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A NATURAL SCIENCE OF SOCIETY

A NATURAL SCIENCE
OF SOCIETY

by A. R. Radcliffe-Brown

WITH A FOREWORD BY FRED EGGAN

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Foreword

THE MATERIAL HERE PRESENTED represents a recorded discussion given before a faculty seminar in the Social Science Division of the University of Chicago in the spring of 1937 by the late Professor A. R. Radcliffe-Brown. This volume has been long awaited, and I venture to predict that it will have an important influence on the development of social science, both in this country and elsewhere.

Professor Radcliffe-Brown is here concerned with the possibility of a natural science of human societies and the characteristics that such a theoretical natural science might have. He believes there can be only one such social science but that it is not yet in existence. Its development depends on the systematic comparison of societies and the improvement of our methods of observation, description and analysis. Since these observations were made in 1937, and not modified subsequently, they offer an opportunity to test his views against the developments in the field of social science over two decades.

One of the innovations introduced by Beardsley Ruml, as Dean of the newly organized Division of the Social Sciences at the University of Chicago, was a faculty seminar devoted to various problems in the social sciences. Professor Mortimer Adler was an active participant and had defended the thesis that there was only one possible social science and its name was psychology. Radcliffe-Brown listened with interest and asked to have an opportunity to reply.

For those of us who were there in the spring of 1937 it

was a memorable occasion. Radcliffe-Brown had come to the University of Chicago in 1931 as Visiting Professor of Anthropology and had remained as a distinguished scholar. In his course on "The Comparative Science of Culture," and in advanced seminars, he had developed and clarified his ideas as to the nature of society and culture and had begun to put them in a wider framework. Shortly before the seminar he had accepted the newly created Chair of the newly created Institute of Social Anthropology at Oxford, so that the occasion had additional significance for all of us.

The seminar was presented in Radcliffe-Brown's brilliant style without manuscript or even notes, beyond a mimeographed set of propositions. Fortunately, Mrs. Sylvia Beyer Dolores, then Professor W. L. Warner's secretary, took down the text day by day and transcribed it in some 152 pages of manuscript. Radcliffe-Brown had intended to revise it for publication, but the onset of the war and his later ill health interfered. We often urged that he let us publish it "as is," but except for a mimeographed edition of limited circulation, he had asked us to wait until he could rewrite it.

An appreciation of some aspects of the seminar discussion depends on a knowledge of the previous seminars. Professor Mortimer Adler had laid great stress on Aristotelian propositions in his discussions of social science. Hence Radcliffe-Brown went back to Heraclitus for his beginnings, incidentally leading Adler to conclude that starting with a particular philosopher was largely irrelevant. Radcliffe-Brown, with his early contacts with Whitehead and Rivers at Cambridge, was one of the first social scientists with a modern philosophical background—and philosophy occupies an important place in the seminar discussion.

Other sections of the seminar refer to earlier presentations by University of Chicago economists and other social scientists; and many of Radcliffe-Brown's examples are drawn from contemporary university or city life. It is these local references that he would probably have omitted in favor of more general ones, but they were quite appropriate at the time and we have let them stand.

For those who know Radcliffe-Brown only by his technical anthropological writings the present volume may contain many pleasant surprises. Particularly important is his discussion of the social system and its characteristics, and his challenging conclusion that no science of *culture* is possible, since culture can only be studied as a characteristic of a social system. Of interest, also, are his views on economics and its relation to the social sciences, and his discussion of comparative epistemology and cosmology. His reflections on functional consistency in its various orders, and his discussion of the structural principles of social systems are still in advance of most current thinking on these subjects. But almost every page has interesting suggestions or provocative insights.

We are indebted to Professor E. E. Evans-Pritchard, as literary executor for Professor Radcliffe-Brown, for permission to publish these seminar proceedings, and to Mrs. Sylvia Beyer Dolores for her excellent transcription. Professor Sol Tax has arranged for their publication. In accordance with Professor Evans-Pritchard's request royalties are placed in a special fund for research and student aid.

We append the outline which Radcliffe-Brown prepared and distributed to the seminar participants, since it presents his argument in brief compass and in somewhat different perspective than does the seminar discussion. Radcliffe-

Brown was fond of saying that it takes twenty to thirty years for new ideas to be appreciated. Today there is far more interest in the concepts and methods here developed than there was in 1937, and Radcliffe-Brown's relatively brief statement can be compared with more elaborate formulations, both from students of philosophy and from various social scientists in this country and elsewhere. He would have preferred to present his ideas in more polished fashion, but interestingly enough more of his personality is reflected here than in his formal writings. Here is the essential Radcliffe-Brown.

FRED EGGAN

University of Chicago

May 15, 1956

PART I

The Problem; The Theses to Be Maintained; The Nature of Science

THE PROBLEM with which we are to be concerned is that of the possibility of a natural science of human societies, that is, of applying to the phenomena of the social life of mankind—its moral, religious, juridical, political, and economic institutions, and the arts and sciences, and language—the same logical methods that are applied in the physical and biological sciences, and by that means to attain to scientifically exact formulations of significant and probable generalizations. The possibility of a natural science of society is still questioned by some, and by a few is even denied. On the other hand, there are some who would say such a science is already in existence. Others, again, hold or seem to hold that the social life of mankind is the subject, not of a single science, but of a number of separate sciences—economics, political science, jurisprudence as a science of law, sociology, criminology, comparative religion, et cetera. Some writers, if one may judge by their works, seem to think that any scientific study of society must be some sort of psychology—social psychology or collective psychology.

The theses to be maintained here are that a theoretical science of human society is possible; that there can be only one such science, although certain of the fields within the science may be capable of relatively separate treatment, as, for example, language; that it must be just as distinct from psychology as physiology is from chemistry; that such a

science does not yet exist in its elementary beginnings; that the method it must pursue is that of the systematic comparison of societies of diverse types; and that the development of the science therefore depends at this time on the gradual improvement of the comparative method and its refinement as an instrument of analysis. This will require: (a) the continuous improvement of our methods of observing and describing societies; (b) the elaboration and exact definition of the fundamental concepts required for the description, classification and analysis of social phenomena; and (c) the development of a systematic classification of types of societies.

If such a science is possible, it is of course still impossible to foresee what its future problems may be. However, it will be maintained that it is possible at this time by suitable method to formulate some of the major problems of such a science.

The first step in our argument will have to be to define, as briefly as possible, what is meant by a theoretical natural science. This can be done by an examination of the natural sciences which are already in existence. In the widest use of the term, the word "science" simply means "knowledge," but it is commonly used in a much more limited sense to mean knowledge only of certain kinds. In this sense, natural science is characteristic of modern civilization, having had its first inception in ancient Greece and its main development only since the beginning of the seventeenth century.

The word "science" in this sense refers to three things: (1) *an activity*, namely, that of the scientists who are engaged in seeking for knowledge for its own sake and often irrespective of any practical results which may follow from their discoveries; (2) *a method*, that we speak of as scientific

method; (3) *a body of knowledge* existing at a certain moment of time. In the last sense, of course, science is constantly changing.

Dismissing metaphysical knowledge as being unverifiable and putting aside for the moment a discussion of the function of philosophy for science, we may say that all other knowledge is or can be expressed in propositions of two kinds, distinguished by Hume as referring on the one hand to "matters of fact," and on the other to "relations of ideas." What may be called "abstract science," by which is meant logic and mathematics taken together, consists of propositions of the second kind, which do not refer to matters of fact, that is, to phenomenal reality. The view adopted here is that of many modern thinkers, that logic and mathematics are not two separate subjects, but are one. Mathematics is sometimes thought of as dealing always with number and quantity, but it has been shown that this metrical mathematics is only a very small part of the whole field of mathematics, although it is the part which has been most completely developed. The propositions of abstract science, that is, of logic and mathematics, are regarded as certain.

The other kinds of propositions are those of matters of fact, that is, of phenomena. Any proposition which has a low degree of probability is called a hypothesis. When a proposition is thought of as having a very high degree of probability, it is called a fact. Examples of such propositions are, "I think I see a cow," or "I see a cow."

Let us consider three propositions. "It rained yesterday." If somebody tells me this, I can either accept it as probable for the reason that he is a reliable witness, or I can remember back to yesterday, or I can question a number of other people who have been able to make observations.—"It is raining

now." This may be easily verified by looking out of the window.—"It is going to rain tomorrow." The only possible way of verifying this is to wait until tomorrow comes.

The proposition of natural science, then, is either an assertion or denial which refers in some way or another to phenomenal reality. The probability of the proposition is always dependent in some way upon its verification by observation.

Propositions about matters of fact are of two kinds—particular and general. Particular propositions are statements of particular events: "Caesar conquered Gaul," "Lewis organized the C.I.O." History deals with propositions of this kind and with the methods of verifying them. In this sense a biography and a newspaper are also history.

The other kind are general propositions, and these are laws of nature. The standard form for stating such a law of nature is, "Any instance of X is also an instance of Y ," thus, "water expands when it freezes," that is, "every instance of water freezing is an instance of expansion." But we have also to recognize statistical laws, of which the general form is, "If n is a sufficiently large number, then in m instances of X , n/m will also be instances of Y ."

Natural science, which is thus distinguished from abstract science, is concerned solely with a systematic investigation of the laws of nature.

Natural laws give us expectability and are therefore essential for action. Intelligent action is always based on generalizations, explicit or implicit. "Explicit" means expressed in words. The generalizations on which animals act are never explicit; the generalizations of human beings sometimes are. In other words, intelligence is the ability to learn from experience, to frame general hypotheses based on experience

and apply them to particular instances. The fundamental postulate of science is that reality is intelligible, and this assumption is what underlies the scientific notion of natural law. Throughout the whole of human history men have formulated common-sense generalizations as to laws of nature.

The generalizations of natural science differ from those of common sense in several ways. First, the generalizations of common sense are usually made in direct relation to practical problems, while those of natural science are the result of the systematic studies of persons seeking knowledge for its own sake. Secondly, the observations on which the generalizations of common sense are based are very rarely systematically made, whereas the essence of scientific method is the testing of the probability of hypotheses by careful and systematic observation of relevant events or occurrences. Further, the propositions of a science, as distinct from the generalizations of common sense, are logically connected one with another.

The Relation of Theory to Practice, of Theoretical Science to Practical Science, and of Science to Philosophy

WE CAN DIFFERENTIATE three kinds of practice. The first is what we may call common-sense practice, which is what we manage our daily lives by, all of us. Secondly, there is special empirical practice, such as that which formerly existed in medicine, and is known as empiricism, gradually being replaced by scientific practice. Such empirical practice is based on generalizations drawn from special experience by a method which is sometimes called that of trial and error and may be regarded as intermediate between common-sense practice and the third kind, which is true scientific practice. The latter is based on the systematic generalizations of theoretical science. An example is modern scientific practice in medicine.

Thus we have an interrelation of four things: abstract science, consisting of mathematics and logic regarded as a single subject; secondly, pure natural science or theoretical natural science, such as the sciences of mechanics, of chemistry, physiology, psychology; thirdly, applied sciences, such as engineering and medicine, et cetera; and fourthly, the arts, such as the art of bridge-building, the art of therapy, the art of education.

There is a close relationship between abstract science and theoretical natural science. The natural scientist uses, and must use, logic and mathematics in the elaboration of

his hypotheses and in their examination. Advances in natural science, therefore, often depend upon advances in abstract science. On the other hand, a problem in natural science may be the cause of developments in mathematics. An example is to be found in Newton's work, when, in order to solve certain problems in mechanics, he found it necessary to invent the differential calculus.

There is also a very close relationship between theoretical natural science and applied natural science. Applied science is still science. In other words, it consists of propositions, but it consists essentially in the application of the knowledge which belongs to theoretical science to the practical problems which are met with in the practice of the arts. Thus, physiology is a theoretic science; medicine, which makes use of the knowledge provided by physiology, by bacteriology, by pathology, et cetera, in the treatment of disease, is an applied science. The actual treatment of disease itself, that is, therapy, is an art—the art of medicine.

Applied science very obviously depends upon theoretical science, but on the other hand, applied science may suggest problems to the theoretic scientist, problems which arise out of the practice of the science and which can be solved only by the method of pure science. To the extent which applied science is not based on theoretic science, it can be only empirical.

The relations of philosophy to science are two. One is the historical and functional relation between them, and the

<i>Abstract Science</i>	<i>Pure Natural Science</i>	<i>Applied Science</i>	<i>Art</i>
Mathematics	Mechanics	Engineering	Bridge-building
Logic	Physiology	Medicine	Therapy
Philosophy of Science	Psychology	Psychiatry	Psychotherapy
		Educational Psychology	Education

other the logical relation. In every society, including primitive ones, there are found beliefs, or propositions, concerning the nature of reality, of knowledge, of the universe, and ethical and aesthetic propositions and judgments of value. Philosophy deals with all these propositions. In a homogeneous society we find only one philosophy; in a heterogeneous society competing philosophies engage in the continuous revision of cosmologies. The investigation of the fundamental relation between these cosmologies and the total structure of the societies which they characterize, which may be called Comparative Epistemology, is the concern of social science.

With respect to the logical relationship between science and philosophy, we must distinguish between two activities: that of formulating concepts and that of applying them to phenomenal reality. Where, precisely, in the engagement of these two activities the scientist begins and the philosopher leaves off is not significant. In so far as the scientist is incapable of philosophical speculation, he will make little contribution to the advancement of his science; and in the measure in which the philosopher fails in the logic required in science, his contributions lack significance for the advancement of knowledge.

There is a reciprocal action between the philosophy of science and science itself. Developments in science must lead inevitably to modifications in our theory or philosophy of scientific method; and, on the other hand, science rests always on a philosophy of science. Developments in the philosophy of science may lead to new conceptions of the problems of our science.

A specific task of the philosophy of science is to make

more explicit the fundamental concepts which underlie our scientific beliefs. In this task it will omit judgments of value, ethical and aesthetic propositions. Its concern will be with the *a priori* assumptions of our scientific beliefs.

Fundamental Postulates of Science

The Nature of Reality

CERTAIN ARISTOTELIAN PRINCIPLES, which have been taken for granted, in philosophy, in theology, in science, I consider too radical, and prefer rather those held by the Ephesian School almost a thousand years earlier. Heraclitus of Ephesus conceived of reality as consisting solely of events and relations between events. No event ever repeats itself: "You cannot step twice into the same river; for fresh waters are ever flowing in upon you." He recognized certain mathematical relations between events as constituting an order of the universe, which he called *Logos*. These two concepts—of events (or occasions) and relations between events—are all we need.

To them Aristotle added the notion of substance, with which I propose we dispense. The notion of substance is necessary to theology but is obstructive to science. (Of the notions of substance, the best is Spinoza's which holds substance to be one and one only.) Aristotle held that all reality is reducible to discrete substances and their attributes. For instance, he would say that if you were to remove from this piece of chalk all its attributes—its whiteness, its hardness, its friability, et cetera—you would still have something left.

To Aristotelianism, nineteenth-century science offered the challenge: "Remove all the attributes, and you have nothing left." Systems, such as this piece of chalk, consist of associated properties, and there is nothing apart from the prop-

erties. The fundamental form of a scientific proposition is relational: "A is *to* B," "this watch *on* the table," "the calcium *to* the carbon and oxygen in this piece of chalk"—"two 'objects' and a relation."

The phenomenal, intelligible reality of entities (or objects) consists of events or sets of events and the relations of real interconnectedness between them. An event is a possible or actual occasion of experience. This chair I see here, I saw yesterday, I will see tomorrow. These three events assure me of the chair's reality, that it would not disappear were I to turn my back. But note, it is only an assurance. Natural laws have not the validity of the abstract sciences.

An entity may also be defined as anything which can be the subject of a proposition. "The present king of France wears a beard," is not a proposition because the present king of France is a non-entity.

Natural Laws

There are, so far as I know, only four fundamental philosophical views of the nature of a natural law. One of these, the Newtonian, holds that "A natural law is a rule imposed upon phenomenal reality by God." This is a good enough view. God does not change his mind, so that what holds for the past will also be true of the future. The Positivist view, very popular at the end of the nineteenth century, is fundamentally fallacious: "A natural law is simply a statement of something which has been observed." This was Karl Pearson's view of a natural law, and almost Huxley's. It gives us no reason for supposing that a law true today will be true tomorrow; it provides no basis for predictability of the future. Then we have the proposition that a natural law

is something which, on the whole, it is convenient to believe, and this is the fundamental pragmatist view: a natural law is a convenient generalization that works.

Against these there is the pre-Aristotelian, Ephesian concept: "A natural law is immanent in the universe." Phenomenal reality consists of events and relations between events. The relations are (1) relations of interconnectedness, and (2) logical or mathematical relations (Heraclitus' *logos*) constituting the natural order; immanent in the universe. This view does not hold a natural law to be convenient merely; once formulated it is always true (within the limits set on that formulation by our knowledge and to the degree that it coincides with phenomenal reality). It is not merely descriptive of something observed. Nor do we have to bring in God.

If we were to set ourselves the task of making an exhaustive classification of the *kinds* of natural laws, I think we should find a considerable number of them. There is at least one important distinction between natural laws which we should bear in mind: the distinction between natural laws which can be quantitatively or statistically stated and natural laws which can be stated only relationally.

It is important also that we shall keep clearly in mind the distinction between the two kinds of relations that exist in phenomenal reality. These are spatio-temporal relations of interconnectedness and logical or mathematical relations, independent of space and time. The simplest mathematical relations immanent in the universe are those of similarity and difference.¹ The relations in a *system* are relations of

1. Two things are said to be similar when in some particular respect they are *identical*, though in other respects they may differ. Thus two objects may be identical in size, shape, and color though they occupy different positions in space, (e.g., two coins of the same year and mintage). Some

interconnectedness. The relations of a class may, of course, have other relations to one another—genetic relations, or chemical relations—but *as a class* their relations are mathematical—relations of similarity and of difference. The statement, “This is the same chair that I sat in yesterday,” is an assertion of a relation of real interconnectedness. “This chair is very similar to one I have seen elsewhere,” is a statement of a relation of similarity.

The Notion of Classification and of a Natural Kind

A class is a set of entities which possess one single character in common which is not possessed by anything not included in the class. In this sense we can make a class in an entirely arbitrary way, of “ships and shoes and sealing wax, and cabbages, and kings.” But a class is of use to us only if, in addition to the character by which it is defined, all the things included possess also a number of other characters in common. The kinds of classes which natural science deals with, therefore, are those which are called “natural kinds.” An example of such a natural kind is a chemical substance—silver, or lead.

Classification, implicit in all our thinking and talking, is an absolute essential in our science. We are trying to classify entities, or better still, systems, into groups such that all

philosophers hold that identity is a relation. This I believe to be an error. Difference is a relation and identity is simply absence of difference. Yet similarity *is* a relation. If A is similar to B this means that in at least one respect A differs from B and in at least one other respect A does not differ from B.

The word “identical” is used in a different sense when I say “This chair in which I am sitting is the identical (very same) chair that I sat in yesterday.” This affirms that the two events “chair then” and “chair now” present chairs that are not only similar in shape, size, etc., but which are related as two occurrences of one chair within a continuum. The relationship is therefore one of actual interconnectedness of the kind that is present in all persistence of material objects.

those which come into a single class will have a considerable number of characteristics in common and no other class will have them.

You can make a class of all red-headed women in Chicago named Mary. You have defined a classification. But the classification would probably not be of much use to science. It is unlikely that anything significant is true of members of that class except that they are red-headed women named Mary living in Chicago. It is very unlikely that you can make any other statement about them that will not also be true of many other people in Chicago. The classification is a useless one.

You can make a class of whatever things you like to collect and make a statement about. It is arbitrary—*as a procedure*. But some classifications are expedient, and others are not. The simple difference is the difference which distinguishes from arbitrary classes those of a *natural* kind. And this requires that we illustrate the notion of a natural kind.

If you group together two or more things by reason of the fact that they have certain elements in common, and you find you have a class about which nothing is true except one common property *X*, then it is not an important group or class. If there is nothing else you can say about it as a class, then it isn't of much use to you. If, however, every member of the class has also characteristic *Y*, and nothing else has it, you have then *a relationship between X and Y*, and a class which becomes significant. Then, if you find you have made a class such that you can discover properties *V*, *W*, *Z*, etc., all of which are characteristic of this class and of no other, then you obviously have a class of very considerable importance, particularly if you have

reason to suspect that you can prolong the list indefinitely. When you establish a class of that kind in phenomenal reality, then you can say you have a class of a natural kind. This is a class that is important to the scientist.

The metallic substance, silver, is of that kind. Here is a class of metal which is white, has a certain specific gravity, a certain relative malleability and ductility, will oxidize at a characteristic rate and become black, et cetera; and these characteristics are true of no other class. You find further, on summing up, that you have not exhausted its characteristic properties: you can still go on and discover more. You find that you have made a classification, which is significant, which is of a natural kind, important to science.

Such classes of a natural kind are readily enough admitted by logic. The pre-evolutionary idea of what constitutes a species was that a species was also a class of this kind. The whole notion of natural kinds which has come down to us through the Aristotelian and Kantian distinction was that of species as essences. Kant was horrified when organic evolution proposed the notion that animal and human species might be related to one another. Lions and tigers were held to be classes just as discrete as silver and tin. The hypothesis of evolution upsets that notion.

The assumption is that a given species during the process of evolution has a continuity which gives rise to what is now recognized as a different natural kind. Eohippus sometime, somewhere or another, turns into a horse. You have a condition of relative continuity between one natural kind and another natural kind.

So the moment one comes to the complex system of plants and animals, and to the still more complex system of societies, natural kinds become more difficult of logical dis-

inction. The point is that of metals one can make discrete classifications. There are instances of silver and there are instances of tin. You do not find silver changing into tin, as Eohippus into horse. There are no intermediate stages. Their kinds in nature are discrete. If we had all the possible animals between Eohippus and horse, and then said, "Where shall we draw the line between these two species?" we would find that nature has not given us here the ready-made demarcations she has between silver and other metals.

Here, then, an arbitrary element enters into our procedure. We have to decide where one species ends and another begins. The same arbitrary decision must be made in the study of social evolution. We may illustrate with languages. When is it that we can say the Latin of the Golden Age becomes Low Latin? When did it become the langue d'oc of Provence and the langue d'oïl of the north of France? When modern Parisian French? There is a continuity by which the Latin of Horace becomes the French of Anatole France. Nature again has not provided us with discrete classes, for the purposes of social classification.

What do the linguists actually do? They note that over a long period of years relatively minor changes occur in a language (change is actually going on constantly); then that here is a period over which major and more numerous changes occur; followed again by a long period of relative homogeneity of speech. They say, "Let us make the break here, and here, and here" (where the major and rapid changes occur). There is a considerable latitude of choice. They will by no means be agreed. Just precisely where the break is made is arbitrary.

The procedure is the one that is followed in the biological sciences. Over hundreds of years Eohippus ranges over

America. Suddenly changes take place during a period in which it is difficult to distinguish him from Horse. Then begins a long period of which we can say, "Here unequivocally we have the ancestor of Man o' War." We are aided in biology in making choice by the general paucity of the intermediate fauna. If they were available, our choice would be arbitrary.

We make classes, which, while they do correspond in lesser or greater degree to reality, do not correspond in the same degree as do classes of metals. The degree of naturalness of the class we make, the degree in which it will correspond to reality, will depend on our insight and skill, in the first place, and in the second, on the number of characteristic properties each of its members can be stated to have in common.

Natural Systems

To explain what I mean by saying "A law is immanent in the universe": This view of a natural law uses the notion of a system,² which occurs as a natural one in phenomenal reality. We are able, in analyzing phenomenal reality, to isolate such a natural system from the rest of the universe. We perform a dichotomy: we have a system, and the rest of the universe becomes its environment; one cannot have the one without the other. We wish to investigate the system's internal nature, i.e., the relations between its unit constituents. All scientific problems become problems of describing systems; all can be reduced to one statement: "A natural law is a statement of the characteristics possessed

2. *System*, from Greek *σύστημα*, an organized whole; an organized or connected body of objects; a set or assemblage of things connected, associated or interdependent so as to form a complex unity; a whole composed of parts in orderly arrangement.—*Oxford English Dictionary*.

by a certain definite class of natural systems in the universe.”—In this sense a law is immanent in the universe. A body falling is an example of such an isolated system, of which the unit events are the body at successive points at successive moments in time. The law of falling bodies is a statement of the class of all falling bodies in the universe. All natural laws are of this kind. *If we have made our class of systems correctly*, all systems within the class will have the same set of characteristics. The important thing about natural laws is that they are true always—not for only one member of the class, not for a few, *but for all*.

A natural system, then, is a conceptually isolated portion of phenomenal reality (the system separated from the rest of the universe which is then the total environment of the system), consisting of a set of entities in such relation to one another as to make a naturally cohering unity. The constituent entities may be events, or themselves systems of events. Such a system is the solar system, an element, an atom, a horse, a falling body.

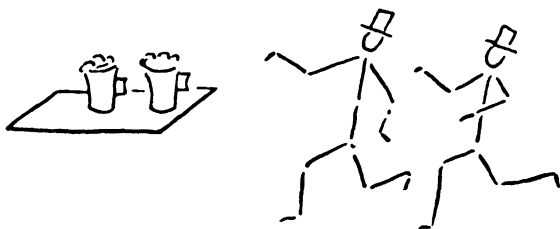
The relations *within* a natural system are relations of interdependence, but *between* natural systems there are relations of similarity, by virtue of which they can be classified into natural kinds, e.g., “the class of bodies falling toward the earth.” The majority of the problems of science can be formulated as attempts to discover the essential characteristics or properties of a class or kind of natural systems.

Within the conceptual systems of abstract science the relations of interconnectedness are also logical or mathematical relationships. Thus an ellipse is a plane curve defined as the path of a point the sum of whose distances from two fixed points, the foci, is constant. This definition, however, could not be given if we had only one example of

an ellipse. Those things which are unique in the universe require methods of investigation other than those of science, because the essence of science is comparison. To verify our "law" of ellipses we require a *class* of systems of ellipses—of at least two ellipses, just as to establish a natural law we required a natural class of natural systems.

The Distinction Between "Class" and "System"

To make clear the distinction between *classes* and *systems* I should like to present a little drawing. I am going to sug-



gest that we have in these men the members of a class, and here a class of glasses of beer. There is a very important similarity between this group of men and this group of glasses of beer. The similarity is that there are *two* of each. The term *two* is the name of a class of which this class of men is one member, and this class of glasses of beer another member; and it is also the name of every other instance of a diad. The type of relationship that exists between all instances of two members, which we may designate as "r" relationship, is the type I am talking about when I speak of relations of similarity.

Now let us suppose that you have here two *real* men and two *real* glasses of beer. You then have something quite

different—a system of men drinking beer—in which there are specific relations of interconnectedness of type “R.” (The relationships would still be real, but quite different, if you had two men and one glass of beer.)

You cannot distinguish between relationships “r,” those of classes, and relationships “R,” those of systems, on the basis that the latter are *real*; both exist in phenomenal reality. You distinguish them as that the first are *relations of similarity*, and the relations of systems are *complex inter-relationships*.

To further clarify the distinction between a class and a system, we may list their characteristics:

<i>Class</i>	<i>System</i>
(“r” relations)	(“R” relations)
Relations simple	Relations complex
<i>Relations of similarity</i>	<i>Relations of interconnectedness</i>
Mathematical relations	Spatio-temporal relations
Without form	Characteristic form
No quality of integration— coordinated by similarity	Integrated—coordinated by inter- dependence
Members may be separated with- out violation to them	Units violated in separation
Members may be moved about without violence to them or to class	Units may not be moved about without violence to them or to system
No cohesion between members of a class	Units cohere and thereby isolate the system from the rest of the universe
No functional relationship be- tween members	Functional consistency
An aggregate	A genuine whole, having a struc- ture
The sum of its parts (members)	Organic unity; not the sum of its constituent units

The Division of the Sciences on the Basis of the Systems They Investigate

SCIENCE DISCRIMINATES among the kinds of systems dealt with; e.g., a social system is distinct from and different from a mental or psychic system. This procedure presupposes that every system can be conceptually isolated from every other and from all else in the universe; and it further presupposes that this conceptual isolation will have a relatively high degree of conformity with phenomenal reality.

Science is in one sense continuous, but there are no shifts from one system to another, from the systems with which one science deals to those of another. The real "discontinuities" occur between systems, in the sense that there are natural kinds of systems between which it is possible to distinguish. Ultimately, as Whitehead and Heraclitus have it, there are only events; but these may be distinguished as belonging to one system or to another.

I do not mean by this to say that the commonly accepted classification of the sciences is on the basis of the systems each deals with, nor that any classification will be a permanent one. I am saying that to classify the sciences on the basis of the class of systems with which each deals is the logical and expedient one. As new types of systems are discovered, new fields will be added to science. As two sciences develop, the fruitfulness of considering their respective types of systems correlatively will lead to an intermediate science.

The division of the fields of science by reference to the general kind of natural system that is the subject of investigation is illustrated thus: mechanics is the science which deals with mechanical systems; physical chemistry deals with atomic systems; chemistry with molecular systems; colloidal chemistry with colloidal systems; cytology with cellular systems; and physiology with animal organisms. Biochemistry illustrates an intermediate science concerned with two kinds of systems. The generalizations of these sciences are statements concerning the characteristics of the system with which each deals.

Mechanical Systems

We can distinguish first between mechanical or temporary systems and systems which are dynamic and persistent.

Mechanical systems are composed of motions and masses in relation. Their unit entities or events are positions of mass at various moments in time, and their relations, the interconnected relations between these events. An example is Galileo's system of a falling body, in which the events are the body at position *a* at time t_1 ; at *b*, time t_2 , etc., and the relations are the interdependent relations between these

a	t_1
b	t_2
c	t_3
d	t_4

occurrences. Galileo's investigation of systems of falling bodies was undertaken for the purpose of discovering the natural law concerning them. "Every instance of *x* is an instance of *y*." His problem was to find the *y*. Having found

it, he was able to state the law as "Every instance of a falling body is an instance of uniformly accelerated motion," a law he was able to express in the formula

$$S = \frac{v T^2}{2}$$

(where S is the distance; T, time; and v, the velocity).

Persistent Systems

The characteristic of any persistent system is that it maintains through a certain lapse of time its structural continuity. The structure of a system is the specific set of relations between its units. The continuity of that structure, in an atom or in a living organism, is a dynamic continuity.

Among the persistent systems which we may distinguish are: an atom, a molecule, a crystal, a colloid, a living cell, a multicellular organism. An atom is a persistent system composed of electric particles in definite interconnected relations maintained through time. A chemical substance is an instance of a persistent system constituted of a set of invariably associated properties seen as events in interdependent relation. A living organism is another such system—a system of molecules persisting in complex interrelatedness throughout the life of that organism. An animal is such an organism; the species is the class of which the animal-system is a member; and natural laws define the species. The lions of Africa, individually, are each such a system; considered all together they constitute a genetic system related by a common ancestry, and as such are one of a class of systems which are the concern of the geneticist.

Each system is characterized by specific kinds of relations. We have to define the relations. In chemistry the relations are relations of affinity, of valency, of ionization—

“chemical” relations. In a mechanical system, the units are masses, and the relations are in space and time, i.e., of masses in motion. A living organism may be regarded as a system of cells in physiological relationship—but it may also be regarded as a system of acts of behavior. The physiologist deals with the human organism as a system of cells and molecules, the psychologist treats it as a system of acts of behavior; and, a human being may be treated as a single system—a physiological-psychological system.

A system can be defined by defining two things: (1) what its units are, and (2) what the special kinds of relations are that hold between these units which make up the system. We can determine a social system: its units are human beings regarded as sets of behavioral events, and the relations between them are social relations. Either there is a flaw in that reasoning, or you can go on to say that as there are identifiable social systems, composed of two or more people, or of a people like the Tlingit, or of the United States, and relations between them which can be isolated from relations to events external of the system; there are here the units and relations of a separate science, of social science. If there are other sciences which deal with these unit human individuals—psychology, physiology, genetics, et cetera—they can be defined in terms of other systems comprised of these individual human beings: mental systems, systems of organisms, systems of species, et cetera, and the system itself can be defined in terms of its specific units and the specific kinds of relations which exist between them.

The development of social science has not been preceded by a definition of its units and their interrelations. It will be necessary to distinguish and define these units and relations. The distinction must ultimately be made on the basis of

the different ways of acting of human beings; conceivably on the basis of "inner behavior" or "economic behavior," et cetera; I believe, however, on the basis of *social* behavior.

The Observability of Systems

Systems are observable in varying ways, and some not at all. I can observe silver, a system consisting of certain properties occurring together, but no one has observed an atom. Yet the chemist and physicist regard atoms as systems of electrons and protons in relation with one another. These they are able to infer.

The Method of Science

THERE IS A MISTAKEN IDEA among some people that the method of science is simply that of making observations and so discovering some general truth. This seems almost to be the idea of Bacon. This method does *not* give us science. Observations, to be scientific, must always be directed by a general hypothesis, that is by some formulation of a possible natural law, which is then tested by means of the observations, and so rejected, or confirmed, or modified, as the case may be.

The method of science is one involving observation, classification, and generalization, not as separate processes, but as parts of a single complex procedure.

Concepts Formulated for Analysis, and Abstraction

The foremost task of science, that is, the continuous one, is to find the right concepts by which to conduct the analysis, of whatever type of system is being investigated. The whole of modern mechanics did not become possible until, as a result of the work of William of Ockham and his followers and of Galileo, Newton was able to formulate the concept of mass—a fairly simple and obvious thing—but no one of Newton's time had thought of it, no one had begun to think of it. Only after this concept had been thought out, developed, and defined scientifically did we begin to get a science of mechanics. I am suggesting that we have not yet

thought of the important concepts for social science. These are still to be discovered and developed and defined.

Now this point, simple as it is, is a rather important one, and, I think, not as simple as it looks: definitions are arbitrary. The only distinction between different definitions is that some are expedient and some are not. I might call this blackboard blue, and this chalk yellow. There is no reason why I cannot define the colors in this way, except that it would not be expedient. Nevertheless it is common practice in the social sciences: one man calls chalk black, another calls it blue. There is an expediency in some definitions and an in expediency in others—that is, in definitions within the sphere of phenomenal reality. I am discussing the definitions of phenomenal reality, mind you, not of mathematics. The ultimate proof of whether a given definition has been expedient will be based on its efficacy for advancing our knowledge of phenomenal reality. The proof is in the pudding.

Abstractions are also arbitrary and either expedient or inexpedient—expedient if they lead to results, and, in any case, necessary. Thus, when Galileo, considering a body falling to the earth, said, “Let us conceive of a body falling in a vacuum,” the unscientific thinkers immediately replied (a number of the modern social scientists might have been included among them): “But that is a mere abstraction. You don’t see a body falling through a vacuum.” Which is perfectly true: you do not. On the other hand, if Galileo had not conceived that abstraction, he would not have solved his problem, nor have succeeded in finding the formula to fit his abstracted system.

There are no rules which will tell you whether what you are doing is expedient. If there were, we could bring any

young man into school, teach him for a few years, and make a scientific genius of him; we could make Newtons of all our children. The way to make epoch-making discoveries cannot be taught. It is genius that finds the right rules and the right abstractions.

Actually there is involved a little more than accident in making an expedient abstraction. There is always beyond this an imaginative perception of an analogy which others have not seen—the imaginative perception of a Newton or a Galileo. That is one reason why really important discoveries have to wait on genius. Once these have been made, other scientific work becomes possible which people who are not geniuses can do.

Obviously, also, in attempting to arrive at an expedient abstraction, one will follow logical procedures. One will, in the first place, be aware of whether one is dealing with concrete phenomenal reality or with an abstraction. You will not, for instance, say of culture patterns that they act upon an individual, which is as absurd as to hold a quadratic equation capable of committing a murder.

Now, one of the amazing things about the universe is that the propositions of mathematics have no relation to phenomenal reality (in the sense that they are not dependent on observation), but that they can be applied to the phenomena of reality. It was an act of faith on Galileo's part that he believed a formula must exist which would express the law which governed falling bodies. Kepler, also, observing the movements in the solar system, believed there must be mathematical expressions capable of being devised which would relate these movements. It was absurd of Galileo and Kepler to believe thus—a matter of faith. The moment you

believe a thing *because* it is absurd, you have committed an act of pure faith.

But only the abstractions of mathematics—of abstract science—have no relation to phenomenal reality. Abstractions of the natural sciences are abstractions only in the sense that they sift the general out of the particular—they state the general relationships between particular events which may be arrived at by eliminating the differences between them.

In the natural sciences we also make use of abstraction in the sense of “separating off from,” for the purposes of analysis. One cannot, obviously, deal with all the facts in the universe at once. When I describe and analyze a social system, I do so in terms of certain sets of relations at a time. To describe the solar system in terms of the actual planets and then to describe it in terms of moving bodies and of certain motions is not the difference between dealing with reality and dealing with a pure abstraction, but is the difference between simple description and scientific analysis, between the history of the solar system and the science of celestial mechanics. To isolate conceptually the solar system from the rest of the universe, to isolate certain of the relations in the system for purposes of scientific analysis does not make that system any less real.

Systems exist. They are real, concrete phenomena: systems of *a* man, *a* cell, *a* society; only “man,” “cell,” “society” exist in the abstract, and not as abstract *systems*. You never have abstract social systems. The only abstract systems are those of mathematics.

Taxonomy

The first step in the development of any science is taxonomic. It has been maintained that one can differentiate between the sciences of physics and chemistry on the one hand, and systematic botany and zoology on the other, in that the latter merely classify, whereas physics and chemistry do something more. That is not a position I am prepared to accept myself, for I believe all these sciences can be defined logically in similar terms.

What is the zoologist doing when he classifies? He is finding recurrent systems of the same type, and he is defining all systems of one class. When he is defining a *lion*, he is giving you the characteristics of all systems which fall in the class *lion*. He is doing fundamentally the same thing as the chemist, although on a different level. All he has to do is to look at certain animals, perhaps not even dissect them, and he is then able to classify them quite soundly.

However, these classifications on a first level lead the zoologists to further investigations of their systems—to the investigation of the relationship between animals of a single species, in which the relationship is as that of parents to children. On the first level the zoologist was considering the lion as the entity, and the relations were between the characteristics of the individual lion: he has a tail, the male has a mane, etc. (That is a very typical natural law: “Every male lion has a mane”—a statement of similar relationships in a class of systems of lions.) When, however, the zoologist went further and considered a father lion, a mother lion, a son lion, and their relationships, and now says that a particular characteristic is transmitted by certain laws of Mendelian inheritance, he is talking about a *genetic* system, in

which the unit is no longer a single lion but a genetically related family of lions.

There is a still further step when the scientist considers the internal relations of a lion and begins the study of the lion's physiology, not merely as a collection of characteristics, but as a series of characteristics which are definable only when the inner interrelationships of the lion are investigated through periods of time and through a series of reactions.

The same steps to higher levels of investigation held in the development of chemistry, which began also as a taxonomy—as an isolation of chemical elements and a classification of them. Chemistry has now reached a very high degree of proficiency, much higher than has botany or than we can hope to attain in social science.

I would suggest that an examination of the other sciences immediately suggests that the first step in social science will be to undertake the task of taxonomy and classification, and in the first instance, the classification of social systems themselves. I propose that no scientific study of societies can get very far until we have made some progress towards a classification of social systems into whatever types, groups, or classes suggest themselves as expedient, that is, likely to lead to valid generalizations with respect to all societies.

Now, there has been a lot of discussion about the classification of social systems. Classifications have been suggested by Comte, Spencer, Durkheim, Steinmetz, LePlay; but if we look at what has been done, we can see that we have hardly taken the first steps toward a scientific classification.

Of course, there is the earliest classification into primitive and civilized peoples; but no one tells us where to draw

the line, and we classify together the Trobriand Islanders, the Australian aborigines, the Maori, when, as a matter of fact, there is probably more difference between the Maori and Australians than between the Maori and ourselves.

The common classifications have been based on only one aspect of social systems—the relationship between a society and its environment. A classification based on this single relationship (worked out by Steinmetz and adopted by Hobhouse), and the one most widely used, divides man into hunting and collecting, pastoral, tillage, higher agricultural, and industrial societies, et cetera. It is obviously a classification on the basis of only one relationship of the social system.

I do not want to discuss at this point the classification of societies, but merely to remark that societies are exceedingly complex. There is an enormous number of difficulties in the way of any satisfactory classification. All I want to say at the moment is that we cannot get anywhere particularly until we have established classifications.

In physics the classifications are simple. We may take as an example one which illustrates how genius enters into the picture. Suppose you consider objects falling to the earth: these constitute one class of systems of falling bodies. Now take an object and throw it into the air. That obviously is included in a different class of falling bodies, one which can be shown to include also a ball shot from a cannon, an arrow from a bow. Now, one of Galileo's points of genius was that he recognized a swinging pendulum as still another special class of bodies falling to the earth. And Newton's genius is illustrated by his recognition that the motion of the moon around the earth is yet another class of the same kind: "The moon is perpetually falling toward the earth."

Newton's and Galileo's procedures were both fundamentally taxonomic. Aristotle had established a taxonomy 1600 years earlier, but the world thereafter was not interested and left his taxonomy alone until Galileo came along.—But, in any case, whatever classifications one gets in physics are inevitably simple; in social science they will be inevitably complex.

Analysis of Systems

Our next problem then will be: "What is the method by which we can discover, analyze, and describe the characteristics of social systems?" That is the fundamental statement of any scientific problem.

You can see that in the case of systems which we are able to observe and control we are able to perform experiments. To certain kinds of systems, those of the physical sciences, for example, we can apply measurement.

The questions then are: "Is it possible to measure and experiment in social science?" And "Is a science possible without experiment and measurement?" To the first question the answer is "No," for, as I think we shall see, it is not possible to measure in the social sciences and obviously it is not possible in the ordinary sense of "experiment" to experiment on human societies. To the second question the answer is "Yes, we can by logical procedures arrive at generalizations in science without measurement and without experimentation."

The point, therefore, is "What is the essence of all scientific procedure?" It is a very simple one. The method of science in all instances is the analysis of a perceived analogy, which perceived and defined in the first instance rather vaguely, is in the end given a more precise definition.

An analogy is always an instance of perceived similarities and differences. It is, in essence, a comparison. Possibly the best illustration I can give of such an analogy is that which has been shown to exist between two ellipses. We perceive between them a certain similarity of shape and certain differences. It is that similarity which the scientist is interested in and proceeds to look at, to analyze.

The first step is the taxonomic one, the task of inventing a name, "oval," or "ellipsis," for all shapes which present these similar characteristics. And that step may be taken years before another step is taken; after it people may rest content for centuries.

If, then, you had asked, "What makes a thing oval?," no one could have given you a very exact definition. You would have been shown an ellipse. You would have been able to distinguish ovals from circles—again a taxonomic step. Obviously there are similarities and differences between them. You would have had further to distinguish these from other curves—hyperbolas and parabolas, which may themselves be distinguished from each other and classified. The procedure is obviously taxonomic.

The next step was, "What is it that all circles have in common with one another?" That was easy: "All points of a circle lie at the same distance from the center." Even a Kaffir knows how to draw a circle, with a stick and a string. It was not so easy to discover what are the essential characteristics of all ovals. The Greek mathematicians discovered it: there are two elements which all ellipses have in common. "An ellipse is the locus of all points, the sum of whose distances from two fixed points is constant." They were able to state the law of ellipses. That was a step

beyond taxonomy. How did the Greeks do it? Obviously by comparison.

There is another step which goes still further: we perceive that circles and ellipses are two subclasses of a larger class, and that, for instance, you can draw ellipses that approach more and more nearly a circle. This involves the notion of limits: a circle is the limit of a certain series of ellipses. But that we need not go into here, except to indicate the fundamental basis of science as analogy and comparison for the purpose of greater precision of definition.

If one were to insist on experiment for science, then astronomers would be in bad luck. However, with respect to certain systems, observation may take the place of experiment. Experimentation is merely observation under controlled conditions, what Whitehead called "cooking the occasion," to test the generalization one has made. In other words, it is *precise* comparison. The essence of scientific method rests on the discovery of techniques of procedure by which one can make more and more exact comparisons. Here measurement and techniques for measuring enter.

Measurement becomes possible where one has measurable quantities. Length is measurable; indirectly temperature is measurable within limits. If I state that "a bar of metal expands when heated," I have stated a general law. But a scientist is not satisfied with a statement of that kind. He is not satisfied until he knows something more precise. He cannot know more about it until he finds some method of measuring amounts of heat. Then the thermometer is invented. With it one can determine *how much* the metal expands when heated. Then you can state the law in mathematical form: "A metal will expand so much for every

degree of rise in temperature," and you have stated your law much more precisely.

However, you can make your measurements without actually yourself applying heat. The scientist, of course, prefers to work in a laboratory, but one can verify the law outside the laboratory. You could do it even if you had no way of heating metals.—You might find a rail in the middle of winter and measure its temperature; find that same rail on a day in spring and measure again, and once more on a hot summer day. Experiment in the laboratory sense is not essential. What *is* important is comparison of two or more instances of certain things.

To summarize the method of science: There is first the perception of an analogy, then the analysis of that analogy whereby we more precisely define its similarities and differences. I think that that is all there is, in essence, in any scientific problem. The procedure is fairly simple if you consider a simple system, but complex if the system is complex.

Therefore, I conclude at this point that if there is to be a natural science of human societies, its method will be the method of comparing, one with another, social systems of different kinds. In other words, if we think that all social systems are analogous, just as all ovals are analogous, and wish to find out what that analogy is—what it is that all social systems have in common—we can do so only by comparing different social systems and then making our generalizations.

One cannot make generalizations from one human society, no matter how well one knows that society. One cannot make valid generalizations about anything which is unique in the universe, about a class which has only one member.

We must have at least two ovals, two societies, and actually we want a great many more.

What is the establishment of a generalization? I have suggested that a natural law is a statement of a generalization having a high degree of probability. The purpose of a natural science is, first, to make such statements more precisely than they have been made before; and secondly, to increase the probability of the generalization. You make a generalization which has a low degree of probability and then proceed to make one that has a higher degree. Generalizations in natural science never become absolutely certain. The degree of probability which a generalization has depends on the total evidence available up to the time when the generalization was made. Therefore, it has become necessary to say something about the notion of probability.

The Notion of Probability

The degree of probability attached to a generalization depends first of all on the nature of the originally perceived analogy. As a matter of fact, a generalization, once stated, has *some* degree of probability before you begin to verify it at all.

The notion of probability is extremely complex. I wish to stress only two aspects:

1. You do not in general increase the probability of a generalization simply by multiplying the instances. In some cases a generalization is adequately verified by a few instances: two ellipses would verify the law of ellipses—you would not have to measure a hundred or a thousand. Galileo was satisfied with one or two very simple experiments to verify his law of falling bodies; he did not, as a matter of fact, even experiment with bodies falling freely through

the air, but with balls running down an inclined plane; and no one has ever considered it necessary to experiment again on falling bodies to verify Galileo's generalization.

2. The second point, which seems to me very important, indeed, is that if you have a given class containing a number of subclasses differing from one another, then any generalization you make of the class as a whole will be verified most readily by taking instances from diverse subclasses.

	Class
Sub-	/ / / / / / / /
classes	a b c d e f g h

Let us suppose you make a generalization about living organisms, about animal life in general. You base your generalization on various subclasses of living organisms—on several species of mammals, of birds, et cetera—and you manage to verify it. Your generalization may be that animal life depends on maintaining a temperature higher than that of the surrounding air, which for those subclasses which you have considered is true. But then, if you proceeded to consider reptiles, fish, et cetera, you would discover that your generalization is totally wrong. You would have to retrace your steps, and instead of considering only similar subclasses, you would consider diverse subclasses, and make a new generalization. It is the diversity of instances rather than their number which is most important toward proving generalizations true.

The same thing will be found to apply to human societies. The generalizations we make will be much more likely to be true if we verify from two diverse rather than from twenty similar societies. This is an extremely important proposition. It is the basis, among other things, of the com-

parative method in anthropology. If anthropology is right, a great deal of the work of social science threatens to be invalidated by having confined its attention to a certain subclass within the general class of human societies.

Causality

There is one sense in which the notion of cause is of fundamental importance to science: It cannot be omitted from practical, applied science. If a bridge is built and cracks, it is the engineer's obvious business to find out the cause. A doctor needs to know the cause of his patient's disease so that he can do something about it. In practical life the notion of cause is absolutely essential.

The modern theoretical scientist, on the other hand, excludes the concept of cause from his scientific investigation. If we ask with respect to a particular series of events, "What is the cause?" we select out of the total set of preceding events those which for special purposes we are regarding as the significant ones, and we define our cause, then, in terms of some immediate and exclusive concern we have with it. If, on the other hand, we were to define cause as the sum total of *all* necessary and sufficient conditions for a given event, then we could never exhaust the cause of anything. Further, when one is engaged in a system analysis, that which may be stated in superficially satisfactory causal terms, can be more accurately stated in noncausal terms. For example, we find that a piece of metal is longer when hot than when cold. The immediate cause, we say, is change of temperature. From the scientific point of view you are being more accurate when you say there is a co-variation between temperature and length. And you can be still more accurate by defining that co-variation in quan-

titative terms. It is the system as a whole which is involved in cause. To define the cause, one would have to define the whole system; one may not select out only certain factors.

There is an aetiology of still another type which refers to cause as totally different from cause within a particular system. It holds, for example, that one is able to explain biological phenomena in terms of chemical phenomena. There is no explanation of a biological system which can be complete in chemical terms. You *can* demonstrate, for instance, that there is a correlation between colloid ionization and muscle tone: muscles contract when potassium disturbs ionic equilibrium and relax again at the addition of calcium. We can find and state generalizations about biological systems which we can then show are co-variant with relations in a chemical system.

A Social System Is a Natural Persistent System

The Social System

IF WE AGREE that natural science is concerned with natural systems, and can agree that a society is a natural system and one that can be investigated, we can have a natural science of society.

A natural system consists of entities that are in relations of real (existing in phenomenal reality) interconnectedness. The entities may be events or systems of events. We have to define the events.

In a social system the entities are individual human beings, in certain relations, which are differentiated from and isolated from all other relations in the universe. The individuals exist as units, but also, considered through time, are each characterized by a set of related acts of behavior which themselves constitute a system. "Tom Jones" is the name of a whole series of events, i.e., a set of acts of behavior; as such Tom Jones is a unit system in the system of society.

The relations *between* individuals in a social system are *social* relations, and these are real things, parts of phenomenal reality.

Two or more organisms are in a social relation as soon as there is some adjustment of their interests between them. *Interest* implies purposive behavior. I use the term similarly to the use of the concept of *force* in physics. Force and

interest are not real entities. *Force* is a logical fiction, a convenient concept by which we can describe a certain type of physical phenomena. *Interest* is a similar logical fiction for describing biological phenomena; it is a shorthand description of a series of acts of behavior—not itself a real entity, but valuable in describing phenomenal reality.

It does not matter for science where one draws the dividing line between purposive and mechanical behavior. An amoeba has a positive, purposive interest in food, a negative, purposive interest in danger. We cannot describe those purposive acts in terms of forces, so we describe them in terms of interests. It may be that some day we will have a way of describing an amoeba's behavior in terms of forces rather than of interests. At present we are unable to describe purposive *human* behavior except in some such terms as those of interest.

We have elementary forms of social relations among animals—in societies of bees and of ants, for example. However, the relationship between a wolf interested in eating a lamb and the lamb interested in not being eaten is not a social relation, because there is no adjustment of their interests. We have here pure strife; the relationship is non-social. Complete disregard of the interests of one organism by another is unadjusted conflict and precludes social relationship. A social relation *may* involve conflict—as in a contest of skills during a game, in a homicide, or in warfare—but social relation is dependent upon modification, in some way, of behavior. If I modify my behavior voluntarily to the interest of another, a social relationship is established. If I pay no attention to another person's interest, I am acting antisocially, but not nonsocially. I may attack the existing social system, but I am still part of that system. The system,

without my voluntary co-operation, perhaps, will bring about an adjustment of interests. Such an adjustment is precluded between the wolf and the lamb.

A social system is one of real relations of interconnectedness between individuals. For example, we have in an *actual* community in Australia, individuals in contact and the existence between them of certain sets of relations involving adjustment of their interests. There is here a natural system because the relations exist in phenomenal reality and are therefore observable. Social science is the discovery of the nature of social systems as defined in this sense.

There arises then the problem of the observable reality in a social system. What are the directly observable phenomena? A multitude of acts of behavior, including acts of speech, of individual human beings acting singly or together. (Collective action is merely a combined series of individual actions.)

Social Science vs. Psychology

How do I meet the criticism that social science and psychology both observe the same entities, acts of behavior of individuals? If the subject matter, the data, constituted the only difference between two sciences, then there would be no difference between the sciences of the psychologist and of the sociologist. You can, however, take an act of behavior and observe it in two totally different systems. The social scientist and the psychologist are not concerned with the same system and its set of relations. The social scientist is concerned with relations he can discover between acts of diverse individuals; the psychologist with relations between acts of behavior of one and the same individual.

Psychology deals with the system we call *mind*. Mind

(and this I think is the only justifiable definition) is the name of a system of mental relations, a system of which the units, individual acts of inner and outer behavior, are connected with one another by relations of interdependence. You do not have to bring in the body, which I believe exists always with the mind, Sir Oliver Lodge to the contrary. The physiologist studies the body; the psychologist, the mind; the physiological-psychologist, the system mind-and-body.

X	Y
a_1	k_1
a_2	k_2
a_3	\longleftrightarrow k_3
a_n	k_n

X and Y are two individuals. $a_1, a_2, a_3 \dots a_n$ are acts of behavior in the system, individual X ; a_1 is, say, an act at birth, a_n an act as an adult. The system, individual Y , is composed similarly of a set of acts of behavior, $k_1 \dots k_n$, and relations between them. X and Y are each mental systems whose characteristics the psychologist is interested in discovering. Relations exist, however, also between acts of behavior of X and acts of behavior of Y , say between a_3 and k_3 . The relations between X and Y are not psychical or mental relations. There is a relation here between two mental acts, not of one individual, but each of diverse individuals, and this relation is a social relation. Merely listening to another involves an adjustment to the interest of another. There is, in such an adjustment, interacting behavior. It is direct. There are actual relations of time and space. They constitute one kind of relation, set apart from all other relations in the universe.

The relations of a man coming into a store to buy a hat or of a woman to buy a beefsteak—with the clerk, with the cashier, with the store-owner—these are social relationships. The relationships *in* a man between coming to realize he needs a new hat and making up his mind to buy one, or *in* a woman realizing she is hungry and deciding to buy a beefsteak—these are psychological relationships. No relationship *between two persons* can by my definition be a psychological relation. The only psychological relations are those which exist within one mind—unless you admit telepathy.

If I go to school and learn geometry and later become an engineer and apply this learning, the relationship between what I learned and how I use it is specifically a psychic relationship. An exchange of ideas, on the other hand, is clearly a social relationship. The moment an exchange of symbols is involved, there is a social relation. That you are angry at a man is a psychological relation between your own mental states; but if you show your anger, swear at him—you establish a social relation. The very fact that one enters into communication with another shows that certain modifications of the interests of two people are taking place. The interest of two people may be in fighting one another; you cannot play a game of chess unless you have an opponent. An enmity of that sort is a conjunction of interests; there is a social relationship. If you are concerned with the psychological system, obviously the relations there are relations under the skin of one individual. The moment you get outside the skin of that individual, you have no longer psychological, but social relations.

I do not believe it is possible to differentiate sciences by reference to the subject matter that the science begins with

—the data observed. I do not believe it is possible to discriminate between the data that the sociologist deals with and those with which the psychologist deals. Both the social scientist and the psychologist are concerned with observing acts of human behavior. The raw data of both social science and psychology are the same. Therefore, if one tries to distinguish between them by reference to the data observed, one finds there is no distinction.

I draw a distinction between psychological laws and sociological laws. There the distinction is as to whether you are dealing with one kind of system or another. Your generalizations are psychological when you make them of one kind of system and sociological when you make them of another.

Let us consider again the nature of a unit or entity, the nature of the relationship between units, and the subsequent nature of a system. Suppose we take an atom as constituted of a set of electrons and protons. The system is the atom as a whole. You can study the characteristics of an atom as a whole, as the *chemist* does. For many purposes he does not consider the internal structure of the atom. Fifty years ago you would have been unable to study the internal structure of the atom; you would have been told it had none. What you did then was study the relation of one atom to another in molecular systems. You dealt with the nature of the atom as a whole, but not with its internal structure.

When, however, you study an atom as the *physicist* does, you discover that certain of the behavior of an atom is dependent upon its internal structure. You find, for example, that the structure of a calcium atom and of a lithium atom are in many ways similar. Similarity of the total systems is

dependent upon similarity of their internal structures. In making that observation you pay no attention to the fact that certain of the particles are electric particles. You assume that, you take it for granted. It is quite obvious, as a matter of fact, that the characteristics of an atom are determined by two things: first, the structural arrangement of the electrical particles; and second, the fact that they are electrical. The *electro-physicist*, again, studies the electric particles, *as electric particles*, no matter where they occur—in the atom or in space.

The analogy applies absolutely to social science and psychology. One may say that the characteristics of a society are determined by two things: first, by the simple fact that the society is composed of human beings; and second, by the internal nature of those human beings. No amount of investigation can explain the characteristics of society by simple reference to the nature of human beings; but by an investigation of human beings *arranged in a certain order*, yes. The social scientist is studying the structural arrangement of the units and takes the internal structure of the units for granted. He can do that. The nature of the units themselves, while irrelevant for the moment to the social scientist, are the essential problem in the investigation of the psychologist; what the latter is concerned with is the internal nature of the units.

If it were argued that one cannot study a society until one has studied the individual, and we agreed—then we should have to say it was quite senseless of the eighteenth-century chemist to study molecules before he found out what atoms were like. Fortunately the eighteenth-century chemists did not think that way: the whole system of chemistry was built up without knowledge of the internal struc-

ture of the atom. It would be perfectly possible to build up a social science without paying the least attention to the internal relations of human beings.

It is true that to a certain extent developments in sociology and psychology will proceed simultaneously and even correlatively. I suggest that those psychological generalizations of which social science sometimes makes use, are common-sense and empirical rather than scientific generalizations; and that no real progress in psychology will be possible until a theoretic natural social science has been developed.

There is one other point that should be made here, and that is with respect to what is sometimes called collective psychology, which entertains the notion of the dependence of a so-called psychology on the social system and holds that if you are to understand the individual, you must understand the society. Yes, that is so, but it does not mean that you must study the society itself. What you will do is study the individual system in relation to its environment. His environment is the totality of the universe, and this includes the immediate social environment in which the individual lives. What the psychologist has to do is to consider the individual's reaction to his environment. Collective psychology, as Lawndale calls it, is not a study of society, but of a class of individual systems. What it will lead to is a statement of natural laws which will apply to mental systems, and not to social systems.

How Psychology and Sociology May Come Together: An Intermediate Science

Let us suppose we have made certain generalizations about a human society, say that of the United States, and

have verified them to some extent so that we regard them as probable. Let us suppose also that we have made some other generalizations regarded as probable about human nature, about the human mind, and verified them. (Actually this isn't probable.) One set of generalizations refers to the relations between human being and human being, the other to relations between acts of behavior of one single human being. We can then ask, "Is there any logical connection between the generalizations we have made about the United States and those whave made about human nature?" That problem, however, will be like the problems of biochemistry, if you like, in which, considering the laws discovered by one science, physiology, and those discovered by another, chemistry, you ask: "Is there any correlation, any relationship of logical dependence, between the laws discovered by each of these?" and proceed to tie them together. Similarly we may ask: "Are there any relationships of logical dependence between the generalizations about human society and those about human nature?" If we can establish that there are, we will have then a field for an intermediate science, for social psychology, as we have biochemistry as an intermediate science.

The second region in which the study of the human mind and the study of society will come together is in the investigation of the development of the individual mind through the course of the individual's life, whether that investigation is of specific individuals or of human beings as a whole—whether of developments as occurring in a single individual, or as in a group of individuals. The problem is one of the way in which the "culture," as it is called (what I call the social system), molds and modifies the human individual. It is quite clear you cannot study the way an indi-

vidual is molded unless you know something about his social environment. However, if you are studying *in* the individual how he is molded by the society, you do not have to study the social environment. You have to study only how it is impinging on that individual. Here, nevertheless, is a realm where sociology and psychology clearly may come very close together, because they will formulate their generalizations largely on the same data. When they formulate their definitions, however, they will find that their results will apply logically to different systems.

I suggest that you have here a precise distinction between social science and psychological science: Ask about any particular generalization: "Is it a psychological or a sociological one?" and if the answer is that it is a generalization with respect to what binds together human beings—marriage, or rank, or subordination, or superiority—it is a sociological generalization, and it is not a psychological one. On the other hand, generalizations about modes of ideation characteristic of human beings in general, association of ideas by similarity or contiguity—these are not sociological, but clearly psychological. There should be no difficulty in making a distinct dichotomy, in constructing a clear line between those generalizations which are sociological and those which are psychological. Only on this condition can you demonstrate afterward that there are between the generalizations of social science, on the one hand, and psychology on the other, relations of compendency, logical relatedness. And these relations of compendency would be the subject matter of an intermediate science.

Types of Relations in the Social System

One form of relationship between the acts of two diverse individuals is that relationship which is constantly repeated, as in the acts of behavior, say, between mother's brother and sister's son in an Australian tribe. The relationship here is immediate, direct.

Another type of social relationship occurs when, for example, you find three Andaman Islanders, all making bows in the same way, although they may never have seen each other. Why do these men, A, B, and C, make bows alike?

A	B	C
x		
	x	
		x

Because the bows are part of a traditional system (i.e., what we call a culture system, but I should like to invoke a taboo on the word *culture*, as well as on *process*). There is here a connection of similarity; as far as the psychologist is concerned these are merely similar acts of behavior. There is a more fundamental connection, however, analogous to that found between acts of one animal species, or say, between those of the lion population of Africa. A population of an animal species is a genetic system—and this accounts for the similarity of their acts of behavior. Making a bow in a certain way is traditional (and not like sneezing, which is common to all mankind.) A, B, and C make bows in the same way because they are members of the same “genetic” system.

If this analysis is correct, we shall be able to define a social system.

We infer relations from acts of behavior. We observe acts of outward behavior. We can never observe inner behavior, but we can infer it. I cannot perceive a man's anger; I can perceive my own, and infer his. (We have to exert special care in inferring inner behavior among people of other societies.) We determine the human relations by observing the acts of individuals in a community. We observe, say, the behavior of sets of fathers and sons. We find similarities in the behaviors of these acts of fathers and sons, and we can determine the relationship with all its characteristics. We can then define a certain type of relationship which is common in that society; we can define a social usage.

Society as a Possible System

To consider again my favorite example of a system of falling bodies: the relationships are invariant only if the body falls in a vacuum. They are not invariant if one introduces the friction of the air. Then the invariant relationships become limited to a very small class of systems. Lead and feathers do not fall at the same rate through air. The important logical point is that in thus using the word *system* and applying it to a *society*, we say that science is investigating recurrent events of real interconnectedness. In physical science we might take a living body and find relationships between cells, fluid, and molecules of that body; and taking another, find similar relationships between its cells, fluids, and molecules: we find similarities between the two bodies. The fact that you find a whole complex set of relations in one, and similar complex relationships repeated in another, means that you have here a class of physiological systems. A natural law is merely a statement of invariant relations in a

class of systems. We are interested in discovering the invariant relations of systems of societies.

The Social Structure

Now, we can observe the social structure. The structure consists of the sum total of all the social relationships of all individuals at a given moment in time. Although it cannot, naturally, be seen in its entirety at any one moment, we can observe it; all of the phenomenal reality is there.

Structural continuity constitutes the persistence of natural systems. As long as the planets remain in their elliptical courses the solar system will persist. A social structure is a natural persistent system. It maintains its continuity despite internal changes from moment to moment, year to year, just as a living organism remains the same living organism in spite of metabolic change; it is dynamic. The United States which is today was a hundred years ago. It is static: its bricks do not fly out of place. Plaster which crumbles is not renewed by an activity of the building itself. (We do not have to take cognizance for the purpose of comparison of the motion in the atoms within the bricks, but only of the brick *qua* brick.)

Structural continuity implies continuity of structural form over a limited period of time. But this form is an abstraction. If we regard, in Australia, the social relations between ten sets of mother's brothers and sister's sons, we find that these relations actually vary somewhat; but, primarily, we find a common element and establish the structural form for the relationship. The kinds of relationship people observe will be the same for the period of time in which structural form is maintained, which is analogous to saying the struc-

tural forms of human beings, unless (or until) they become pathologic, remain the same.

It is the structural form of the society which the social scientist has to describe. (One might call that form "non-mental" or "super-psychic" *if* one liked.) It is explicit in social usages. The investigation of social usages—of structural form—in different social systems we might call *social morphology*.

Social usages control behavior among human beings. They appear in several ways: either between two or more persons acting together, or in the relation of an individual to the society as a whole. A social usage is itself a system, but not a social system. It can exist only in a social system.

A social usage is not merely a common mode of behavior. We have, for example, behavior characteristic of only one man, the King of England, or the President of the United States. It still constitutes a social usage, which always involves a rule of behavior: there are proper or appropriate ways of behaving under certain circumstances. The king acts according to social usages which apply to no one else, but every one else recognizes the usage. A social usage is more than simply something which people do. A, B, and C make bows; D recognizes that that is the way to make a bow. The fact (1) that some or many people observe it, and (2) the fact that a large number of people recognize it as a rule constitutes the reality of a social usage.

So defined we have connected social usage with reality, and thereby cut Durkheim's Gordian knot. He held that there is a social reality outside the individual human being, independent of people, with an individuality of its own—almost having substantial existence. Tarde, on the other hand, thought that all one has is acts of people—the social

facts are *in* people. As usual, both were right and both were wrong. Our concept eliminates the contradiction between their conceptions. Behaviors occur both in the individual and outside the individual. Social usages, in the context of the natural social system, are both in the behavior of the given individual, and outside that individual in the behavior of other individuals and in the relationship between these behaviors. What constitutes the reality are the sets of behaviors of individuals which are of two kinds: acts of behavior in which social usages are observed and acts of recognition of these as proper, or, in the breach, improper.

There is another sense in which social usage is not solely in individuals. A social usage involves acts of behavior of a number of individuals who are integral parts of a single social system. A social usage can exist in reality only in a social system; it is a set of relations of interdependence—*itself* a system, as a lion is a system in a genetic system. For example, a language is a certain set of speech usages, an epiphenomenon of a particular social system. These speech usages are not only used, but regarded as proper. They exist in reality and can exist only because they exist in a certain social system.

Social usages may be defined as norms. The norm, however, is not one imposed by the scientist. It is one which he notes as observed by the society. It may be sufficient in some instances to go and see what all the people are doing to determine a social usage. You see, for instance, that all men in the United States wear trousers: you have established a social usage. In many instances, however, it is not as simple as that, because you find certain variations in behavior. You have then to go to the people themselves and ask, "What do you think is the proper thing to do?"

They may give you a rule. It is the recognition of that rule, together with its observance, which constitutes the usage. Any given rule has two aspects, both of them establishing the norm. First there is the recognition of the rule, and you get at that simply by asking people questions. You may find that in a given instance 80 per cent of the people will tell you that that is the rule; 15 per cent will say, "I don't know"; and 5 per cent will say, "No." Second, there is the degree of conformity, and in an instance in which you get an 80 per cent recognition of the rule, you are likely to get perhaps only 60 per cent conformity. Twenty per cent may say, "I know that is what I should do, but I get away without doing it." Your norm, therefore, is always of this double nature. You cannot define a social usage except in terms of what people do and what they think ought to be done. The norm is not established by the anthropologist. It is a rule which has an average distribution and a certain standard deviation in its observance; it is characterized by what people say about rules in a given society and what they do about them.

A Society as a Social System

AS I HAVE DEFINED a social system, a social system can be said to exist whenever two human beings come together and find some convergence of their interests. For example, I enter a store. I want to get a hat. The clerk wants to get rid of a hat. We enter into a relationship; he shows me a hat; I don't like it; I say I don't want that hat. He says it is a good hat. The system develops as he brings out more hats and I try them on. Finally, I either buy a hat and the system closes or I go off without one and the system is broken.

There you have a simple example of a social system which can be described in simple terms. Further, it is an example of a constantly recurring system. You can therefore classify it with a large number of instances of the same kind and recognize a class of social systems of people buying hats. And you can classify buying hats with systems of buying other things, and make a larger classification. I am not suggesting that these are satisfactory social systems to go out and study, but they *are* systems.

Suppose you did try to investigate systems of this particular kind: it would at once become clear that you could not understand the behavior of the two individuals concerned if you considered them apart from all other behaviors, if you isolated merely that system from the rest of the universe. The two individuals behave in certain ways which are imposed upon them by the fact that they are people living in Chicago and are following certain customs current in the United States in 1937. The system can be interpreted only

in that context. In Chicago in the United States in 1837, or in Tonga at any time, the system is an entirely different thing.

If a science of society is possible, it is quite clear that these small social systems, in isolation, are nothing we can do anything with toward the development of such a science. They are simply minute parts of the total social system, say, of the United States. Such simple systems may be analyzed as units in larger systems, and their analysis might be described as social histology.

Where do we, for the purposes of a study, draw our line around a system? Remember the system is separated from all the rest of the universe. In all sciences the scientist attempts to separate conceptually what he is studying from its environment. To some extent, as I have said, such abstractions are arbitrary, but some abstractions are expedient and some are not. The art of science is to know where to make the abstraction. The art of the scientist lies in his ability to distinguish between the expedient and the inexpedient, thus assuring that his investigation will have positive results. This distinguishes a good scientist from a bad. It involves a certain amount of intuition.

I am suggesting that the most expedient abstraction we can make of a society is to take a territorially delimited group which seems to be not only clearly marked off from other groups, but which is also sufficiently homogeneous in most respects of the behavior of its individuals, if not in all of them, so that the similarities can be discovered and constitute a material which can be adequately described.

The social anthropologist does this fairly simply with savage tribes. He generally takes the abstractions made by the savages themselves. I go into a savage country and say,

“Who are you?” As a matter of fact, what I say is, “What language do you talk?” They give me the name of their language, “We are the Kariera people.” They have given themselves a name. Then I ask, “Do these people over the river speak Kariera also?” “Yes.” “Are those people over the hump Kariera?” “No.” They will offer details, and they will mark off for you a definite territory, and people who talk the same language, and say those are Kariera. On the whole, language usually constitutes the line of demarcation. There is a single region which can be described as Kariera by the fact that Kariera is spoken there. There are also certain bodies of common usages which again you can describe as characteristics of these people. Therefore I can get a convenient unit which is of a people territorially delimited, speaking a common language, having common usages, and define this as my unit of study.

In certain regions of Africa it becomes more difficult to decide what unit to take. The problem becomes more complex still when you get to a society like that of the United States today. From certain points of view it would be convenient to take the whole of the United States as a unit—obviously so if you are dealing with certain political problems. On the other hand, in considering economic institutions, the whole world becomes the unit, the whole world is the society now. Again, for certain other kinds of social problems, the United States is far too big, and therefore, what we have to do is to take as a unit a smaller community which we can separate out, define, and study as a system.

There are no rules as to how we shall do this. I am insisting again that the procedure contains an arbitrary element, and the only question is whether you are acting expediently or inexpediently, and probably you cannot tell whether your

abstraction has been expedient until you have made your study and see what results you get.

A society, then, is not actually the same thing as a social system. A society is a body of people, in certain relations, which we study as a unit—as a conceptually isolated system—to describe and compare with other similar units. If that is so, then we have reached some definition of what constitutes a society. I do not believe there is any more precise definition which can be given.

Resumé

THE MAIN THESIS I am arguing is that a natural science of human society is possible. On the other hand, my view has been that that thesis is true only if certain assumptions or presuppositions are maintained. I would suggest that if one takes a certain view of the nature of science and says that in science we are concerned with the attributes of substances, then one will have to say there can be no such thing as a social science; we can have a science of human beings, a psychology, if you like, but we cannot have a scientific study of human society.

1. A science of human society is possible only if certain presuppositions are granted. A natural science is concerned solely with natural laws. The problems of all the natural sciences can be described, I think adequately and significantly, as problems of the analysis of natural systems, a natural system being a set of entities, whether events or themselves systems which in turn consist of entities of events as simpler systems. A system of this kind consists of certain units, events, or systems standing in certain relationships of interdependence with one another. A natural law may be defined as a statement of characteristics of a certain class of natural systems. I therefore hold that it is possible to reduce all the kinds of natural laws to one single class.

I pointed out that this does away with the distinction which is sometimes made between what are called the purely taxonomic sciences, such as zoology and botany, and the explanatory sciences, such as physics and chemistry, in that

both types can be defined as being concerned with system analysis or the determination of the characteristics of systems, the only distinction, then, being whether the sciences are concerned with determining the superficial characteristics of systems which can be immediately observed, or with more profound analyses, as of systems which cannot be directly observed, such as systems of atoms in electronic physics. Here you are dealing with a system which is never really observed. One can see the path of a helium atom, through the medium of condensed moisture, but no one has ever seen an atom. Still less has anyone ever seen an electron. What you are doing here is analyzing a theoretical system—a system of electrical particles constituting a persistent system which we know as an atom.

The difference between one type of science and the other is not that one is taxonomic and the other explanatory, but is as to whether you are dealing with directly observable systems or with systems indirectly got at by theoretical consideration.

2. The second point I am arguing is that there is such things as social systems, which means, more particularly, that there are relationships—social relationships—distinguishable from every other kind of relationship in the universe.

Since the nature of a system is dependent upon the units of the system and the relationships between them, one has different kinds of systems—mechanical systems, mental systems, physiological systems, chemical systems. A mental system is one in which there is a certain kind of relationship. There is a relationship between things I think today and those I thought yesterday and what I thought a year ago and things I want to do a year from now. These are the relationships of specific connectedness which constitute the reality

of the system which, if you like, we call a mind, and these are mental or psychic relationships. In a chemical system, the relationships are chemical relationships. But in a social system the relationships are again something different; they are never mental or psychical, or chemical, or physiological, but are systematically of a kind of their own and definable. When a relationship exists between two human organisms such that there is some convergence of their interests, we have a relationship we can call a social relationship, distinct from all other relationships in the universe—in a system in which human beings are the units. A human society is constituted of human beings and of what are the relations, defined in this sense, between them.

The Method of a Social Science

OUR NEXT PROBLEM, then, is one of methodology, to see if we can define precisely and as all-inclusively as possible what kind of problems a scientific study of society will present and what kind of methods can be used for the solution of these problems.

Relational Mathematics Will Ultimately Be Required

A natural science is possible, first, wherever measurement can be applied to phenomena, and second, wherever relational analysis is possible, i.e., systems are identifiable and characterizable. Relational analysis, even if not metrical, may be mathematical, in the sense that it will apply non-quantitative, relational mathematics. The kind of mathematics which will be required ultimately for a full development of the science of society will not be metrical, but will be that hitherto comparatively neglected branch of mathematics, the calculus of relations, which, I think, is on the whole more fundamental than quantitative mathematics.

That there is a correspondence of degree between things that are not measurable is an assumption from the physical world. No one has discovered how to measure a hardness and a softness; but that does not prevent imaginary scale, putting diamonds at one end and butter at the other. One can then compare any two substances—not very exactly, but roughly—by noting, first, that they fall here or here on the scale, and there. One can then state for them relative degrees of

hardness or softness with respect to each other. This can never be expressed quantitatively. One *can* create a purely arbitrary series of numbers for the scale, but that is misleading oneself. I believe that with respect to any one of a large number of characteristics, societies can similarly be put along a unilinear scale. If you would grant that that might be possible, one might then make a series of scales, establishing in each instance for a given character the relative position of a society:

A	x	y
B	xy	

On scale *A*, characteristic *x* might fall here and characteristic *y* there. On scale *B*, *x* and *y* might come together. You may, with two such scales, proceed to a correlation. Such a correlation might never be of the kind, "If *y* falls here on Scale *A*, it will precisely there on Scale *B*"; but it might be of the kind: "If *y* falls here on Scale *A*, it may be expected to fall within a definable range on Scale *B*." You are trying to establish a correlation, but on a nonquantitative basis. (You might use a two-dimensional scale, but that would be much more complicated.) If such a procedure is valid, correlation can be shown to exist, though not stated quantitatively. If it is not valid, a great deal of social science falls outside the bounds of natural science.

Scientific Description vs. Scientific Analysis

Obviously, if you are going to study societies, you have to describe them. The first task of the social scientist is to describe societies as they can be directly observed. But that is not science. There can, however, be different kinds of

descriptions. In a certain sense, some descriptions can be more scientific than others. If there is a set of concepts which has been scientifically developed, a description which uses them will be more scientific than one which does not. This is the only sense in which a description can be either "scientific" or not.

However, when we come to a *scientific investigation* of societies, the first general problem we face is: "What kinds of societies are there? In what ways do they resemble one another? In what ways do they differ from one another?" The moment you have stated that problem you find that it is a taxonomic one. That problem I regard as specifically scientific. It involves us in scientific procedure—in analysis, which inevitably implies treating a society as though it were a system or system of systems; and that process of analysis is something much more than a description.

The Problem of Typing Societies

The fundamental problem, then,—either in a logical sense or in a historical sense, but certainly logical—is "How many different kinds of societies are there, and in what respects do they differ from one another? What is the range of variation, and, more important, what common characteristics are there discoverable by analysis which are characteristic of all human societies?"

It is quite obvious that if we answer the last question, we get a series of natural laws. In this sense: I make a statement of the kind, "Every human society has a religion." (I am leaving aside entirely the question of what a religion is; I assume that we have already reached an agreement on that point.) Please note what the statement is when made in that form. It does not mean all the societies I have

observed are characterized by having a religion. It means all human societies of the past, the present, and the future are characterized by religion. The statement will, if true, be true of societies a thousand years from now as well as those of half a million years ago. I am not suggesting it is true. I will, however, give you one statement I believe: "Every human society has a system of morals." Note that is not a positivist statement; it is not a statement of an observation of several societies. It is a statement I believe true—a natural law—true of all societies that have ever existed, that exist now, that will ever exist. It is a statement which is intended to be true of the whole class of societies. I am suggesting that of such are the fundamental propositions which we want to discover and prove.

How are we going to prove a proposition of that kind? Is it possible to prove that all human societies have a system of morals? Must they all have religion (whatever that may be)? It is obvious that if such propositions can be proved, we have statements of the most general kind, statements of natural laws which relate to all human societies.

The very statement of the problem involves a series of subproblems: "What kinds of societies are there? How do they vary from one another? What, on comparison, do they prove to have in common?"

The answer to these problems will give us a classification of society. We shall find human societies characterized in general by the fact that they all belong to one class and that all of them fulfill a certain function, which we can represent by X. X is a function that is true of any society—present, past, and future.

But in addition we will find that certain characteristics vary from one group of societies to another, and that we can

then subdivide all societies into types, such that here is a type possessing certain common characteristics and here a type possessing certain others.

Therefore the complete answer to "What kinds of societies are there?" is the complete classification of social types—which at present we have not got. So that we must ask ourselves, "What are the methods by which we can arrive at a classification of social types?"

We establish our type by comparing a number of individual societies. Let us say *A* is the Australian type of social system. By having taken as many individual societies in Australia as possible, by studying their characteristics, and eliminating their variations, we have been able to discover what is common to all of them. It is a matter of empirical determination to discover that they all possess certain abstract characteristics in common. The type which these common characteristics represent we are calling *A*. Suppose we then set up another type, the Polynesian, *B*, by abstracting the general characteristics which define that type. We can establish a number of fundamental types: *A*, *B*, *C*, *D*, *E*, *F*. We can then proceed to a further process of comparison: we can now compare *types*. If I compare a series of very diverse types—as many as I can establish from all over the world (it is not the number of instances that determine the probability of a conclusion, but the variety), I can discover things which are common to a considerable number of diverse types, possibly to all of them. By taking a reasonably large number of human societies, by including types as divergent as, say, Australia, Polynesia, Africa, the United States, Ancient Rome, we can arrive at a number of probable generalizations.

On the other hand, it is also said that we can arrive at

certain generalizations from an analysis of human nature. Such conclusions might be important if we could define our terms precisely. If you ask, "Is religion a universal characteristic of all human societies?" Your answer will depend on how you define "religion." If you take a religion as defined in some instances, I can say, empirically, no. Religion in the sense, "Men know little; men exceed what they know by their beliefs," is not the sense of it which the anthropologist likes to use, nor the scientist can use. If you allow me to make my own definition, then I would say, "Religion is something which, by means of symbolic expression, maintains in a body of individuals a certain set of sentiments and principles which control their behavior, and thereby maintains social coaptation." Clearly, what is required to establish the probability of this generalization is the analysis of social systems and their classification into types.

It has been pointed out that, within different species, plants take different forms, and that the problem there has analogies in social science. The problem for social science is one of dividing social systems into types. Unless we can classify societies together, we can never make any statements about them. The only way to classify societies, avoiding "species," is to classify all societies into a certain number of subclasses, which I am calling types.

The first statements we can make, then, will apply to types. But we will have to be able to define our types. We could not, for instance, say, "It is true of all primitive societies that so and so is the case." If we are going to make a statement of that kind, it is assumed that we know what "primitive" is and can divide primitive societies from civilized societies. There is no break in continuity from type to type of society. If you consider the United States from the

earliest days to the present—it is still, in one sense, the same society. You call them both—the society of one hundred years ago and that of today—the United States. In what sense? In the sense that there has been a structural continuity involving certain other kinds of continuities, that go along with it, and upon which that primary continuity depends. Yet, on the other hand, I would say that there are certain differences between the *kind* of system which you had in 1837 and the kind you have in 1937. If you are going to compare them, I will say that you have got to treat them, not as societies of one type, but as societies of two types. Where does the change come? I would say it does not come precisely anywhere. Where you draw the line is more or less arbitrary. You are facing the same problem always in all history of social development.

Suppose we have classified societies into types: if we can make a proposition that is true of societies of only one certain type, that in itself is a generalization of some considerable value. I am going to suggest that the generalizations which an economist or political scientist makes are generalizations of that kind. Those which the psychologist makes when he is being a sociologist are also generalizations about a single type. I am suggesting further that these generalizations are made without defining the type.

Suppose we take our knowledge of the United States today, 1937, and our knowledge of what it was a hundred years ago, plus our knowledge of European countries, and with the material at hand proceed to make generalizations as to the sociological or economic individuals and their behavior. Such generalizations are valid and important if they can be precisely stated as characteristic of a certain type of societies. But that implies defining your type. I sug-

gest that the weakness of economic generalizations is not that they are not true, but that the economist has not definitely defined what type of society he is talking about.

I am proposing later to consider economic behavior as the conceivable unit behavior of a social science. If I can show that economics can never be developed into a science except in the sense that the specialized science whose subject is the cell is a science, which is ultimately intelligible only in terms of the general science of physiology which deals with the total organism of which that cell is a part—I believe that I shall have demonstrated that there can be a social science only in the sense of the terms which I have defined.

Comparison for the Purpose of Arriving at Generalizations

“How is it possible to discover what are the necessary conditions of human societies (necessary, not in the logical sense, but in the sense that they pertain to social systems as such and will be characteristic of all social systems), and to discover what characteristics are accidental (happening to belong to this social system and not another)?”

We may, by way of illustration, apply the test of accidental and necessary characteristics to languages. All languages use certain categories and forms. It is the linguist's objective to discover which of these are necessary to all languages, which accidental to one. All languages have morphemes. Most, perhaps all, use tense. How does one determine what are the essential and what the accidental characteristics? Obviously it is possible only on the basis of comparison. On that basis we find that there are at least two categories necessary for all language, which Jespersen named *nexus* and *junction*. Sex genders are accidental, but there is

no language without junction, without nexus. It is necessary to compare at least two languages, because you have no other means of eliminating accident. The process of comparison is the process of eliminating accident, in languages, in societies.

You cannot, however, compare the whole of one society with the whole of another, an Australian tribe as a whole with the whole of the United States. There classification into social types becomes essential. You compare Australian tribes and establish a type free of variations; you similarly establish an African type, etc.; these types you compare to arrive at a theory of the essential characteristics, the "necessary conditions" of any society. You cannot, obviously, compare all the characteristics at once. You may take, first, certain aspects of the legal systems of various types and make a series of comparisons, and you may find that there are present always systems of sanctions or systems of rights and obligations. You may consider the distribution of activities and gratifications, and find there is in all known human societies always some inequality in these distributions. Children offer the simplest example of this inequality: they get gratifications but engage in no technological activities. We might say, "Let's discover what the essential characteristics of these inequalities are." It cannot possibly be done except by considering a series of societies—by taking, say, an Australian tribe, the people of Tonga, and the inhabitants of Newburyport, Massachusetts, and by defining their variations, discovering what is common, be able to record them as three different types.

If we attempt to arrive at generalizations which must distinguish between what is accidental and what necessary, we cannot possibly succeed unless we *compare*, in order to

eliminate accident, by noting that a characteristic occurs here and does not there. To take a particular instance: When totemism was first reported of Australia as occurring among the Arunta, Frazier, Durkheim, and Hartland proceeded to take as fundamental to their thesis, as being necessary conditions to all totemism, features of the Arunta type which we now know to be accidental. Now that we have examples from various parts of the Australian continent, we get a totally different concept of totemism. The failure of these men resulted from their lack of comparative material and their readiness to make their generalizations without them. This *joie d'esprit* runs through anthropology and is true also of sociology. Take, for instance, certain generalizations which have been made, which, while they sound plausible enough if you know only the Middle Western community on which they are based, are nonsense when you compare this community with Tonga or South Africa; you realize that what the sociologists who make these generalizations are doing is treating as necessary that which is purely accidental.³

Such a generalization as that every language necessarily includes the particular categories of junction and nexus may not seem to tie up to anything else in the social system. It presumably will tie up with certain other propositions about language. Some of these latter propositions may tie up with propositions concerning, not language, but other aspects of social systems. Meillet's essay, *Comment les mots changent leur sens*, indicates such interrelations. In other words, within the field of linguistics you may get a certain number of generalizations which refer simply to linguistic phenomena and which do not logically relate to or depend on

3. The Lynds: *Middletown; Middletown in Transition*.

propositions with respect to other aspects of the social system; but some of your generalizations within the field of linguistics will be of significance for, will tie up with other generalizations you have already made in linguistics, and will also tie up with other generalizations on other aspects of the social system than linguistics. Such interconnections of generalizations may be demonstrated for various aspects of social systems, and presumably for all.

The experimental method in itself gives you nothing, and similarly the comparative method alone gives you nothing. Nothing will grow out of the ground unless you put seeds into it. The comparative method is *one* way of testing hypotheses. We can illustrate its inefficacy by itself alone, by the fallacious idea of the uses of the comparative method still current among some anthropologists, notably in California. The method was first brought forward by a gentleman named Tylor. If you determine the distribution of trait *A* among a series of peoples, and its absence among a series of others, and then the distribution and absence of trait *B*, you may find *A* and *B* associated together and $-A$ and $-B$ together in a number of instances; this is not a matter of pure chance, and you therefore have an "adhesion" between *A* and *B*. In that sense you may say that by merely comparing, you can get a series of correlations. Any such correlations, empirically arrived at, however, may be a purely accidental correlation, or it may be a necessary one. There is nothing in the comparison itself which will tell you whether it is necessary or accidental. That can be determined only by rational analysis. The world is full of accidental correlations.

One of the great tasks of anthropology, one which is important, is to determine whether such correlations so

discovered are the result of historical accident or not. Are they evidence of necessary or of accidental characteristics of societies, of parallelism or of convergence? The actual solution of the problem is to be found only by rational analysis. I see that procedure as requiring us to isolate problems in the sense to be discussed later—for example, the problem of determining structural principles of societies, such as that of justice, and to conduct an analysis of just what are necessary conditions of this principle and what accidental variations.

The Problem of How Social Systems Persist

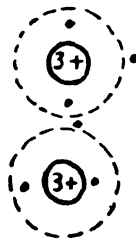
Our first class of problems was: “What kinds of societies are there?”—problems of taxonomy and morphology. A second important group, I would suggest, follows immediately from the definition of a system: “How do societies which I have called systems persist?”

A system, as we see it here, is a set of relations between a set of entities, and we have already seen that the relations do not remain unchanged. There is not a static continuity. There is a dynamic continuity, whereby a society retains its structural form during a certain period of time. This raises problems exactly parallel to those of the physiologist and of the electronic physicist. What is your physiologist concerned with? With finding out how it is that the organic system manages to continue. As long as it does we have the life of the organism. The physiologist is investigating how it is that the organic system persists. And you can also say that your electronic physicist is dealing with the same problem: “How is it that the particles which form an atom remain together? How is it that the electrons revolve around a nucleus, making jumps within the atom, individual electrons coming and

going in the processes of combination with other atoms—and the atom still persists?”

You have precisely the same or similar problems for social systems. How does the social system persist? I would suggest that that problem constitutes a whole branch or subdivision of the science of society. It is quite clear that the system persists only as long as there is what I have already called dynamic continuity of *structure* of the society. Thus, if something happens to the blood of an organism which destroys or affects its chemical composition—then some other part of the organism will be called into activity to remedy the damage and to restore the balance. This is what I mean by dynamic continuity. Of course, if the organism fails to respond to particular needs for keeping the organism going—then, in time, the organism dies.

Let us take the simplest system we can, say, an atom, and see if we can define what a system is through time. Suppose you could actually inspect an atom, that you are possessed of divine perception: At a given instant of time, T_1 , you observe the atom has a certain structure, which we will call S_1 . You could define this structure as that at that moment it has 7 protons and 3 electrons in this spatial arrangement: Then you come back at a later instant, T_2 , and you find a structure which is S_2 :



This structure has something in common with structure S_1 . It still contains the same electrical particles (exactly what you mean by that is questionable, but at any rate, you have the same number of particles). They are not arranged exactly as they were at S_1 , but they have similar spatial relations: 2 electrons in the inner shell, 1 in the outer. In other words, you can say the structural *form* is the same at T_2 as at T_1 . You come along to T_3 and find S_3 and discover another structure but similar spatial relations as in S_1 and S_2 . The system is constituted through time. These are the events: T_1S_1 , T_2S_2 , T_3S_3 —events succeeding one another in time and connected with one another in time. That is the system we are dealing with.—We do not, as with societies, have to be concerned with the problem of change of *type* of the structure of an atom: not for 100,000, but for 10,000,000 years it is the same atom.

We may consider an organism as a continuous system. Actually its persistence is nowhere nearly as protracted as that of the atom, but that is an arbitrary matter. Exactly when did I become an organism? At the moment when a certain spermatozoon fertilized a certain ovum, which we may call T_1 . There is a continuity between the structure of the organism at that moment, T_1 , and the individual I am now. Although I am much bigger, yet there is a single system. When I die, that is the end of that system. In a sense it is arbitrary which moment you select as T_1 . You might begin at birth—the actual moment of expulsion into the outer world. It is necessary only that we define our temporal limits.

Social systems do not die. They always change into something else. A foetus at three days does not look like a human being; It looks like a fish. At six weeks it is something dif-

ferent again, but it still doesn't look like anything human. Yet you have a continuous system of *one type*, you have a process of growth. One of the very important distinctions between human societies and organisms is that societies do change type. If an animal gets sick, it either dies or recovers, but if a society gets sick, it makes in due course a recovery, in which, however, it is likely to change its type. A pig does not become sick and recover as a hippopotamus; but that is what a society does.

Societies do not die. An Australian *tribe* dies out, but societies do not die in that sense, nor are they born—Spengler to the contrary notwithstanding. The analogy is a bad one—though useful, dangerous. The nice metaphor of the birth and death of nations is an analogy which is not exact. Societies are not organisms; they do not experience parturition nor death.

The establishment of a colony is not the birth of a society. Your colony is formed of a group of units, who, although they have not been in these precise relationships before, have been in other similar ones. The units have not changed, nor do they sever their former relations. The Russian emigrants to America are really in two social systems. They do not begin absolutely *de novo* in the United States; they are not completely separated from the Russian scene nor completely absorbed into the new. That fact is of very considerable importance. A colony cannot be interpreted in itself alone. In any colony there is usually a community of tradition, of speech, of other usages, which can be fully understood only in the context of the country of origin. The first colonizers of Iceland all talked Norwegian, they established a set of common usages which was not an entirely new organization but was a reorganization of something existing

before. You cannot make a rearrangement of a dead organism and set it going again. You may use the metaphor of birth and death, if you like, but it is dangerous.

I discussed the persistence of an atom and of an organism through time; how, though changes are actually continuously going on, in the atom, in the organism, both yet remain the same atom, the same organism. That which remains the same is the structural *form* of the atom, the structural form of the organism. We are said to be constituted every seven years of an entirely new set of cells, molecules, etc. Yet we are each the same individual. Our structural form does not change. It is this persistence of the structural form which constitutes the continuance of the system.

The persistence of the structural form of a social system constitutes the persistence of a society. You go to an African tribe and find relations between fathers and son, mothers and daughter, husbands and wives, between chiefs and subjects, men and women—relationships which you can define in certain terms. You come back say, in twenty years time. Obviously the actual structure has changed: the old chief is dead and has been replaced by a new one; new individuals have been born, some of the old have died; the children have grown up and they are married and have children of their own. Nevertheless, when you come to describe the structure, you may do so in precisely the same terms you would have twenty years before. The society has maintained its structural form. The persistence of the social system is the persistence of that structural form.

Social science will have to deal with the question of *how* social systems perpetuate themselves. A large number of the problems of, say, the economists, are problems of precisely that kind. Suppose we institute a study of foreign

exchange, to see how it works, how the various usages of different societies function in arranging for an exchange between countries of commodities. We study a certain part of a social system, at a given time, to see how it manages to keep going. You may find that there are cycles: period of expanding foreign trade followed by periods of diminishing trade; and that this cyclic phenomenon is tied up with the way in which the entire social system works. You describe, analyze, and form generalizations: what you may be said to be doing is characterizing a society, and not by its form, but by *the way in which it manages to persist*.

That is what is meant by me when I use the word "function." "Function" has a great many different meanings; it means many things to many people, but when I use it, I do so only with reference to this type of problem.

Function may be defined as the total set of relations that a single social activity or usage or belief has to the total social system. One of the most important things that people sometimes forget is that, as is perfectly obvious, one can never define all of the functions of an activity, usage, or belief, not if one wrote twenty volumes on the given society. For scientific purposes we do not need a complete description of the function, in this sense, of anything. If we take a particular custom, X_1 , which occurs in one form in one society, and in a somewhat different form, X_2 , in another society, the problem of science is to discover what common function there is for this custom in the two or more societies in which it exists. The scientific question then will be, "What are the significant aspects of this functional relation?" and to determine what is significant, we have to have some sort of hypothesis about human society in general.

There is an obvious relation between the two groups of

problems: the study of how societies persist and of how they are classified. We cannot get very far in our study of how they persist until we know what kinds there are, nor can we know very much about how to classify them until we have some notion of how they continue. In other words, the social scientist has first the problems of taxonomy or classification and morphology, and secondly, those of physiology which deal with the functioning and persistence of the system.

The Problem of How Societies

Change Their Type

There is a third set of problems, analogous to certain of those of biology, which deal with change of type. (I would like to suggest that the closest analogies which we shall get in social science are not with the physical sciences but with biology and physiology. To make an analogy between a society and a physiological system is less open to fallacy than to make one between society and a mechanical system. The analogy between society and an organism is not to be taken in its nineteenth-century sense, but merely in the sense that each is a persistent system.)

I do not believe there is any problem of society with which a social scientist is concerned that does not fall into one of the three groups I have mentioned: "How are societies classified? How do they persist? How do they change their type?" There are problems concerning the nature of social systems which we are not discussing here, but all of them, I believe, will fall under these three heads.

To consider the third group: How do societies change? so that you have one kind and then another? so that you get

the passage from one type of social system to another? What are the general laws relating to the change of type of social systems? to the particular events which occur in change of type?

The word "change" (and more particularly "process") is ambiguous in relation to society. I want to differentiate two totally different kinds. One goes to a primitive society, witnesses the preliminaries to a marriage ceremony, the ceremony itself, and its consequences: two individuals, formerly unrelated or in a special relationship, are now in another, that of husband and wife; a new group has been organized, which develops into a family. Obviously, you have here something which you can call social "change" or "process." There is a change *within* the structure. But it does not affect the structural form of the society. Such changes are studied, not as part of the third major group of problems I have stated, but as part of the second. They are analogous to the changes which the physiologist can study *in* an organism—the changes of metabolism, for instance. The other type of change occurs when a society, as the result of disturbances induced either by internal developments or impact from without, changes its structural form.

These two types of change it is absolutely necessary to distinguish and to study separately. I would suggest that we call the first kind "readjustment." Fundamentally, it is a readjustment of the equilibrium of a social structure. The second I would prefer to call "change of type." However slight the latter may be, it is a change such that when there is sufficient of it, the society passes from one type of social structure to another.

*The Second vs. the Third Type of Problems
(Synchronic vs. Diachronic Problems)*

We have said that the first and second type of problems cannot be separated—problems of the classification and of the persistence of social systems. The second and third type, however,—how societies persist in maintaining their type in spite of internal change and how societies change their type—which we may distinguish as synchronic and diachronic problems, these it is absolutely necessary to study separately. These problems are the major problems of the analysis of social systems. The first major task of analysis I conceive to be the synchronic study of the society. Such an analysis is more fundamental than a diachronic one.

We are making an abstraction, quite clearly, in separating diachronic from synchronic problems, for, insofar as we treat a society only synchronically, we consider it as unchanging, which none is for long. The dichotomy is essential, however, for an analysis. Even so, we become sufficiently involved in complexities. Thus, booms and depressions, i.e., business cycles, which may follow a sine curve, are to be studied as constituting a synchronic problem. If, however, we had evidence that over a period of years the society itself were changing, that the rhythm of boom and depression changed its type—as the business cycles of today are said to be of another type than those of the first half of the nineteenth century—these phenomena, then, would be the material of a diachronic study. As between synchronic and diachronic problems, the distinction is between such changes as change within the cycle and change of the type of the cycle.

In studying a society synchronically one treats it as though it were persisting relatively unchanged. A linguist, say, wants

to study English as it is spoken in Chicago in 1937. He can take a cross-section and discuss it, eliminating from his discussion all questions of any changes which are taking place during the period of study. Even if the period covered only one year, some changes would occur which are observable. During ten years, more would be observed: new words would come in, some drop out. The same is true of any society as a whole. Fundamentally societies do not remain unchanged. Certain societies which are pictured as remaining the same, change apparently, although not as rapidly as other social systems. Australian society does change, although it is very conservative. China, in spite of its alleged conservatism, has been undergoing rapid changes.

Nevertheless, it is justifiable to study a society synchronically and certainly it is necessary—in order that we may separate out our problems. We say: “Let us take a society and consider it as though it were merely persistent, without change.” If we do not do that, we cannot arrive at generalizations as to how societies persist. It is logically of the very essence of things that we shall be able to make that discrimination.

The Nature of the Social System Elaborated

Social Coaptation

EARLIER I PUT A TABOO on the word "culture." I wish to revoke that taboo now for two reasons. One is the important distinction that must be made between human and other animal societies. That distinction we shall have to discuss in terms of "instinct" and "culture." Secondly, if I entirely neglect this word, there will remain a certain vagueness as to exactly how some of the things I have been saying fit in with some of the things we have been accustomed to think.

If we ask ourselves, "What is the outstanding characteristic of all social systems, the most general characteristic of all of them, the thing which is essential to any society at all," I would suggest that it is a phenomenon, the term for which has fallen out of use since the eighteenth century, except in medicine where it has a special use—"coaptation." *Coaptation* means "fitting together." The most characteristic thing about any society, human or animal, is that the individual members of the society have their behavior fitted together in some way so as to maintain a social life as a result of that fitting together. The way the modes of behavior of drones, workers, and queen are fitted together in a hive of bees so that the social life may go on are fundamentally characteristic of a society. Social coaptation in this sense is the fundamental characteristic of all societies.

As a second point we may say this: the one main thing that is required for social coaptation is that the behavior of the individual members of a society shall be standardized in some

way. For example, in a hive of bees, it is only because the behavior of the queen and workers and drones is standardized that we get a group of bees continuing as a society. So uniformity, or better, conformity of behavior in some sense is what underlies and is the first necessary condition for social coaptation.

The moment we compare animal with human societies we come upon an important distinction. In animal societies social coaptation is by instinct. In human societies, on the contrary, it is by instinct *plus* culture. It has been maintained that certain animals have culture, and especially trained animals. Trained animals are animals in human society. Circus dogs are certainly cultured animals, but that does not make culture characteristic of animal society. I am not at all certain whether weaver birds do not to some extent *learn* how to make their nests. There is a certain continuity in their colonies; it has been maintained that they build their nests on tradition, in which case there is here an instance of culture. I am quite willing to admit that instances of such behavior may exist, but it does not seem to be very significant or very important, because the amount of such behavior becomes minimal in comparison with the part played by instinct. Why I consider the point more or less irrelevant is that nobody has yet told us how the instincts actually do work. We do not know enough yet about genetic systems. We know more about social systems. We do know something about how culture is transmitted, but not how instinct is transmitted. We use "instinct" merely as a label to describe processes we do not understand, that we know almost nothing about. It is just a tag we attach to certain kinds of behavior. The characteristic is a constant within a single species; therefore, however the continuity is explained, the particular instinct is part of a

genetic system, acquired by offspring from parents through physical inheritance. The word "culture" we see immediately is not characteristic of a species but of a particular society or group of societies and therefore is characteristic, not of a genetic system, but of a social system.

Culture

The word "culture," then, as I am going to use it, is a term which obviously refers to a certain standardization of behavior, inner and outer, in a certain group of human beings, in a certain society. That is the primary significance of the word.

On the other hand, the word "culture" has been used in a number of other senses and has undergone a number of degradations which have rendered it unfortunate as a scientific term.

"Culture" is, in fact, merely a doublet of "cultivation." "Agriculture" and "cultivation" were used alternatively in England. In France you can still use "culture" only in the sense of "cultivation"—of plants or of animals.

If we go back to its use by Hobbes, its meaning is perfectly clear: "Culture" is defined by him as "the training and refinement of minds, tastes, and manners." In other words, it is a process by which individuals are educated or cultivated, and can in that way be applied to either of two things: to the process itself or to the product of that education. That sense continued to the middle of the nineteenth century.

The first occasion on which the word is brought into anthropological discussion is by Tylor, who defined it as "the habits and capabilities acquired by man as a member of society." He is using it to mean, not a process, but a product. Note that "culture" is here the name of a certain

phenomenon which is, in a certain sense, of reality; but we have got to decide what kind of reality that is. "Culture" thus used applies only to modes of behavior of human beings. The definition is, then, left rather vague. It is uncertain whether culture in this sense is supposed to be characteristic of an individual or of a society. And, after all, a *society* does not behave or think. Modes of behavior or thought are things characteristic only of individuals.

If, therefore, we ask, "What is the culture of a group?" we may land ourselves in the difficulty always involved in the description of an average or a sum. Let us take the citizens of the United States as a whole as constituting a social group. Then we can say that the vast majority of them over a certain age can all carry out simple arithmetical procedures, and that this elementary arithmetic is therefore in a certain sense part of American culture. Notice it is not universal, but merely pretty nearly so, among Americans. Let us ask ourselves a question. A certain number of men and a slightly smaller number of women can solve quadratic equations, but there are a great many who cannot, who are not quite sure what a quadratic equation is. "In what sense is knowledge of quadratic equations part of American culture?" Obviously not in the same sense as arithmetic. Finally, about a hundred people in the United States can carry out calculations on Einstein's theory of tensors. "In what sense is Einstein's theory of tensors part of American culture?" Quite clearly all of these procedures are in some sense or another parts of the culture, or rather, they are elements in the culture of the United States as a whole.

When an anthropologist tries, by Tylor's definition, to describe the culture of a people, what is it he must describe? the average or the sum total of the culture of all individuals?

In either case, it is a very difficult quantity to get hold of. What would be the average of mathematical knowledge in the United States when you have at one end of the scale simple arithmetic operations, at the other the theory of tensors, and a vague, ill-assorted middle ground? If you take the sum, that is perhaps a bit easier. You can work it out: so many can carry out simple arithmetical procedures, so many can solve quadratic equations, and a still smaller number can carry out calculations on the theory of tensors. You can add them together and have a statement of the mathematical culture of the United States in 1937. But you see that the moment you talk of culture in this sense, there is a lack of precision in all reference to it. In order to make "culture" precise, we must analyze it out and make it much more definite.

For Tylor a particular manner of making a bow and a particular way of using the bow were parts of culture because they are habits and capabilities possessed by man as the result of living in a society. But what about the bow itself? For Tylor the bow could not be part of culture, since it is a *product of culture*, of modes of activity. The same held for a printed book, which is a product of and also a mechanism for the transmission of culture; and "culture," by Tylor's definition, refers only to habits of human beings.

I asked in one of my classes for an example of culture. My watch on the table was pointed out as such an example. This is a recent degradation of the term. If you follow the process through, you see that "culture" now has become the name for a lot of material things as well as for modes of behavior—for both concrete things and abstractions. You throw the lot together and say, "All this is culture," and finally reach the *reductio ad absurdum* of a definition like this:

“In the broadest sense it may mean the sum total of everything which is created or modified by the conscious or unconscious activity of two or more individuals interacting with one another or conditioning one another’s behavior. According to this definition, not only science, philosophy, religion, art, technics, and all the physical paraphernalia of an advanced civilization are cultural phenomena; but the trace of a foot-step on the sand left by a savage and seen by Robinson Crusoe, a heap of refuse and broken trees left by an exploring party in a virgin forest, the bones, shells, and ashes left by some prehistoric tribe in the ground excavated by an archeologist— these and millions of other human creations and modifications are all a part of culture.” (Sorokin).

The moment you get a definition of that sort, all general propositions about culture become either meaningless or false. The moment you put different logical types together into a single class and then make statements about the class, you inevitably make false or meaningless statements. That is just what has been done in the foregoing use of the word “culture.” Nevertheless, some such sense is the one in which the word tends commonly to be used.

I am going to use the word to refer distinctly to a particular phenomenon which is characteristic of human societies and only of human societies. In any human society there is to be found throughout groups as a whole (or throughout the society as a whole if it is a homogeneous one) certain standardization of modes of behavior, inner and outer, which I shall call “culture.” Thus, it is characteristic of the United States, and only the United States, that in the individuals of this society there are found certain specific standardized ways of behaving, of thinking, of

feeling emotion. As such, "culture" is a very wide term, and is, if you will notice, not a term for a concrete phenomenal reality; it is for a description. The concrete phenomenal reality to which it *refers* is behavior.

Perhaps this is best illustrated by comparing speech and language. Whenever I am talking, my behavior consists of sets of acts of speech. Any act of speech is a concrete event, a real concrete thing in phenomenal reality, and as such is observable. What is a language? When you compare the acts of speech of a number of individuals in a single speech community, you find there is a certain standardization of behavior. That standardization is never perfect. No two people pronounce any word alike, use the same words, assign the same meaning to a given word. There are individual differences. Professor Sorokin and I will never use the word "culture" in the same sense, though we belong to the same speech community. Nevertheless, the variations fall within standardized limits. The standardization of speech activities within a certain defined community is what we refer to when we use the word "language." In this sense language is not a concrete, existing reality. It is a *description*, of a set of concrete acts of speech behavior and of the relations between specific acts of speech. A grammar and a dictionary are such a description. A language is constituted by the uniformity observable in a set of acts of speech carried out by individuals of a single speech community. A culture will also be a description of standardized modes of behavior—of thinking, feeling, and acting.

Nobody says a language teaches a child how to speak, but you *will* find people who say it is the culture which produces effects upon individual people. You will find the statement: "The psychology of the individual is affected by

the action of the culture upon him." If you examine that statement you will find it is nonsense. I can quote you such a statement from a friend of mine, Gregory Bateson, who should know better: "The standardization of behavior in an individual in a given society is the effect of culture upon him." I hope I have shown you that culture is the *name* for that standardization. So what Bateson is saying is that culture is the product of culture—which is quite true in the sense that the culture of the United States on May 12 is the product of the culture of the United States on May 10, but that was not the sense in which Bateson meant it. Culture continues by the fact that individuals are subjected to the acts of other people on them, not to acts of culture. If you say the individual is acted upon by his culture, you are again in one of those logical impasses which renders all discussion futile.

The fallacy of reification of culture discussed above is practically the same as Durkheim's reification of the collective consciousness. In both instances there is treated as if it were a kind of concrete phenomenal reality that which is merely a description of things which can be observed in concrete reality.

Just what does this standardization of behavior called culture, this social coaptation, consist of, and how is it obtained? In the first instance, it is clear there exists as one part of the social mechanism a set of rules. And I would draw a distinction between specific and general rules of behavior.

The specific rules are innumerable. At one end of the scale we can put techniques—such specific rules of behavior as those by which an Andaman Islander makes a bow or a bricklayer builds a wall. They are provided by the society.

In other words, there is a standardization about these things which makes their *description* a part of culture.

A second example are rules of a game, or rules of procedure—rules for chess, or club rules say—characteristic of a certain society.

Then there is a very important set of specific rules which we can call ritual. Whether these are social rituals, such as shaking hands and taking off your hat when you meet a lady; or whether they go to the extent of being religious rituals; or whether they are a combination of social and religious rituals, such as those of a coronation—they also are specific rules of behavior laid down for people to act upon. At one end of the scale of specific rules, then, are techniques; at the other end, rituals; and in between, rules of the game, rules of procedure.

Then there is a set of general rules of behavior in which the rule states not what exactly has to be done but the general principle of behavior which has to be followed in all circumstances. Moral rules are rules of this kind. They do not tell you what to do in such and such a specific circumstance. They say that through all your life you should follow certain principles. Rules of politeness, for example, differ from specific rules of etiquette. Morals and manners are generally controlled by generic rules of behavior.

It might be important to draw a distinction (not from certain points of view, nor too rigidly) between rules of behavior as counsels on the one hand and precepts on the other. A rule may be formulated in absolute form: "You must do so-and-so," in which case what is given is a precept. The Ten Commandments are a good example: "Thou shalt not kill," etc. A counsel is in this form: "If you wish to attain such-and-such an end, you must go about it in

such-and-such a way." In other words, there is an *if*; the rule is hypothetical; the statement is conditioned rather than absolute: "If you wish to build a wall so that it will stand up, you must do it this way." I think the distinction must be made, because, although the authority of society is behind both kinds of rules, it takes different forms. A counsel is not obligatory, but a precept is.

Culture, in the sense defined, then, obviously consists of a set of rules of behavior. It is quite obvious that if we ask what kind of phenomenal reality a rule has, the answer is that a rule exists only in its recognition. There can be no rule of behavior in a society unless the members of that society recognize the rule. The *recognition* is the phenomenal reality. When we refer to the rule, we refer to its formulation, but its actuality is its recognition. That recognition is characteristic of the behavior of a certain number of individual human beings. Thus, in the Andaman Islands it is recognized that if you want to make a good bow, you go about it in a certain way. The rule of behavior is something which exists in the minds of a certain number of people owing to the fact that they recognize it as the proper procedure.

The first aspect of culture, then, is a set of rules. Those rules establish social coaptation by producing a certain uniformity of action. The first condition of fitting human beings together into a social system depends on obtaining a certain uniformity of behavior. Society is fiduciary. You cannot live in a society unless you can on reasonable grounds expect that people will behave in a certain definite way.

The second aspect of culture which I wish to bring to your attention is the existence of certain common symbols and common meanings attached to those symbols. The neces-

sity for these is the necessity for communication between individuals. You cannot fit your behavior to that of other individuals unless you have some means of communication. Even animals communicate. A bee that returns laden to the hive begins to dance; all the other bees of the hive join in; all dance together. There is apparently some means of communication between them, perhaps through the olfactory sense: the other bees go straight to the source of honey the returned bees have discovered. A bee returned after an unsuccessful journey does not dance. We must have communication and symbols of some sort. Obviously, one aspect of the culture of a given society is a certain body of accepted symbols which are used by certain persons and understood by other.

Words are the simplest example. They are used to convey certain meanings and are understood as conveying those meanings. But words are not the only kind of symbols. Gestures may be symbols. Works of art may be—rather ambiguous ones perhaps; at any rate certain of the fine arts are what they are by virtue of certain symbols current in the society. Rituals are definitely symbolic. Myths are symbolic, which explains their value as myths.

A symbol is anything that has meaning. There are levels of symbolism. Things that have meanings may involve similarities and differences at three levels. One is the universal human level. Secondly, a given society has its own set of recognized symbols. Third, individuals have their own particular sets of symbols. It is not easy to sort out these levels. Take, for example, a gesture, the ritual of shaking hands: if we examine that, we find it is not a universal human symbol. It is specifically limited to a definite number of societies. In every society, however, you do

find some form of salutation which involves contact of two epidermi: Eskimo rub noses; an Andaman Islander sits on another Andaman Islander's lap. In other words, the *basis* of the symbolism is universal and probably instinctive—in the skin reactions of human beings. The actual symbol of shaking hands is limited; it is the symbol of a certain definite number of societies, although now the Polynesians have come to shake hands, even among themselves. I would suggest that the “up and down” symbolism appears to be universal—the idea that “up” is good and “down” bad; heaven is above, and when you improve you go up; and you go down through a whole series of hells. I suspect that if we had not gotten up on our hind legs, if we were still walking on all fours, everything in front of us would be good and everything behind us bad. The up and down symbolism runs through our words: superior and inferior, high and low justice, for example; such words have an element of universal symbolism. Of course, one symbol need not necessarily coincide with another in a society. Contradictions may arise here as in language in general or in other aspects of societies.

A symbol need not necessarily imply communication. Some people, particularly psychically unbalanced ones, talk to themselves. We all do. I am suggesting the symbols which people use to communicate with themselves are not culture symbols. They may be based on culture symbols, but the culture symbol is such by the fact that it is recognized by a group.

Symbolism is the relationship between two things—between the symbol itself and the thing of which it is a symbol. To speak of a symbol as “a representation of phenomenal reality” is to use it in a wider sense than I wish

to. Whitehead uses the word "symbolism" or "meaning" as "sign." That is one view; "the moment you have any perception, a process of symbolism is involved." When you perceive a certain sensory object moving dimly in the distance, when presently it acquires a definiteness, which you can express by saying, "I have recognized a horse"—you can, in Whitehead's sense, say that that symbol, "horse," is a representation of phenomenal reality. I am trying to limit its meaning. In talking of *social symbols*, I mean that aspect of an object, word, or act which *communicates a meaning* or which is associated regularly with a meaning. A word, a gesture like taking off your hat when you meet a lady, religious paraphernalia, are symbols in that sense.

Here, then, with respect to symbols, we no longer have rules (although there may be rules as to how symbols should be *used*), but we have a large body of meanings provided for purposes of social coaptation. Symbols may be acts of behavior; they generally do involve acts of behavior. Words involve speech. A ritual may be a gesture, a movement of some sort, or a series of these.

Then we have as a third aspect of culture, two things, and I do not believe we want to separate them. There have to be as part of the social coaptation of any given society a certain common set of ways of feeling and a certain common set of ways of thinking. Any given society is characterized by certain specific sentiments and certain specific beliefs held by the majority of its people. These vary from society to society and are a definite part of culture. The nature of these sentiments and beliefs we need not go into, save to indicate that there are such sentiments as "patriotism," "esprit de corps," etc. Nor need we here enter into a psychological discussion of the affective or emotional side

of human nature and its cognitive side. We can recognize, however, that beliefs and sentiments are very frequently quite intimately related, and that a belief may be an expression of a sentiment. Sentiments cannot be kept alive except as formulated in beliefs or at least in symbols and rituals. Symbols and rituals are vitally important for the maintenance of a uniform sentiment in a community.

You have, then, a body of common sentiments and beliefs, called by Durkheim *représentations collectives*, which is shared, but not necessarily by the whole society. It will be, in a homogeneous society, but not in a heterogeneous society. A society like the United States has a certain number of common beliefs which everybody holds, but a considerable number are confined to a certain group—to a religious group for example; you have, say, the Fundamentalists, and the Liberal Methodists, each with different sets of beliefs. We do not find complete uniformity but may have it over a certain portion of beliefs. This relative uniformity of belief is again an aspect of culture which is essential to social coaptation.

Previously, in trying to avoid the word “culture” I adopted “social usage” and explained it as a mode of behavior observable in a given society in a certain number of individuals and having certain recognition or authority in that society as suitable or appropriate. What I have done here is to refer to the rules behind the usages rather than to the social usages themselves. It does not much matter whether one regards the social usages as constituting culture or the rules behind them as doing so. Social usages perhaps better lend themselves to objective consideration: you can observe people carrying them out. The recognition of the rule is in people’s minds. Both aspects—rule and usage—have to be

taken into account. If you watch an Andaman Islander making a bow, and then another following a similar procedure, you can write a definition of a certain body of technical usages. But behind that technical usage there is in the minds of the Andaman Islanders the recognition that that is the way to make a bow, that this procedure is the proper one. The usages are parts of concrete reality.

Such an analysis of culture as the above can, I believe, be used for scientific purposes, but I do not believe that Professor Sorokin's can be used for that purpose or for any other.

The Relation of Culture to Society

There is a point now which I think becomes an important one, because it shows the connection between culture and society.

Perhaps we must refer back to the difference I stressed between logical or mathematical relations such as relations of difference and identity, on the one hand, and relations of actual interconnectedness in phenomenal reality, on the other, which are of a very different kind. It is unfortunate to have to use the word "relation" for both, because the distinction is absolutely fundamental.

Suppose, now, we consider a series of actions of a given individual animal, and a series of actions of another animal of the same species. It is quite clear that between the actions of A^1 and the actions of A^2 there is a relationship of similarity.

But let us now consider an atom of oxygen. This atom, wandering loose in the world, ties up with two atoms of hydrogen. The atom has a history. We find that at one moment in the life of this atom of oxygen it behaves in a

certain way. And we will find that another atom of oxygen at a given moment in its life behaves in precisely the same way. The *only* relationship we can state between the two events is a relationship of similarity, which means of a certain identity together with certain differences.

If we consider the acts of behavior of the two animals, there is a like similarity which constitutes a *logical* relationship. But *in addition* there is another relationship, one of *real interconnectedness*. We assume there is by using the word *instinct* to explain their behaviors. The similarity of behavior between two oxygen atoms is chemically motivated and is not owing to instinct, but that of two animals of the same species is due to instinct. The moment we use the word "instinct" we imply that there is a real interconnectedness between this act of behavior and that similar act of behavior of two animals, and this assumption is based on the fact that if you were to trace the two animals back far enough you would be bound to find a common ancestry. You say the similarity of behavior is the result of *relations of real interconnectedness within a genetic system*.

Now you have the behavior of one human being and the behavior of another human being, and these behaviors are similar because both individuals are members of the same society. An Andaman Islander makes a bow on one occasion, and another Andaman Islander makes a bow on another occasion; there will be no differences between their behaviors, and thus there is a relation between their behaviors of similarity. Again, however, the relation of similarity is not like that of the behavior between two atoms of oxygen. The assumption is that two Andaman Islanders make bows in the same way because they both *learned* to behave that way. In other words, the relation here is *a relation of real*

interconnectedness within a social system. Just as instinct corresponds to a genetic system, culture corresponds to a human social system—to a human, and not to any other.

Therefore a social usage, if it is the name for a certain collection of acts of behavior of different human individuals, is not simply a name for a certain *class* of acts of behavior, but is the name of a *system* of acts of behavior. These various acts of behavior which we observe as social usages are a set of acts between which there is a relationship of real interconnectedness. While they characterize a certain number of individuals, they are the product in those individuals of the action upon them of other individuals within a specific social system.

That, I think, is what Durkheim had in the back of his head when he seemed to want to say that the social usage is a thing and the whole argument with his opponents revolved about the point that the sum total of social usages, of collective representation, has a reality of a particular kind. He was right, but he was misunderstood when he said social usages must be treated as things. People thought he meant *real things*. When we think of them as *events*, Durkheim was right; they have a reality which is not simply that of a class.

No Science of Culture Is Possible

This brings us to a fundamental axiom of the science of society, as I see it. Is a science of culture possible? Boas says it is not. I agree. You cannot have a science of culture. You can study culture only as a characteristic of a social system. Therefore, if you are going to have a science, it must be a science of social systems.

The position I am maintaining is that if we define a science of society at all, we must admit that one problem—and only one—of that science is the investigation of the nature of social coaptation. Social coaptation *implies* on the one hand a set of relations between persons, that is, social structure. Social coaptation in any society is the standardization of the behavior of the individuals in the society. In animal societies that standardization is by instinct; in human societies we refer to that standardization by the term “culture.” Neither social structure nor culture can be scientifically dealt with in isolation from one another.

Culture cannot exist of itself even for a moment; certainly it cannot continue. What, for example, is the basis of the continuity of a language? (This question immediately raises the whole problem of persistence of systems, of classes, and of what are natural classes.) A language you recognize as a body of speech usages, and you can describe it in terms of a set of rules. It is quite clear that a set of speech usages does not remain unchanged, even for a comparatively short period. But English today is still English, though not that spoken in the eighteenth century. We recognize a certain fundamental continuity. What is the basis of it? It is that at any moment of time between the eighteenth century and the present day we could have put our finger on a certain body of human beings who constituted the English-speaking community of that time *and had a structural continuity as a group*. The continuity of the language depends on continuity of the social structure. Just so does the existence and continuity of the whole of culture as a characteristic of the group. You cannot have coaptation without culture and you cannot have the continuity of culture with-

out continuity of social structure. The social structure consists of the social behavior of actual individual human beings, who are *a priori* to the existence of culture. Therefore if you study culture, you are always studying the acts of behavior of a specific set of persons who are linked together in a social structure.

On that basis I would say no science of culture is possible, that even a science of language is part of the total science of which I am speaking. I can qualify that statement a little in this way: while no complete science of culture is possible by itself, you can have an independent scientific treatment of certain aspects, of certain portions of culture. They will not give you the final scientific conclusions, but they will give you a certain number of quite important provisional ones. The science of linguistics is a good example. You can take the body of speech usages of a community and study them by themselves, make generalizations about them, and call that study the science of linguistics. I think you can do the same with certain other aspects of culture, although probably not as well, and one reason for that is that, on the whole, language, speech usages, are that part of culture which attains the highest degree of uniformity in any given social structure. More even than religion. Ritual? Perhaps, although one does not get uniformity in all instances, not to the degree we get it, say, in techniques. At any rate, it is possible to study speech usages separately, rituals separately, techniques separately. What I would like to point out, however, is that one does not get, in these separate studies, the final interpretation of the phenomena one is dealing with. One gets a series of generalizations—but if you seek the answers to the fundamental problems of lan-

guage, or of technology, or religion, you cannot find them except by first determining what is the relationship between language, or technology, or religion and the social structure—that body which predicates the continuity of the culture.

There Can Be Only One Social Science

ONE OF THE THESES I am maintaining is that if it is possible that there shall be a science of society, there will be only one such science. I am maintaining that we cannot have an independent science of law, of economics, of politics, etc.; that insofar as such sciences are theoretical as distinguished from practical science, they must be part of a single general science of society. I admit that we can have a *practical* science of law independently—of economics, of political management, etc. That is perfectly true. I am maintaining the thesis that if there is to be a *theoretical* science of society in which we are seeking directly for natural laws, then there can be only one theoretical science of human society, and this will in no sense be a psychology.

We can, first of all, say that all science is one. We can say that science recognizes in the universe certain big classes of systems. The really satisfactory method of differentiating sciences, then, the precise, exact, and scientific method, is in terms of the systems which each science studies and of which its generalizations are made. We can put all systems into one class and talk about the class of all systems. Or, we can, say, take all mechanical systems—micro- and macroscopic—and have a science of mechanics; or, again, consider only the movement of bodies on the earth, or only those in the heavens, and have both terrestrial and celestial mechanics; and we can have molecular mechanics. All the systems of mechanics will always be definable in terms of mass and motion and in no other terms. Then there is the investigation

of electrical systems, atomic systems, cellular systems, organic systems, genetic systems. Science as a whole will at any given moment of its history divide up in terms of the various kinds of systems which are being studied at that time. That is the only satisfactory way of differentiating one science from another, and it is something which it is quite possible to do.

The question then is whether social systems as I have defined them are systems of one general kind or whether they can profitably be divided into still other things, such as economic systems and political systems, etc. Can we, if we make an abstraction by which we recognize the social system, make another expedient abstraction whereby we split up that system and make a whole series of subdivisions, each a separate social science?

The decision must rest upon factual material. If we are to consider the possibility of dividing up and establishing a series of social sciences, the first thing we will require is an exact definition of the systems which are being investigated—by the economists, the political scientists, the sociologists, etc. I think we would find that, as a matter of fact, they are all studying the social system, but in varying forms of abstraction.

To what extent are these abstractions valid? To what extent is it expedient to split up the system and cut off economic activities from all other activities of the social system? That can be decided only by investigation of the actual factual material. Does the abstraction work as a theoretical abstraction? I have already granted that it is a practical abstraction.

The economists are the only ones so far who have made their abstractions and applied them. Therefore it will be

necessary to consider only the economists' data. The economist finds it possible and expedient to deal with only certain acts of behavior, to study them, and make generalizations. The question arises: "What kind of generalizations does he get, what are the applications?" and we will find that they apply to only some societies. Economics is the only instance we have to consider. If economics cannot exist by itself as a theoretical science, political science, et cetera, cannot. A theoretical science will aim at defining all social systems.

Economics Cannot Be a Separate Theoretic Social Science

Let us consider a law (which some economists now reject): the law that there is a relationship of interdependence between the demand for a certain kind of goods, the supply of goods of that kind, and the price at which those goods are exchanged. It is held an axiom that supply, demand, and price are all tied up together, and that a change in one will induce a change in the others. It is quite true—for certain societies.

But let us go to a very simple society. There are regular markets where products of the land—yams, copra, etc.—are exchanged for fish and other things from the sea. You will find that when there is a bad year on land and yams are scarce, the same number of fish still buy the same number of yams. You would think that since there is an abundance of fish and a scarcity of yams, you should get a lot of fish for less yams. You are shocked to find that the one thing that remains constant is the price. If I could get one yam for ten fish ten years ago, I can do it now and ten years hence. I may find it hard to get yams, but if I do, I will

still need to pay no more fish for it than when there was no drought. The important thing, the thing that is regarded as essential, is that there shall be the greatest possible stability of prices.

What societies actually do with respect to how they expect to pay prices for their goods is fundamentally characteristic behavior. Take the man-in-the-street in the United States who has been acclimated to change in price as the market varies. He works on a budget; there has been a drought and therefore he has to pay more for his beef; he then balances his purchases between pork and beef. Compare his behavior with that of a man from a primitive tribe in which the main aim of everybody is to keep prices fixed. Suppose you told him, "There aren't so many yams this year, you will have to pay more fish." He would be very indignant. He would not proceed to balance a budget. The point is that if you describe what actually occurs in the ordinary economic procedure in one society and then in the other, you get characteristically different consecutive forms of behavior. In the one society you can say people do not recognize the relevance between supply and demand: to keep prices fixed is the important thing. In the other society, people do recognize that relevance.

Of course, you completely disrupt the economy of the kind of state which insists on stability of prices if you inflate its currency. In New Guinea, for example, some years ago, there was on the whole a limited supply of dogs' teeth. The Germans were bent on buying up everything. They imported a whole boat-load of dogs' teeth. The natives were for two or three years completely lost, flabbergasted, even more than we would be if Roosevelt were to buy up all the gold in the world. Panic followed because what you had

here was an economy which rested on the notion of a stable exchange. The price of a commodity was held a fair price, something permanent—something in the nature of the universe.

The really interesting thing is this: if we investigate the nature of a theoretic science of society, in what relation does economics stand to the rest of it? Is economics something apart, or does it furnish a statement of knowledge which can be included in the whole? Does it stand as something entirely separate or does it stand in a relation in which it will provide a form of knowledge which can immediately be applied with other knowledge to give us a complete science? These are the problems of a philosophy of science.

Are economic relations social relations or not? A social relation exists between any two persons or any two groups the moment there is some adjustment of interest between them. The adjustment of interests, or coaptation, takes place in animal societies on the basis of instinct, and in human societies on the basis of culture, or social usages. Either economic relations are social relations in that sense or they are not. If they are, they are part of the science I have outlined. I would say that they are. I would say, for instance, that the relationship between me and the man who picks coffee beans on a Brazilian hillside for the coffee I eventually drink at breakfast is a social relationship.

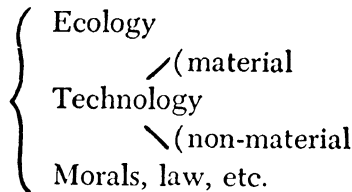
Let us take as another example a simple procedure in a primitive society. A man, wishing to express his friendship, offers another a gift, which he accepts. The latter feels obligated to return a gift of about equal value (and that apparently is where the simplest form of evaluation of goods enters into human life). Sooner or later he returns a gift. What has happened is that there has been an adjustment of

interests. You find that exchanges of gifts are definitely used as a mechanism for maintaining certain types of relations between certain persons. In a certain tribe you find that it is used to maintain a relationship between mother's brother and sister's son; in another, between son-in-law and father-in-law, etc. You find a set of relations which are definitely social because they are the linking together of individuals; they are social coaptation on the basis of exchange of goods.

The anthropologist's view of what he calls economic relations can be defined fairly easily.

There is, first of all, a whole set of relations, a whole aspect of social systems which can be called ecological. I am not saying that ecology can exist as an independent science; all it can be is an essential part of the analytical description of a society as a whole; or societies may be classified on the basis of their ecologies, as to whether they are hunters and gatherers, pastoral, agricultural, industrial, etc.

Next to ecology, you have technology, and this will have to be separated into two parts: material and non-material.



The nonmaterial is concerned with techniques—for war, for education, etc. Nonmaterial technical procedures are not concerned with the production of material things. Education may make use of a blackboard, but its techniques are edu-

cative techniques. The techniques of the society are certain of its social usages which depend upon the social structure. The techniques you apply to yourself depend on social relations; educational techniques definitely.

Material and nonmaterial technology obviously connect with something else—with a body of usages which are regulative of rights and obligations—customs which control the acts of production of goods and the way in which they are distributed. The moment you consider the circulation of goods, you find the ecology and technology tied up with property rights, laws, and morals; you have a relation between ecology and technology and a set of social customs whereby goods, produced by the technology, are circulated. When you get co-operative enterprise—helping cut a canoe in the Andaman Islands, exchange of services, general mutual aid, and gift exchange—and regard them from the point of view of the functioning of a society as a whole, you note that what these phenomena constitute are the distribution of activities and gratifications.

One must distinguish between activities and gratifications. Lying in the sun is an instance of activity and gratification contained within one individual, and such instances are not our concern. We can, however, study in society after society the way in which activities are distributed, and again how gratifications are distributed. I do not know whether this is what the economist is interested in. It is what the social anthropologist is interested in. It will be here, and here only, that their lines of investigation will converge.

Some economists, I believe, are attempting analytical descriptions of economic systems of the present day as functional systems. My criticism would be that they sometimes take a one-sided view. There are two aspects from which

one can define a functioning economic system. First, how gratifications and activities are actually distributed: attention is concentrated on the actual goods and on the services actually being distributed. The other aspect focuses attention on the coaptation of individuals that results from and at the same time is the basis of that distribution. You have in a simple society, say, a system of chiefs and commoners. The chiefs engage in activities which are considered "higher"—religious, political, et cetera. They do not grow any food. The commoners provide all the food. The chiefs get more than the commoners, and their pick of the manufactured goods. I would consider that the two problems, of how goods circulate, and of how relations between individuals are established and kept going thereby, should not be isolated from one another. What is more, I hold the relations between individuals to be the more fundamental of the two. The distribution of goods is in a sense secondary.

Comparative Epistemology Cannot Be a Separate Theoretic Science

The anthropologist finds that any society he examines has a cosmology, namely, a set of beliefs about the nature of the universe in general. There is no society without some sort of cosmological scheme, and cosmologies vary from one society to another, and from one period to another. Such cosmologies can be studied in a purely objective way. In such a study it is essential, however, that we avoid the word "knowledge" and speak only of "belief." If, in discussing the cosmology of the Australian aborigines, I used the word "knowledge" with reference to their beliefs about the relation of man and animals, that is, totemism, I should be understood to be implying their beliefs were sound and true.

As an anthropologist, I have no business to do that; nor may I imply that they are false. If the Australians believe in the Great Law-Giver who established in the beginning of time the social system in which they now live, I have no business to say "that is false," and equally no business to say, "it is true." What I have to do is investigate the belief as a phenomenal reality. When we do this we can divide up the kinds of beliefs and note that in a primitive society what corresponds to scientific knowledge or belief in our society consists of formulations of natural laws; in either instance these underlie the technical procedures of the society. On the other hand, there is another body of beliefs which underlies ritual and which finds its expression in the ritual itself and in the mythology. These various forms of belief together give us a cosmology, a conception of the universe.

There is a fundamental difference between logic as an investigation of truth, and logic as the subject matter of a comparative study, except that we use logic in pursuing the latter which otherwise is an *a priori* field. If we compare actual logical processes (people of different communities do not follow the same premises to the same conclusions), it seems to me the scientist has no business to say whether the procedures of a search after truth are true or false. He *may* say, "Here all thinking is on the basis of analogies. In our modern thinking we use certain types of analogies and in certain ways; here other analogies are used and differently." Take the analogic thinking which underlies ancient Chinese philosophy. It can definitely be proven to follow a logical process, of which it is silly to say whether it is true or false. Take the Chinese concept of Yang and Yin as the principles of good and of evil, of strength and of weakness, male and female. It is very like Heraclitus' con-

cept of the unity of contraries. One proceeds on the basis of conceived opposites to a classification of all things: day and night, winter and summer, twilight and darkness. Everything in the universe is brought into the classification: mountains and lakes, rivers and seas. Now there is a system of logic—a full system for handling analogies. It seems to me the scientist has something to investigate here; the system is important to Chinese civilization, a determinant of and determined by their whole social life. But the scientist has no right to say whether the system is applicable to the universe, whether it is true or false. If he does, he introduces something, as when he says of the Australians that to put to death sixth cousins who marry is absurd. One essential, necessary condition of all natural science is that all evaluations, whether ethical or logical, shall be eliminated. Therefore I believe it is never well to speak of “knowledge”—to say, for instance, which belief is right: the sun goes around the earth, or the earth around the sun. It is not the anthropologist’s business to settle that at all.

That particular branch of our science which deals with the beliefs generally held by societies I would call comparative epistemology, that is, the comparison of different types of beliefs. One of the criticisms of the little work done in that field by Levy-Brühl, by Pareto, and others, is that it is vitiated by the fact that the irrelevant question is introduced of whether the beliefs with which they are concerned are true or false. We immediately apply our system of logical thinking to the beliefs, instead of studying them in terms of logic. Levy-Brühl, for example, speaks of pre-logical thinking; Pareto of non-logica; and this is wrong from the scientific point of view.

The anthropologist can study the relationship of the prim-

itive cosmology as a whole to the "science," i.e., to the primitive knowledge underlying technical procedures. He finds that the two things are interrelated in a very definite way, and that that interrelationship can be demonstrated. I think the same thing could be done for every society. There is an interaction between the body of scientific or technological beliefs at a given time and the cosmological beliefs at that time, and that interaction is an actual relationship. Any study of that relationship does not hinge upon the question of the logical relation between the scientific and cosmological beliefs, but upon the functional relationships between them.

Again, comparative epistemology cannot be separated from general linguistics, because one of the important factors in determining what and how people think is the set of categories contained in their language, of which they may not be aware, but which they will use. It will be impossible to follow the logical procedure of the Chinese without taking into consideration the characteristics of the Chinese language. There is a correlation here, a necessary, not an accidental one, between the type of epistemology and the linguistics of the Chinese. Although to a certain extent you can treat logic by itself, sooner or later problems will arise for the solution of which you must bring language and logic together.

To hold that epistemology can be treated as a separate science I believe is a totally false position to take. I am saying dogmatically it is wrong. I am convinced that the beliefs and ideas of a people at a given moment of time can be understood only when you know the total functioning system. (I would not say, "You can't know anything until you know everything," but I *would* say, "You cannot know

everything about anything until you know everything.)

Let us take, for example, an Australian tribe. The Australians give you an explanation of the world dawn very like our own: "It is true there was a period in which the world received its form."—They will then tell you about spots in the country which contain a certain force or power: in a certain spot you will find a rock or waterhole in which is contained the life-force of a species, of kangaroo, say, and in another that of another species; and the order of the universe goes on only if at the proper time of the year you perform the proper rituals so that the life-force is distributed over the country, and the kangaroos, etc., multiply. Those are particular beliefs held by a particular people. At first sight they appear erroneous. Nevertheless, I could demonstrate to you that on those erroneous beliefs hangs the whole social structure of that tribe. Destroy those beliefs and you destroy the whole structure. The whole system of relationships of the people with one another is maintained and kept going by the body of particular beliefs and ideas of which the above are instances.

A social system anywhere in the world will continue only on certain conditions, and one of these is the maintenance of a particular body of cosmological beliefs. That is what I mean when I say a cosmology, no matter how erroneous it may be as a view of the universe, is something which rationalizes a set of behaviors which constitute the system of coaptation of that particular society. That can be proved. At any rate I can prove it for a few societies, and I suspect it of others. Therefore, I maintain that any body of beliefs or knowledge, studied apart from its functional relationship with social usages and the whole social structure, is omitting, is missing out on a really significant clue

to the understanding of what that body of beliefs means.

A social scientist is not concerned with the private beliefs of a private individual. What he is concerned with is the body of beliefs current in a society and which have a certain recognition in that society or one of its groups. If you study Australian totemic beliefs, it is not as these have anything to do with the evidence of any one individual. Some individuals may offer you evidence. For instance, when travelling in western Australia, in a region in which the fauna was practically extinct, a native told me it was obviously the fault of the squatters because of whom the natives had had to give up totemic ceremonies. I drew his attention to the fact that kangaroos had not become extinct. He said, "Well, someone must have been carrying on ceremonies." Such beliefs are not reached by the logical processes of science. In our own culture the reasons for the extinction of a certain species are arrived at by a logical process. Most of our current beliefs, however, are not arrived at logically. Those common beliefs in our own society which are logically arrived at are comparatively few. I accepted the doctrine of the Trinity, not because it is logical, but because I was taught it as a small boy. Australian belief, not otherwise than ours, has the whole force and authority of society behind it. The individual does not accept it after a process of trial and error, but accepts it because it is something he has to accept. We have to study these beliefs, irrespective of the logicity of the individual who holds them. *How* he arrives at them is part of our study. Obviously he was taught them as a small boy. They give value to his life. That is why he holds on to them.

We do not want to explain the factual beliefs of a particular society, of the Australian aborigines, for instance, but

we do want to compare this society with other societies, to determine what is the interrelation between a people's cosmology and their total social structure. This can be done adequately only by comparing a number of diverse examples, for instance, from Australia, from China, from Africa. We may make a series of such comparisons and a series of abstractions. We can, if we go far enough, study all of human society. We can then state a general law of relations between cosmology and social structure. We can make some generalizations now, for instance, with respect to cosmology and the development of technology. The question is often asked: "How do you explain the beliefs of the Australian aborigines?" There are two explanations here. One is the historical: these beliefs grew up in a certain way as a result of a series of accidents. The process of history is always accident. The other explanation lies in the relations, the interconnectedness of these beliefs with the total structure, an interrelation which I describe as the structure's consistency.

The Functional Consistency of the Social System

THE NOTION of functional consistency is a vitally important one in social science.

Suppose we undertake to study a society. We select, as a suitable unit, say the Tlingit of the Northwest Coast. We can recognize that society as a perfectly concrete discrete thing. We can determine all those individuals who are and those who are not Tlingit, and that the Tlingit are scattered over a certain delimited area. You describe the society. What do you describe?

You will describe a social structure—that of the Tlingit Indians. It will involve *pointing out* that they have certain localized groups: households collected in villages; that they have kinship groups: a moiety organization, clans, etc.; and further that there are certain dyadic relations which are regulated and standardized.—These will give you the social structure in outline.

You can *describe* that structure in full—but only by describing a set of social usages, and by describing also (if you will make a complete description) the characteristic inner behavior as far as you can determine it—the beliefs, sentiments, ideas current in the society (what is commonly called the psychology of the society).

I maintain there is a system underlying these usages that is obviously not given in the description, that there are a series of interreactions between the traits of this society

which link them together. What is the nature of this inter-connection? Do all these parts possess a unity, and if so, in what terms do we describe that unity? My own conception is known: We can describe it in terms of its consistency. In order to distinguish what *kind* of consistency, to differentiate it from *logical* consistency, which is merely one kind of consistency, I offer the following:

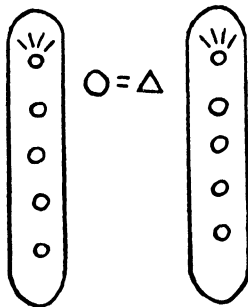
The lowest order of consistency is merely negatively so. One of the first essentials of the persistence of systems is that there shall be no marked inconsistency between any of the system's characteristics so that they are perpetually coming into conflict with one another. That merely negative aspect of consistency with reference to a society means that there is nothing in the total organization which particularly conflicts with anything else, or, more to the point, in any way makes it appear in conflict to the individuals in the society; it is the reaction of the society, not of the anthropologist, which is at issue.

The second order of consistency exists when one part of the whole system involves another or other parts. There is a reciprocal action between them. Each reinforces the other.

Let us consider a particular institution: the potlatch of the Tlingit. There are here two moieties, the Eagle and the Raven. If a household on this side wants to build a house, they cannot do it themselves; they have to ask the people over on the other side to build it. *They* have to repay with a big feast and large presentation of goods. If those on the other side want to build a house, they have to follow the same procedure. You can't, in fact, bury your own dead, or raise a totem pole; you have to get "the other side" to do it. The other side has to validate the rank of

your children. Clearly there is here in the potlatch an economic usage—a mechanism, in the large presentations of gifts which are made, for the circulation of goods. If, however, you study merely the economic phases of the institution, you make an artificial abstraction; you tear it out of its context and rob it of its actuality. It can be demonstrated that the potlatch is much more.

First, there is involved the existence of moieties, of clans, of rank and of the details that accompany rank—hats, crests, the right to a certain name on your house, etc. It can be shown quite easily that the potlatch system is the system by which the whole kinship structure and the whole system of ranking of the social structure is maintained in existence. The whole thing is kept going by the potlatch. The social structure itself is what supports the potlatch, and the potlatch vitalizes the social structure. There is a relation of reciprocal action between the two. The maintenance of the structure requires the performance of the potlatch at given intervals. We can tie up exchange of goods with the clan system, with relationship, with rank. We can demonstrate the interaction by considering kinship alone, which here is dependent on cross-cousin marriage, that is, marriage between people of this side and of that. A child from the chief's



house on this side must marry with a child from the chief's house on that. Children of the marriage will be given their rank by a potlatch of this house and of that house. These people give those a lot of property, and vice versa. Whereas the two bodies compete with each other in giving away goods, each serves to uphold the rank of the other in the total system of ranking families.

If you turn to the system of beliefs, sentiments, and ideas, you see that the potlatch is involved, among other things, with a whole series of myths. Certain ones have no meaning until tied up with the potlatch, and certain features of the potlatch remain meaningless until tied up with the mythology.

Here there is a typical example of something characteristic of society in general. The system primarily concerned is that of the exchange of goods. If you analyze it out, however, you find that before you have finished the analysis, you have studied the complete social structure and made a complete study of the ideas and beliefs of these people. The potlatch enters even into the juridical procedure in certain obscure ways. It has its part to play when offenses are committed, by groups of people, who can make restitution either by becoming the objects of retaliation or by a potlatch.

One might offer a hundred other illustrations of the interaction of the traits of a society. Analyzing a society as a whole with respect to one aspect, you find everything tying up with that one aspect. The best illustration is from Malinowski. He said, "Let's take this society and trace the effects on it of sex," i.e., sexual cohabitation. He found that to cover the field thoroughly was to cover the whole Trobriand society. Audrey Richards, one of his students, said, "Let's fol-

low food through the society and see where it takes us," and again, food took one through the whole society; it is by food also that everything is tied together.

The point I am arguing is that a society is a system in this sense, that in any description we could make of the society, or of what constitutes the culture, all characteristics to a greater or lesser extent function together consistently. The degree of consistency varies from society to society. The lowest order, the absence of all conflict, is an order to which I think a number of simpler societies approximate. Then there is that order in which the parts of the structure, including the cosmology characteristic of that society, work closely together to reinforce each other and maintain the structure. In that latter sense I spoke of the Tlingit as having a system.

But the Tlingit system is similar to that of the Haida south of them. Our analysis will be made more complete by considering the Haida also. The social usages of the Haida vary in certain respects from those of the Tlingit. If we analyze the Haida also, compare the two systems, and eliminate the variations, we can define a system of which the Tlingit and Haida are two examples.

Clearly, we have made an abstraction. The Tlingit and Haida systems are each a highly complex one, and for purposes of comparison it was necessary to break each down into a large number of abstracted characteristics. But the first sense in which the word "system" is applied to a society of this sort is not the sense of the totality of these abstracted characteristics but is the sense which assumes there is something which we call functional consistency characteristic of the totality of traits of a given society.

Structural Principles of the Social System

Abstraction in Social Science

IN ANY SCIENCE we use a certain number of abstract principles to guide our thinking and formulate hypotheses, and these are then tested by reference to a specific body of empirical data. What are the kinds of abstractions that have to be made in social science? It seems to me there are several ways in which "abstraction" may be used.

One process of what people sometimes call "abstraction" I have illustrated. I spoke of the Tlingit and Haida as being closely similar to one another. I suggested that by a study of the two, a comparison of their social systems, and the elimination of the variations between these social systems, we could define a *type*, which we could call the Tlingit-Haida system, of which each of these would be an example. This would not be either the Tlingit or the Haida system, but would be an abstraction from actual concrete systems. This is one sense of the word in which "abstraction" may be used. It is the same sense in which we used it when we spoke of an Australian tribe as conforming to a single type. "Type" here was similarly an abstraction. Clearly "abstraction" in this sense has an important meaning for the discussion.

Another sense in which people use the word is in saying that in a society you may abstract from the totality of the behavior, say, the economic behavior, and study that by

itself. In this case you abstract out from a concrete system a certain definite portion of it which you call the economic life, to study this by itself. Now it is that type of abstraction which I am saying is only partly valid; valid in different degrees for different social phenomena, and never completely valid in the sense that you can make a separate science of economics, or politics, or comparative religion. You can study economic institutions by abstracting them from the rest of the social system with which you are dealing and get some important results. The full and most useful significance of these, however, will not be apparent until correlated with the rest of knowledge about the social system.

There is a third meaning of abstraction which is, I think, the most important. Abstraction, in this sense, is a procedure by which we separate out, we abstract from a social system a certain structural principle which we find in this society, and in another, and in another, so that finally, if we have selected our material rightly, if we have made our abstraction correctly, we can formulate what will be a universal structural principle of all human societies. This formulation will have been arrived at by a process of rational thought and application to empirical data. We can then proceed to test our abstract formulation by applying the principle to various societies and studying the variations of it that occur in a number of concrete instances. I would suggest as an example of this type of abstraction what I call the principle of justice, which I believe can, in the above sense, be abstracted out of social systems and studied by itself.

It has been said, "The universal traits of all societies are due to the specific nature of man, his powers and weaknesses." In one sense, yes, and in another, no. Specific traits are characteristic of society owing to the fact that societies

are arranged in structures. Just as the structures of atoms vary and nevertheless certain structural features occur in all atoms, so the structures of societies vary, and yet, I believe, there are certain structural principles in societies that are universal. I believe there are many of those principles we do not at present know. I suspect the only possible way we can discover them is by an empirical and not a rational process. It is possible, perhaps, to give an example—not to illustrate the generalization, because I do not know it—but to illustrate the body of material which one would study in order to get a generalization of fundamental structural principles in human society. A social structure is a certain arrangement of social relations in which the interests of different individuals and groups are adjusted one to another. It is quite clear that one mechanism for maintaining that adjustment, in any society, is the system of law. You may say the function of law is to maintain the social structure by perpetually readjusting interests between individuals. I believe it is possible to say there are certain fundamental structural principles which are deducible, not immediately from the nature of man, but, if from anything, from the fundamental nature of human society. Just as the fundamental nature of atoms is not discoverable from the investigation of a single atom, I hold the fundamental nature of society is not deducible from individual human nature.

The Abstract Structural Principle of Justice

The nearest I can come to what I would call an abstract structural principle which I believe characteristic of all social systems is the principle of justice.

For the social scientist such a principle is not to be discussed ethically. He is not concerned with what justice ought

to be. He is concerned only with finding what actual principles have appeared and in what forms in various societies they represent justice. We are going to use the word "justice," as applied to certain sets of phenomena by various societies, totally irrespective of what we, as individuals capable of ethical judgments, regard as just.

The analysis will come very near the conclusion that justice is what Immanuel Kant thinks it to be: "A person who does evil should suffer evil, and one who does good should receive benefits." This is the theory of retribution, a theory of justice of a particular type. Kant held this an ethically sound position to take. Certain philosophers think they have a sounder theoretical basis for a concept of justice in Aristotle. Between the positions of Kant and Aristotle the social scientist is not choosing. He is concerned with what people have done in the past in the way of administering justice and in organizing their social relations in this respect. What people have actually very frequently done in the past is to see that people who have done wrong should suffer.

I hold there is in human societies the principle of just retribution. How that principle is applied as a universal principle of social structures is our problem. It is not isolated in itself, and therefore it is always modified by other principles which come in and act upon it or with it. It is found in some form in every human society of which we have adequate knowledge, so that we can make an analysis of societies with this as our guiding principle.

The way in which it can be modified is very clear in certain simpler societies. There is here no justice, strictly speaking, between brothers. The relationship between broth-

ers should be one of affection and does not require that it shall be governed by justice. It is accepted quite simply in Australian tribes that certain relationships do not need to be regulated by justice because they are regulated by love. Christianity also proposed to abolish justice for love. Again, justice may be overridden by rank. What is right for *A* is not necessarily right for *B*, if *B* is in a position of subordination. Nevertheless, in spite of such modifications, we will still get a general principle conforming to the type.

We can, as a matter of fact, derive from this principle a second principle of equivalent return. As we observe it in human behavior this has actually three forms.

A injures *B*. Then justice steps in and says *B* is now entitled to receive satisfaction for the injury inflicted upon him: *B* is entitled to injure *A*. That is the law of *talion*. An important thing is that here, probably for the first time in human history, the notion of quantity is brought in. The amount of injury *B* may inflict upon *A* may not be in excess of that *A* has inflicted on *B*. An eye for an eye, a tooth for a tooth, a life for a life. If I knock out one of your teeth, you are not therefore entitled to knock out five of mine.

In the second form of the principle, *A* benefits *B*, whereupon *B* is under obligation to benefit *A*, and *A* can expect a benefit of equivalent value. One gets this form in mutual aid, where people help each other over tasks. In a Japanese village, for instance, when a man wants to build a house, all the neighbors come and help build the house. When the neighbor wants a house built, you go and help him. In the Andaman Islands, when a man wants to cut a canoe, everyone comes and helps.

This form of the principle is also found in the very com-

mon feature in primitive life of gift exchange. *A* gives *B* a gift, and *B* gives one of slightly greater value to *A* at a later time.

The third form of the principle occurs in indemnification for an injury. *B* now compensates for the injury he has inflicted on *A* by paying an indemnity.

The single structural principle which runs right through all these institutions is the principle of an equivalent return: good for good, evil for evil, or, in the last instance, indemnification for injury. You will find that in the form of "good for good, evil for evil," it runs through the customary behavior of primitive tribes, and then becomes incorporated, in the form of "indemnification for injury" in more complex societies which have some form of legal system. In this third form it is clearly the principle at the basis of actions in tort, for obtaining damages in civil law. The principle is slightly modified and somewhat more complex when you study *A* and the society at large. *A* commits an offense against which the *society as a whole* reacts. Here the principle appears as the basic principle of criminal justice, in the punishment of crime. It is the same fundamental principle, running through all human social behavior, but varying from society to society.

I would say that principles of this sort, if rationally arrived at and empirically tested, will tie up systematically with other structural principles. The question is, do we get several sciences or one fairly completely unified science out of these processes? It seems to me that on the whole they make a unified system. If we can show, for instance, that the principle of justice gives us systematic propositions about law, it could then be combined with the principle of expiation to give us an adequate account of a great mass of

religious phenomena. Without adding greatly to it, the principle of justice may also give us the basis of a theory of economics, namely that of value and price. If this can be demonstrated by rational analysis and application to empirical data, we shall have started with one single abstract principle, that of simple justice, and have tied up with it law, religion, and economics.

The notion of expiation seems also to be a universal structural principle. The concrete forms of the principle vary. If *A* does a wrong and then himself suffers hurt, the wrong he has committed is neutralized, completely wiped out and abolished. Perhaps that is not an exact statement, for in some forms of expiation it is difficult to see how suffering comes in. In a primitive society, for instance, a man does something which makes him ritually polluted. He then submits himself to certain ritual procedures, generally involving restriction on his behavior, possibly some personal discomfort. When this is over, his crime is wiped out, the wrong eliminated. Criminal justice can similarly be viewed as expiation. An individual commits a crime, suffers punishment; he has expiated, the wrong is wiped out. In religion an individual is said to commit a sin; he undergoes penance, a self-infliction of a state of unhappiness, even if only temporary, and we say again the wrong is expiated. The notion is rather complex. Those familiar with primitive peoples will recognize that it combines with the principle of just retribution: *A* injures *B*. *B* injures *A* in return. *A* is then said to have expiated his offense. He may, for instance, give himself to have a spear thrust in his thigh by *B*. Once this has been done, his offense is regarded as having been wiped out. If a man submits to the prescribed retaliation, no one thereafter can hold the offense against him. You will

find the principle in ritual procedure, in religion, in magic, varying from simple forms to the most complex.

In our own religion it takes the highly elaborate form of vicarious atonement. All men, being sinners, ought to suffer. As a matter of justice, since we have all sinned, we all deserve to be punished. Expiation is not left to each of us individually, however. God's son, having become incarnate and having suffered death, thereby expiated all our sins. One gets the sacrifice of the god himself in this and certain other instances—Osiris, Dionysus, Orpheus, for instance. The particular notion of sin and expiation in a highly complex pattern, however, is especially characteristic of Christian theology.

The principle of justice, with some modifications, as I have said, may be used to elaborate an economic theory of price and value. Here is one problem which is theoretically the problem of social science.

In theoretical social science we are interested in how prices are actually determined and regulated in a given society. We find that in any society goods are circulated always according to the fundamental principle of equivalent and fair exchange. Even in the simpler societies, where there is no buying and selling, one nevertheless finds the custom of gift exchange on the basis of a just equivalent return. *A* gives something to *B* as an expression of his friendship. If *B* refuses it, that is an expression of *B*'s enmity; if he receives it, a ratification of his friendship. *B* is then under obligation to make a return, of something which he thinks is slightly more valuable than what he has received. You always try to give in return a *little* more than you get, to keep face. Not much more, but only a little more, so as not to cause *A* to lose face. Not to lose face is important.

If I give you something worth five dollars and you give me something worth ten, I have to run off to get something else worth six to give to you. Again it is necessary that you shall be able to estimate value, so that you can say, "This thing is equal to that."

No matter how valid the theory of supply and demand under certain conditions, it does not give us an explanation of how prices are actually determined in a large number of instances. Take Chicago in the Year of Grace, 1937. Suppose you find yourself there and in need of a mild saline laxative. You may know that sodium phosphate is a mild saline laxative. You have two alternatives. One is to go to a wholesale drug house where you can purchase it in twenty-five pound lots at \$1.50 a lot. Or you can go to your corner drugstore and buy a package of Krazy Krystals, for which you will pay \$1.50 for fourteen ounces. A professor of the University of Chicago says that the difference between what you get in one instance and what you get in the other is something which may be called "subjective value." This is a very important factor in modern society. It is clear that there is involved here more than simply a matter of supply and demand.

I am suggesting that if you examine the problem of a price that is just and proper, one of which it may be said that the exchange is fair, you will find that that price is determined by a very large number of different factors in the total social situation. Besides the principle of justice, there is, for example, the modifying factor stated by a famous American woman as "Never give the sucker a break."

Now I would suggest that what operates to regulate exchange is the adjustment of interests on the basis of an equivalent return; that the mechanism for exchange of goods

is one of correlating interests to produce what I have called social coaptation. In the simpler societies you find gift exchange; in certain ones, barter; and in still others, purchase.

In any social system there will be at least two ways of finding an adequate adjustment of the individual interests involved in exchange.

The belief here is that it is desirable, in order to maintain permanence of social relations between persons, that there shall be a standard set of values which never vary, so that every one knows at all times what the value is of a given entity. In order to get interests really adjusted, you must satisfy *A* and you must satisfy *B*. *A* has to be satisfied that what he gets is at least equal to what he has given, and *B* has to be satisfied that he has not given too much. There is in the initial situation the possibility of disagreement between *A* and *B*, and of failure to get a satisfactory adjustment of their respective interests. One way of standardizing behavior in such a way that there cannot be any dispute or disagreement is to standardize values.

One basis of adjustment has been adapted variously by a large number of societies, and that is a standard set of exchange values. We may take as an example a people of the Caucasus, the Pshav, and their fixed values for payment of indemnities.⁴ You pay an indemnity if you have injured a man or otherwise committed a wrong. In order that the amounts of indemnities may be clearly stated, they are fixed in terms of cows. You may not have enough cows. In order that you may pay in other commodities, there is a series of fixed ratios of values—of commodities in terms of a cow. A mare is worth 4 cows (translated into Russian currency, 20 rubles; 1 cow = 5 rubles). A gun is worth 20 cows or

4. Alexander Grigolia. Ms., Wheaton College, Ill.

100 rubles. A horse is worth 10 cows; a mule, 8 cows; a sabre, 7 cows; $37\frac{1}{2}$ stils of copper, 3 cows. So that you may be condemned in court to pay 24 cows, and actually you pay mules, a sword, a few stils of copper, and only one cow in the whole lot.

It is very important in a society of this sort that the standard ratio of values be maintained. The society has found one way of arriving at adjustment of interests on the basis of a principle of justice, a way which works, which functions.

On the other hand, there is a totally different method for arriving at an adjustment of interests. In a society which adopts it, it may be said, "Well, when there are plenty of goods on the market, we'll sell for less, but when there aren't so many, they ought to fetch a better price." That you find certain societies adopting this method of adjustment will not, however, establish the law of supply and demand as a universal characteristic of all human societies. By logical processes and investigation of factual material we can determine that there are alternative mechanisms.

There may, in fact, be a conflict between the two mechanisms of adjustment: a standard set of values, and supply and demand as the determinant of a fair price. For instance, in a primitive society there is a fixed ratio of exchange between yams and fish. But the supply of yams varies from normal in certain years. Under this strain the system may not work so well. There may be conflict, and in the end, compromise, but the weight of tradition will fall on the side of maintaining the fixed ratio of values.

Whichever principle one tends to adopt: fixed price, variable market price, "never give the sucker a break," or whatever other principle, all are examples of how prices are

actually arrived at. Principles vary only according to the different standards of what is adjudged as just in different social systems. All revert to one fundamental point: to the need for the adjustment of interests between individuals. The adjustment is based on what is accepted as justice by the people of the society themselves, on what they regard as a proper price. They must feel that what they get in exchange is in some sense equivalent to what they give. Then there is a satisfactory situation. If one feels that one gets less than one gives, there is not. One *may* have a society in which a large number of individuals are always trying to get more than they give, in which case they are prepared to be unjust, so long as injustice does not lead to open strife.

I have offered here a theory of economic value, one which attributes the notion of the evaluation of goods and of services and of injuries to the same fundamental principle. The principle may be a general structural principle characteristic of all human societies, possibly even a necessary structural principle. I do not mean "necessary" in the logical sense, but in the sense that it may be found to characterize all human societies which have existed or may ever exist. Such a principle, having been formulated and adequately tested, we may proceed to the statement of a whole series of problems relating to it.

Summary

I HAVE ADVANCED several theses. The first of these was that a theoretical natural science of human society is possible. My second thesis was that there can be only one such science; the third, that such a science does not yet exist except in its most elementary beginnings. The fourth thesis, which seems to me important, was that a solution of any of the fundamental problems of such a science must depend on the systematic comparison of a sufficient number of societies of sufficiently diverse types. The last was that the development of the science therefore depends at this time on the gradual improvement of the comparative method and its refinement as an instrument of analysis, and this will require the continuous improvement of our methods of observing and describing societies; the elaboration and exact definition of the fundamental concepts required for the description, classification and analysis of social phenomena; and the development of a systematic classification of types of societies. I have endeavored to illustrate these points. One point, the second, that there can be only one such science (which really belongs together with the fourth, that a solution of any of the fundamental problems of such a science must depend on the systematic comparison of a sufficient number of societies of diverse types), remains perhaps not sufficiently discussed.

To consider my first thesis: In what sense can we say that sciences are different from one another or are branches of a single science? In one sense, all science is one. The most

satisfactory, rational, logical way of dividing sciences is to define them by reference to the kind of systems with which each is concerned. If, therefore, there are in reality such systems as I have defined as social systems, then there can be a natural science of human society. If they can be distinguished from mental systems, then the science of society will be fundamentally distinct from psychology. It will be distinct in exactly the same way that physiology is distinct from chemistry because the physiologist investigates a class of systems distinct from that of the chemist, and the generalizations each makes characterize only the specific system each investigates.

On the other hand, and with respect to my second thesis, is it possible to say that within the field covered by the study of social systems there can be recognized certain separate fields not defined in terms of distinct systems? Are there subdivisions of the science of society which can exist as relatively independent investigations, which can discover of themselves valid generalizations—generalizations which will not have to be thrown overboard when the field they cover is correlated with other fields of the science of society? On the whole, it seems that the greater mass of characteristics found to hold in the science of social systems are such that one cannot separate off parts of the field for separate study except possibly in a few instances.

The clearest case for such a separation seems to me to be the study of language. Linguistics, as a systematic investigation of the social usages which control speech, can be studied to a considerable extent without reference to the rest of the science of society and some important conclusions reached. That is due to the very peculiar relations in which a language stands to the society. I conceive that a social

system might remain almost unchanged in its general constitution although the language which its people spoke changed. People speaking a Gaelic language, let us say, take over Latin at the time of the Roman conquest. I can conceive that such a change might take place without necessarily producing fundamental changes in the social system as a whole. The really important thing about language is that it permits individuals to communicate with one another. It is thus a mechanism of coaptation. The nature of language is not such, however, as seriously to affect the social relations which people establish by communicating with one another. Therefore it is possible to study language largely irrespective of the rest of a society's characteristics. Not completely so, as witness Meillet's observations recorded in his essay, *Comment les mots changent leur sens*. He demonstrates that changes in the meaning of words may often be traced directly to changes in the structure of the society. Nevertheless, I believe linguistics stands apart as having a purlieu of its own. In the anthropology department of the University of Chicago, general linguistics is followed as a separate field, except that historical linguistics is frequently combined with it, which seems a fairly convenient joining of disciplines.

What is the method of the linguist? Obviously it is comparative: Your linguist will study as many different kinds of languages as possible in order to be able to make generalizations which will be valid for languages of all kinds and anywhere.

Economics also claims to be a separate science in some sense or another. Political science makes this claim; at least it has its own departments. Sociology regards itself as not including economics and political science, though exactly where the line is drawn between them is difficult to say.

Sociology does include criminology and penology, which *might* be regarded as separate studies. History we do not include among the sciences. The science of law is dealt with, not as part of social science, but in the Law Schools, as a subject apart. Comparative religion is taught in theological seminaries; also in anthropology departments; and sometimes as a subject by itself.

There is an isolation in social science of law, religion, economics, political science, etc. It is conceivable that each of these can be the subject of a separate science. In comparative religion the comparative method is adopted; in economics, it is not, in the full sense of the comparative method I have described. It is not in political science in general, although there is a subject called comparative politics. This usually, however, extends its comparisons only to European countries and only sometimes as far back as the Greek city-states.—If we examine what is actually done in American universities under the name of politics, we see that politics is not (nor apparently claims to be) a theoretical science of anything. It is a practical subject, dealing with practical problems, obtaining systematic information for its direct bearing on practical problems: how to run a political party, how to improve Chicago. If politics claimed to be a distinct theoretical science, it would be sure to be asked, “How can you separate the political aspect of social life from its legal institutions? How in the early forms of social life can you separate political institutions from the religious ones?” You cannot do it. When the chief of an African society is also high priest and judge, when all three of his aspects are regarded as a unity, you have to take into account his religious and judicial functions as significant factors.

Sociology also, I think, is in American universities for the

most part a practical subject. Criminology certainly cannot be regarded as a theoretical science. It studies a particular body of things. Its main concern is with systematizing knowledge in relation to practical problems.

If my argument has been correct, a practical subject cannot be called a practical science unless it is based on a theoretical science. I gave as an example medicine, a practical study followed systematically as a means of ordering practice. If there is in existence no theoretical science on which a practical study is based, the practical study has to be based on generalizations of common sense and upon empirical knowledge. In early medicine, the doctor based his treatment on the traditional trial and error method; if it worked, it was right. He was, in fact, called an empiric. When medical science developed physiology, pathology, biochemistry, then medicine became a practical *science* because based on theoretical science. Criminology is not at present a practical science because it is not based on a theoretical science; at best it can be only empirical. According to Dr. Adler of the University of Chicago, our empirics are not succeeding very well; they are aiming at a practical science and not being practical.

As for economics, I would suggest that a good deal, and the more valuable part of it, is description of the actual economic conditions of modern society. A large part of its aim is clearly practical guidance: how to conduct a business, how to run a bank. Economics will become a practical science when it is based on theoretical social science. If and insofar as there is a theoretical science of economics, the question is whether it is a separate science or one branch of a general theoretical social science. I believe it is a branch, perhaps further developed than any other.

I had as my third thesis that a theoretical science of society does not yet really exist; that it will probably be quite a long time before it does. To give you briefly my reasons for this belief:

The first, and I think the least important, is implicit in certain intrinsic difficulties of the subject itself. It is often stated that the phenomena with which a science of society has to deal are so complex that one cannot possibly apply the methods of natural science to them. Similarly the people of the middle ages thought the phenomena of thunder and lightning so complex that it was hopeless to try to investigate their nature. From the point of view of a medievalist, that was right; from the point of view of Franklin and the modern electrician-physicist, it is not. The complexity of the material is not a valid argument. The exploration of the field of social science, however, requires on the part of the student an acquaintance with such vast numbers of fact, that he must also take into consideration complexity in the quantitative sense.

My second reason for believing a theoretical science of society a distant possibility seems to me a much more significant one. It is that there exists one general obstacle to the development of such a science—the historical fallacy. It is the conception that the proper way to interpret the facts of human life is by historical explanation. The historical explanation is held to be the only valid explanation, and being valid, sufficient. That is the view of a number of anthropologists in America and in other parts of the world. It is the view, naturally, taken by historians. It is so entrenched that it constitutes a real obstacle to the development of social science. The first tendency of almost all of us is to think in historical terms.

The third obstacle is the psychological illusion—on the whole, I don't know which is worse, since, as a rule, the two are combined, and one cannot tell which is getting in the way. The psychological illusion is the notion that since, after all, social life consists of the behavior of human beings, therefore an explanation of the actions of individual human beings is an explanation of social behavior. The syllogism is perfect to all appearances. If my argument has been correct, however, I can refer to the statement made by Durkheim in 1895 that any statement of social phenomena in psychological terms, i.e., in terms of the mental characteristics of human beings, we need not examine, for we know it immediately to be false. That, I think, is one of the conclusions I come to here. The vague conception that social phenomena can be explained in terms of some sort of psychology, even under the *nom de guerre* of Social Psychology, is the third obstacle.

The fourth obstacle is the fact that practical science, i.e., practice, appeals to one thousand people where theory applies to one. What people demand of universities in general is the kind of research which Bacon called frugiferous in contrast with that which he called luminiferous. People want, not investigations which lead to theories, but those which lead to immediate results. The situation of social science seems exactly like that of alchemy and metallurgy in the time of Boyle. It was Boyle who made of these a real science. His summing up in *The Skeptical Chymist* of the state of knowledge at that time is most interesting. All investigations into the nature of substances had been carried on for the purpose of improving practice, including that in metallurgy, for finding remedies for sickness or an elixir of life, or for discovering a philosopher's stone to transmute other metals into gold.

Boyle said, "As long as we follow these lines, we shall never get anywhere toward science. Let us start afresh, in an entirely different way, paying no attention to practical results. Let us set out on a luminiferous research, to see what we can find out about the characteristics of substances just for the sake of finding out." As a result of that attitude, the skeptic Boyle with his helpers succeeded in establishing within a period of twenty years a science of chemistry.—We are faced with a situation in which the demands for *practical* results are so insistent that it is unlikely any considerable amount of attention will be devoted, in our times, to the purely theoretical science of human society.

Lastly, and this ties up with the other obstacles, there is that presented by the vested interests of the existing social sciences. The sociologists, the political scientists, the economists, the lawyers, follow each their particular line, without any coordination of studies, without desire for it, creating a situation in which the institutional set-up is such as more or less to exclude the possibility of a theoretical science of society. That is why it has had to take refuge in departments of anthropology as the only place left to it.—Therefore, while a theoretical science of society is possible, I am not particularly optimistic as to the prospects of its immediate realization.

APPENDIX

Systematic Social Science⁵

The following propositions are selected as suitable for directing discussion to significant points in reference to the possibility of a systematic social science and the nature of such a science if it be possible. They are current doctrines of what is known as "sociology" in the University of Paris, which is different in many important respects from what is known as sociology in America. The science or study referred to is represented by the fourteen volumes of *L'Année sociologique* and the published and unpublished work of Durkheim, Bouglé, Fauconnet, Meillet, Hubert, Mauss, Hertz, Doutté, Maunier, Granet, Simiand, Halbwachs, Bourgin, etc. The formulation of the propositions is in terminology selected by myself for this occasion.

Basic Postulate: We must assume that human conventions and works of art (products of man's activities) can be treated as though they were *entia naturae*. Durkheim's formulation of this is—*les faits sociaux sont des choses.*)

What Are the Specific Entities with which Social Science Deals?

The immediately observable data which are utilized in social science are the actions, including acts of speech, of individual human beings, acting singly or together, and the material products of such actions.

5. The following pages were prepared by Professor A. R. Radcliffe-Brown and distributed to the Faculty Seminar as a basis for the discussion accompanying the main presentation given above [F.E.].

The social scientist may also use in the interpretation of the observable data defined above his knowledge of "states of mind" which he observes immediately only in himself though he infers or assumes the existence of similar "states of mind" in other individuals.

The crude data of social science, as defined above, are of the same kind as the primary data of psychology.

From the crude data social science must extract its own proper data. (The process of extraction is important from the point of view of methodology.)

If a suitably selected collection of individuals be examined it is possible to discover, by a study of their behavior, certain *social usages*. A social usage is a mode of behavior usual amongst the individuals of a certain definable collection and distinguishing it from some other collection.

Social science is concerned with the *social relations* of individuals as they are recognized in and controlled by social usage. (Whenever the actions of an individual are dependent upon the existence of some other individual or individuals we have a social relation.)

In a suitable collection of individuals the totality of all social relations recognized in social usage constitutes a *social structure*.

In such a suitably selected collection of individuals we can therefore distinguish a *social system* consisting of (a) the social structure, (b) the totality of all social usages, and (c) the special modes of thinking and feeling which we can infer or assume (from behavior and speech) to be related with the social usages and the social relations that make up the structure.

Social science is the investigation of the nature of social

systems. It aims at the discovery of general propositions which will enable us to understand or interpret the characteristics of social systems.

*What Kinds of Problems Are Presented
by Social Science?*

Complete knowledge of a single social system would require:

(1) Knowledge of its *form*, i.e., of the parts or elements of which it is composed and the relations of those parts within the whole.

(2) Knowledge of its *functioning*, i.e., what it does or how it works, and what is the function of each part of the system in relation to the functioning of the whole.

(3) Knowledge of its derivation, i.e., of the process by which it has come into existence.

(4) Knowledge of its potentialities for future development.

The problems and investigations of social science are to be distinguished as being either *synchronic* or *diachronic*.

Diachronic problems are those relating to how social systems change or develop.

Synchronic problems are those concerned with the *form* and the *functioning* of any social system as it exists at a particular moment of time and irrespective of its past or future development.

Theoretical Social Science Must Be Comparative

General propositions regarding the nature of social systems can only be derived from a comparison of an adequate number of social systems of different type.

Such comparison requires some systematic classification of social systems. No satisfactory classification has yet been provided.

The Concept of Function

In the same sense as physiology social science must concern itself (as one part of its task) with the function of social usages.

(Function must be rigidly distinguished from "purpose" and from "usefulness.")

The function of any social usage (or of any belief, idea, or sentiment, that is part of a social system) consists of the contribution which it makes to the "proper" or "essential" activity of the social system of which it is a part. (The contrary of "proper" in this sense is not "improper" but "accidental.") The proper or essential activity of a social system is (a) to provide a certain *adaptation* to a particular environment and (b) to provide a certain *integration*, i.e., a uniting of individuals into an orderly arrangement. The function of any social usage (or belief) in a given social system is the totality of the effects it has in relation to adaptation and integration.

The function of a particular moral obligation or a particular religious belief (etc.) is to be stated in relation to the particular social system in which it exists. But the function of morality in general or religion in general is to be stated in terms of social systems in general.

As an integrative mechanism a social system functions by controlling the behavior of individuals, by forming in them habits of thought, feeling, and action. The process can be called "cultural conditioning." (It is the presence of this

cultural conditioning that differentiates human society from other animal societies.)

(The process and the results of cultural conditioning are never identical in two individuals.)

Cultural conditioning depends upon the potentialities of intrinsic human nature. We cannot learn anything about such potentialities except by observing their actualization in social life.

Means and End

A social system is not purposive. (Unless the universe as a whole is purposive.)

A social system provides individuals with means to attain certain ends. But it also provides the individuals with ends. (Culture provides both instrumentalities and evaluations.)

What are final ends for the individual (e.g., the pursuit of truth, beauty, and goodness) are, within the social system, means of adaptation and integration.

Any element of a social system, or any change produced in an element, may have an "ostensible purpose." That is, it may be believed by a considerable number of the members of the social group concerned that the element or change produces or will produce certain desirable effects. It is exceptionally that the "ostensible purpose" of a usage or a change corresponds to its function.

Part of a social system may be a set of beliefs as to the nature and "purpose" of social usages. We can call such beliefs "social theory." (Thus a commonly accepted body of ethical doctrines would be "social theory" in this sense.) Theoretical social science must treat such beliefs as data to be investigated in the same way as its other data, viz., by

the study of the processes by which they are produced and the functions that they perform (or the effects they have on other parts of the social system or on the system as a whole.)

Theoretical Social Science and Psychology

Social science and psychology are distinct sciences, though they both start with the same directly observable data.

Psychology deals with the observable behavior of an individual in its relation with that individual as a psychophysical complex entity.

Social science deals with the behavior of individuals in relation to some particular social system.

* * *

The study of intrinsic human nature is the task of general psychology.

Since social systems are actualizations of the potentialities of intrinsic human nature they should ultimately be capable of explanation in terms of those potentialities. This means that the generalizations of social science may ultimately be explained in terms of the generalizations of psychology. But any particular social phenomena cannot be so explained. Any psychological explanation of any specific social usage is invalid. (The relation between social science and psychology is analogous to that between physiology and chemistry.)

* * *

The process of cultural conditioning of the individual is the concern of social science in relation to the functioning of the social system. If the process is considered in relation to the way in which it takes place in the individual it belongs to individual psychology or to general psychology.

