man-and-man and men and environment, through hundreds of thousands of years. As the heritage of each generation slowly increased, the process gathered speed. As a result of this accelerating accumulation, man's adjustment to the earth and to his fellow men has been completely transformed during the last two hundred years. These recent developments have an unbroken history, of course, going back through the evolution of man as an increasingly efficient mechanism for the transformation of energy. This view of man himself, incidentally, was perhaps largely the result of these conspicuous technological developments. As a result of their obvious and sensational efficiency in the form of electrical and steam driven machinery, and because of the societal transformations associated with these developments, technology has received increasing attention in the social sciences, and espe-

cially with reference to societal change. This interest in technology as narrowly defined above, has on the whole had an entirely salutary effect upon the social sciences. In the first place, it has been a principal nexus through which social scientists have begun to see the unity of all science and thus gradually adopt points of view and methods of more highly developed fields. In the second place, the study of society from the standpoint of technology has suggested that perhaps societal mechanisms also may be invented which will be equally effective in achieving much desired societal adjustments. From this point of view, technology means *knowledge of all of man's adjustment technics whatsoever, from the simplest reflex to the utilization of the most powerful engine or the government of an empire.* This broader definition of technology should be kept in mind in the discussion that follows.

The phase of this age-old development which has recently thrust itself most conspicuously on our attention is the rapid development of instruments for achieving certain long desired adjustments to the geographic and physical environments. The emphasis on this phase in the sociological literature of recent years has been so pronounced as to create the impression that it is an entirely new phenomenon, which it clearly is not. Its prominence at present, owing to the comparative rapidity of its development in certain fields, makes this aspect, however, a convenient point of view from which to study societal processes. This approach is in fact a healthy corrective for the much more naive and general habit of attributing important societal changes to persons and political regimes. As Ogburn has said: "The doctrine of states rights is being broken down much more completely and successfully by these inventions [automobile, telephone, radio] than it was by the armies of Grant and Sherman. It is futile to blame President Roosevelt for the concentration of power. It would be more appropriate to fix the blame on Bell, the inventor of the telephone. Henry Ford, developer of the automobile, protests vigorously against these trends in the federal government, yet he is doing more to build up the power of the federal government and to break the spirit of local government than is the president." [4]

It does not follow that technology, especially in its narrow reference to the mechanical inventions of the last several centuries,

constitutes a kind of philosopher's stone for the explanation of all societal developments. Inventions and technical developments are themselves to be explained, and they are to be explained only in terms of the same sociological laws which explain other societal behavior. We turn, therefore, to a brief consideration of invention as a societal phenomenon.

C. INVENTION AS A SOCIETAL PHENOMENON

In the most general sense, invention is merely a word we use to describe some new and successful adjustment of an organism to a situation. Every stage in the learning process may be regarded as invention or as technological development from this point of view. As Gilfillan has said: "What is called an important invention is a perpetual *accretion* of little details, probably having neither beginning, completion nor definable limits, though it is hazily and somewhat arbitrarily defined by a word or phrase in the English language, and by our standardizing habits in thought and industry, as well as in language. An invention is an *evolution*, rather than a series of creations, and much resembles a *biologic* process." [5]

This is also all that sociologists mean by their frequent statement that invention is the result of (1) a social demand, plus (2) the necessary cultural base (raw material, and knowledge) and (3) "mental ability." That is, an organism with a tension calling for adjustment tends to adapt itself by whatever means are at its disposal. If the organism is a human being who through symbolic mechanisms has at his disposal the accumulated experience of other generations as well as suitable raw materials, his adjustment in such a situation may consist of a recombination of old technics and habits into a new combination. If the new combination achieves the desired adjustment in a notably more facile manner than is customary, it is likely to be called an invention.

The word invention tends to be restricted in popular usage to designate only innovations which are of sufficient dramatic significance to attract widespread public attention, as contrasted with the daily inventions of minor or private significance made by nearly all people at some time or another. From the sociological point of view, however, it is important to note the essential

similarity of the processes by which all of these innovations take place. As Gilfillan again has said: "Invention would become much easier with advancing civilization, were 'invention' not defined by language usage, which sets the modern standard higher. Hence many 'important inventions' of early times would be too simple and easy to be called inventions, if made today." [6]

The same author has summarized the conditions which produce inventions as follows: "An invention is essentially a *complex* of most diverse elements—a design for physical object, a process of working with it, the needed elements of science, if any; the constituent materials, a method for building it, the raw materials used in working it, such as fuel, accumulated capital such as factories and docks, with which it must be used, its crew with their skills, ideas and shortcomings, its financial backing and management, its purpose and use in conjunction with other sides of civilization and its popular evaluation. Most of these parts in turn have their separately variable elements. A change in any one of the elements of the complex will alter, stimulate, depress, or quite inhibit the whole." [7]

On account of our preoccupation with "mechanical" gadgets, the word invention tends further to be popularly restricted to so-called "material" things. But essentially the same process takes place in the invention of a new system of poor relief or a new system of logic or mathematics as in the invention of the automobile or the radio.[8] All of these innovations develop in the process of man's adaptation to imbalances and disequilibria in societal situations. In some cases this imbalance is merely the "intellectual curiosity" of the inventor. But intellectual curiosity is from our point of view also subject to interpretation as disequilibrium of an organism in a situation. The tension is, furthermore, usually present also in many other persons as is evident from the fact that considerable numbers of people working independently are usually ready to announce the same invention at the time that the publicly acknowledged inventor announces his success.

The precise form an invention takes is necessarily determined by the adjustment technics possessed by the inventor, i.e., his knowledge and all his capacities plus whatever substance of a "material" or symbolic sort is necessary and available. Which individual of a given group experiencing the same tension or cu-

riosity will successfully complete and receive credit for a new invention depends upon who happens to be in the most favored position as to opportunity, competence, and ability to command public attention.

Gilfillan, after the most thorough study of the subject which has thus far appeared, has summarized the influences that produce inventors and certain tendencies in the field as follows: "There is no indication that any individual's genius has been necessary to any invention that has had any importance. To the historian and social scientist the progress of invention appears *impersonal*. Yet invention can only come at the hand of some sort of *inventors*, and its directions, frequency, and efficiency are determined wholly through deliberate actions by these men, in some proportion to their absolute numbers, intelligence, moral traits, strength of motives for inventing, time free for it, and mental and mechanical equipment for it. Perception of the need and the way to meet it depends first upon any individuals of a numerous inventive class, but *indirectly* upon the suggestions tossed up by a wider intelligent and technologically minded class, more indirectly upon the whole population's thoughts, and *ultimately* upon the physical environment and the general social and racial heritage, which determine the mental level and slant of each class and country. The inventors are checked by a variable brake of *conservatism in the patrons* of invention, whether enterprisers or consumers. The more restricted, select, specialized, and intelligent is this patron class, the less will be its conservatism and the faster progress. The popular notions of great inventors are essentially mythology; and that man is preferred as the *titular inventor* who belongs to one's own or a related country, and who first achieved commercial success with the device.

"The craft of invention reveals the following *trends:* (a) from the empiric toward the theoretical; (b) from the unconscious inventor through the amateur to the professional one; (c) from the evolutionary toward the discrete or broken, epochal; but (d) from the accidental toward the deliberate and sure; and (e) from the individual source to the organized inventing group. (f) A consequence of these trends (and others) is a prodigious increase in the efficiency and rate of invention. The inventions which revolutionize a device or industry are commonly made by men *outsiders* to

it yet informed regarding it; the far greater and more valuable mass of perfecting inventions are made by *insiders*. The inventors are in *partnership* usually with *enterprisers* whose courage, intelligence, business sense and wealth are commonly of importance comparable with that of the inventors themselves." [9]

The same author has summarized the effects of invention as follows: "*Equivalent invention:* perceived needs are met by various unlike, as well as duplicate solutions, so that any great invention is simultaneously paralleled by other, often utterly dissimilar means for reaching the same end at the same time, e.g., reaching California by clipper, steamer, pony express, railroad and telegraph. Inventions may be seen as arriving in groups of several for one function. Hence *no* single *invention* ever *revolutionizes civilization*, nor brings, simply through having been invented, any important changes in the life of the mass of men. An invention coming *before its time* remains undeveloped and practically useless. The desirability and acceptance of inventions are matters of their meeting the felt needs of certain individuals, and not of society; so an invention may flourish and be practically imposed on all, through competition, though it only decrease the general wealth or welfare. (a) Inventions may save labor, land, capital, lives, or may not save anything, but add science to destruction, or bring a private profit, or a new enjoyment or convenience for the public. (b) Between *labor-land-and-capital-saving* inventions the discrimination of effects is complicated, but as a rule the factor chiefly economized loses in relative share of the distribution of the national income, while usually all ultimately gain in their absolute shares." [10]

From the point of view we have adopted inventions are, then, merely a new type of societal energy transformation. As such they are to be explained within the same general framework within which we have dealt with the basic societal processes, which underlie also invention. As a new type of energy transformation—a new way of behaving—an invention may, and usually does, dislocate some or all of the components of the field in which it occurs. It is this dislocation over periods of time which constitutes societal change. Inventions are, as we have seen, the result of the accretion and convergence of all the little details constituting ordinary life in a group. Because the more important inventions,

especially in modern times, serve to punctuate and dramatize the steady stream of cultural evolution, there is some tendency to regard invention as a sort of explanatory principle or key to social processes, whereas invention is itself merely the more dramatic aspect of these processes. The basic characteristics of these processes we have described in Part II of this book. The fact that inventions represent relatively objective and even dramatic crystallizations of the common constituent societal processes may, however, make inventions a convenient type of behavior phenomena in terms of which to study the societal processes of which inventions are one type of illustration. Such studies as those of Pemberton,[11] Bowers,[12] and others indicate fascinating possibilities of this approach. Bowers's statement of his hypothesis is also a good summary of the position discussed above: "The direction and intensity of cultural diffusion are functions of the interaction between an invention and a culture pattern, one or both of which may be undergoing change." [13]

D. THEORIES REGARDING LAWS OF SOCIETAL CHANGE

We have defined societal change as our way of responding to successive positions of societal phenomena in time. As in the case of all other phenomena, our chief scientific interest centers around the possibility of formulating laws describing the course of societal change and thus enabling us to predict its future movements. Such predictability implies that the phenomenon recurs according to some observable sequence under given circumstances.

The possibility of formulating in a generalized way the "course of history" has always been a problem of scholarly interest. An enormous literature bears witness to the persistence and perhaps also to the barrenness of the quest. Hypothesis as to the linear, spiral, or cyclical nature of societal change have been advanced and supported by voluminous though frequently dubious data. This is not the place to review the enormous literature on the subject. Suffice it to say that the results have been inconclusive. Among the principal reasons for this inconclusiveness are (1) the inadequacy of the historical data which has been relied upon in nearly all these studies; (2) the difficulty or impossibility of applying sufficiently rigorous scientific methods to the data availa-

ble to permit reliable generalization; and (3) the incomparability of the concepts, methods, and data employed by different students which prevents both corroboration and comparison of their results.

Each of these reasons could again be elucidated at some length. A few of the minor difficulties surrounding the task will readily come to mind. Much of even the better historical records of medieval and ancient history was selected and interpreted by historians who, however brilliant and informed by the standards of their times, nevertheless lacked knowledge of the more rigorous scientific methods of modern times. The necessarily statistical basis of all valid generalization and the intricacies of reliable sampling are modern developments, and without their competent use no scientifically adequate historical study of any epoch is possible. The reconstructions of events by modern historians often represent ingenious and critical inferences from highly dubious data and as such are most praiseworthy and valuable in suggesting hypotheses. Even with the most rigorous scrutiny and evaluation, however, it is doubtful to what extent these data can be used in reliable scientific formulations.

The other sciences rely, in fact, almost entirely upon the observation of contemporary events, although history is equally replete with records of phenomena relevant to these sciences, i.e., alleged physical conditions and events of other times. The lack of standardized instruments and symbols for recording these events at the time of the original observations makes the existing records of remote historical periods largely useless for modern science. There appears to be even less justification for attaching scientific significance to historical records of societal events. To point out these considerations is not to imply any lack of admiration for the critical capacity and ingenuity of inference of the better historians of both this and other times. I am merely expressing the opinion that for scientific light on the course of societal change we shall probably have to confine ourselves to very much more modest undertakings than those which have interested the philosophers of history of both the past and the present. Scientists will probably not attempt, for the present at least, to plot the course of societal change *in general* over centuries and thousands of years. They will limit themselves instead to the plotting of trends, fluc-

tuations, and cycles of particular kinds of societal behavior over periods of time for which we have relatively reliable data subject to check and corroboration.

With the increasing adequacy of historical records of events in the form of formal and authentic statistics in symbolic forms which are relatively stable in their meaning, plus the vast increase in printed and pictorial records of every sort, it should be possible to reconstruct and generalize very much more adequately and reliably from the historical records of the next thousand years than is possible for the past thousand years. When such data become available over such periods of time, the charting of long time trends of historical events may yield conclusions of greater scientific worth than have past attempts in this fascinating field.

Much of the controversy as to whether linear, cyclical, or other representations of the course of societal evolution is the most useful way of explaining and predicting societal events will also wait for a solution, if any, upon the availability of more adequate data of the kind mentioned above. In the meantime we shall probably devote ourselves to more modest hypotheses and researches than those that have activated the philosophers of history. The hypothesis of a *general* law of cultural growth is furthermore not a necessary one. It may be that certain types of events follow one type of curve, while other events recur according to entirely different patterns. On the other hand, there is evidence that a more refined analysis of some data reveals a common law underlying them which is obscured or obliterated by too comprehensive and crude grouping of data. Consider, for example, Figures 21 and 22, and the following comment by Pemberton:

"When the cumulative figures of the adoption of this trait [compulsory school laws] were plotted they did not resemble in the least the typical ogive. It was found, however, that the southern states with large Negro populations tended to adopt compulsory school laws much later than did the northern and western states. This fact immediately brought out the point that with respect to the culture trait of compulsory school legislation the south represented an entirely different culture area. Compulsory school laws to the southern legislator meant providing the same school facilities for Negro children as for white. Such laws meant, too, the adoption of the principle that Negro children should have an

education. This entirely different situation in the 'North' and the 'South' meant that the population units which are the adopting agencies could not be included in the same analysis. In statistical language the two areas include populations which are homogeneous within themselves but not with respect to each other. In cultural language, the two regions are different culture areas with respect to this trait." [14]

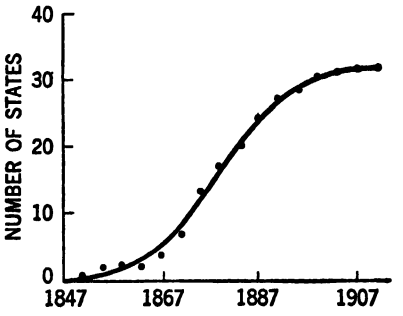


FIG. 21. Dates of enactment of compulsory school laws by northern and western states; four-year intervals, 1847–1911. Fitted with the cumulative curve of a normal frequency distribution of which σ is 11.76 and Y_0 is 4.2. (From Pemberton.)

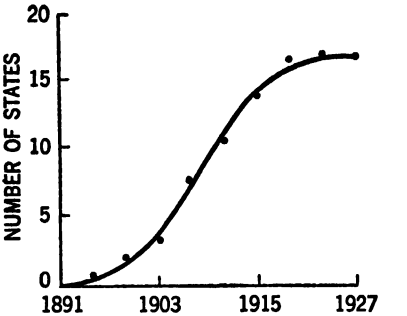


FIG. 22. Dates of enactment of compulsory school laws by southern states; four-year intervals, 1891–1927. Fitted with the cumulative curve of a normal frequency distribution of which the σ is 6.72 and Y_0 is 4.05. (From Pemberton.)

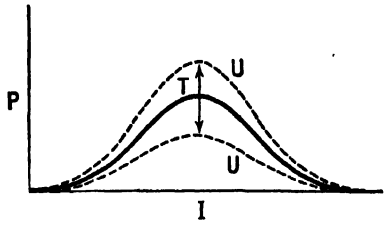
A separate analysis of the diffusion of this trait for thirty-one northern and western states (Figure 21) and for seventeen southern states (Figure 22) with the largest percentage of Negroes, shows a highly similar rate of diffusion in both areas.

In his *Dimensions of Society* Dodd has summarized with admirable brevity and perspicacity the five principal types of changes in societal phenomena as defined by statistical moments. The accompanying diagram, equally applicable to any measurable phenomenon, illustrates the five types of change in terms of which a large number of concrete situations of societal change can be generalized. The plethora of "concrete cases" of change with which we are confronted in actual life frequently involves us in myriads of classifications and generalizations of immediate but limited usefulness, to the exclusion of the principles of inclusiveness and parsimony to which science must always hold. Dodd's comment on the accompanying diagram (Figure 23) will bear serious reflection for those who feel that the approach here

FIG. 23

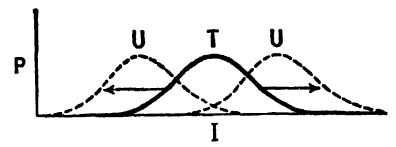
DIAGRAMS OF PROCESSES DEFINED BY STATISTICAL MOMENTS
(Modified from Dodd)

I. NULLARY PROCESSES—ZERO ORDER MOMENTS
Change in *frequency*



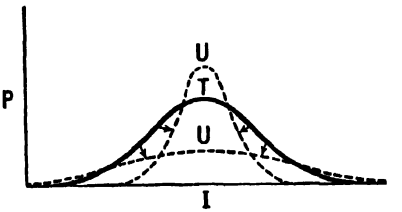
The area under the curve changes; i.e., the population increases or decreases

II. PRIMARY PROCESSES—FIRST ORDER MOMENTS
Change in *mean*



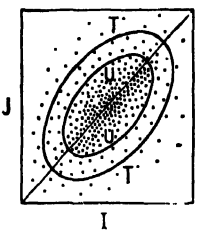
The whole curve moves in one direction; i.e., the population increases or decreases its mean characteristic.

III. SECONDARY PROCESSES—SECOND ORDER MOMENTS
A. Change in *sigma*



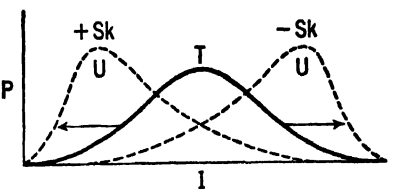
The curve moves in two directions from the center; i.e., the population is dispersing from, or concentrating towards, the mean.

B. Change in *correlation*



The scatter moves in two directions from the reference diagonal; i.e., the population is dispersing from, or contracting towards, the diagonal line.

IV. TERTIARY PROCESSES—THIRD ORDER MOMENTS
Change in *skewness*



The curve moves asymmetrically in one direction; i.e., the population increases on one side of the center.

adopted is too abstract and devoid of warm human content. He says: "All this means that, within a sector, our classification is based in large part on the statistical *form* of the societal change rather than on the societal *content* of the change. Processes are defined by frequencies, means, sigmas, and correlations, not by religious, educational, economic, and other types of content. This principle is a corollary of the definition of Sociology stated in this volume, as the study of the 'general characteristics common to all classes of societal phenomena.' The content of change is more specific to the field of changing data, while the forms of change, according to our working hypothesis, are common to all the social sciences. In studying forms of change, those forms were chosen which can be operationally defined, for these can be communicated and duplicated and verified—which are essential requirements in building a science. The statistical forms, such as the formulae of this chapter, are operational definitions since they tell the operator what calculations he must perform to obtain what the formula defines. Any two competent operators, given the same recorded data, will then get the same means, sigmas, etc. and hence reach objective and complete agreement as to what the processes are they are studying." [15]

Finally, and above all, we must remember that the conventional symbolic technics by which we today represent various types of change as cycles, linear trends, etc., are merely ways of responding to events and should not be taken to represent necessarily inherent characteristics of societal events or of change. (See Chapter VI.) Whether a given series of changes are cyclical or not depends, in the first place, on our definition of that concept and upon the nature of the coordinates on which we represent the events. It may not be possible to portray adequately cultural fluctuations on two-dimensioned Cartesian coordinates. The variation of events in time may be more adequately represented by multi-dimensional figures to which such terms as "cycles" and "trend" are not applicable. Even upon the conventional two-dimensional "time series" chart, the question as to whether a "trend" or a "cycle" is present may depend upon the perspective of time in which we choose to view the graph. Almost any curve, viewed in sufficiently small segments, will provide illustration of any type of trend and fluctuations. The most pro-

nounced "secular" trends may reduce to a dead level if considered over a sufficiently long time. Even the most pronounced and regular cycles may become only straight lines if we plot sufficiently crude averages as representing the original data, which is likely to become necessary as we attempt to chart increasingly comprehensive data over long periods.

These considerations are mentioned not to deny the possibility of plotting the course of historical events for considerable periods of time or to depreciate the efforts that have been made in this direction. On the contrary, some of these attempts have yielded stimulating hypotheses and have not been entirely without predictive value. Graphic representations of past fluctuations in given fields, in spite of their inadequacies, are still the chief guide to all intelligent large-scale administration and prediction. I am merely pointing out that these technics tend to yield reliable results in proportion (a) to the adequacy and specificity of the data on which they are based and (b) to the proximity of the data to the period for which prediction is made.

In short, whether a series of events can be considered cyclical or otherwise often depends upon the time span within which we consider them. Thus, possibly some of the "cultural" cycles we may hypothesize may require millennia for their completion, not to mention other millennia necessary for the corroboration of an observed cycle. It is not possible, for example, to infer seasonal cycles in temperature from the weather reports of a single day, a week, or a month. Likewise, the period of recorded history may be to the life of society somewhat as a day is in a human lifetime. The more ambitious attempts to generalize about "social evolution" in general from historical records may, therefore, be somewhat similar to an attempt to infer seasonal cycles from the weather reports of a day, a week, or a month. That is, the hypotheses are not subject to either proof or refutation because adequate data for either are not available.

Again, we may perhaps draw the most pertinent lesson from scientists in other fields. They confine themselves first to intensive study of proximate and readily available data with careful descriptions of the conditions under which such events occur, with due attention to observable influences of time. Most of the effort of these scientists is directed at the *accurate measurement*

of the variables, including time, that appear to influence currently observable phenomena rather than in attempting to find remote historical parallels, contradictions, or confirmations. From the demonstrable influences of such a factor as time *as observed and measured contemporaneously* the whole history and evolution of the physical world is *inferred,* with results highly compatible with the generally accepted experience of man today.

To be sure, the records of the earth's crust, of fossils, and minerals constitute a kind of historical record of remote physical events. But the *interpretation* of these records in terms of the cosmology of modern science has become possible only as a result of the intensive and rigorous observations of *contemporary* physical events whether in the laboratory or in the field. The reconstructions of prehistoric human society in its currently accepted form, developed not so much from further scrutiny of the writings of early historians or the collection of historical relics as from the *power of interpretation* of these data through biological and anthropological knowledge derived from intensive study of contemporary life. Darwin, and others, formulated the theory of evolution not primarily from books but from extensive and intensive studies of nature in their own generations. *As our observations and measurements of small influences, both of time and of other factors, on contemporary culture increase in reliability, we shall be increasingly able to reconstruct the course of societal evolution and formulate its laws.* This does not mean that history as a record of individual, unique events necessarily will be superseded by science. Science is not interested in the reconstruction of unique historical events, but in the formulation of generalizations of such universality and stability as to permit prediction from them. Toward this broader problem, historical records of the conventional sort here under consideration may be extremely valuable in suggesting hypotheses, and, when they meet the requirements of scientific data, in providing verification.[16]

E. SOCIAL VERSUS *ASTRONOMIC TIME*

The main point of temporal reference in current science and in our discussion thus far has been astronomic time. The susceptibility of the human senses to the succession of astronomic

events has made astronomic time, as previously noted, perhaps the most universal point of reference in man's orientation to his world. As our susceptibility to other invariable sequences, biotic, societal, or any other develops, we may find other time coordinates than the astronomic more meaningful for certain purposes. For example: "Lecomte du Noüy has defined biological time by the dependence of the rate of reparation of cells upon the age of the organism. He found that the rate of cicatrization of wounds decreases with age as ordinarily determined; in a man of sixty the rate is one-fifth that of a child of ten. Processes that are uniform when measured in terms of astronomical time become non-uniform on the biological time scale." [17]

The use of other than astronomical events to designate time intervals is and has always been a common practice. Primitive as well as modern people speak of "a day's journey," "a working day," "the duration of the war," "a generation," etc., all of which may be highly variable in terms of astronomic time. The same practice of designating time in terms of certain societal events is found in such expressions as "less time than it takes to tell about it," "before you can say Jack Robinson," etc. We have already in a previous chapter (Chapter XI) emphasized the greater usefulness for sociological purposes of such measures as mental age, emotional maturity, etc., instead of astronomic years to designate age. One conspicuous example of its use in the social sciences is Alfred Marshall's use of "long" and "short" periods in his analysis of economic equilibrium.[18]

This is not to imply that such designations of social time are of a fundamentally different character than astronomic time or that the former are not convertible into the latter.[19] Both astronomic and social time refer to responses to *successive events* of some kind, whether the events are phases of the moon, the ticking of a clock, or the recurrence of a coronation. Furthermore, scientific objectivity and the need of accurate communication has in most cases dictated the translation of designations in terms of social time into terms of astronomic time, using averages and measures of dispersion of astronomic time to allow for the variations or "irregularities" in these societal events as they appear upon a continuum of astronomic time.

There is no doubt, however, that in many situations the mere

occurrence of certain events regardless of their astronomic duration (within wide limits) is the sociologically significant time designation. It is unquestionably quite useless to attempt to teach, propagandize, or convince certain groups of certain ideas or the desirability of certain programs of action unless they have first lived through certain events, i.e., unless they have had a certain amount and kind of experience, i.e., unless they are "mature" or "ripe" in the respect concerned. Conversely, certain types of propaganda readily acceptable to the immature and inexperienced will not have any effect on the mature. Although "experience" and "maturity" are in most uncontrolled situations fairly constantly correlated with age measured in terms of astronomic time, it is only by virtue of this correlation that the latter method of measuring time is at all relevant in the societal situation in question. The directly relevant factor is whether the individual or the group has lived through a certain sequence of experiences regardless of the astronomic time occupied by these experiences. Failure to recognize this fact frequently accounts for the miscarriage of societal programs which in themselves can be shown to be models of logic and efficiency. In such cases we say that the community was "not ready for" the innovation—a phrase referring to a certain lapse of social rather than an astronomic series of events.

Returning now to the question of whether societal change "is" cyclical, linear, spiral, or describable by any other conventional system of cartography, it will be clear that certain series of events which show no uniform trend or fluctuations in astronomic time might possibly show such regularity if plotted upon some feasible abscissa of social time. The latter type of designation usually represents a variable *rate* of change which is in certain situations the important consideration rather than the mere duration in astronomic time. One writer has illustrated this point as follows:

"In physics 'frequency' and in music 'tempo' are the terms which may be equated with the concept of 'rate' as it is beginning to be used in biology; and just as, in physics, alterations in wave-length frequencies may serve to change one substance or sensation into another, or, as in music, alterations in tempo may serve to change a lively secular tune into a *cantus firmus* for a Mass; so a 'speeding-up' or a 'slowing-down' of the rate of social

development may result in *a corresponding alteration of the character of the continuum* in which these events occur. Hence, it is clear that it would be quite unsound to compare any two events which had been subjected to such changes with one another without taking these changes into account." [Italics mine.] [20]

Now a rate may and usually is itself expressed in terms of astronomic time. But the number of significant events in each interval of astronomic time may vary, and a continuum which takes this into consideration gives a very different perspective to the events portrayed. Dodd in his *Dimensions of Society* (Chapters 9, 10, and 11) has elaborated and illustrated at some length ways of expressing societal duration, change, velocity, and acceleration. To become a scientifically useful device, social time would, of course, have to be reduced as nearly as possible to event-units definable as objectively and accurately as the units of astronomic time which we have developed. We already approach this end to some extent if, for example, we rate the qualifications of a civil service candidate for a certain employment on the basis of the positions of different kinds he has previously held successfully rather than on the basis of mere length of previous service. College graduation today usually requires a certain number of years of attendance at a conventional institution. If and when college graduation is defined in terms of *accurately measurable attainments*, then "college graduation" may become a definitely measurable unit of social time with only very slight correlation with astronomic time. Accurate units of measurement and quantification are, therefore, just as necessary in social as in astronomic time.

F. THE CONCEPT OF "CULTURAL LAG"

We have pointed out that the transformation of energy, which is the basic postulate to which we attribute all change, may result in a disequilibrium of the system under consideration. This disequilibrium sets up further transformations of energy tending to reestablish a new equilibrium. We have repeatedly emphasized that we mean by equilibrium, not some absolute state of affairs, whether Utopian or otherwise, but a purely statistical point or condition, entirely relative and perhaps constantly shifting in time.[21] That is, we have defined equilibrium (Chapter VI) in soci-

etal phenomena precisely as it is defined in physics, namely, as the next most probable state of any energy system. Equilibrium is here used, then, merely to designate that point or state of affairs which is most conveniently used as a norm from which to measure deviations. It follows that a narrowly circumscribed situation may be considered in equilibrium within itself and at the same time be a part of a larger system which is far from equilibrium, i.e., the most probable state of the larger system. For example, statisticians may designate synchronous or conflicting cycles or trends of phenomena, with reference to a selected point, line, or band on the chosen coordinates around which variations most nearly cluster. Likewise, a secular trend up or down over a short period of time may be merely a sub-trend or sub-cycle of a larger movement in the opposite direction, if a longer period of time is taken into consideration. The definition of balance and equilibrium will always be relative, therefore, to the limits of the situation which we select as a reference.

When a new invention or other societal transformation takes place of such a character as to dislocate noticeably the state of affairs accepted and defined as the normal, the resulting situation is frequently designated as abnormal, maladjusted, pathological, etc. We have discussed the scientific meaning of these terms in a previous chapter. (Chapter VI, pp. 213–216.) When certain components of disequilibrated situations fail immediately to make compensatory adjustments to synchronize themselves with the observed changes in the components we have chosen as independent variables, the former components are said to "lag" behind those which are considered to dominate the situation. This difference in rates of change between different parts of a culture complex has received a major share of the discussion of societal change, usually under the name of "cultural lag." Frequently this phrase is used to designate merely the disparity between a given state of affairs and the beholder's notion of how things "should" be. That is, "cultural lag" is frequently used as the obverse of "progress," which is a word widely used to designate movement toward any particular state of affairs desired by the person speaking or writing. In the older moralistic and theological sociological writings, desperate and somewhat pathetic attempts were made to show that "progress," "optimum," etc., were absolute processes or

states inherent in nature which man merely "achieved" or "discovered" if he was good and wise. The fact that both "progress" and "lag" have been and are still being used with this moralistic implication does not mean, however, that they *must* be used in this way, or that they cannot be used as entirely defensible scientific terms. If a statistician demonstrates that interest rates, on the whole, lag behind pig-iron production by about twelve months, i.e., the peak of interest rates consistently occurs about a year after the peak of pig-iron production, the mere report of that fact as a lag in interest rates contains no implications whatever as to the desirability of this state of affairs to anybody. Likewise, a lag of, say, three days in the frequency curve of a certain disease behind a highly similarly fluctuating curve of atmospheric temperature carries no implications whatever as to the "desirability" of this "lag." In short, the word *lag* is used *in science* merely to designate the *lack of synchronization* (i.e., lack of coincidence of points on the coordinates adopted) between two or more variables in a time series. The word has no other *necessary* implications whatever. Sociologists who take the word in its folk-meaning as indicating a lack of synchronization with respect to some standard inherent in nature or in "moral law" are simply lapsing back into their theological orientation. Much current discussion of the point is merely another illustration of the sort of infatuation with words to which we devoted a good deal of space in Part I. As one student put it: "Strictly speaking (!) *is* cultural lag *really* always a lag?" [22] [Italics and exclamation point mine.]

In short, the whole protracted and wearisome discussion in sociology about the meaning of "normal," "adjustment," "pathological," "balance," "equilibrium," "lag," etc., is purely and simply an attempt to introduce and reconcile the meaning of these terms as employed in a theological framework with the completely different framework and meaning of the terms in science. In the former system we take a theoretically perfect god as a norm known through revelation, conscience, or faith and the same to all men yesterday, today, and forevermore. From this norm we measure deviations and specify kinds and degrees of sinfulness, maladjustment, etc. In science we take some average of *observable men or conditions* in a given situation as a convenient point from which to measure deviations. This point is *taken* as the "normal" and

deviations from it may be called by any of the terms discussed above. Their meaning *in their context* is always understood in terms of deviations from *any* arbitrarily selected but explicit norm. We are not compelled to select *the mean* as the point from which to measure deviations. We can measure from the value of the 90th percentile or the tenth percentile of a distribution if we choose, and all deviations from either we may call abnormal or pathological. (In the theological frame of reference the norm lies outside the continuum upon which men and earthly conditions can be described, i.e., beyond the 100th percentile—God and Heaven.) As a matter of fact, the norm adopted in practical affairs is that which the consensus of a community accepts. This is itself a statistically determined norm. To point out that it *could be* and even *should be* different, and that perhaps "after all" automobile production "should" adjust itself to old-fashioned ways of road construction rather than *vice versa,* is neither a scientific problem nor a solution. Scientists might determine the consensus of a group on such a question and depict the probable consequences of acting upon each of the different views of the matter. They may also predict the most likely next development. For a scientist to pretend that he has other and more ultimate criteria of what the course of events "should" be is to lapse back into the role of another kind of priesthood.

The allegedly "subjective nature" of such terms as "cultural lag" is, therefore, merely another example of the results of a postulate which assumes that some words necessarily designate phenomena which are intrinsically "subjective," and that other words denote phenomena inherently objective.[23] Our position is that "cultural lag," "lead," maladjustment, balance, equilibrium, pathological and all the rest are definable just as objectively with respect to all societal phenomena as they are definable in the case of any other natural phenomena whatsoever, and by the same methods. The assumption that our view of *societal* events only is influenced by the standpoint from which we view them is entirely gratuitous. Our views of *all* events are so influenced. Take, for example, the following statement: "*When values are involved,* the character of the lag is determined by the observer's standpoint." [24] By "character of the lag" this writer clearly means (see full context of the article) whether the observer approves or disapproves

of it. In this sense the character of *any* or *all* lags depends upon the viewpoint of the observer.

The position here adopted also disposes of a long and sterile controversy as to whether invention is the "prime and basic cause of social change," whether change in "nonmaterial culture" precedes or follows changes in "material culture," whether the machine "sets the pace" for other changes, etc., etc. The view of causation involved in these controversies, we have already shown (Chapter II) to be incompatible with the scientific orientation. *For practical purposes* we *select* one (or more) variables as a point with respect to which to observe the fluctuations of the rest. The position or characteristic of the variable selected as an origin, independent variable, or "cause" is itself the result of its interaction with the rest of the components of the field. The "priority," or basic "nature" of a component so selected is the result not of its intrinsic "natural" or "causal" property or character but purely the result of the fact that we respond to the situation in this way.

At the present time there is much agitation over the alleged tendency of physical science to "outstrip" the social sciences and the danger of equipping man with new and increasingly effective machines without a corresponding development of ethical standards and means of societal control. Bizarre proposals for a moratorium on science, "fighting" against new extensions of more efficient technological devices, etc., are forthcoming both from scientists and the more traditional priesthood. These effusions are, of course, merely the present aspects of the same process through which the present situation and science itself have evolved. The problem is not to be denied, but it is as old as society. The conditions of man's survival on the earth have been and undoubtedly still are such as to compel him, within broad limits of time and with due allowance for the persistence of habits and institutional ossification,[25] to turn his attention to those problems that are most persistently and urgently thrust upon his attention. The prominence in current literature of the problem of "cultural lag" which at present is directed very largely at conditions of societal organization, is indubitably an indication that a larger proportion of the total attention of scientists as well as of other men is today being directed toward this aspect of life.[26] Indeed, must

we not account in this general way for the rise and rapid development of the social sciences themselves in the last century? Is not the trend toward the viewpoint expounded in the present book, for example, an index of a growing recognition of a need for sociological knowledge *of the type* available regarding "natural," "physical" phenomena? The felt disparity interpreted as a "lag" between the kind of reliable and useful knowledge which we possess regarding the "physical" universe, and which we do not have regarding the societal behavior, has resulted in a pronounced development of the social sciences in the direction here indicated. It represents a trend toward a state of affairs which, if attained, would constitute a new equilibrium as defined throughout this book. Development of the social sciences in this direction, also, tends to "correct" the "lag" of these sciences and thereby to provide a basis for an orderly adaptation to or an adjustment of these social conditions which are today in the foreground of public concern.

G. CONCLUSION

In this chapter we have considered briefly the concepts of time, invention, and change. All of these words designate aspects of societal behavior of great scientific and practical significance. As in previous chapters, we have not attempted chiefly to delineate the current trends of society or any part of it. We have merely tried to indicate the point of view from which *any* trends would be considered under the approach we have proposed.

From the point of view adopted in the first chapter and followed throughout the book, time is not an absolute "entity" or "thing" as Newton conceived it but rather as Leibnitz recognized, a word used to describe man's responses to a succession of events. It follows that *any* events, astronomic, societal, or others, observable by man, may be used to measure time and as a temporal frame of events. Objectivity and measurability of the units employed will still be an indispensable requirement, regardless of the type of events in terms of which time is designated. But it may be that the temporal aspect of some societal events, especially that aspect called change can be most clearly depicted on multidimensional coordinates with time designated in terms of rates of growth, experience, or achievement ability.

Invention and technology in the restricted meaning of their popular usage as treated in this chapter, we found to be merely special cases of the general struggle of organisms and groups to adjust to their environment as discussed in Chapter VI. These concepts, therefore, present no new theoretical problems, but some interesting practical aspects. The objectivity and dramatic quality of inventions as popularly defined may make their study especially feasible and valuable in formulating laws of societal change and culture diffusion which will also be generally valid for subtler and less conspicuous forms of societal behavior, of which invention is only a special case. For the same reasons, inventions may be useful as convenient barometers of societal prediction.[27]

Finally, we have shown that the description of societal change involves no new theoretical problems but requires only the accurate observation and recording in symbols of stable meaning of states of behavior or societal conditions at successive periods of time. The measurement and meaning of "cultural lag," likewise, involve no special problems if we avoid the fallacy discussed at length in Part I of assuming mysterious absolute norms instead of specified statistical ones from which to measure the deviations implicit in such words as "lag." To measure the rate of development of two or more phenomena *in any relevant units* and to compare the rates is as feasible with societal as with any other phenomena. Which phenomena to measure and in what units will be determined as these problems have been determined in the other sciences, namely, by what men need to know at a given time and the efficacy of certain measurements and units in supplying that need. This general technic is equally applicable to problems of societal change.

In this flexibility and effectiveness of science as a method of achieving *whatever* goals men may choose to pursue lies both its present prestige and its future hope. *If* and *as long as* science can demonstrate itself to be the most effective way of attaining *whatever* men want, it is in little danger of serious attack or permanent decline.[28] To assume a situation in which men actually preferred a *less* effective to a demonstrably *more* effective method of getting what they want is a contradiction in terms. Nor does this view neglect the possible importance of science in influencing men's wants. *By charting reliably the near and remote consequences*

of alternative courses of action, science may itself become a major influence determining the ends and means of man's activities. The criteria of ethical control which, it is frequently assumed, must be maintained outside and above science, themselves become a part of mature and authentic social science.

Man's sensory and correlational equipment enables him to deal only with limited segments of the universe at any one time. Accordingly he selects through symbolic abstraction those segments that seem relevant to any given problem. In some situations societal behavior and its results considered as attributes of human individuals or groups may be our point of interest. In other situations these same phenomena take on a meaning relevant to our problem only when related to the geographic area within which they occur. With reference to still other problems we are interested in the same behavior as viewed at successive intervals of time, that is, from the standpoint of change. Convenience and the focus of our interest may be allowed to determine from which point of view we choose to regard these processes in a given case. But a full account of the basic societal phenomena represented by these processes requires that whatever dimension we choose to use as a principal axis or point of reference, the others must always be represented in their relevant relationship. A comprehensive theory should therefore provide a place, *and only one place*, for any and every phenomenon, so that it will always be located at the intersection of its particular coordinates regardless of which axis from which we choose to view it. The relation of a given phenomenon to all the rest will thus at any given instant always be determinable.[29] To provide such a system of coordinates is one of the purposes of scientific theory.

When such an orderly classification of the phenomena of a scientific domain has been worked out, the necessary concepts will also have been developed and symbolically defined. There remains the prodigious task of relating these symbolic definitions to the concrete behavior phenomena of the field in all their variation. This calls for the construction of adequate measuring scales of increasingly refined degrees of discrimination. Only when such measuring devices are constructed are operational definitions possible *in terms of the concrete phenomena* of a field. At such time

also becomes possible the construction of mature scientific theory in the sense of a verifiable system of postulates and theorems.

Throughout this book we have regarded the societal situation as a field of force, and its changes as transformations of energy in conformity with our view of changes in other aspects of the universe. We have dealt with this fundamental framework, as such, only briefly, but have returned to it from time to time as a point of reference. As a point of reference or as a theoretical postulate, it needs no lengthy exposition of its own. Nearly all of the labor of science must lie not in elaborations upon the "nature" of energy or a field of force, but in *painstaking description of the behavior on the basis of which we postulate both energy and fields of force.* It is the correlations between these behaviors and the resulting laws that constitute the body of any science. Accordingly our chief interest has been in laying the *theoretical foundations for methods* designed to yield such knowledge of societal events.

No scientist aspires to reveal the "ultimate," "true," or eternal framework of the universe. Indeed, he cannot even contemplate what such a revelation would mean, for it is foreign to the orientation which he has adopted for himself. On the contrary, the scientific theorist conceives of himself merely as a humble worker upon a scaffold which aims to supply only for the time being a convenient vantage point from which to view the universe so that we may deal with it most effectively. The scientist may believe and hope that his present scaffolding will be useful as parts of succeeding and more adequate structures and he may even build at present with this end in view. But he will not forget, if he remains a scientist, that scientific theories are only scaffolds to facilitate our work upon these walls whose foundations lie in remotest antiquity and whose plan through the centuries contemplates no capstone or spire. That plan contemplates only such an equilibrium of life for mankind as a whole as is compatible with his continued survival and a maximum realization of his aspirations, *whatever* they may be at any given time.

H. NOTES

1. For a good symposium on "The Time Scale," see *Scientific Monthly*, XXXV, Aug., 1932, especially the article by P. W. Bridgman, "The Concept of Time."

2. On the relationship of symbolic devices to powers of discrimination see the classical experiment of A. Lehmann "Ueber Wiedererkennen" (*Phil. Stud.*, V, 1888, pp. 96–156) in which it was demonstrated that if subjects were assigned numbers for each set of nine shades of gray, they could identify each shade with considerable accuracy, whereas without this symbolic device their success was little better than chance. Cited in E. A. Esper, "Language" (Ch. 11, p. 456, in *A Handbook of Social Psychology*, edited by C. Murchison, Clark Univ. Press, 1935). Except for the refined instruments and symbols that have been developed for the measurement of infinitesimal intervals of time, only comparatively long intervals could perhaps be discriminated. Psychological experiments indicate that shorter intervals than one-hundredth of a second cannot be directly distinguished by the average individual. See Mary Sturt, *Psychology of Time*, Harcourt, 1925, Ch. 1, or almost any text on the subject.

3. *Dimensions of Society*, Macmillan, 1940, Chs. 9, 10, and 11. For actual data on current societal change in the United States and methods of studying the phenomenon, see *Recent Social Trends*, President's Research Committee on Social Trends, McGraw-Hill, 1933, Vols. 1 and 2, W. F. Ogburn, Director of Research. Also the numerous monographs on the principal aspects of contemporary society in the United States by various authors under the same auspices. For attempts to chart world changes over long periods of time see O. Spengler, *The Decline of the West*, Knopf, 1926, and P. Sorokin, *Social and Cultural Dynamics*, American Book Co., 1937, Vols. 1–3. The theory and works of C. Gini on the life-cycle of nations also should be considered in this connection. To the extent that adequate data of the type recognized as necessary for valid generalization in science is available in support of a theory of youth-maturity-and-old-age of nations, I have, of course, no objection to such a theory. See C. Gini, *Nascita Evoluzione E Morte Delle Nazioni*, Libreria Del Littorio, Rome, 1929. An incomplete version of this work by the same author will be found in *Population*, University of Chicago Press, 1930. See also Gini's *Prime linee di patalogia economica*, Milan: Dott. A. Giuffrè, 1935, Fourth Edition. Gini's neo-organismic theories of society and especially his treatment of equilibrium as applied to economic and demographic data deserve most careful consideration.

4. W. F. Ogburn, "Technology and Sociology," *Social Forces*, XVI, Oct., 1938, p. 4.

5. S. C. Gilfillan, *The Sociology of Invention*, Follett Publishing Co., Chicago, 1935, p. 5. At Dr. Gilfillan's request, a few minor changes have been made in the quotations here used as compared with their published form.

6. *Ibid.*, p. 6.

7. *Ibid.*

8. For illustrative lists of societal inventions, see A. D. Weeks, "Will There Be an Age of Social Inventions?" *Scientific Monthly*, Oct., 1932, pp. 366–370. Also, W. F. Ogburn and S. C. Gilfillan, *Recent Social Trends*, Ch. 3. For an interesting account of the granting of patents on social inventions (projects of social organization) under the French Patent Act of 1891, see L. L. Willof, "Social Organization Inventions—'Dangerous Patents,'" *Scientific Monthly*, Aug., 1935, pp. 168–169. For a very valuable treatise on the relation of inventions to

practical administration see *Technological Trends and National Policy*, by the National Resources Committee, W. F. Ogburn, Chairman of the Subcommittee on Technology, U. S. Govt. Printing Office, 1937. The following sections are especially pertinent in the present connection:

I. "National Policy and Technology," by W. F. Ogburn

II. "The Prediction of Inventions," by S. C. Gilfillan

III. "Social Effects of Inventions," by S. C. Gilfillan

IV. "Resistances to the Adoption of Technological Innovation," by B. J. Stern.

9. S. C. Gilfillan, *op. cit.*, pp. 11–12.

10. *Ibid.*, pp. 12–13.

11. H. E. Pemberton, "The Curve of Culture Diffusion Rate," *American Sociol. Rev.*, I, Aug., 1936, pp. 547–556. "The Effect of a Social Crisis on the Curve of Diffusion," *Ibid.*, II, Feb., 1937, pp. 55–61. "Culture Diffusion Gradients," *Amer. Jour. of Sociol.*, XLII, Sept., 1936, pp. 226–233.

12. Raymond V. Bowers, "Differential Intensity of Intrasocietal Diffusion," *Amer. Sociol. Rev.*, III, Feb., 1938, pp. 21–31. See also the same author's "A Genetic Study of Institutional Growth and Cultural Diffusion in Contemporary American Civilization" (unpublished Ph. D. thesis, Univ. of Minnesota Library, 1934).

13. "Differential Intensity of Intrasocietal Diffusion," *Amer. Sociol. Rev.*, III, Feb., 1938, p. 21.

14. H. E. Pemberton, "The Curve of Culture Diffusion Rate," *op. cit.*, p. 554.

15. S. C. Dodd, *op. cit.*, Ch. 10.

16. See for example the use made of such material by F. S. Chapin in his *Cultural Change*, Century, 1928, Part II. See also his more recent formulations of a theory of social cycles in his *Contemporary American Institutions*, Harper, 1935, pp. 58–59, 296–299. The theory may be briefly summarized as follows: "Social structure passes through three phases: first, initial inertia; followed, second, by a period of experimentation; and terminating, third, in a state of integration of the successful experiments into a new pattern of structure and adjustment. . . . Then, as soon as the newly integrated pattern lags behind indicated social changes and becomes inert and resistant to change, the cycle begins all over again." (P. 58.)

17. V. F. Lenzen, *International Ency. of Unified Science*, University of Chicago Press, 1938, Vol. I, No. 5, pp. 21–22.

18. Alfred Marshall, *Principles of Economics*, Macmillan, 1930, 8th Ed., pp. 363–380. For a good discussion of Marshall's position in this respect see R. Opie, "Marshall's Time Analysis," *Economic Journal*, XLI, June, 1931, pp. 199 ff. "When he (Marshall) distinguished long and short periods he was not using clock time as his criterion, but 'operational' time, in terms of economic forces at work. Supply forces were given the major attention, and a time was long or short according as it involved modifiability or fixity in some chosen forces on the supply side. The greater the modifiability of the supply forces, the longer the period under discussion, irrespective of clock-time." (P. 199.)

19. Thus, P. A. Sorokin and R. K. Merton in their article "Social Time, A

Methodological and Functional Analysis" (*Amer. Jour. of Sociol.*, XLII, March, 1937, pp. 615–629) suggest that social time is a "symbolic" whereas astronomic time is an "empirical duration" (p. 625). George Devereux (*Amer. Jour. of Sociol.*, XLIII, May, 1938, pp. 967–969) in a discussion of this paper correctly points out that there is no fundamental difference between the two kinds of time inasmuch as *all* time is definable only in terms of order of succession of events. Sorokin concedes this point in a rejoinder. The same criticism should be made of the statement by Sorokin and Merton that "social time, in contrast to the time of astronomy, is qualitative and not purely quantitative" (*op. cit.*, p. 623). If *all* time is defined in terms of the order of succession of events, the number of these events (of whatever quality) constitute the quantitative aspect of time. The attributes or characteristics of the events constitute their "qualitative" aspect whether the events are a succession of seasons or the beat of a metronome, on the one hand, or, on the other hand, societal activities of any kind. In either case the events may be regarded as *quantities of some quality*, as we have pointed out in a previous discussion of the assumed mutual exclusiveness of the categories quantitative and qualitative. (Chs. II and XI.)

20. M. F. Ashley-Montagu, *Am. Jour. of Soc.*, XLIV, Sept., 1938, p. 284.

21. Cf. V. Pareto, *The Mind and Society*, Harcourt, 1935, I, p. 66: "It is therefore a monumental stupidity to say, as one critic said, that when I speak of a state of equilibrium, I am thinking of a state which I consider *better* than another state, equilibrium being better than lack of equilibrium!"

22. Cited by A. P. Herman, "An Answer to Criticisms of the Lag Concept," *Amer. Jour. of Sociol.*, XLIII, Nov., 1937, p. 444.

23. See, for example, J. W. Woodward, "Critical Notes on the Culture Lag Concept," *Social Forces*, XII, March, 1934, pp. 388–398. Also W. D. Wallis, "The Concept of Lag," *Sociology and Social Research*, XIX, May–June, 1935, pp. 403 ff. These authors are right, of course, in pointing out that "lag" is currently being used in a highly subjective way. Michael Choukas ("The Concept of Cultural Lag Re-examined," *Amer. Sociol. Rev.*, I, Oct., 1936, pp. 752–760) has suggested a more refined analysis of the problems involved. John H. Mueller's excellent article on the same subject ("Present Status of the Cultural Lag Hypothesis," *Amer. Sociol. Rev.*, III, June, 1938, pp. 320–327) is in agreement with my position except that Mueller seems to be of the opinion that certain types of data are intrinsically incommensurable. He cites it as a case of "spurious lag," for example, "if industrial indexes double while divorce increases only by 25 per cent" (p. 321). But these data, plotted on coordinates of percentages and time, clearly represent as "true" a lag in the scientific sense (i.e., a demonstrable statistical relationship) as the relationship between depressions and birth rates which Mueller cites as exemplifying "true" lag. As for the degree of certainty to which the association between either of these sets of data has been established, and other criteria which Mueller suggests (p. 326) as distinguishing true from spurious cycles, that is a matter of the extent to which relevant research has been carried out, not a matter of inherent differences in data. To the extent that current discussion designates "lag" purely in terms of "the de-

gree of unrest subjectively experienced by the observer" of events, Mueller's criticism is, of course, valid. But to say regarding industrial indexes and divorce rates that there is "*no* measure of this unequal rate of change" (p. 321), except such "unrest," is surely erroneous.

24. W. D. Wallis, *op. cit.*, pp. 404–405.

25. The common kinds of resistances to social change and especially to technological innovations have been well stated by B. J. Stern (*op. cit.*). See also his *Social Factors in Medical Progress*, Columbia University Press, 1927. In listing the various conditions in the way of vested interests, profit motives, etc., which retard the substitution of new for old inventions, it is frequently overlooked that part of the "lag" is necessarily inherent in the administrative and purely physical problem of how to introduce in a short period of time an innovation affecting millions of people. The physical problem of mere substitution as well as the social decision of how frequently to discard partly obsolete devices are themselves major technological questions.

26. In common with all other aspects of culture, intellectual technics also change from time to time. At such times the cry of anti-intellectualism is sure to be raised against the groups who precipitate the transition. *Another type* of intellectualism invariably arises, and except for the temporary interruption of revolutions and other crises, the succeeding regime picks up the vital threads, if any, of its predecessors' work and continues those pursuits that have relevance to the situations demanding attention. The process is somewhat analogous to bankruptcy and reorganization in the process of which impossible debts are cancelled and a new and unencumbered start is made. Illustrations of the phenomenon may be found in every age and to some extent in every generation. There is, for example, in contemporary sociology still some inclination to define true erudition in terms of the number and antiquity of the sources that can be mentioned with facility, no matter how irrelevant they may be. Proficiency in the methods of modern science is by these mandarins regarded as a comparatively vulgar and unimportant qualification. Bertrand Russell's summary of the causes of collapse of the old Chinese Empire is also applicable to other times and places. "It was impossible," he says, "for the literati to understand that other knowledge than that of the Confucian classics was needed for coping with the nations of the West, or that the maxims which had been adequate against semi-barbarian frontier-races were of no avail against Europeans." (*Power*, Norton, 1938, p. 177.) The transition in the social sciences at present illustrates the same principle.

27. For an excellent discussion of this aspect of invention see W. F. Ogburn, "National Policy and Technology," Section I of *Technological Trends and National Policy*, National Resources Committee, June, 1937. Also S. C. Gilfillan, "The Prediction of Inventions," Section II (*op. cit.*), and "Social Effects of Inventions," Section III (*op. cit.*).

28. I have elsewhere recently expressed my views as to the relationship of science to so-called "social action." (See "Contemporary Positivism in Sociology," *Amer. Sociol. Rev.*, IV, Feb., 1939, pp. 51 ff.) I have not dealt with this subject or most of the other "warm" issues that agitate the journalists, states-

men, and a major portion of social scientists (?) of the day because I consider these issues largely irrelevant to the purposes of this volume. Briefly, the position I have taken in the above paper may be summarized as follows: (1) If social scientists wish to displace the metaphysicians, theologians, politicians, and other traditional spokesmen who have provided in the past that unified and coherent theory which men have always craved, it behooves social scientists to provide a substitute theory which will be more compatible with man's experience than the systems it aims to supplant. Such a system is in my opinion the framework of natural science when consistently applied to societal phenomena. Social *scientists* had better devote a major part of their attention to the effective development and demonstration of this system if they wish that security and status which some hope to insure through current political regimes, "class" alignments, or other so-called "social action." I have no objection to anyone as a human being and as a member of community devoting himself to whatever movements of immediate or proximate social renovation that may interest him. I consider it equally defensible to devote oneself to the development of a science of such demonstrable reliability and predictive power that no regime will dare to ignore its spokesmen and practitioners. Which pursuit we follow, or the degree to which we follow each, is a matter of taste, interest, competence, and the compulsions of the situation in which we find ourselves. In short, I do not admit the assumed dichotomy between the pursuit of science on the one hand and "social action" on the other. *The development of a reliable social science may be regarded as the most fundamental of all social action.*

29. S. C. Dodd's classificatory scheme summarized most concisely in his "quantic solid" (*Dimensions of Society*, frontispiece, and Ch. II, Sec. C) fulfills this requirement. See also S. C. Dodd, "A System of Operationally Defined Concepts for Sociology," *Amer. Sociol. Rev.*, IV, Oct., 1939, p. 627.

INDEXES

AUTHOR INDEX

Adler, M., 86, 130
Alihan, M., 197, 498
Allee, W. C., 126, 199, 369, 370, 429, 465, 498, 499, 500
Allport, F. H., 164, 165, 197, 199, 415
Alpert, H., xii, 81, 84, 200, 312, 329, 330
Anderson, N., 281
Aquinas, T., 73, 74, 308
Aristotle, 39, 73, 75, 78, 83, 125, 167
Arnold, T. W., 43, 77
Arrington, R., 371
Ashley-Montagu, M. F., 532

Bacon, F., 74, 88
Bain, R., xii, 87, 88, 128, 201, 280, 281, 329, 419
Baker, O. E., 465
Barnard, F. A., 34
Barnouw, A. J., 465
Barrie, J. M., 313
Becker, H., 36, 87, 111, 132, 248, 261, 267, 280, 281, 282, 348, 371, 374
Beebe, C. W., 177
Bell, E. T., 26, 38, 43, 78, 79
Bentley, A. F., xi, 34, 36, 44, 78, 84, 85, 86, 87, 130, 131, 132, 253, 254, 283, 284
Bernard, Claude, 221
Bernard, L. L., 43, 80, 130, 199, 215, 228, 239, 242, 285, 325, 326, 327, 328, 374
Bertalanffy, L., 58, 83
Bierstedt, R., xii
Bisbee, E., 152
Bittner, C. J., 326
Blackmar, F. W., 248, 281
Blakeman, 495
Bloomfield, L., 79, 131, 202, 280, 281
Blumenthal, A., 126, 199, 242
Blumer, H., 80
Bogardus, E. S., 329, 330
Bohr, N., 58, 83
Bowers, R. V., 238, 511, 531
Bridgman, P. W., 38, 40, 43, 58, 81, 83, 198, 202, 529
Brown, J. F., 37, 38, 42, 82, 83, 87, 130, 131, 242, 328, 479, 500
Brownlee, 495
Bruce, A. A., 152
Buchanan, R. E., 240
Buckle, H. T., 470, 496
Burgess, E. W., 142, 152, 199, 215, 248, 249, 253, 281, 283, 338, 386, 497, 498, 500, 501
Buros, O. K., 331

Cardozo, B., 200
Carey, H. C., 102
Carnap, R., 78, 84, 85, 131
Carr, L. J., 201
Carrel, A., 78, 468
Carr-Saunders, A. M., 465
Chapin, F. S., xi, 63, 87, 179, 180, 182, 199, 216, 238, 331, 338, 355, 356, 357, 363, 364, 371, 373, 374, 376, 377, 378, 379, 415, 416, 417, 459, 531
Chaplin, C., 420
Charles, E., 465, 467
Chase, S., 43, 77, 165, 197
Child, C. M., 170, 198, 208, 209, 238, 410, 420, 498, 501
Choukas, M., 532
Ciocco, A., 465
Coghill, G. E., 78, 468
Cohen, M., 39, 80
Coker, F. W., 198
Colbert, R., 482, 501
Cole, W. H., 495
Comte, A., vii, viii, 13, 92, 93, 102, 124, 134, 151, 340, 368
Cook, W. W., 200
Cooley, C. H., 19, 125, 132, 192, 197, 226, 241, 268, 271, 274, 283, 287, 294, 296, 317, 325, 326, 327, 328, 331, 500
Copeland, M. A., 42, 79, 199
Cottrell, L., 142, 152, 215, 386, 465
Cover, J. H., 464
Cowdry, E. V., 370
Coyle, D. C., 419

Darmstaedter, L., 496
Darwin, C., 53, 54, 135, 148, 518
Dashiell, J. F., 328
Davidson, D., 371
Davis, J., 333
Davis, M. M., 197
DeLaguna, G. A., 281
Devereaux, G., 532
Dewey, J., xi, 3, 35, 42, 83, 84, 86, 130,

131, 146, 152, 153, 239, 240, 281, 283, 410, 420
Dittmer, C., 482, 501
Dodd, S. C., ix, x, xi, 4, 12, 73, 76, 83, 87, 88, 98, 103, 111, 112, 117, 119, 120, 123, 131, 132, 157, 182, 183, 215, 216, 234, 236, 239, 247, 251, 252, 265, 272, 273, 281, 285, 288, 289, 318, 323, 331, 332, 342, 345, 346, 363, 369, 373, 418, 422, 463, 467, 468, 504, 514, 515, 521, 531, 534
Doob, L., 274, 281, 285, 287, 288, 331
Dublin, L. I., 439, 442, 466
Durkheim, 35, 197

Edgeworth, F. Y., 236, 495
Edin, K. A., 465
Einstein, A., 16, 38, 39, 49, 50, 60, 73, 78, 81, 109, 127, 131, 151, 197, 198, 287
Elliott, M. A., 239
Ellwood, C. A., 132
Engels, F., 409
Esper, E. A., 243, 280, 281, 282, 530
Eubank, E. E., 4, 83, 236, 245, 246, 280, 281, 287, 289, 338, 341, 346, 368, 369, 371, 374

Fairchild, H. P., 110, 132, 419
Faraday, M., 142
Faris, E., 41, 327
Fechner, G. T., 236
Feldstein, M. J., 371
Folson, J. K., 416
Forbes, S. A., 499
Ford, C. S., 412, 413, 420
Frank, L. K., 78, 83
Frank, J., 200
Frazier, L., 200

Galen, C., 167
Galileo, 15, 49
Gallup, G., 419
Galpin, C. J., 338, 374
Galton, F., 225, 496
Gause, G. F., 465
Geddes, P., 43, 93, 94, 117, 129, 132, 466, 499, 500
Gibbs, W., 126, 127
Gilfillan, S. C., 507, 508, 509, 530, 531, 533
Gillette, J. M., 239
Gillin, J. L., 248, 281, 482, 501
Gini, C., 431, 465, 467, 498, 530
Glueck, S. and E. T., 142, 152
Goldenweiser, A., 82
Gosnell, H. F., 419
Gray, G. W., 196
Grillenzoni, C., 467
Groves, E. R., 416, 466, 467

Haddon, A. C., 197
Hall, J., 152
Hall, M. C., 419
Hansen, A., 419
Hardy, W. B., 495
Harkness, Wm., 82
Harrison, S., 498
Hart, H., 142, 152, 201
Hartman, D. A., 415
Hatch, C. E., 467
Hayes, E. C., 236, 249, 280, 281
Hecht, 58, 83, 196
Heiman, E., 242
Heisenberg, W., 58, 83
Henderson, 114, 127, 132, 218, 239
Herman, A. P., 532
Herrick, C. J., 199
Hogben, L., 77
Holmes, O. W., 200
Holmes, S. J., 467
Holt, E. B., 241, 328
Homer, 167
Hoover, C. B., 243
Horney, K., 285
Hubbard, H. D., 82
Hubbert, K., 128
Hull, C. L., 35, 88, 151, 221, 240, 285
Huntington, E. V., 151
Hutchins, R. M., 131
Hutchinson, E. P., 465

Infeld, L., 16, 39, 109, 127, 131, 197, 198
Inglis, R., xii

Jacobsen, E., 238
James, Wm., 39
Jameson, S. H., 202, 333
Jastrow, J., 39
Jennings, H. S., 241, 468
Jensen, H. E., 131

Keller, A. G., 117, 119, 132, 317, 330, 331
Kepler, J., 134, 151
King, W. I., 331
Kirkpatrick, C., 70, 71, 85, 86, 87
Kluckhohn, C., 420
Koffka, K., 57, 83, 472
Köhler, W., 42, 56, 57, 82, 472
Komarovsky, M., 416
Korzybski, A., 43, 78, 81, 83, 164, 197
Kroeber, A. L., 415

Kuczynski, R., 427, 428, 465
Kuznets, S., 238

Lamprecht, S. P., 240
Langford, C. H., 78
La Piere, R. T., 199, 243, 280, 338, 374
Laune, F. F., 142, 152
Lavoisier, A., 11, 13
Lawsing, M., 287, 500
Lehman, A., 243, 530
Leibnitz, von, G., 526
Lenin, N., 408, 409
Lenzen, V. F., 369, 531
Le Play, F., 102, 117, 140, 470, 496
Lesser, A., 151
Lewin, K., 37, 38, 78, 82, 131, 500
Lewis, C. I., 78
Lilienfeld, P., 198
Lindsay, R. B., 81
Linné, von, K., 342, 346
Lippmann, W., 84
Lobatchewsky, N., 49, 50, 78
Longmoor, Elsa, 131, 486
Loomis, A. M., 371
Loomis, C. P., 371
Lorentz, H. A., 287
Lorimer, F., 338, 467
Lotka, A. J., 209, 237, 442, 466, 494, 497
Lottier, S., 483, 501
Lowell, A. L., 200
Lowie, R., 466
Lucasiewicz, J., 78
Lundberg, G. A., 35, 78, 81, 130, 131, 132, 198, 199, 201, 281, 284, 287, 328, 333, 369, 416, 500

Mach, E., 287
MacIver, R. M., 13, 39, 79, 80, 84, 152, 324, 330, 333
Malisoff, W. M., 94, 129, 132, 371, 466
Malthus, T., 426
Margenau, H., 149, 152
Markey, J. F., 42. 43, 197, 325, 327, 328
Marshall, A., 418, 519, 531
Marshall, T. H., 329
Martin, E. D., 197
Martineau, H., 368
Marx, K., 73, 308, 409
Maxwell, C., 142
May, M., 86, 216, 274, 281, 285, 287, 288, 331, 468
McAtee, W. L., 465
McCarthy, D., 282
McCormick, T. C., 420
McDougall, Wm., 132, 191, 192, 202
McKenzie, R. D., 338, 474, 485, 488, 497, 498, 500, 502
Mead, G. H., 42, 226, 242, 281, 283, 292, 326, 327, 333, 354, 373
Mead, M., 201, 288
Mendel, G., 225
Mendelćeff, D., 342
Menger, K., 342, 353, 369, 372
Merrill, F. E., 239
Merton, R. K., 35, 42, 531, 532
Metcalf, W. V., 132
Meyerson, A., 468
Michael, J., 86, 130
Minkowski, H., 287
Mitchell, W. C., 238
Monachesi, E., 142, 152
Moore, H. L., 149, 238
Moreno, J., 237, 258, 261, 284, 321, 332, 333, 349, 350, 351, 371
Morris, C. W., 43–44, 88, 242, 367
Moulton, H. G., 417, 418
Mowrer, E., 501
Mueller, J. H., 328, 532
Mukerjee, R., 87, 130, 472, 497, 498, 499
Müller, H., 83
Mumford, L., 419
Murchison, C., 243, 280, 329, 530
Murphy, G., 331
Murphy, L., 331
Mussey, H. R., 419

Nagel, E., 66, 84, 85, 86, 128, 152
Nasu, S., 465
Newcomb, T., 331, 371
Newsholme, A., 466
Newstetter, W. I., 371
Newton, I., 49, 82, 151, 526
Nicholson, 429, 465
Noiiy, du, L., 519
Notestein, F. W., 465
Novicow, J., 198

Ogburn, W. F., 338, 416, 466, 467, 506, 530, 531, 533
Ogden, C. K., 43
Osborn, F., 338, 467

Paget, E. H., 202
Pareto, V., 13, 102, 119, 127, 152, 236, 238, 532
Park, R. E., 197, 199, 248, 249, 253, 281, 283, 329, 338, 496, 497, 498, 502
Parsons, T., 42
Parten, M., 416
Patterson, M., xii

Pearl, R., 423, 424, 425, 426, 428, 429, 463, 464, 465, 466
Pearson, K., 52, 56, 240, 495
Pemberton, H. E., 238, 501, 511, 513, 514, 531
Peters, C. C., 501
Phelps, H. A., 411, 412, 420
Piaget, J., 325
Plato, 167
Priestley, J., 11, 13
Poincaré, H., 240
Poole, W. C., 329

Rashevsky, N., 87, 196, 241
Ratner, S., 44
Read, H. S., 465
Reiser, O. L., 78, 80
Rice, S. A., 201, 415
Richards, A. I., 43
Richter, K., 496
Riemann, B., 131
Riemann, G., 50, 78
Robertson, J. M., 496
Robinson, J. H., 39
Roche, J., 418
Ross, E. A., 247, 248, 280, 371, 434, 439, 440, 466, 468
Ross, F. A., 501
Ross, R., 495
Rueff, J., 199
Russell, B., 83, 85, 86, 236, 240, 286, 287, 471, 497, 533

Sanderson, D., 374
Sapir, E., 280, 281, 406, 408, 419
Sarkar, B. K., 499
Schelderup-Ebbe, T., 329
Schreiner, O., 465
Schrödinger, E., 58, 83, 259
Scifriz, Wm., 44
Semple, H., 496
Shaw, C. R., 131, 484, 501
Shirasaki, K., 438
Shriver, H. C., 200
Simmel, G., 37, 335, 347
Singer, E. C., 38, 39
Smith, M., 501
Smith, T. V., 299, 328
Soddy, F., 231, 242
Sorokin, P. A., 82, 95, 113, 129, 131, 198, 199, 236, 237, 238, 241, 243, 287, 289, 324, 325, 329, 330, 332, 333, 338, 374, 499, 530, 531, 532
Souter, R. W., 238
Spencer, H., 102, 119, 120, 124, 134, 135, 237
Spengler, O., 530
Spykman, N. J., 335, 347, 371
Stecker, M., 418
Steele, M., 284, 333
Stern, B. J., 531, 533
Stevens, S. S., 37
Stix, R. K., 465
Stone, S. E., 238
Stouffer, S. A., 467
Sturt, M., 530
Sully, J., 197
Sumner, W. G., 117, 119, 120, 132, 181, 199, 206, 317, 328, 329, 330, 331, 498
Sutherland, E. H., 468
Sydenstricker, E., 331, 466

Tannus, A., xii
Tarde, G., 186, 199
Tarski, A., 78
Taylor, G., 487, 497, 502
Terman, L. M., 467
Thomas, D. S., 371, 489, 500, 502
Thomas, W. I., 88, 92, 107, 117, 130, 132, 220, 240, 385, 416, 466, 467, 445
Thompson, W. S., 338, 466, 467
Thomson, J. A., 43, 93, 94, 129, 132, 466, 499, 500
Thorndike, E. L., 435, 468
Thurstone, L. L., 59, 66, 70, 71, 80, 87, 132, 463, 468
Tolman, E. C., 83

Veblen, T., 33, 44, 232, 242, 317, 329, 331, 392, 395
Vold, G., 142, 152
Volterra, V., 464

Waller, W., 81, 82, 83, 84, 416
Wallis, W. D., 197, 532, 533
Walras, L., 236
Ward, L. F., 13, 102, 119, 124, 134, 370
Warner, W. L., 374
Watson, J. B., 35, 41
Weber, M., 200, 240, 329
Weinstein, A., 241
Weiss, A. P., 40, 42, 235, 236, 239
Wertheimer, M., 83, 472
Westermarck, E., 416
Weyl, H., 287
Wheeler, W. M., 343, 369, 370
Wheelwright, P. H., 39
White, R. C., 501
White, W. A., 284
Wiese, von, L., 36, 87, 102, 111, 132, 248, 261, 267, 280, 281, 282, 348, 371, 374
Willey, M., 197

Willof, L. L., 530
Wilson, W. H., 501
Winiarsky, L., 236
Winn, R. B., 1
Winston, S., 433, 465
Wirth, L., 497, 500, 502
Wolfe, A. B., 463
Woodruff, L. L., 465
Woodward, J. W., 532
Woodworth, R. S., 39
Woodyard, E., 468
Woolston, H., 464
Worms, R., 198
Wundt, W., 197

Yano, T., 438
Young, D., 88
Young, E. F., 131, 486, 501

Zimmerman, C. C., 338, 374
Znaniecki, F., 80
Zuver, D., 420

SUBJECT INDEX

Ability, *see* intelligence
Abnormality, 213–216, 522, 523, 524; economic, 397; mental, 454–458. (*See also* normal.)
Abstract and concrete phenomena, 36, 360, 365. (*See also* concrete.)
Abstraction, 6, 72, 85, 105, 109; of aspects of situations, 90
Acceleration, defined, 236; societal, 521
Accommodation, 264
Acculturation, 87
Action, mechanisms of, 173–185; relationships, 264; science and social, 534
Actuarial methods in sociology, 142–144
Adjustment, 5; as a test of truth, 26, 28; prediction of marital, 386
Administration, public, *see* public administration
Administrative problems and community homogeneity, 485
Age distribution, 435–440; and adaptability, 437; and learning capacity, 435, 437; importance of, 435, 438–439; superstitions connected with, 435
Aggregation, meaning of, 341, 343, 362, 368, 444
Algeria, growth of population of, 423–424
Altruism and sympathy, 296–297, 304
Amalgamation, 291
Ambiguity, of current discussion, 131; of words, 153
Analogies, 156; scientific value of, 198, 282–283
Analysis and synthesis, their place in explanation, 128
Animism, 308
Anthropocentrican, 219
Anticipatory responses, 245
Appearances as realities, 251
Aptitude, meaning of, 84. (*See also* intelligence.)
Aristotelian, laws, 48 ff.; logic, 78; survivals, 69
Art, and science, 368, 383; magical functions of, 410
"Artificial" and "natural" units, 68–69
Artist, the insights of, 382–383; and verification, 383; as source of hypotheses, 461
Aspect, meaning of, 23
Assembly, meaning of, 184, 186, 361–362
Assimilation, 249, 291
Association, 343, 362, 369; composite indexes of, 320
Association-dissociation, 256–268, 275, 284; and ecological processes, 492; methods of defining, 265–266
Assumptions, nature of, 3
Astronomic and social time, 518–521
Atom, meaning of, 125, 128, 132, 164, 371; social, 351–352
Attitudes, as demographic data, 460; expansion of primary group, 299–311; importance of measuring, 440; meaning of, 59, 84, 201; measurement of, 60, 87; of readiness, 245
Attraction, indifference, and repulsion, 352
Attraction-repulsion, 252–253, 257, 258, 259, 321; in electrons and protons, 203; in institutional populations, 349–351; in mating, 467; in physical systems, 267–268
Axioms, importance of, 151–152; nature of, 3–4, 133–136; regarding parallel lines, 50

Balance, 208; regional, 472–473, 497–498, 499–500
Behavior, as motion, 311; dynamics of, 203 ff., 244 ff.; "inner," 253; interpreted in disparate ways, 445; mechanisms of, 173–185; symbolic, 253. (*See also* symbolic behavior.)
Behavioristic position, ignores or denies no data, 19, 29, 35; objections to, 19
Behavior patterns, latent and manifest, 379–384
Beliefs, 3
Biosphere, 48, 344
Birth control, *see* contraception
Birth rate, decline of, 439
Buddhism, 446
Business cycle, 214–215

Calibration, of instruments, 85; cultural influences on, 87
Capitalism, 48, 381, 399–400

Cartesian concepts, 1
Case studies and statistics, 49
Caste, 290, 312, 317; as a type of group, 360, 366
Categories, as differential responses, 25; as generalized habits, 23–26; as symbols releasing habit mechanisms, 244–245; nature of, 12, 30–31, 79, 339, 340, 360, 368, 369
Catholicism, 107, 108, 381, 446
Catholics, fertility rate of, 467
Causation, 12, 79, 80, 82, 205, 218, 222, 224, 225, 226, 232, 260, 262, 281, 286, 287, 288, 289, 449, 450, 452, 525; from operational viewpoint, 83; meaning of, 58; mystical notion of, 128–129
Centralization, ecological, 480, 481, 482; trend toward, 404–405
Centralized government and technology, 506
Change, 503–534; and measurement, 526–527; and the social sciences, 417; as a concept, 233; as an aspect of society, 492; assumed to be especially characteristic of societal phenomena, 145–146; generalization regarding, 514–516; in public opinion, 189–191; in standards of living, effects of, 418; in terms of statistical representation, 516; mathematical ways of representing, 49; theories of, 511–518. (*See also* societal change.)
Chess game as illustration of field of force, 494–496
Choice, 11, 42, 222; in mechanics, 161, 163, 164, 167, 188
Christianity, 305
Church, the, as classification of people, 376; as institution, 406–410
Class, 184, 290, 312, 317, 339; as a category, 368, 369; as a group, 360; defined, 341; distinctions, 324, 329; intelligence as a measure of, 448, 457; struggle, 322, 477
"Classics," the, 533
Classification, based on gradations of some common factor, 247, 252, 261, 265, 267–268; examples of, 342, 359–365, 369, 370, 372–373; history of, 246; importance of, 342; need of system of, x, 345; not determined by data, 93, 362, 363, 365; of dyadic groups, 348–349; of environments, 228–229; of human plurels, 339–343, 346; of organic plurels, 343–344, 370; of societal processes, 246–252; of the sciences, 92–98; on basis of non-sociological criteria, 319; problems of, 345–346; requirements of a scientific system of, 528; value of, 353–354
"Classless" society, 457
Closed systems, 209–210, 260, 262
Collective behavior, 155
Colony, 343
Columbia University, 34
Combinations and permutations in groups, 352–354, 372
"Common essences," 86
Common factors, 342, 346; in dyadic groups, 349; in marital customs, 445–446
Common sense, 25, 305–306
Communact, 254
Communicance defined, 254, 283
Communication, 252–256; and classification of groups as primary, secondary, etc., 303, 317; and science, 3, 277; as communion, 274; as a common factor in societal processes, 256, 275, 278, 279; barriers to, 99; between people of different status, 313–314, 317; defining community boundaries, 482; definition of, 253, 256, 260, 273, 274, 275; distinguished from contact, 283; ecological aspects of, 471, 481; expansion of, 276
Communion, 274, 283; as criterion of group, 360
Communism, 48, 107, 108, 399–400; and fascism, 242
Communist ideology, 232
Community, 343; and organism, 197; boundaries dependent on means of communication, 482; defined, 361–362; ecological, 474; symbolic representations of, 105
Comparison as measurement, 84
Competition, 249, 268–277; attempts to define, 250, 267, 271, 278, 285–286, 288; in ecology, 492. (*See also* cooperation.)
Complexity of societal phenomena, 75–76, 114, 118, 137–138, 149, 343, 368
Concentration, ecological, 480
"Concept" and "percept," 39
Concepts, fundamental, 203; nature of, 36; of sociology, 75, 245 ff.; reasons for inadequacy of, 75; requirements of, 245
"Conceptual imagery," contrasted with sense experience, 415–416
Concrete and abstract, 36, 360, 365

Concreteness of societal data, 130
Conflict, 249, 268–277, 278; and communication, 275, 276; and ecology, 492; and the advancement of science, 276–277; as a release of tension, 307; between primary and secondary group attitudes, 304, 305
Conscience, 163
Conscious interaction, 368–369; in ecology, 473, 476, 498
Consciousness, 19 ff., 39; of kind, 104, 259; self and social, 294
Consensus, as a statistical concept, 524
Consternation, science as preventive of, 340, 368
Contact, societal, as basis for group definition, 364; distinguished from communication, 283, 289
Contraception, 423, 431, 433, 445
Control, political, 400–406
Control, social, *see* social control
Convention, 182
Cooperation, 268–277; attempts to define, 250, 264, 271, 277–278, 285–286, 288; in ecology, 492
Corollaries of postulates of science, 8, 9 ff.
Correlation, and scientific laws, 136; and explanation, 83, 85; meaning of, 52 ff.
Cosmos, meaning of, 9
Craze, 182, 504
"Creativeness," 82
Crimes, according to distance from metropolitan centers, 483, 484
Criminal groups, 304–305
Criminality as a cause, 442
Crowd, the, 167, 186, 361–362
Cultural, 21; as contrasted with "physical," 7–8
Cultural cycles, 514, 517, 531
"Cultural" factors in ecology, 473, 476
Cultural lag, 521–526; and conceptions of progress, 522–523, 532–533; and the sciences, 8, 525–526; defined, 522; nonethical implications of, 523; "spurious," 532–533; statistical meaning of, 523–524
"Cultural" phenomena, derived nature of, 236–237; meaning of, 126
Culture, 179, 345; diffusion, 511
Culture area, as an ecological concept, 499, 514
Curiosity and invention, 508
Customs, 165–166, 179–180, 181–182, 192; as environment, 229–230; objectivity of, 17
Cycles, 211–213, 237, 238; and culture, 211–212; as a symbolized way of responding, 516; as a way of responding to periodic motion, 211; business, 214–215, 238; cultural, 514, 517, 531; their dependence on statistical manipulation, 212, 238–239

Darwinism, 17
Data represented by symbols, 9
Death rates, *see* mortality
Decentralization, ecological, 481, 482
Decision, mechanisms of group, 400–406
Deduction-induction, 49
Defectives, mental, 454–458
Definition, and measurement, 58–61, 84; methods of, 58; nature of, 249, 362, 363, 365; of situation, 92; tautological, 97; technique of group, 359–365
Delinquency areas, 131
Democracy, 48, 399–400
Democratic ideology, 232
Demographic aspects of society, 421–468; and populations, 432–446; assumed to be intrinsically more objective and quantifiable, 422, 458–459; enumerated, 460; institutional behavior as, 411; qualitative gradations of, 446–457; socio-economic and occupational status as, 459; socio-economic status, housing condition, attitudes, and personality traits as possible extensions of, 459–461
Demography, extension of meaning of, 459–463
Denotatum, 43, 368
Density, measures of, 66, 86; ecological, 479, 480
Description and explanation, 38, 106
Designatum, 43, 367
Desire, 42, 201, 205, 251, 272, 273, 282, 288
Determinism, 196
Dicaud, defined, 253–254
Dicaudane, defined, 254
Dichotomies, 309
Diffused-symbolic institutions, 376–378
Diffusion, laws of, 513–514
Dimensions of society, interrelationship of, 470–475
Disorganization, social, 213–216
Dissociation-association, 256–268, 275, 284; methods of defining, 265–266
Distance, social, 233, 290, 311–323, 330; and interdependence, 316; instruments for measurement of, 314–323,

325, 330–332; margin, 315; relativity of, 313–314; tests, 318–319; understanding and sympathy as measure of, 314, 330. (*See also* social distance.)
Distribution, ecological, 479–492; of wealth, 396
Dominance and subordination in communities, 482
Domination-subordination, 317, 311–323, 324
Dreams as source of hypotheses, 461
Drives, 251, 282
Drosophila melanogaster, 423
Duration, societal, 521
Dyads, 347, 348–349
Dynamic relationships, symbolic representation of, 109–115
Dynamics of behavior, 203; and processes, 244 ff.

Ecological approach, 87
Ecological distribution, 479–492; centralization, 480; concentration, 480; density, 480; fluidity, 480, 488; migration, 489–492; mobility, 488; segregation, 485; specialization, 480; succession, 485, 488
Ecological environments, 344
Ecological processes, as forms of association, dissociation, cooperation, competition, conflict, etc., 492
Ecological regions, factors in, 474; inclusiveness of, 130; meaning of, 472–474; types of, 475–479
Ecology, 104, 106, 107, 206, 469–502; animal, 477; cultural, 476–478, 492–494; defined, 474; factors in, 474, 476; graphic methods in, 478–479; of language, religion, race, rainfall, health and illiteracy in Europe, 487; objectivity of, 471; of community boundaries, 482; of crime, 483; of public relief, 486; of truancy, 484; scope of, 472–474
Economic interpretation of history, 387
Economic laws, 390
"Economic man," 140, 141
Economic science, and equilibrium, 392–393, 395–396; and expanding economy, 393–396; confusion of symbols with operations, 397–398; major aspects of, 388–390; on money and prices, 396–400; preconceptions of, 388–400; state of, 387–389
Economic standards, relativity of, 390–393
Electron, 128, 203; meaning of, 125
Element, 6–7
Elimination, 264, 265
Emotional alignments in the community, 382–383
Emotional currents, distribution of, 351; in groups, 257
Emotional expansiveness, 237
Emotion in religion, 408
Employment, customs regarding, 397
Ends, 11, 20, 34, 402
Energy, 103, 107, 115, 156; as a postulate, 529; as behavior, 128; conversion of, 471–472; defined, 205, 210, 236; dissipation of, 358; distribution of, 257; (kinetic), 236; meaning of, 125; (potential), 206, 235, 236. (*See also* energy transformation.)
Energy flow in latent patterns, 380
Energy patterns in a community, 351
Energy transformation, 9–10, 203, 204–205, 206–207, 503, 505, 510, 521; and technology, 206; defined, 205; economy in, 206; social results of changes in, 231–232
Engineering, social, 403
Environment, 86, 87, 197–198, 291, 292; as hypothesis, 227; classification of, 228–230; conditioned by death, 478; cultural, 228; defined, 222–223; described, 226–231; determined by response capacities of organisms, 226–228; effect of, on thought, 232; external, 221; fiction, myth, and superstition as, 228; internal, 220–221; relation of instruments to, 228
Environment-heredity, 219, 223–226, 241; an obsolete dichotomy, 49, 449
Environment-organism, 217–223, 231, 234, 239–240
Environments, ecological, 344
Equilibrium, 5, 49, 91, 207–211, 233, 234, 237, 457, 529, 530, 532; and cultural lag, 521–522, 526; and predictability, 207–208; economic, 392–393, 395–396; in population growth, 429; in physiology, 208; meaning of, 34, 307, 310; moving, 208–209, 472, 477, 497–498, 499–500; not necessarily a return to preexisting conditions, 209
Esprit de corps, 327
"Essences," 86
Ethical standards, 525, 533–534
Ethics, 450, 451, 456; and science, 29–31, 403, 404, 527–528, 533–534
Ethnocentrism, 300–301

Etiquette, 304
Eugenics, 457
Event, 254
Existence, 25, 40, 69, 98, 105, 193; Einstein's and Infeld's views of, 16; meaning and relativity of, 14–17, 22, 202; "substantial," 283–284. (*See also* reality.)
Experience, nature of, 9, 11, 220
Experiment in sociology, 138–139
Explanation, 6, 79, 83, 106, 156, 231; and description, 38; as correlation, 287; of social groupings, 103–104; relative to state of the inquiring organism, 128–129; scientific, 260–261
Exploration, 129
Extension and intension, 85
External environment, 221
External universe, 38
External world as postulate, 9

"Fact," 14, 15, 16
Factor analysis, 110; need of, 430, 440
Factors in ecology, 474
Faculties, 220
Fad, 182, 504
Familial, sexual, and kinship patterns, 384–386
Family adjustment, prediction of, 142–143
Family as a primary group, 310–311; as an elementary unit, 347; composition of the contemporary American, 416
Fascism, 48, 399–400, 446
Fascist ideology, 232
Fashion, 182, 504
Fear, 12–13
Feeble-minded, *see* mental defectives
Feeling, 11, 19, 220; as contrasted with behavior, 377
Fertility and wealth, 424–426, 430–431
Fiction as environment, 228
Field, 3, 14, 294; as frame of observation, 130; as only reality, 40
Field of force, 14, 90 ff., 115, 121, 123, 260, 262, 268, 311, 470, 472, 479, 492–494; as a postulate, 529; as a situation, 107; illustration of, 494–496; meaning of, 90, 103–109, 126
Fluidity, ecological, 480, 488
Folk, 337
Folk language, inadequacy of, 196; unsuited to scientific purposes, 366
Folklore, of demographic relationships, 421; scientific value of, 461
Folkways, 165–166, 179–181, 192
Force, 259, 281; meaning of, 125, 205, 235–236; social, 236
Formal and informal methods, 84
Frames of reference, viii–ix, 89 ff.; as habit systems, 90–92; determination of, 27–28, illustrated by theology, 27–28; requirements of, 98; sources of, 91, 98–100
Frameworks of inquiry, variety of, 3–4; mixing of, 523; of natural science applicable to societal data, 99; tentative nature of, 529
Freedom of speech, 405–406
Function and structure, 49, 339; illustrated, 415
Function and variable, 220
Functional and organic disorders, 443
Function, societal, 356, 358
Future and past as present stimuli, 314

Gang, 361–362
"Geisteswissenschaften," 12, 28
Generalization, 26; defects of, 64–65; distinguished from hypotheses, 56; in history, 512; meaning of, 54–55; of scientific laws and principles, 6; prevalence of common sense, 101–102; prevalence of societal, 64; quantitative nature of, 54–58, 76; regarding human reproduction, 423–429
"Genius," 82, 214 ff.; and invention, 509
Geographic factor, prominence of, in sociological description, 470–471
Gestalt psychology, 24, 42, 80, 130; and behaviorism, 57–58; and quantification, 57
Goals, 285–286, 288
Government, defined, 401
Gradational character of scientific categories, 366
Gradations of societal processes, 309–310
Gradients, 105, 108; as indices of homogeneity, 482, 485; defined, 481; examples of, 483, 484; urban, 481–484, 501
Graphic representation of social and psychological phenomena, 105, 106
Gravity, defined, 263; social, 173
Gregariousness, 104
Group and individual, 164–166, 171–173, 194–195; defective definition of, 196
Group behavior mechanisms, 181–185; public opinion as, 185–192
Group concepts, reality of phenomena designated by, 166, 192–193, 415–416
Group "fallacy," the, 128, 163–173

Group formation, mechanisms of, 173–185
Group mind, 166–173
Group organization and emotional expansiveness, 237
Groups, as electron-proton configurations, 204; classification of, 339–343; defined, 341; defined in terms of mechanism involved, 184, 339; determination of, 316–317, 319–321, 327–328; dyad as type of, 347; environment of, 226–231; informal and latent, 381–383; interaction as criterion of, 360–361, 371; monad as type of, 347; primary, 294–311; secondary, tertiary, etc., 316–317, 319–321, 327–328, 364; technic of definition of, 359–365, 368; types of, 339–374
Growth, laws of, 423–426
Guess, 5

Habits, 166, 177–181; as categories, 23–26; as economy of energy expenditure, 206
Habit-systems, and societal patterns, 385; as frames of reference, 91; as standards determining status, 311–312
Hate, 12–13
Herd, 343
Heredity, as designation of influences not yet controllable, 225, 241; as designation of preconception influences, 223; of societal defects, 455, 456
Heredity-environment, 219, 223–226, 241; an obsolete dichotomy, 49, 449
Hermits, 347–348
Heterocentrism, 328
Historical data, inadequacy of, 511, 517; generalization of, 512; growing adequacy of, 512–513
History, and science, 512–513, 517–518; as a record of unique events, 518; economic interpretation of, 387; laws of, 513–514; philosophy of, 511–512
Holy Ghost, 31, 289
Homogeneity of societal phenomena, 137–138, 149
Horde, primitive, 347
Hunch, 5
Hypothesis, 5, 100, 101, 112, 113; sources of, 461

Ideals, 21
Ideas, objectivity of, 17 ff.
Identification and communication, 275
Ideologies and rate of reproduction, 446; influence on demographic change, 440
Idiots, *see* mental defectives
Imaginary phenomena as real, 42
Imagination, 297, 325; as source of hypotheses, 461; objectivity of, 19 ff.
Imbalances, 5, 91; kinds of, 115
Imbeciles, *see* mental defectives
Imitation, 294, 297, 328; of other sciences, 123–126, 150, 233
"Immanent" logic of history, 237
"Immanent" perception, 220
Indeterminism, 196
Indexes, nature of, 87
Indicators, 345–346
Indifference, 284
Indifference, repulsion, and attraction, 352
Individual, and group, 162, 164–166, 171–173, 194–195; as reality, 86; defective definition of, 196; differences, 225–226; isolated, 346–347, 351
Induction-deduction, 49
Industrial equipment, obsolescence of, 419
Inertia, law of, 133–134
Infants, as a group, 365; beginning of social consciousness among, 258; vocalization of, 282
Inferiority and superiority, feeling of, 324; of populations, 446–458
Informal and formal methods, 84
Informal measurement of distance and status, 325
Informal quantitative methods, 53–54
Informal social groups, 381–382
In-groups and out-groups, 319
"Inner" phenomena, 36, 179, 220–221, 253, 281, 282, 293, 473, 476, 498
Insanity, 214–216
Insects, species of, 343
Insight, 51–52, 56, 80, 325; of the artist, 382–383
"Inspiration," 82
Instability of societal phenomena, 144–148; the effect of perspective in time and space, 147
Instincts, 104, 116, 163, 173, 205, 251, 259, 322, 477; concepts substituted for, 260, 262, 282, 284, 285
Institutional characteristics as demographic data, 411
Institutions, 179–183; and persons, 354–358; as uniform behavior, 192; diffused-symbolic, 182; interests as basis of, 411–412; meaning of, 375–

379, 411, 414; nucleated and diffused-symbolic, 182, 376–378
Instruments, importance of, 102
Integration, societal, 290 ff.; of human groups, 290–311
Intellectual curiosity and invention, 508
Intellectualism, 533; and the birth rate, 431–432
Intelligence, as a metaphysical term, 452; as a quantitative demographic characteristic, 467; definition of, 59, 84, 215, 446–458; misconception of, 468; relativity to some culture, 453–454; tests of, 447–458
Intelligent behavior, 308–309
Intelligentsia as a group, 360, 365
Interaction, 217–226, 252–253, 282; and communication, 253; as basis of social distance, 316; as criterion of groups, 360–361; as subject matter of sociology, 311; beginning of social, 349; defined, 217; illustrated, 218–219, 230, 234; importance of mathematics in describing, 79–80; mechanisms of, 173–185; of principal sectors of society, 471, 477, 492, 499–500; psychic, 253, 254
Intercommunication, 3. (*See also* communication.)
Interdependence as basis of social distance, 316
Interests, 205, 236, 251, 259, 262, 282, 288, 339, 354; as basis of ecological distribution, 481; as basis of institutions, 411–412; vested, 329
Interhuman activity, 97, 103
"Internal" and "external" phenomena in ecology, 473, 476, 498
"Internal" and "external" stimuli, 36
Internal environment, 220–221. (*See also* "inner" phenomena.)
Interpretant, 367
"Intrinsic" nature of phenomena, 251
Introspective data, 20
Intuition as source of hypotheses, 461
Invention, and individual genius, 509; and intellectual curiosity, 508; as a societal phenomenon, 507–511; as a societal process, 510–511; as a type of energy transformation, 510; as evolution and accretion, 507; conditions resulting in, 507–508; credit for, 508–509; effects of, 510; meaning of, 507–508; resistance to, 533; social, 508–509, 530; trend of, 509–510
Isolated, the, 257
Jesus, 420
Jukes, the, 225

Kallikaks, the, 225
Kantian *ding an sich*, 84
Kinship, familial, and sexual patterns, 384–386
Knowledge, as symbolized sense experience, 415–416; nature of, 8–9 ff.; non-scientific forms of, 129–130
Kwakiutl, 413

Labor, 48, 308
Laboratory methods, difficulty and possibilities of, 32–33; laboratory control, in sociology, 138–139
Lag, cultural, *see* cultural lag
Language, Arabic, 75; as frame of responses to nature, 33; as influencing ideologies, 260, 271; as instrument of inquiry, 243; as obstacle to scientific inquiry, 88; as social behavior, 178; types unsuited to science, 366; inadequacy of, 50, 308; mechanisms, importance of, 505; of data and of constructs, 37; primary group, 306–307; symbols basic to science; systems, generalized, applicable to any subject matter, 233–234
Latent and manifest patterns, 379–384, 416; in city families, 417
Law, legislative, as expectation of court action, 200
Laws, 6, 133–152; and prediction, 135–136, 141–144; and societal change, 143–144; as correlations, 136; chief defects of, 139; criticism of logistic, 464; economic, 390; generality of, 115–116; meaning of scientific, 133; multiplicity of, 136–137; obstacles to the development of, 137–142; of cultural diffusion, 513–514; of inertia, 133–134; of physics, 139–140; of population growth, 423–426; status and prospects of sociological, 142–144; tautological, 97, 133 ff.; types of, 133–137
Leadership, 290, 322
Learning in physical systems, 159, 196
Lebenschance, 329
Legislation, described by logistic curve, 513–514
Life span, 440–441
Linguistic determinants of ideologies, 260, 271
Linguistic patterns, subject matter of sociology, 178

Logic, vii, 133; and psychology, 50; non-Aristotelian, 78; symbolic, 106, 107
Logistic curve, of historical development, 513–514; of population growth, 423–426, 464

Magnitude, 67–68, 85, 86
Maladjustment, social, 213–216, 304, 523, 524
Manifest and latent patterns, 379–384, 416; in city families, 417
Man-land ratio, 478
Maps, as symbolic representations, 48, 105
Marital adjustment, prediction of, 142–143, 386
Marital status, 444–446
Martyrs, 134, 296; as conditioners of social environment, 478
Marxism, 284–285
"Material," the, 21, 255
Material and non-material culture, 525
Materialistic interpretation of life, 44
Mathematical expressions, not always translatable into folk terms, 131
Mathematical symbols, need for new, 150; in social science, 243
Mathematical techniques, importance of, 49
Matter, 34, 81, 90
Meaning, 12; as a type of classification, 22–23
Meaningless questions, 81
Measurability of societal phenomena, 137–138, 149, 289
Measurement, as a principal task of social science, 470; as comparison, 84; and convention, 330; and definition, 58–61, 84; and description of social change, 526–527; and instruments, 85; and knowing what is measured, 60, 61–65, 68; and the interpretation of historical data, 517–518; fallacious assumptions regarding, 68–74; importance of, 528–529; in economics, 388, 390; informal, 325; in laboratory experimentation, 139, 141; in the classification of groups, 363; objects and methods of, determined by what we need to know, 527; of attitudes, 87; of density, 86; of intelligence, 446–458; of social time, 521; of status and social distance, 314–323, 331; relativity of, 315–316; societal, 263–264, 271–272, 275, 279; theoretical problems of, 65–68; to verify laws, 135, 141
Measuring scales, societal, 87
Mechanics, classical and quantum, 196
Mechanisms, defined in terms of group it produces, 339; definition of, 156, 159–162, 174–175; evolution of concept of, 163; kinds of, 175–185; of language, 505; of action, interaction, and group behavior, 173–185; of group decision and control, 400–406; of individual and group behavior, 155–156, 183–184
Medical profession, socialization of, 444
Membership character, a kind of behavior, 354
Memories, 21
Mendel's laws, 225 ff.
Mendeléeff's table of atomic weights, 342
Mental character of societal phenomena, 36
Mental defectives, 213–216, 454–458; fertility of, 456–457, 468
"Mental" disorders are organic, 443
"Mental" phenomena, 284, 368–369, 404; as contrasted with "physical," 7–8, 10, 377; as movement in a societal field, 478–479, 498; in ecology, 473, 476, 477, 493–494
Mental-physical dualism, 281
Metaphysics, definition of, 40–41, 59
Methods of natural science in sociology, 99
Metricization of diagrammatic constructs, 482–483
Middletown, 383
Migration, 489–491; hypotheses regarding, 490; urban-rural, 490–492
Mind, 6, 11, 24, 29, 220, 253, 254, 255, 326–327, 341–342; as environment, 230; as mechanism, 159, 163; definition of, 369; locus of, 166–173, 188; origin of, 291–294
Mob, 184, 186, 361–362
Mohammedanism, 446
Monad, 347
Money, 396–400
Morality, 214–216
Morals, 404
Morbidity, 441–444; extent of in the United States, 443
Mores, 179–180, 182, 192
Morons, *see* mental defectives
Mortality, 440–442; principal causes of, 441–442
Motion, 203, 311, 503; defined, 235
Motion pictures in social research, 33

Motivation in competition and cooperation, 285–286
Motives, 11, 221–222, 281, 282, 285–286, 288; as social forces, 236
Movement, 503
Musical symbols, 243
Myth, as environment, 228

Nation, 184
National Health Survey, 443, 446
"Natural" and "artificial" units, 68–69
Natural area, *see* region
"Natural" as assumed characteristic of some data only, 7–8, 10
Natural law, 144
Natural science, and technic, 335; as source of hypotheses, 123; imitation of, 123–126; methods applicable to social science, viii; theory of human society, 103–117
Natural science theory, requirements of, 115–117
Natural selection, 429–430
"Nature" of things, 84
Naziism, 446
Need, 34 ff., 299; and want as basis for selective observation, 256
Non-Aristotelian logics, 78
Nonethical nature of science, 29–31, 308, 368
Nonmetrical representation of social phenomena, 478
Nonscientific inquiry, value of, 129
Nonsociological criteria of social classification, 319, 361
Nonsociological definitions of social phenomena, 327
Normal, 5, 141, 233, 239; as the usual, 209; confused with the desirable, 213, 532; meaning of, 213–216; 532
Nucleated institutions, 376–378
Nurture, 223–226

Object, meaning of, 202
Objectification of verbal structures, 81
Objective criteria of classification of groups, 347
Objective phenomena, 311, 312, 326–327
Objective reality, 17
Objective relativism, 242
Objectivity, and subjectivity, 17 ff., 39, 137–138, 149, 178, 293, 524; as a manner of responding, 10; degrees of, 22; dependence on verification, 18; dependence on verifiability and communicability, 25; of demographic data, 422; of ends, 35; of societal phenomena, 17 ff.; relativity of, 19
Observation, selective, 256
Obsolescence of industrial equipment, 419
Occupational status as demographic datum, 459
Operational definitions, 54–56, 58, 60, 67–68, 251, 330, 516; examples of, 235–236
Operational methods, 83
Operational point of view, 7
Operational terms, 81, 136; limitations of, 81
Operationalism, 151–152
Operations, as definition, 26
Opinion, public, *see* public opinion
Opposition, 264
"Optimum," as a scientific category, 522
Orbit of earth, as postulate, 16
Order, defined, 244, 245
Organ and organism, meaning of, 168–170; and culture pattern, 169
Organic and functional disorders, 443
Organic concept of the region, 476
Organic plurals, types of, 343–345
Organism and community, 197
Organism-environment, 217–223, 231, 234, 239–240
Organismic view of society, 168–169, 198; ill repute due to antiquated definition, 169
Original nature, 223–226
Out-groups and in-groups, 319

Pair, 347
Parallel axiom, 50
Parasitism, 344
Parsimony, principle of, 13, 35, 91, 116, 135, 185, 207, 462, 463
Part, meaning of, 23; and wholes, 24
Part-whole relationship, 43, 79, 130, 164–165, 193
Past and future as present stimuli, 314
Pathology, 522, 523, 524; social, 213–216
Patterns, of city families, 417; composition of family, 416; defined in opposite ways, 385; economic, 386–400; familial, sexual, and kinship, 384–386; interpreted in disparate ways, 445; latent and manifest, 379–384, 416; plurality, 355–357; political (*see* political patterns), structural, and functional, 415; religious and recreational, 406–410; structural and functional, 415

"Percept" and "concept," 39
Perception, immanent, 220
Permutations and combinations in groups, 352–354, 372
Person, the, 347
Personalities and social change, 506; in interpretation of social movements, 307–308
Personality, as intersecting membership-characteristics in groups, 356; inadequate definition of, 196; traits as demographic data, 461
Persons and institutions, 354–358
Philosopher, as source of hypotheses, 461
Philosophical terminology, 106
Philosophies, incompatible, vii
Philosophy, as generalizations of experience, 245; of life as a habit-system, 408
Phlogiston, 10
"Physical," as contrasted with "social," 31 ff., 38; with psychic, 39; with mental, 377; as an assumed characteristic of some data, 7–8, 10
Physical and social phenomena compared, 145–148; contrasted, 79, 80
Physical and social sciences, 135; disparity between, vii, 525–526
Physiology, not basic to sociology, 174
Pictures ("talkies") in social research, 33
Place, as a sector of society, 337, 346
Planning, necessity of prediction for, 421–422; social, 504
Platonic "essence," 84
Plurality patterns, 355–357; perceptibility of, 36
Plurels, classification of, 339–343; defined, 340, 344–345; organic, 343–345; types of, 339–374
Political patterns, 400–406
Political problems mainly technological, 401–402
Political regimes and social change, 506
Political science, defined, 402 ff., 410
Poor relief, geographic distribution of, 486
Population, age distribution of, 435–440; as sector of society, 421–468; demographic constitution of, 432–446; laws of growth of, 423–426; marital status of, 444–446; morbidity of, 441–444; mortality of, 440–441; optimum, 450; quality of, 446–458, 467; sex ratio of, 432, 435
Positional relationships, 104
Positivism, 19, 35, 42
Postulates, vii, 73, 135, 148; and axioms, 151–152; nature of, 3–4; of social science, Chaps. 1, 5, 8 ff.
Poverty, 418; relativity of, 390–393
Power, as a fundamental concept in social science, 471–472; defined, 236
Prediction, 97, 462; as basis for planning, 421–422; as means of relieving tension, 421; invention as barometer of, 527; of change, 511, 517; of marital adjustment, 386; scientific, 52; societal, 135–136, 141–144
Prestige, 290, 316
Prices, 396–400
Price system, 398–399, 419
Primary group, 294; attitudes and their expansion, 299–311; defined, 310–311, 327–328; ideals, 300; language, 77, 306–307; not necessarily face-to-face, 310–311; secondary, tertiary, etc., 316–317, 319–321
Primary, secondary, tertiary, etc., groups, 364
Principles, 6
Prisoners, 348
Probability, 152, 161, 162, 259, 309; of achievement, as criterion of status, 312, 322; of court action, as law, 200
Process, meaning of, 280–281
Processes, as gradations, 247, 252, 261, 265, 267, 275, 279; classifications of, 246–252; defined by statistical moments, 515; methods of defining, 265–266; mixed, 267–268, 269–270; societal, 244 ff.
Processes and groups, defined in terms of degrees of communication, 320
Productive capacity, estimates of, 394, 418–419
Professionalization of the public service, 406
"Progress," 276–277; and cultural lag, 522–523; statistical meaning of, 523–524; nonethical implications of, 523
Proletariat, 308; as a group, 360, 365, 366
Protons, 203
Proverbs, as generalizations, 64
Psychiatry, 162
Psychic phenomena, 281, 282, 285–286, 293; as movement in a societal field, 478, 479; in ecology, 473–476, 493–494; interaction, 253, 354, 368–369
"Psychical," nature of society, 326–327
Psychoanalysis, 162, 284–285
Psychological analysis, 285–286
Psychological and sociological fields, 130
Psychology, 116; and logic, 50; as cul-

tural ecology, 477, 478; gestalt, *see* gestalt psychology; growing objectivity of, 479; not basic to sociology, 128, 174
Public, the, 167, 196, 361–362; definition of, 186–187
Public administration, 400–406
Public opinion, 155, 165–166, 172; as a general factor in group behavior mechanisms, 185–192; changes in, 189–191; fickleness of, 202; in terms of probability of behavior, 189; measurement of, 189–190; not necessarily unanimous, 187-189; relation to acquiescence, 188; relative to specific situations, 191; superiority of, 191–192
Public relief, ecology of, 486
Pulsations, cultural, 211
Purpose, 42, 221–222, 251, 282, 339, 345, 500

Qualitative and quantitative, 131, 150, 153; aspects of time, 532; not inherent characteristics of data, 459
Qualitative analysis, 81
Qualitative characteristics in process of quantification, 458–459
Qualitative measures, 61 ff.
Quality and quantity, 69–70, 76, 83, 366, 467
Quality of population, 446–458, 467; quantification of, 458–459
Quanta, meaning of, 125, 128
Quantification, 45 ff.; and Gestalt's psychology, 57; possibility of, 118
Quantitative and qualitative, 131, 150, 153, 459, 532
Quantitative methods, 53; importance of informal, 53–54
Quantitative nature, of all generalization, 54-58; of demographic data, 422
Quantitative study of cultures, 412–415, 420
Quantitative symbols and methods, 50–51
Quantity, and magnitude distinguished, 86; and quality, 69–70, 76, 83, 366, 467

Radicalism, measurement of, 72
Random observation, value of, 129
Rank, 312
Rate, defined, 235
Reality, 25, 33, 38, 39, 40, 69, 89, 105, 109, 116, 203, 212, 251, 278, 279, 283–284, 291, 311, 341–342, 366, 376, 377, 380–381, 469, 474, 493, 523; and the individual, 86; as a bio-social problem, 41; inferential nature of, 21; nature of, 8–9 ff.; of atoms, electrons, etc., 194–195; of group concepts, 155, 162, 164, 165, 166, 167, 170, 189, 193; of institutions, 415; relativity of, 78
"Reality" and "existence," Einstein's and Infeld's view of, 16; relativity and meaning of, 14 ff., 17
Recreation, religion as, 419-420
Recreational activities and birth rate, 431–432
Recreational patterns, 406–410; defined, 410
Reductionism, 38, 85–86, 128, 173–174, 287
Reflexes, 166, 176–177
Reform, 477, 504
Region, 104, 107; sociological, 130
Regions, as fields of force emphasizing geographic factor, 472; as frames of reference, 89; definition of ecological, 472–473; horizontal and vertical, 475; types of, 475–479
Reification of words, 84, 104, 523
Relational thinking, 121
Relationships, symbolic representation of, 109–115
Relativism, objective, 242
Relief, ecology of, 486
Religion, and rate of reproduction, 446
Religious patterns, 406–410
Repeatability of scientific experiments, 85
Reproduction, and age, 425; and marital status, 444–446; and morbidity, 441–444; and mortality, 440–441; and sex ratio, 432–435; conditions influencing rates of, 429–446; effect of religious and other ideologies on, 446; effect of recreational opportunities on, 431–432; effect of wealth on, 430–431; rates of human, 423–429; space effects on, 429–430
Repulsion and attraction of electrons and protons, 203, 352
Repulsion-attraction, 252–253, 257, 258, 259, 321, 352; in physical systems, 267–268; in mating, 467
Repulsion, indifference, and attraction, 352
Research, appraisal of, 101
Resettlement Administration, 351, 491
Residues, 116
Responses, anticipatory, 245; defined, 217; resulting from tensions, 339; selective, 217, 339

Response-stimulus, 231, 234, 239–240; as scientific fiction, 240
Revolution, 504
Rhythms, 211
Rural and urban, definition of, 500

Scales, 61 ff., 70–72, 330–332; and units for definition of groups, 364–365
Schizoid culture, 77
Schizoid personalities, 355
Schizophrenia, social, 300, 305
Science, and art, 368, 383; and communication, 277; and conflict, 277; and ethics, 527–528; and historical interpretation, 517–518; and practical affairs, 368; and technic, 335; and "the" classics, 533; and social problems, 533–534; and "truth," 81; as a fiction, 299; as a method, 211; as an endless quest, 211; as an influence determining ends and means, 527–528; as an influence determining wants, 450; as a sociological subject, 5; as mental hygiene, 7, 76–77, 340, 368, 421; as the most efficient instrument of adjustment, 527, 534; as technic of adjustment, 5 ff.; content of, 6; dependent on technology, ix, 82, 234; dependent on special language, 366; difficulty of sociological, 114–115; distinguished from other forms of knowledge, 57; evolution of symbols in, 75; imitation of, in sociology, 123–126; natural and social, 417; nonethical nature of, 29–31, 450, 451, 456; objectives of, 103; of economics, *see* economic science; origin and classification of, 358–359; political, 402 ff., 410; postulates of, 8 ff.; role of symbols in, 45–50; social and physical contrasted, 47 ff. (*see also* "physical" as contrasted with "social"); social, handicapped by anthropomorphic vocabulary, 163–164; subject matter of, 230; taking over magical functions of art, 410; the faith of, 463; unity of, 44, 128; classification of, 92–98
Scientific concepts, requirements of, 245
Scientific laws, and prediction, 135–136; as correlations, 136; defined, 133; generality of, 115–116; of physics, 139–140; tautological, 133 ff.; types of, 133–137
Scientific methods not the only methods, 81–82
Scientific systems, steps in construction of, 113–114, 116
Scientific theory, need of, 100; lack of, 101, 102; requirements of, x, 73–74, 528–529
Scientists and communication, 277
Secondary groups, 310–311; and tertiary, etc., 316–317, 319–321, 327–328
Secondary group societies, inapplicability of primary group concepts to, 47, 48
Sectors of society, 337, 345–346; interaction of, 471, 499–500
Segregation, ecological, 485–487, 502
Selective observation, 256
Selective responses, 217, 339, 345; nature of, 89–90
Self, as objective experience, 293; origin of, 291–294
Self-consciousness, beginning of, 258; growth of, 291–294
Selfishness, 296–297
Semiosis, 44, 367
Sense, common, 25
Sense experience, symbolized, 415–416
Senses, unreliability of, 64
Sensorium, social, 170
Sensory evidence, 20
Sensory experience and ultimate datum, 38
Sex ratio, 432–435; and geographic areas, 433; and occupational opportunities, 433; and war, 434; and marriage rate, 434; and cultural factors, 434–435
Sexual, familial, and kinship patterns, 384–386
Sexual selection, 467
Sickness, *see* morbidity
Signs, 44; theory of, 467
Sin, as a cause, 442
Situation, 217, 250, 260, 314; as a field of force, 104, 472
Skill, meaning of, 84
"Social," as a category, 21, 29
Social "action," and science, 534
Social and astronomic time, 518–521
"Social" and "physical," 31, 36, 37, 38; contrasted, 7–8, 10, 38, 79, 80; compared, 145–148. (*See also* "physical.")
Social and physical sciences, 135; contrasted, 47 ff.
Social bonds, intensity of, 320
Social change, 503–534; and centralized government, 506; and duration, velocity, and acceleration, 521; and persons and political regimes, 506; generalization regarding, 514–516; in terms of statistical form rather than content, 516; technology and, 504–507; theories of, 511–518

Social consciousness, 258
Social control, 414, 504
Social disorganization, 213–216
Social distance, and status, 311–323, 330, 331; instruments for measurement of, 314–323, 325, 330–332, 358; margin, 315; tests, 318–319; understanding and sympathy as measures of, 314, 330; vertical, 499
Social energetics, 236
Social expansiveness as a demographic datum, 459
Social, forces, 236; pathology, 213–216; planning, 504; phenomena, *see* societal phenomena
"Social" problems contrasted with sociological, 29 ff.
Social processes defined by statistical moments, 515
Social psychology as the ecology of symbolic behavior, 477, 478; growing objectivity of, 479
Social research, appraisal of, 101
Social science and natural science, alleged differences between, 417; effect of technology on, 506
Social science, handicapped by anthropomorphic vocabulary, 164
Social Science Research Council, 88
Social sciences, undeveloped state of, vii
Social space, 131, 263; defined, 330, 477
Social stimuli, volume of, 357, 358
Socialism, 399–400
Socialization, 290–299; of the medical profession, 444; too broad or too narrow, 300–311
Sociation, 256, 257, 259, 260, 263, 284; forms of, definable in terms of degree, 265, 267
Societal change, theories regarding, 511–518. (*See also* social change.)
Societal contact, 253, 276; distinguished from communication, 283, 289
Societal integration, 290 ff.
Societal measurement, 65–68, 263–264, 271–272, 275. (*See also* measurement.)
Societal phenomena, complexity of, 75–76; instability of, 144–148; objectivity of, 17 ff.; tangibility of, 17 ff.; visibility of, 17 ff.
Societal processes, 244 ff.; as gradations, 247, 252, 261, 265, 267, 275, 279; classifications of, 246–252; methods of defining, 265–266; mixed, 267–268, 269–270
"Societal," reasons for using term, 4
Societal space, 311; in ecology, 477
Societal tension, 111, 272–274
Society and individual, 162, 164–166, 171–173
Society, as a type of group, 368–369; natural science theory of, 103–117; psychical nature of, 326–327
Socio-economic status, 318; as demographic datum, 459–460; measurement of, 61–63
Sociography, 107
Sociological and psychological fields, 130
Sociological laws, 133–152; and laws of physics, 139–140; and prediction, 135–136, 141–144; and societal change, 143–144; as correlations, 136; chief defect of, 139; multiplicity of, 136–137; obstacles to development of, 137–142; proverbs as, 136–137; tautological, 133 ff.; status and prospects of, 142–144; types of, 133–137
Sociological problems, contrasted with "social," 29 ff.
Sociological science, possibility of, 118
Sociological theory, lack of, 101, 102; practical applications of, 353–354; requirements of, 100
Sociology, 155; as science of behavior common to all social sciences, 358; as synthesis, 96–97, 231; concepts of, 245 ff.; concerned with symbolic interaction, 311; definition of, 95–97; field of, 95–97, 230, 516; need of technical methods in, 150; units of, 347
Socius, 347
Soul, 8, 24, 86
Sovereignty, 401
Space, 81; defined, 235; geographic and nongeographic, 104–109; societal, 263, 311, 330. (*See also* social space.)
Space effects on population reproduction, 429–430
Spatial aspects of society, 469–502
Spatial constructs, 121
Specialization, 132; ecological, 480, 481
Spiritual, 21, 29, 31; as contrasted with physical, 7–8, 10
"Spiritual" phenomena in ecology, 473, 476, 493–494; as movement in a societal field, 478–479
Stability of natural as compared with social science, 417
Stability of "physical" phenomena, 144–148; the effect of perspective in time and place, 147

Standards of living, 110, 418; relativity of, 390–393
State, the, 170, 194–195, 196, 361, 381, 400–406; as a classification of people, 376; as a political unit, 400–406
Statistical methods, 53; and case records, 49, 162; as substitutes for experimental controls, 138–139, 141
Status, 203, 290 ff., 263, 311–323, 330, 499; always relative to specific criteria, 313; and prestige, 316; as a behavior relationship, 312; as probability of attainment of coveted goals, 312, 322; conventional criteria of, 322, 323–324, 331; relationship, 264; socio-economic, 62
Status-fixing behavior, 312
Steam engine, social effects of, 231–232
S-Theory, 117
Stimuli, volume of, 357, 358
Stimulus-response, 231, 234, 239–240; as scientific fiction, 240
Straw votes, 306
Striving, 34 ff.
Structure and function, 49, 339; illustrated, 415
Structure, societal, 356, 358
Subjective and objective, 137–138, 149, 293, 311, 326–327, 524. (*See also* objective.)
Subjective, meaning of, 6, 10
"Subjective" nature of all data, 20
Subject matter, classifiable under several sciences, 230; defined, 32; not intrinsically part of one science rather than another, 129
Subjugation, 264, 265
Subnormals, 214–216
Subordination and dominance in communities, 482
Subordination-domination, 317, 311–323, 324
Subsistence, minimum requirements of, 418
Substantial existence, 283–284
Succession, ecological, 485–488
Superiority and inferiority feeling, 324
Superiority and inferiority of populations, 446–458
Supernormals, 214–216
Superorganic, 155
Superstition as environment, 228
Symbiosis, 344, 493
Symbiotic relationship, 316
Symbolic behavior, 45 ff., 179, 253; ecology of, 477; mysticism toward, 479
Symbolic devices and powers of discrimination, 530
Symbolic interaction, *see* interaction
Symbolic logic, 106, 107
Symbolic processes, 36
Symbolic representation, of communities, 105; of dynamic relationships, 109–115
Symbolic substitution, levels of, 180
Symbols, all data in form of, 121-122; importance of written, 122; as instruments of inquiry, 243; confused with referents, 397–400; dependence of scientific advance on, 31; representing responses, 9; role of, in science, 45–50
Sympathy, 274, 283, 294, 327; and altruism, 296–297; as a measure of social distance, 314
Synthesis, 290; and analysis in explanation, 128
Systems, closed, 209–210, 260, 262, 472; as fictions, 127; of sociology, 112; physico-chemical, 126–127; steps in construction of, 113–114

Taboo, objectivity of, 17 ff.
Tact, 303
Tangibility of societal phenomena, 17 ff., 33, 130
Tautological laws, value of, 134–135
Tautological principles, function of, 97
Technical equipment, necessary in science, ix, 13–14, 82, 335
Technocracy, 419
Technological development, makes subjective data objective, 20; necessary for advance of social science, ix, 150
Technology, and centralization of government, 506; and change, 504–507; dependence of science on, ix, 102, 234; ecological aspects of, 471, 476, 477; effecting the social sciences, 506
Temporal aspects of society, 503–534
Tension, 5, 128; determining selective responses, 89, 91; economic, 390, 392–393; intellectual, 26, 77; societal, 111, 272–274; departures from the usual, 397; resulting from unpredictability, 421
Tests, of intelligence, 59, 446–458; social distance, 314 ff., 321, 331–332
Theological survivals, 259–260
Theology as frame of reference, viii, 27–28
Theories, tentative nature of, 529
Theory, practical applications of, 353–354; scientific, 100; lack of, 101, 102;

requirements of natural scientific, 115–117
Thinking, 19; defined, 167
Thought, feeling, etc., as contrasted with behavior, 377
Thoughts, influenced by environment, 232
Thoughtways, as barriers to production, 418–419
Time, 81, 337, 346; and duration, velocity, and acceleration, 521; and tempo, 520; as an aspect of society, 492; as a sector of society, 503–534; biological, 519; defined, 235, 503; operational, 531; perspective in symbolic representations, 516–517; quantitative and qualitative aspects of, 532; social and astronomic, 518–521, 531–532
Time-space, defined, 235
Todas, 435
Topological constructs, 105 ff., 478, 482
Topology, 131
Totalitarianism and organismic view, 170
Traditions, 182; as environment, 229–230
Transformation of energy, 203, 206–207; and technology, 206; defined, 205; economy in, 206; social results of changes in, 231–232. (*See also* energy transformation.)
Transportation, *see* communication
Travel, *see* communication
Triad, the, 349
Trial-and-error, 7
Tropisms, 166, 175–176
Truancy, ecology of, 484
"Truth," viii, 14, 15, 16, 26, 27, 28, 29, 34, 98, 306; and science, 81
Two-point variables in demographic data, crudeness of, 467
Types, function of, 462
Types of attraction-repulsion patterns, 350–351; of organic plurels, 343–345; of regions, 475–479

Understanding, 4, 6, 7, 51–52, 260–296; and intimacy, as measures of social distance, 314; as a mystical word, 82; as a technic, 81; meaning of, 80
Unified science, 44, 128
United States Resettlement Administration, 491
Units, "artificial" and "natural," 68–69; as constructs of convenience, 527; never part of what is measured, 85; of sociology, 347; unique in different sciences, 234
Universe of discourse, 26 ff., 89 ff.; determination of, 27–28
Urban and rural, definition, 500
Urban patterns, 481–484; gradients of, 481 ff.
Utilitarian test of theoretical constructs, viii, 3–4, 15, 27–29

Values, 11, 21, 288, 402, 524–525; defined in terms of tension, 272–274
Variable and function, 220
Velocity, defined, 236; societal, 521
Verification, 52, 112, 125, 151–152
Vested interests, 45, 329
Vice as a cause, 442
Visibility of societal phenomena, 17 ff., 33, 36
Vocabulary, sociological, 245; need of standardization of, 363
Vocalization of infants, 282
Voodooism, viii
Vote, as index to opinion, 201

Wants, 299; and need as basis of selective observation, 256
War, causes of, 289
Wealth and fertility, 424–426, 430, 431
Web of life, 344
"We-feeling," 316; and communication, 317, 327
Whole-part relationship, 43, 79, 130, 164–165, 193
"Wholes," 24, 89
Will, 11, 220, 222, 391, 392, 425; as a cause, 442; in ecology, 474; in mechanics, 161, 163, 164, 167, 188, 189
Wishes, 116, 201, 205, 322; in ecology, 474
Word systems, 252
Words, ambiguity of, 153; antiquity of, 278; as barriers to community adjustments, 47; as barriers to scientific inquiry, 47; as data, 37; as entities, 22; as guides to conduct, 46 ff.; as instruments of inquiry, 243; as objective phenomena, 10 ff.; as vested interests, 45; changing meaning of, 1; confusion of, 74; "correct" or "true" meaning of, 59; in the social sciences, 75; invented to serve needs, 278; meaning of, 11; primitive, 47; reification of, 69, 84, 88, 278, 523
Work, 235; defined, 236, 337

Zenos paradox, 46, 77–78