CONCEPTS AND STRUCTURE IN THE NEW SOCIAL SCIENCE CURRICULA

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CHAPTER 2

Concepts and the Structure of Knowledge

I wish to talk about the nature of concepts, since we philosophers are specialists in generalities. I would like to approach the whole controversy concerning the nature of scientific concepts by way of an introduction that will serve as a framework for my discussion. I have written here a number of things that I don't believe; I intend to explode all of them. (See Figure 1.)

I shall speak from what I think is a moderate amount of consensus among recent philosophers of science. I will not try to explain what is being done, except to say that the major task that is perceived in the philosophy of science today is not so much trail blazing for future scientific discoveries, or formulating new scientific theories, but understanding science. Science is tremendously complex in this age, requiring a special effort merely to learn to understand it. Hence, philosophic clarification and conceptual analysis are of some significance from an educational point of view.

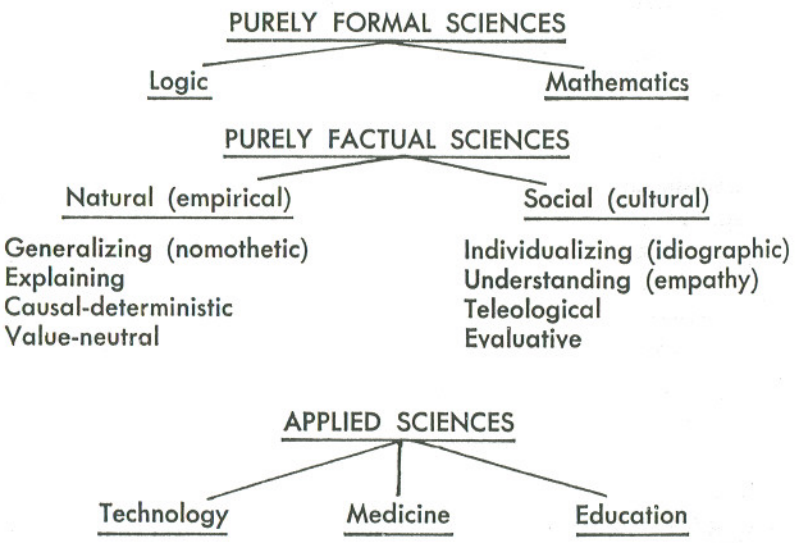
Before approaching the all-important issue of concepts and of grasping the meaning of concepts, I should like to discuss the division of the sciences.

The Division of the Sciences

The purely factual sciences, natural and social, provide the basis for the applied sciences. The distinctions made between the sciences are logical, not practical or historical, for there is tremendous interchange between all of these disciplines. It is perfectly clear that mathematics and some of the purely factual disciplines arose out of needs—physics, for instance. On the other hand, advances in mathematics, such as the tensor calculus and matrix algebra, were

applied in physics, after first being developed by mathematicians. I am not saying that there is not, from a psychological, practical, and historical point of view, a great deal of interconnection. It makes sense, for the sake of clarification, and especially for such clarification as might be needed in the educational enterprise, to make the following distinctions.

Figure 1



The truth claims or knowledge claims of the purely formal sciences do not ultimately rest on experience or observation, as do those of the purely factual sciences. Even on that there is some controversy; but I think it can be seen that, for example, the word "proof" means two entirely different things. When a mathematician talks about "proof" it is a logical derivation of a conclusion or theorem from a given set of premises, postulates, or axioms. If a chemist says, "I can prove it in the laboratory," the word "proof" obviously means something entirely different. He says, "I can show you. You will be able ultimately to check on my hypothesis or my knowledge claim, by observation, experiment, or statistical design." Ultimately, all of these go back to some form of observation.

I will skip the philosophy of logic and mathematics, vital and interesting though it is, and turn to the division of natural and social sciences. Certain German philosophers, late in the last

century and early in this century, established a fashion which, to my regret, has also appeared on the American scene. In this scheme the natural sciences are characterized by generalizing, the social sciences by individualizing; the natural sciences by explaining, the social sciences by understanding; and so on, as shown in Figure 1. It is these distinctions that I will criticize.

Generalizing versus Individualizing

It is said that the natural sciences are essentially nomothetic, generalizing, seeking formulae, making statements which tell what happens under what circumstances. The social sciences, by contrast, are individualizing. They are referred to as idiographic, a term derived from the Greek word referring to specific facts and specific individuals; for example, the heroes in history. Special descriptions in history, such as those of the art of the Renaissance or the music of the nineteenth century, are also idiographic, because they are concerned with specific periods of time in which certain types of things happened.

An extreme case makes the distinction clear. Newtonian mechanics and the law of gravity are generalized laws pronounced universally valid, generalized over all of space and time. However, a good scientist realizes that such a generalization can be valid only until further notice, and can be held only tentatively. That type of knowledge claim is made in any case. A historical incident such as the one found on certain plaques in New England, "George Washington slept here," is something that cannot be experimented about. Ascertaining by scrupulous scrutiny whether George Washington actually slept there can be done scientifically. Thus, something similar to the scientific method can be used in ascertaining historical truth. When contrasting theoretical physics with history, in the sense of a narration about individual events and individual persons, the distinction is quite clear.

Psychologists have, for a long time, tried to formulate laws of human behavior or of mental experience; they have been straddling the fence. Some branches of psychology are clearly natural-scientific in approach, such as the psychology of perception, the study of the sense organs, psycho-physiology, and neuro-physiology, to the extent that it sheds any light on psychological phenomena. All this has the makings of a natural science. Coming to the psychology of motivation and examining the role of behavior and attitudes of individuals in groups, psychology looks very much like social

science; and the Germans call it "Geisteswissenschaft." In English this means "spiritual science," but this literal translation would be misleading. "Cultural science" is a possible substitute.

There's something badly wrong with this distinction. Some natural sciences are clearly idiographic, and some social sciences are nomothetic. The idiographic-nomothetic distinction won't do. Physical geography, in locating mountains and rivers of the continents, is idiographic. Geographers state that Mount Elbert is the highest mountain in Colorado, and it has a certain latitude and longitude. That's as idiographic as "George Washington slept here." The geography of the moon, or the selenography, has been worked out by the scientists. Every mountain on the moon has an astronomer's name on it. That's also idiographic. Geology, to the extent that it traces the history of the surface of the earth and the formations of the mountain ranges, is idiographic. Yet, it is a natural science.

On the other hand, the social sciences, including psychology, have had some success in formulating laws that are highly confirmed by the evidence. Social scientists are making serious, and partly successful, efforts to formulate general laws; for instance, mathematical formulations in economics about the functional relations of supply and demand, prices, labor force, and so on. Similarly, sociology, learning theory, and theories of motivation in psychology are nomothetic. Skinner's work in the psychology of learning, his schedules of reinforcements, and the regularities that he has formulated are statistical laws about human behavior and animal behavior. In the light of such knowledge he is able to teach pigeons to perform many tasks. The idiographic-nomothetic distinction between the natural and social sciences does not hold up.

Explaining versus Understanding

It is often said that the natural sciences try to explain, whereas the social sciences strive for understanding in the sense of empathy. Empathy means knowing how a fellow human being feels. Empathy is different from sympathy, which implies affinity and approval.

Empathy is described as a method of arriving at some of the truths in social psychology, in the psychology of motivation, and in history—in understanding, for example, what historical personalities do at a given juncture of events. Important as is the technique of understanding in this sense of empathy, it is not a method of validation, nor is it a method of justification for knowledge

claims. Empathy may be an important source of "hunches," which are very useful in arriving at hypotheses; but empathy is not a means of testing hypotheses. Convictions based on empathy can be terribly wrong. Hypotheses must be tested in science, both natural and social, by an accepted method in which empathy plays no part.

Science by definition is intersubjective by its very conception. I use "intersubjective" in preference to "objective" because of the numerous definitions of the word "objective." There's subjective objectivity and objective subjectivity. "Intersubjective," I think, is fairly clear. The word is built in analogy to the word "international" or "inter-racial" or "inter-religious." The idea is that science is intersubjective in the sense that anyone equipped with the necessary intelligence and the requisite apparatus can check up on the knowledge claims of others—of the astronomer, the nuclear physicist, the biologist, the social psychologist, etc. No matter how strong the empathy-based subjective conviction is, it can be badly wrong. Ideas still may have to be corrected in the light of such intersubjective or objective tests as science has at its disposal.

Causal versus Teleological

The concept of scientific explanation has undergone tremendous changes. An important transformation in the history of scientific thought has changed the whole concept of scientific explanation. In classical antiquity, a true explanation was one that started with premises which are neither in need of proof nor capable of proof. This was the case, for instance, with mathematical axioms. Nowadays postulates are preferable to axioms, assumptions preferable to first principles, but these are just verbal changes. The important thing is the change in attitude that came with the Renaissance and people like Galileo and Newton who introduced the idea of *empirical confirmation* of premises.

Explanation is, in a twofold way, always relative. Its premises are relative to the empirical evidence, upon which they ultimately stand or fall. They are relative also in the sense that the premises upon which the explanations are based themselves remain unexplained within the context of that explanation. With luck, an explanation for these may be found on a higher level.

A simple example is found in everyday life. Hands get warmer when rubbed together. The intelligent child might ask, "Why do they get warmer?" Daddy replies, "Friction always produces heat and this is a case of friction. Hence, your hands get warmer." An

ordinary Aristotelian syllogism is the method of explanation here. But then a really inquisitive child might ask, "Why does friction produce heat?" Daddy is stumped if he hasn't studied physics. If he has, he can draw upon thermodynamics and say that mechanical energy in the process of friction is transformed into calories of heat. If the child further asks, "Why is it that mechanical energy can be transformed into heat?" there is still another answer to that, namely the molecular or kinetic theory of heat. This illustration sketches the levels of scientific explanation in the natural sciences.

It is said that the natural sciences use causal analysis in their explanations. The laws formulated, especially on the lower levels of scientific explanation, are often causal laws in that they state regularities concerning the sequence of events. Friction and heat, lightning and thunder, the deviation of a magnetic needle near an electric current, are all formulated by using the concepts of cause and effect. Thus, many concepts of cause and effect are perfectly good in everyday life, even though philosophers of science still have some important unanswered questions about the nature and meaning of causality. Equations are written such as the gas law, PV=RT, a formula which holds to a certain degree of approximation. The formula is mathematical, but the content is a formulation of empirical regularities. It indicates that if the pressure on the gas is increased the volume may be decreased or the temperature increased.

The concepts of cause and effect make good sense in the social sciences. Of course it is often hard to perform a causal analysis. What caused the First World War is a complex question. A classroom lecture can't indicate that the causes of the First World War were such and such. It is a complex constellation of circumstances. However, it is not impossible, and responsible books have been written about it.

It is said that in the social sciences causal analysis is replaced by the teleological. Explanations are elicited by asking the question, not "Why?" in the sense of what caused it, but, "What for?" The accusation of being teleological once was equated with being unscientific, but this view is changing. Biologists, who repudiate teleology as a philosophy, explain the functioning of the heart and liver partly in terms of the functions they perform in the body. There are many such statements in science which sound teleological. It may not be desirable to call them true explanations, but they may state some necessary condition, thus aiding understanding of how these things work. An important book, *Cybernetics,* by Norbert

Wiener, which appeared in 1948,[1] has finally made clear that teleological mechanisms may be spoken of without contradiction when dealing with systems in which there are interdependencies and feedback, such as with the home thermostat. Wiener created a new discipline called cybernetics, a name based on the Greek word for governor. His work has led to some exciting developments in biology and in physiology, which give a causal explanation of an interesting kind. The French call it circular causality. It accounts for homeostatic phenomena, such as the question of why the blood sugar level remains roughly the same.

Homeostasis has also been used by some psychologists. For example, an Austrian psychologist has said that there is a homeostasis in personal self-concept. If a person is criticized or if someone tries to lower his ego concept, he somehow restores it by rationalization. He reacts to criticism because he likes to keep his self-respect on a certain relatively stable level. There is a certain self-adjustment that takes place even in the scholarly world. A scholar who gets a bad review of something he has published may say to himself, "The reviewer is an idiot." He protects his self-concept by this bit of homeostasis. How this works neuro-physiologicaly conceivably might be explained by certain brain mechanisms.

Value-Neutral versus Evaluative

It has been said that the natural sciences are value-neutral, but that the social sciences are evaluative. I think that is wrong, too.

There is no question that we deal with values in the social sciences. Nothing could be more interesting and more important than the evaluations that individual poeple and certain groups of people make. But such judgments are not made by social scientists, *qua* scientists. Evaluation depends ultimately on personal commitments and is not derivable from factual statements alone. Studying evaluations is different from *making* evaluations. The psychologist studies motivation, and the anthropologist studies the moral codes and values of the Eskimo. But if the anthropologist says that the Eskimos are wrong because they aren't Christians, that is an evaluation made by the anthropoligist as an individual, not as a scientist.

Concepts

Turning from the alleged differences between the natural and social sciences, another important matter can be taken up.

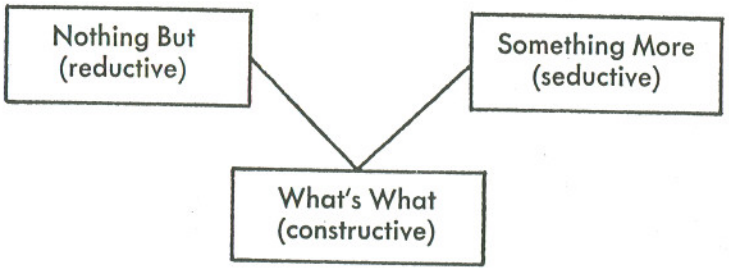
There is a classical, fundamental distinction between proper

names and concepts. A proper name refers to some particular object. A concept is a generalized notion about objects or ideas. Plato made this a metaphysical distinction, declaring that concepts have an existence of their own, in a super-heavenly place far beyond everything that is perceptible. Everything in man's experience is an imperfect copy of these eternal ideas and ideals.

At the other extreme from Plato's idea is the nominalist view, which says that the only really meaningful words are particular words; that is, proper names. This view negates the whole idea of concepts. It will not do, because concepts have a function; they do something useful in thinking. On the other hand, Plato's metaphysics of ideal concepts with an independent existence in some super-heavenly place is also extreme (although he may have been using poetic license in order to emphasize the contrast between concepts and particular things).

When faced with extreme alternatives of this kind, I often find it useful to use a little dialectic of my own. In the case under consideration, I would call the nominalist view of things a "nothing-but" philosophy; it indulges in the reductive fallacy, failing to see

Figure 2



any but the most obvious things. The Platonic view, if taken at face value, illustrates a "something-more" philosophy; it indulges in the seductive fallacy, reaching out for more than is warranted by the facts and the logic of the situation. The synthesis of the two extremes I call the "what's-what" philosophy; it is constructive, preserving that which is best and most reasonable of the two extreme positions.

This little dialectic is diagrammed in Figure 2. Women's fashions provide another illustration of its use. Bikinis illustrate the "nothing-but" philosophy, Mother Hubbards the "something-more" view, and decent dress the constructive "what's-what" resolution of the extremes.

In the dispute over concepts, between realistic nominalism and Platonic idealism, my own (constructive) point of view may be summarized as "a concept is what a concept does." Concepts are represented by words and symbols which we use according to certain rules, being careful about understanding and applying these rules. I do not know exactly what word to use to explain the right approach to the use of words and symbols. Operationalism—defining concepts in terms of identifiable and repeatable operations—has been useful, but has led to excesses on the side of the reductive fallacy. Functionalism might be acceptable, if taken to mean a careful statement of the rules according to which words and symbols are used.

A Heirarchy of Concepts

Between the heavenly mysteries of Platonic idealism and the absurdities of nominalism, different levels of generality of the concepts we use can be distinguished. The least general of these is the descriptive level. Just above the descriptive level, in the hierarchy of generality, are empirical laws, and above these are various levels (as many as three) of theory. These levels can be illustrated by the example given above. The descriptive fact is that hands get warm when rubbed together. The empirical law is that friction produces heat. Above the empirical law at the first level of theory, there is classical thermodynamics. At the next level is statistical mechanics, or the kinetic theory of heat; and, finally, at the most general theoretical level, quantum mechanics.

As we go up in the hierarchy of theory we encompass more and more facts. The aim of scientific explanation, the ideal that guides the search for scientific explanation, is to explain a given set of facts with a minimum of basic concepts and principles. The higher the level of theory, the greater the number of facts that can be explained with a given number of concepts and principles. Newton's laws explain more than Kepler's, and Einstein's more than Newton's.

The social scientists, like the natural scientists, strive to discover high-level theories which will explain many facts with a few simple concepts. An example is the common idea that much of history can be explained by the personalities and abilities of heroes. The Marxian view is almost the opposite—that certain social changes will occur when their time has come, and that people can always be found to fulfill the role of hero. I think the truth lies somewhere

in the middle; key individuals occasionally have a remarkable influence on history, but broad social forces are also very important.

I will conclude by applying some of my remarks to a question that is bound to arise.

Is History a Science?

What would have happened if I had not had anti-freeze in my radiator when the temperature dropped to 25 below zero? This is a question that can be answered simply and convincingly by an appeal to scientific evidence. What would have happened if Hitler had not been born? This is the same kind of question as the one about my radiator—much more difficult to answer, of course, but not an illegitimate question.

The historian scrutinizes evidence very carefully, reconstructs past events on the basis of currently available evidence, and makes careful inferences. These are scientific endeavors. If, in paleontology, the tracing of the evolution of life on the surface of this planet is scientific, I do not see why cultural history, the history of art, the history of literature, and the history of music are not also scientific.

Historians are also performing a part of the scientific task when they describe events. Reliable descriptions are important in every science, even though they are, to the philosopher of science, less exciting than theories.

If by science one means the formulation of general, reliable laws, then history has not, so far, been very scientific. However, some historians have attempted to support some generalizations about history. Spengler and Toynbee, for example, have suggested some broad rules about the rise and decline of civilizations. But these attempts are generally precarious, and usually unsuccessful.

One way to improve explanations for historical phenomena would be to use the terms of the various sciences, rather than historical terms. I would look for the roles played in the historical process by economic, sociological, political, and psychological factors. In any case, it is an exceedingly complex problem, but so are many of the problems of the natural sciences, such as in meteorology and astrophysics.

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1 Norbert Wiener, *Cybernetics; or Control and Communication in the Animal and the Machine* (Cambridge: Technology Press, 1948).

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CHAPTER 3 Organizing a Curriculum Around Social Science Concepts

For years professional associations and social science educators have defined and redefined the objectives of social studies education. Volumes have been written about the behavioral changes, the skill objectives, and the changes in attitudes that social studies education is expected to achieve. Many of the statements emphasize that the purpose of social studies education is indoctrination of values. The National Council for the Social Studies has emphasized for years in its publications that the ultimate goal of education in the social studies is the development of desirable socio-civic behavior and the dedication of youth to the democratic society. Fundamentally, nobody would object to these goals if the students could achieve this behavior through the rational analysis of society. But in most of the statements indoctrination of values is emphasized at the expense of analysis.

The Need for Analytical Thinking

The primary function of the development of analytical thinking is to help our youth understand the structure and the processes of our society. With possession of analytical tools, our youth will be able to understand the dynamic changes of our society and the problems created by science and technology. In the final analysis, the purpose of social science education is the development of problem-solving ability. By acquiring the analytical tools and the skill to apply the tools to the problems, our youth will feel that, as adults, they can participate intelligently in the decisions of a free society. The development of the problem-solving ability will help our young people to gain respect for social sciences as an organized body of

knowledge and will motivate them to choose social science as a professional career. This emphasis is neglected in the guidance programs in our schools.

The correct use of analytical tools and the discovery of the ideas underlying the social process require a particular mode of analytical thinking. The development of analytical thinking requires a long process of conditioning. Such conditioning should start in grade one of the primary grades.

The present social studies program does not offer the proper intellectual framework to develop the analytical faculties of our youth. Social studies educators who have tried to identify generalizations for the social studies curriculum have suppressed the unique characteristics of the individual social science disciplines and formulated concepts so general that they are without analytical content. Since social scientists have not yet achieved a unified theory of society, economists, sociologists, political scientists, and anthropologists observe society from different points of view, and their findings have to be superimposed on each other before social change can be understood. Since all the social science disciplines are necessary to explain social phenomena, the fundamental ideas of all the disciplines should be introduced in the school curriculum. Why not in grade one?

Grade Placement of the Social Sciences

Some academicians interested in the social science curriculum have raised the question many times whether social science instruction should not begin with geography and history. In an article, "The Structure of the Social Studies,"[1] Professor Scriven recommends that social science education start with geography and history in grade one. He justifies beginning with history and geography because the generalizations are less "high-falutin'" and nearer to common sense. He would rather introduce a "low-falutin'" approach in the lower grades, hoping that "high-falutin'" understanding will develop later. The history of the social studies curriculum indicates that a curriculum begun as "low-falutin'" will remain "low-falutin'."

Professor Scriven does a disservice to geography and history when he assumes that a geographic or historical phenomenon can be explained meaningfully without the aid of the various social science disciplines. Primary school children study Indians and the colonial period, but since they do not possess the fundamentals of economics,

political science, sociology, and anthropology, their learning is trivial. It would make more sense if geography and history were culminating courses in high school. In the intervening years the children could have learned the fundamental ideas of the various social sciences, thereby enriching the geography and history courses.

The Organic Curriculum

A team of social scientists has worked with me during the last two years to outline the fundamental ideas of the various social sciences. This team includes Professor David Easton, Political Science Department, University of Chicago; Professor Robert Perrucci, Sociology Department, Purdue University; Professor Paul Bohannan, Anthropology Department, Northwestern University; and Professor Peter Greco, Geography Department, Syracuse University. These fundamental ideas of the various social sciences represent:

a. a logical system of ideas;
b. the cutting edge of knowledge; and
c. an organization of ideas that can be used at every grade level.

Presenting the structure of knowledge in this way challenges popular curriculum practices based on minimum understandings broken up and parceled for different grade levels.

Our team has been guided by the awareness that we are training children for an age which we don't even foresee. We are giving the children knowledge that we want them to use in the 21st century. A hundred years ago the idea that our children are a generation ahead was a platitude. Today it is a drama. No longer can parents understand their children when they come home from modern mathematics or modern science classes. The stage where parents will not understand their children when they talk about the nature of society will soon be reached.

After we had formulated the fundamental ideas of the social sciences, I visited first grade classes to find out how many of these ideas could be related to the first graders' experiences. I found that the children's experience in social matters is potentially so meaningful that the fundamental structure of knowledge can be related to their experience.

After we found this out, we formulated the next question. If we teach all these fundamental ideas in the first grade, what can we teach in the second grade? The same structure of knowledge, only now with increasing depth and complexity. And in the third grade

we teach the same structure but with still greater depth and complexity, as the child's experience grows.

On a scope and sequence chart, all concepts are listed vertically, and all grades are shown horizontally. Since every concept is taught in every grade, the scope and sequence chart should show in the first column, for the first grade, very pale checkmarks. In each grade the intensity of the checkmarks is increased until the darkest color is used for the twelfth grade, indicating that the same concept has been taught with increasing depth and complexity. The question arises as to how this can be done.

How can political science, sociology, economics, and anthropology be taught all in one grade, particularly the first grade? This is a new art, I think, which I call the orchestration of the curriculum. Units have to be constructed in such a way that different units give emphasis to the different areas of the social sciences. In some units the sociologist plays the solo role while the other social scientists play the accompaniment; then the economist is the soloist, then the anthropologist, and so on.

The first element of my approach, taking the fundamental concepts and teaching them with increasing depth and complexity, I call the organic curriculum because these concepts are not presented atomistically between grade one and grade twelve. They are introduced all at once and grow with the child, as he moves from grade to grade. I call the second element the orchestration of the curriculum. The child may not know that the sociologist is talking to him, or the economist, or the political scientist, nevertheless he will be exposed to the social science disciplines in an undiluted form.

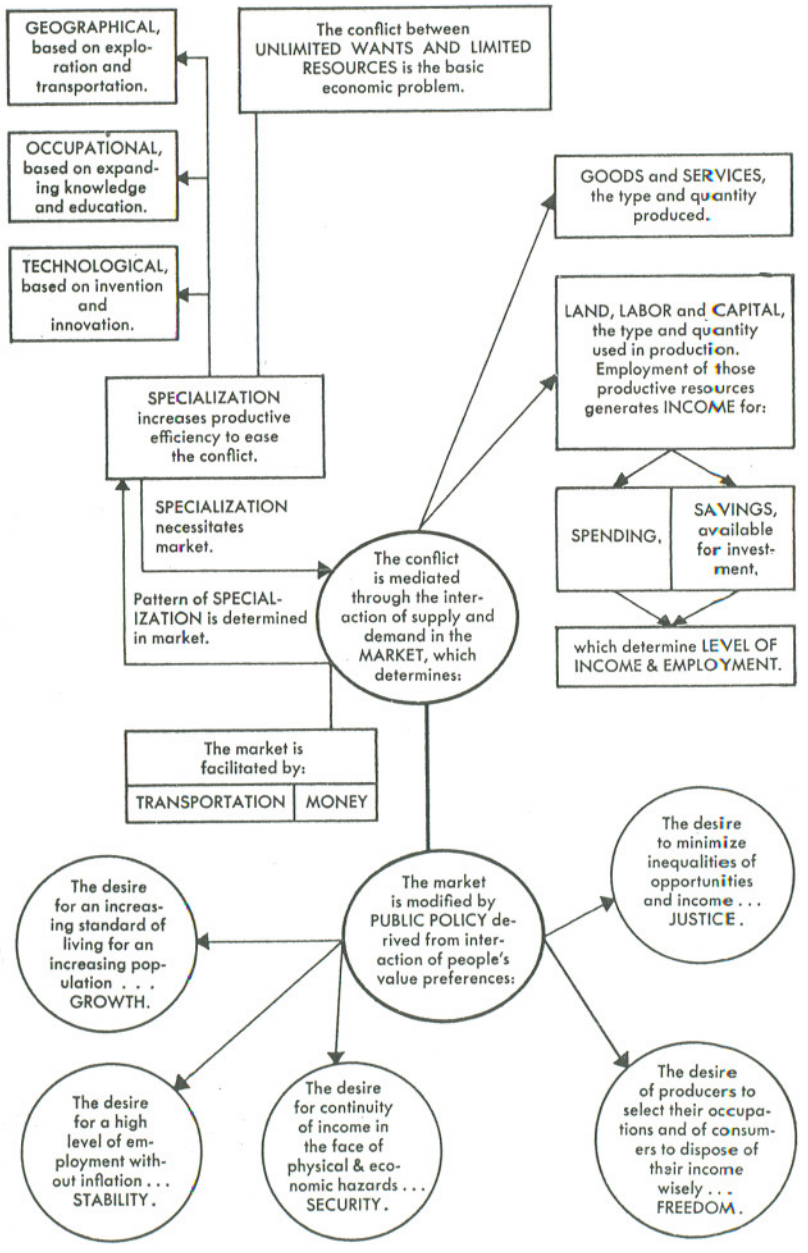
Fundamental Ideas in Economics

The solo role of the economist can be illustrated by the following development of fundamental economic ideas. The same ideas and relationships are shown in chart form in Figure 1.

1. The central idea of economics is the scarcity concept, namely, that every society faces a conflict between unlimited wants and limited resources.

2. Out of the scarcity concept a family of ideas emerge. Because of scarcity, man has tried to develop methods to produce more in less time, or more with less material and in shorter time. Various types of specialization were discovered in order to

Figure 1
FUNDAMENTAL IDEAS OF ECONOMICS



overcome the conflict between unlimited wants and limited resources. We specialize geographically, occupationally, and technologically. The third family of ideas grows out of specialization.

3. Because of specialization, we are interdependent; interdependence necessitates a monetary system and a transportation system. The fourth idea emerges from the first, scarcity, and from interdependence.

4. Men had to discover an allocating mechanism and this is the market, where through the interaction of buyers and sellers price changes occur. Prices determine the pattern of production, the method of production, income distribution and the level of spending and saving, which, in turn, decide the level of total economic activity. The fifth family of ideas grows out of the fact that the economic system is a part of political society.

5. The market decision is modified by public policies, carried out by the government, to assure welfare objectives. These welfare objectives are determined in the United States through the political interaction of 200 million people which generates thousands of welfare objectives which I have reduced to five: our attempts to accelerate growth, to promote stability, to assure economic security, to promote economic freedom, and to promote economic justice.

These are the fundamental ideas of economic knowledge which we try to incorporate at every grade level, always with the objective in mind that these analytical tools should help the students analyze the cause of a problem, to measure its scope, to develop some solutions, and to measure the dislocations which have been caused by the attempt to solve it. We try to put the problem in a dynamic context and then see what other dislocations are created.

Teaching Applications of Economics

Now I would like to present a few ideas on how I relate these economic concepts to the child's experience. The first grade child recognizes the scarcity concept beause he lives it. He goes to the A&P and he recognizes that he cannot have everything which is on the shelves. The "three wish" fairy tales reflect men's yearning to close the gap between unlimited wants and limited resources.

Cut-outs from the *National Geographic Magazine* and other pictorial material can dramatize the different degree to which nations have satisfied their people's wants.

Division of labor can be dramatized with the children by using simple experiments in the classroom. The class may organize two teams. One team executes a production process, such as making gingerbread boys on an assembly line, while the other makes them without using the division of labor. The time keeper decides which of these teams has been able to produce a given amount in less time and with less waste of tools and materials. Children discover division of labor in the home (where each family member does a particular job), in the neighborhood, in the city, in the nation, and in the world. Children discover the division of labor between men and machines. All these kinds of specialization introduce to children the ideas of international trade and mass production. In many classes, the teacher associates the children's discoveries with those of Professor Adam Smith and Mr. Henry Ford. Such identification of the child's experience with the experience of the big society is necessary to the success of this program.

Children's literature is full of delightful stories that can underpin specialization and the resulting interdependence. Through stories and games the children learn that trading would be much more complex if we could not use money as a medium of exchange.

In the second grade, the children can develop models for perfect and imperfect competition, and they can simulate the operation of the market. To dramatize the principle of perfect competition, the children may become wheat farmers one morning. Each child can represent the farmers of the different wheat-growing countries. The teacher can play the role of the broker whose task is to sell the farmers' wheat at the best possible price. At the end of the harvest the farmers report to the broker how much they have produced. The weather was good throughout the world, and since the game limits each country's production to two truckloads, the farmers from Australia, Canada, U.S., U.S.S.R., and Argentina ask the broker to sell their two truckloads at the best possible price. The broker starts an auction among the rest of the class who are the buyers. Their ability to bid has been limited by the toy money the teacher has given them. The bidding starts at a low price and as the buyers bid for the ten truckloads, the price moves up toward an equilibrium price at which all the wheat that has been offered for sale can be sold. The children discover the most important

characteristic of perfect competition—the lack of control of the market by producers and consumers. The class may extend to another period when the harvest was twice as good as before. The children will be surprised to learn that the equilibrium price will be so low that the farmers' earnings will be smaller than previously when the farmers brought the smaller quantity to the market. This activity introduces to the children the concept of elasticity of demand without its being identified as such.

To dramatize imperfect competition, some children in the class may play the role of inventors, manufacturers, and owners of grocery stores. The game will help children discover that all these producers can control the market in different degrees. The class discussion can bring out how these different degrees of control affect the producers' power to set prices.

Discussion finally gets to public policy, where the children decide what goods and services will be purchased together. Many goods and services are not purchased by each family but purchased together. The Mayor, the Governor, and the President of the U.S. each prepare a long shopping list. Discussing the lists, some people think they are too long and others think they are too short. When they agree upon the proper length of these shopping lists, taxes are collected. The people may decide to pay for a part of the list from tax monies, and to pay for the rest by borrowing money. If they don't want to pay taxes, they have to go into debt to buy goods and services together.

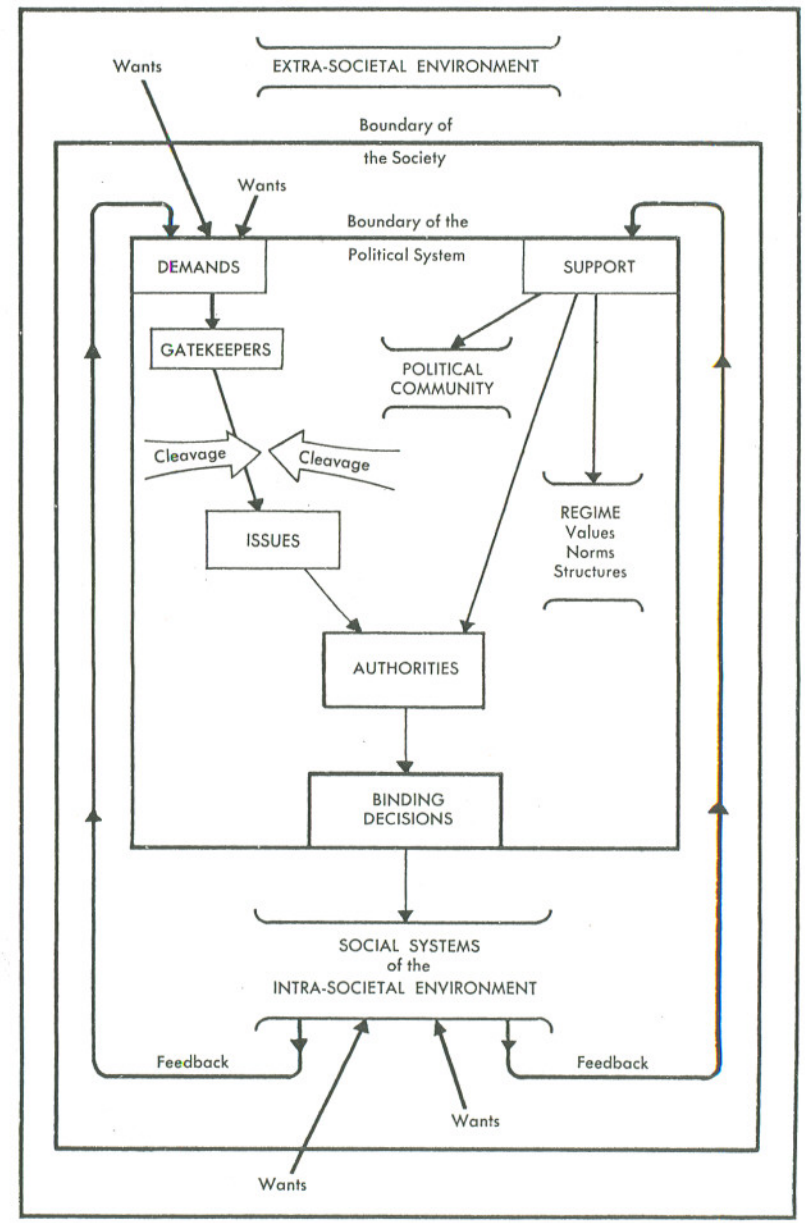
Fundamental Ideas in Political Science

The important idea relationships of political science were defined just as with economics. Figure 2 shows the systems analysis of political life which Professor David Easton of the University of Chicago has developed. This chart contains the following ideas:

1. Members of society have many wants which they hope to satisfy.
2. Some of these wants will be satisfied through the economic system, family system, educational system, and religious system. Wants that cannot be satisfied by any of these systems are channeled to the political system.
3. As the people's wants enter the political system for satisfaction, they become demands. These demands are screened.
4. The screening process operates through formal or informal organizations. These organizations act as gate keepers. Some

Figure 2

SYSTEMS ANALYSIS OF POLITICAL LIFE



of the demands vanish. Others become issues debated in the political community (a group who share a desire to work together as a unit in the political solution of problems).

5. The issues are molded by cleavages in the political community and by the authorities which translate these demands into binding decisions.
6. The binding decisions affect the social systems and the participants in them, generating positive or negative support.
7. The support may be directed toward the political community, toward the regime (a political system which incorporates a particular set of values and norms, and a particular structure of authority), and/or toward the authorities (the particular persons who occupy positions of political power within the structure of authority).
8. The binding decisions generate new wants which appear again at the gate of the political system asking for recognition.
9. The source of the support for the political community, regime, and authorities may originate from the social systems in the form of education, patriotism and other mechanisms.

Teaching Applications of Political Science

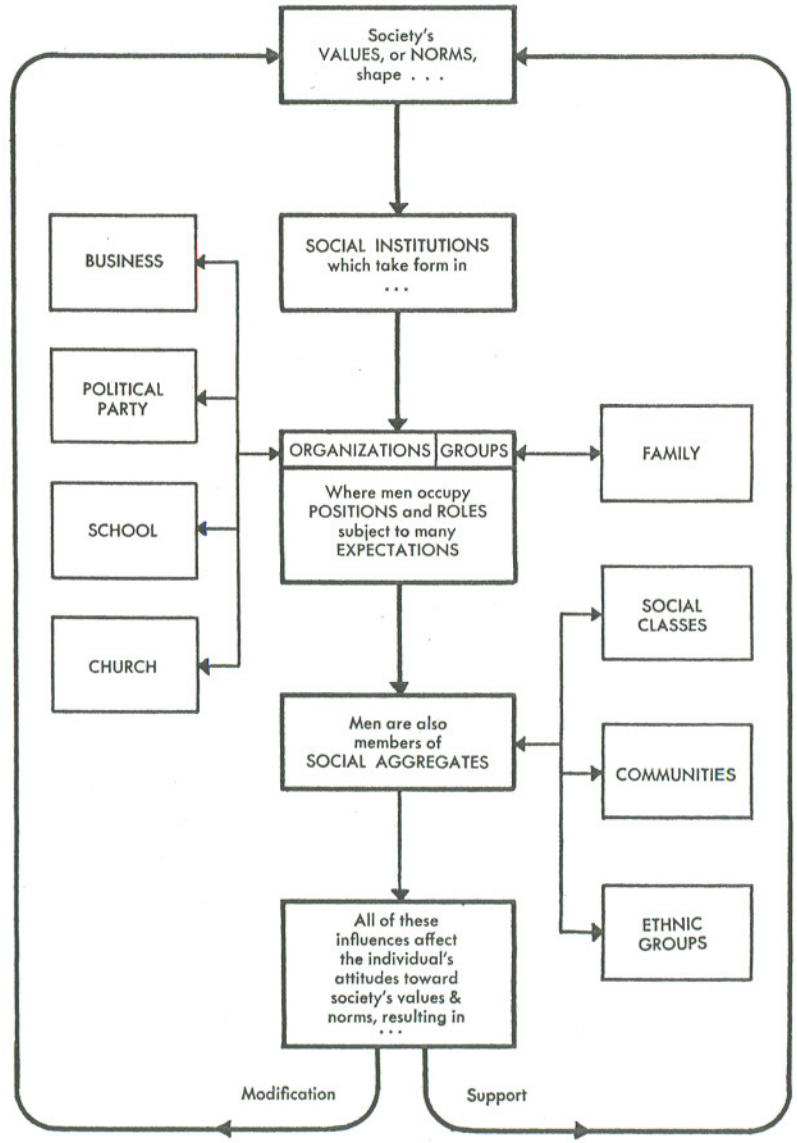
In the same way that the fundamental ideas of economic knowledge can be related to the child's experiences, we can also relate the fundamental ideas of political science on every grade level. The home is a good example of how the innumerable wants of the family are satisfied through the various institutions, and of how many of the wants are exposed to the political scrutiny of the members of the family before they become the rules of the home. The discussion about the various forces which keep the family together has a striking resemblance to the different types of supports which keep the political society together. Looking upon the political system in this way is a fundamental departure from the present civics curriculum where the main emphasis is on description of the legislative, judicial and executive branches of the government.

Fundamental Ideas in Sociology

Professor Robert Perrucci of Purdue University has developed a fundamental structure of sociology which is already in use in experimental classrooms. The core idea is that of values and norms. The system is illustrated in Figure 3.

Figure 3

FUNDAMENTAL IDEAS OF SOCIOLOGY



1. Values and norms are the main sources of energy to individuals and society.
2. Societies' values and norms shape social institutions, which are embodied in organizations and groups, where people occupy positions and roles.
3. People's positions and roles affect their attitudes toward society's values and norms, and result either in support of the existing values and norms, or in demands for modification of them, and the circle starts again.

Teaching Applications of Sociology

The conceptualization of sociology makes it possible to develop units in the primary grades which will make children aware of the importance of predictable behavior among people. Units may show how the ability to predict human behavior creates orderliness in the family, neighborhood, city, and the world. The teacher can demonstrate through experiments how unexpected situations have both very funny and very sad consequences. Children's plays can bring out that the school, business and family could not exist without predictability and order in human behavior.

The many positions men take in society can be observed at home. The children may prepare charts showing the different positions fathers, mothers, and children take and the difficulty of fulfilling all the expectations attached to the positions. The children can show that, depending on which positions we think more important or less important, and depending on our ability, we can fulfill some positions better than others. The story of *The Ant and The Grasshopper*[2] points out effectively the value preferences of the two. The children can also observe and experiment in the classroom how men's positions, due to science and technology, and due to change in ideas, have changed during history.

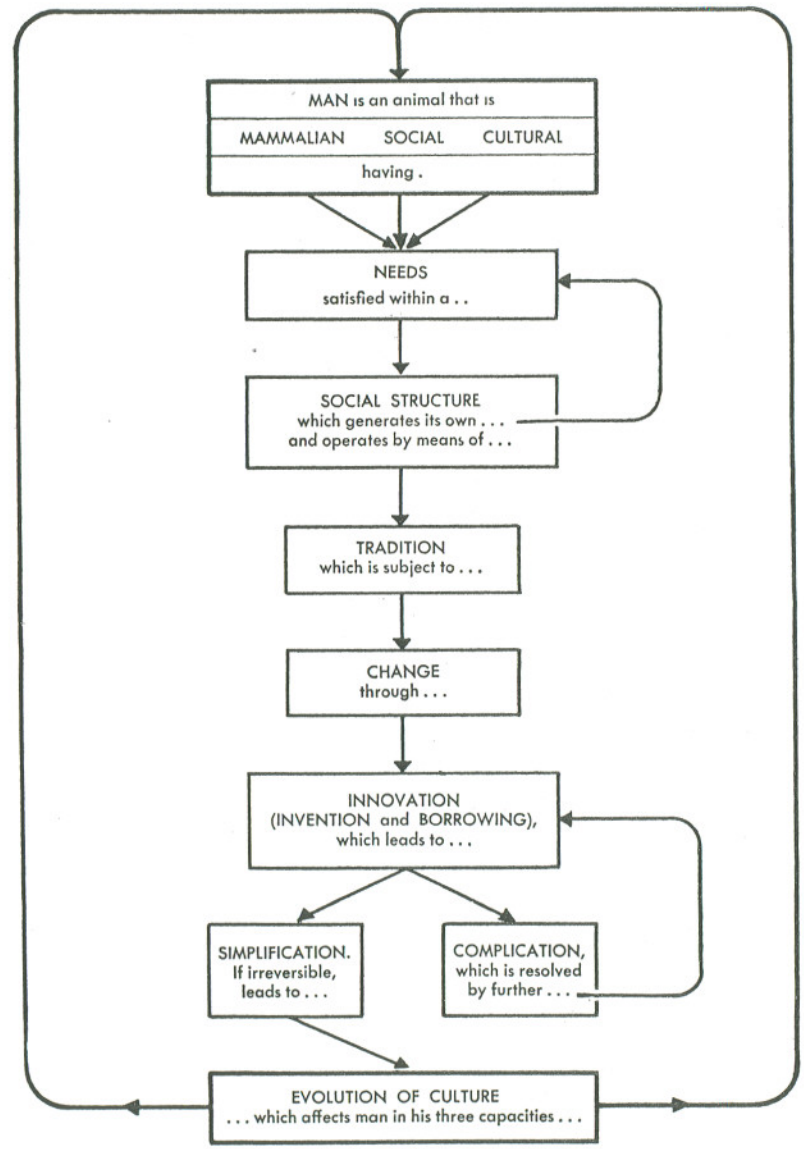
Laying the foundation of sociological concepts in the primary grades helps children to understand later how interplay between values and institutions brings about social reforms.

Fundamental Ideas in Anthropology

Fundamental ideas of anthropology have been developed by Professor Paul Bohannan of Northwestern University. Figure 4 shows the following idea relationships.

Figure 4

FUNDAMENTAL IDEAS OF ANTHROPOLOGY



1. Man may be looked upon as a
   a. mammalian animal,
   b. social animal, and
   c. cultural animal.
2. Man, in these three capacities, has needs.
3. Man's needs are satisfied within a social structure.
4. Social structure itself has needs (called "requisites") which must be satisfied if it is to persist.
5. Needs are satisfied within a particular set of patterned behavior: tradition.
6. All traditions leave some wants unsatisfied.
7. Dissatisfaction leads to changes in traditions.
8. Changes take the form of invention and borrowing: innovation.
9. Innovation leads to complication and simplification.
10. Complication leads to social dislocations. Problems caused by dislocations may be resolved through further innovations.
11. If simplification is of such a magnitude that it forms an irreversible base for man's behavior (for example, the use of fire), it leads to evolution of culture.
12. The evolution of culture affects man in his three capacities as a mammalian, social, and cultural animal.

Teaching Applications of Anthropology

The conceptualization of anthropology in this way will enable the elementary school curriculum builder to develop meaningful units on such conventional subjects as the Eskimos and the American Indians.

A unit on the Eskimos, for example, demonstrates how acceptance of the idea of money changed the life of the Eskimo. The Eskimo in our unit acquired his food, clothing, and part of his shelter from caribou. The scarcity and his nomadic life affected his value system. Then he found out that far away there was a trading post where Eskimos could trade silver fox pelts for articles which he had never had before. Our Eskimo family stopped hunting and started to trap silver fox to use as a medium of exchange. The family settled down near the trading post in an Eskimo village. There was less uncertainty here. This story presents to the children evolution in the Eskimo culture. Living together with other Eskimos created new problems. The family's needs changed. Their desire for learning increased. The changes came about because

money as a medium of exchange had been accepted by the Eskimo family.

In the higher grades, the conceptualization of anthropology will help the curriculum builders to develop units which will show how the development of underdeveloped areas and the pursuit of nationalism affects people's tribal loyalties and changes their physical, social and cultural needs.

These are the four areas of social science in which we have tried to formulate the fundamental idea relationships. Deliberately, we are leaving the areas of history and geography to the last stages of our inquiry. The reason is that these two areas have a different character from the other social sciences. They have to borrow many of the analytical tools of the other areas of the social sciences to explain a geographic area or the processes of history. Until now history and geography in the elementary and secondary school curriculum have been mostly a narrative of men's actions and a description of their environment. Now, our team of social scientists hope to use their analytical tools to explain cause-effect relationships in man's actions in time and place. Using the analytical tools of social scientists, the children can begin to simulate the historians' and geographers' methods of inquiry.

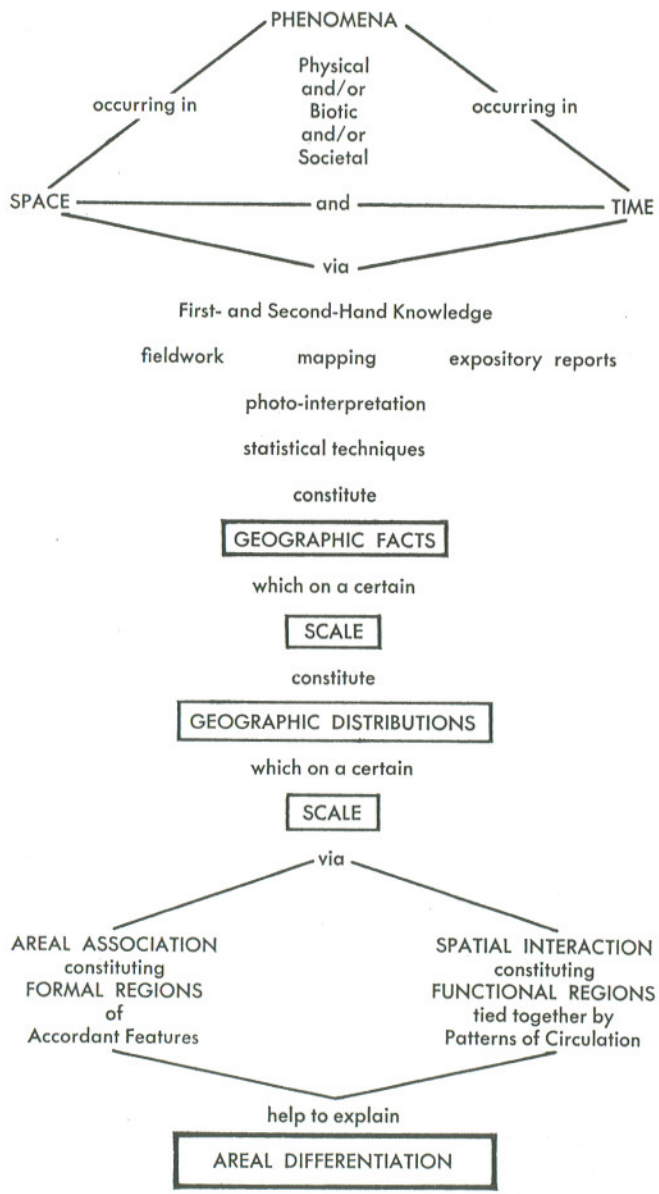
Fundamental Ideas in Geography

The scope of the geographers' inquiry has been worked out by Professor Peter Greco of Syracuse University. The fundamental ideas in geography are shown in Figure 5, and described below.

1. Every geographic area is affected by physical, biotic, and societal forces.
2. The impact of these forces on a geographic area creates similarities among areas. These similar areas are called uniform regions. They are static in character.
3. The similarities among different areas have been brought about through different combinations of physical, biotic, and societal forces.
4. An area may be kept together through a pattern of circulation binding the area to a central place. This area is called a nodal region, held together by functional relationships. The nodal region is dynamic in character.
5. Uniform and nodal regions are often related to each other through gravitation to the same central place.

Figure 5

FUNDAMENTAL IDEAS OF GEOGRAPHY



Teaching Applications of Geography

The classroom applications of geography are now in preparation. Activities are being constructed to show the many ways in which the surface of the earth may be divided by geographers, depending upon the objectives of their inquiries. Units are also being constructed to show how the shape and size of the divisions of the earth's surface are influenced not only by natural forces but also by the state of science and technology. Deserts and cold lands, which in the past have been unproductive, may now become productive through scientific progress; for example, irrigation or the discovery of oil can make a desert productive, and the discovery of minerals in Alaska and the Antarctic can increase the usefulness of those frigid lands.

In defining and studying regions, geographers are concerned with physical, economic, sociological, anthropological, and political facts. The regions defined by physical, economic, sociological and anthropological factors seldom coincide with the boundaries of the political systems that men have set up to solve some of the most important social problems. The resulting dissimilarities between political and non-political regions have been the cause of many problems. For example, if a river basin or an ethnic group is bisected by a political boundary, serious political tensions may result. Such problems may be "solved" by war, by international agreements, or by other social mechanisms. The approach we are taking, as shown by this brief description, provides a partial synthesis of political science, economics, sociology, and anthropology with geography.

Conclusion

The development of the organic curriculum and its orchestration is not a crash program. It is a lifetime commitment. It is the job of the academic departments of universities to stimulate more social scientists to pay attention to the problem of structuring the knowledge of their own discipline. Such logical patterns of ideas will serve the social scientist as a map to identify new areas of research, and will serve the curriculum worker as a guide to build a cur-

riculum which can be adjusted to incorporate new ideas as the frontier of knowledge expands.

■

1 In G. W. Ford and Lawrence Pugno, *The Structure of Knowledge and the Curriculum* (Chicago: Rand McNally, 1964).
2 *The Ant and the Grasshopper; A Georgian Folk Tale,* translated from the Russian by Fainni Solasko (Moscow: Foreign Languages Publishing House, no date).

Round Table: Concepts, Processes and Values

CHAPTER 4

The Obsolescence of Particular Content

Taba: I have a philosophical question about the whole business of identifying concepts, in trying to relate what Professor Feigl has said to what Professor Senesh has said. First Professor Feigl said that all concepts and structures are related to some discipline, and that they are constructs. In that sense they are somewhat colored by the prejudices of the particular discipline, or of the particular enterprise. Then Professor Senesh brought up a much more generic question; he said that we are preparing children for a world of the twenty-first century, one that we don't even see yet. This means that economics and everything may be different than they are now. If we visualize society in the twenty-first century, we might be able to visualize one without war, and, as Buckminster Fuller describes it, a society where we can make more and more with less and less. That's his idea of the dynamics of technology. If that is so, what about the concept of scarcity as a central concept of economics? If we take these three ideas into account, don't we need to question what concepts we select and how we use them in this enterprise for which we are preparing, i.e., education?

Senn: One way to begin it would be to ask: Scarcity for whom? The capital resources required to utilize technology are so expensive that by the twenty-first century, if our present rate of population growth continues we know that Africa, Asia and South America won't have sufficient capital resources. One way to get at this is to ask, who is going to have scarcity? In any event, some aspects of the scarcity problem which require choices will not be made obsolete by Fuller's visions

Taba: You forget Mr. Fuller's assumption that if we produce more and more with less and less, we may have a society of total affluence.

McNee: Another approach to this is to accept the basic premise of economists that there will always be a scarcity of something. It may not be the things that have been scarce for ten thousand years; something is going to be scarce, though. This affluence produces waste products which must be taken care of. The real scarcity of the twenty-first century may be fresh air, and other things that we have always thought of as free goods. I don't think I would be so quick to write off the idea that there will always be scarcity.

Taba: No, I am not writing it off. I was asking the question: When we formulate concepts, what are all the things we may need to take into account, if we assume that we are preparing children for something that we don't yet have? Is there not a greater dialectic needed than saying in economics that scarcity is central? We need to open up alternatives and this is the essence of my question. Scarcity was just an example.

Senesh: I agree with you; we should open up a lot of alternative ways for children to look at things. But economists at present would not consider Buckminster Fuller's idea very seriously. It seems to me that we will never resolve scarcity. If we resolve scarcity there wouldn't be economists, since there would be no need for them. As a matter of fact, at that point we wouldn't need an economic system to allocate resources. The allocation problem would cease to exist. When Galbraith talks about the affluent society, he doesn't mean that we have technologically licked the problem of scarcity.[1] He is bemoaning the affluence in the private area and the poverty in the public area. Allocation is a greater problem than the technological solution of scarcity.

Stevens: This doesn't seem to get to the question. We are not asking specifically about scarcity. We are talking about the selection and formation of particular concepts that we include in the curriculum now, but that may not be applicable in twenty-five, thirty, or fifty years.

Senesh: That is absolutely right; we must try to prepare for changes that cannot be predicted. Here is a little experience I have had, in handling the subject of cities in the third grade. In visits to metropolitan areas of underdeveloped countries I have

seen real metropolitan development. My whole attitude on the theory of urban development has changed considerably since I talked to urban developers in India and in Japan. This new type of urban theory deals with the relationship of urbanization to industrialization. In the past we have assumed that industrialization is ahead of urbanization, but now a new phenomenon has been created. People are pushed out of the farm and moved to the city as a last resort; they are not pulled into the city. I am now incorporating this new idea into my third grade unit. All I can say is that I agree with Professor Taba. We should try to anticipate the future by utilizing the cutting edge of knowledge, but I do not think that scarcity was the best example.

Content and Grade Level

Saylor: In your assumptions about teaching these concepts and ideas in the first grade, there is no question but that they can be taught in the first grade, but should they? You did not in any case justify including them in the first grade. Should first grade be devoted to linquistics or to the arts or to music? Perhaps these economic and social science concepts should be delayed until junior high, let us say.

Senesh: All I can say in my defense is that we teach social studies in grade one. I am not asking for a new subject, but to eliminate the Mickey Mouse and put in something good. I am not demanding more time. All I ask for is that the same time should be allocated but underpinning the children's experience with analysis.

Learning Analytical Processes

Hering: Professor Senesh mentioned that the crucial thing is to develop the analytical process, or respect for problem-solving. If we do this we have solved the problem you present. If new concepts are necessary, the needs will be recognized as they appear. If we have developed analytical faculties, we do, in fact, answer part of our problem.

Shaver: This is very interesting. If you take Schwab's definition of a discipline and are willing to think in terms of substantive and what he calls syntactical or methodological concepts,[2] and look at the current projects in social sciences, you find that most of them concentrate on the substantive concepts. If you look at the

chalk board on anthropology, you see that it is describing what the world is like or what we think it is like. The emphasis is not on the process through which the scientist arrives at the ideas and tests them. The emphasis is not really on the analytic but on the substantive. I think that a philosophical question, or a logical question, is raised about the relationship between statements of objectives and what actually emerges. It almost brings one back to the period in education when we assumed that children learn how to be as critical as historians by reading histories. I doubt that anyone learns to think like Schlesinger by reading *The Age of Roosevelt*. There seems to be an assumption that if we teach children the substantive concepts of a discipline they will learn to be analytical, and I would question whether this assumption is valid.

Hering: It depends on *how* they learn the substantive concepts, though.

Senesh: I would like to react to the question, What is analysis? There is beneath the chart published in my resource unit[3] another that I have not published because I was afraid of frightening the teachers away. In this one I underpin the different significant theories which can explain the market phenomena. When it comes to government, I introduce welfare theory. I incorporate these theories in important model-building exercises in the resource unit. However, these charts are just one-dimensional, with other layers underneath, used in much the same way as Professor Feigl used different layers. The chart I presented to you may be at the descriptive level, but I have done that only for the purpose of communicating with first-grade teachers. When we come to the resource unit, I beg you to notice how deliberately I build on that descriptive chart, underpinning it with some analysis and model-building.

Content and Process

Sigel: I think that there are two problems before us. First, how we organize social science knowledge is arbitrary. Let's start with the assumption that we have an amorphous body of information. We are going to organize these pieces of information in ways that are meaningful to us for some reason. We have been trained traditionally to think in disciplines. We think in economic terms; we think in sociological terms; and so on. The organization of knowledge is important; but equally important is the fact that the

method of organization is arbitrary, and therefore that it can *change* and, conceivably, *improve*. By improvement, I mean change of a kind that will make it more relevant for solving problems.

Second, if we say that the state of knowledge is tentative, not only in sociology or social science but in all our stated knowledge, then the comment that was made about teaching children the way to approach a problem, as an active process of cognition, is extremely important. What we must do is find out how we attack a problem irrespective of its content. The question is how do we present to the child facts a, b, c, d, which are contradictory, or which are similar, and how do we teach children how to handle contradictions? How do we help them to coordinate multiple bits of information into some kind of a unit? This is what I think of as process. What we have to do is simultaneously grapple with content and procedure.

We have the same trouble the children have, because we cannot coordinate any better than they can. We were not trained to coordinate subjects. We were trained to take a course in Economics 101 and a course in Sociology 101. Those professors never talked to each other and we never could talk to each other about that examination we flunked. So we really have to reorganize our own ideas, and that is the core of our dilemma. Whether we'll resolve it in all of our lifetime is another question. I think we have to face up to what our problem really is. I get impatient with the preoccupation with substance, although I don't deny its value.

Shaver: I would like to expand on Professor Sigel's statement. It is not only necessary to help children learn how to handle conflicting evidence, but there are also operational and procedural concepts that you can teach them. If you are teaching something in history you should not just take two documents which are internally inconsistent and help them find the internal inconsistencies. If you do this with one or two documents, the next time they may not think to look for internal inconsistency. *You first help to develop the concept of internal inconsistency* which the historian brings to bear on all of his documents when he looks at them. You label the concepts specifically, and teach them, because the evidence is that students aren't going to learn them implicitly. If you can label the operational, procedural, or syntactical concepts and put them along with the substantive concepts, you have some guarantee that the children may learn them and be able to apply them later.

Attitudes and Values

Fenton: I would like to expand this analysis one step further by indicating dissatisfaction with concentration on content and analysis without specifying objectives in the area of attitudes and values. It seems to me that Professor Senesh *is* getting at attitudes and values. I wrote down a quotation from his talk, "gain respect for analysis." That's an attitude. I am also concerned about the concentration on material about our society, and our society alone, and its possible effect on the attitudes and values of children. Aren't they being conditioned to think there is something wrong with people from primitive societies because there is no division of labor there, and because they don't use some of the obvious techniques we have developed to change their society in ways that will make it work better? Aren't we really encouraging ethnocentrism if we concentrate almost exclusively on the study of our own society in the elementary years, so that we teach the students implicity that a command society in economics, or a traditional society, is in some way "wrong"? I think that unless we get our attitudes and values defined behaviorally very early in the game, we may implicitly, if not explicitly, disregard them.

Berlak: I would like to pick up this point, dealing with ethical issues. When we say that we are going to teach children to solve problems, we must ask: What kind of problems? I suspect that many of the problems with which we may want to deal in school involve basic ethical conflicts that confront us in our society. In my opinion, if we are to teach students to handle basic ethical conflicts, for example equality versus freedom, we must teach them the intellectual skills for dealing with the value issues as well as with the empirical propositions. As I look at the recent curriculum development work in the social sciences, I observe the absence of careful definition of intellectual processes not only with respect to empirical propositions but also with respect to value issues. I think that there are canons of rigorous ethical discourse just as there are canons of rigorous empirical investigation. There is a lot of vague talk about "problem-solving," without any careful attention given to its meaning. Curriculum makers in the social studies must concern themselves with methods of careful analysis of ethical issues if they claim they are dealing with problem-solving.

Hering: Please forgive a personal example, since I have not been out of the classroom very long. In the context of what has been said here about ethics, and what Professor Fenton said about ethnocentrism, there are people who state that the primary purpose of social studies is to open closed areas. The question that I would raise is: Why, ethically, are the areas closed? I am reminded of a problem with a slow learner class I once had, which made a comparison of the ethics of the Buddhist precepts and the Hebrew ideas of the Ten Commandments. These children, who were extremely poor readers and had a very difficult time grasping a lot of things, began to see, for example, that the Ten Commandments are expressed in a negative tone. The Buddhist precepts are expressed in a much more positive tone, and they began to question why this was the case. Why was one negative and the other positive? It seemed to me that two things were accomplished. One is that they learned a little bit about the fact that various people meet their needs in different ways. One of the needs that they face is that of behaving in order to get along with each other. More important than that, they learn through this process that you can inquire and discover how man satisfies some needs which aren't necessarily economic, although they could become that. By learning this they have learned process at a very elementary level.

I think it is important to get across the idea that what you learn is not as important as how you learn it. When new things confront you in the future, you've got to know how to go out and learn them yourself. I have seen an emphasis on *how* to learn work with extremely weak students and I don't see why we can't begin to orient ourselves more and more toward this approach.

Symmes: I'm going to assume that we have both behavioral and substantive outcomes. You can't have the analysis in a vacuum. I wonder, Professor Senesh, whether the content of what you teach about the structures of particular disciplines will apply as well to other cultures, which have non-market economic systems. It seems to me that your curriculum is not necessarily culture-bound, that it could be applicable to other cultures.

I am also wondering, in terms of learning theory, at what point the child understands this structure of the total system. Does he learn bits and fragments until he reaches a ninth grade or a senior course, when he learns the total structure? Certainly the teacher has to know this. Or, are you assuming that at the first grade level,

in each of these areas, the structure of each discipline would be taught?

Senesh: Not at all. I am not proposing that the teacher should teach the structure of knowledge of the various social science disciplines in the classroom. This structure is a pedagogical device which I recommend that teacher-training institutions engrave on the mental screen of the teachers. Suppose a child comes to the classroom and says, "My father broke my piggybank and took my savings. He said he would give my savings back when he gets a job." If a teacher possesses knowledge of the structure of economics, she will be able to make a meaningful intellectual experience from this story. The trouble with teacher training today is that the future teachers today are not exposed to the structure of knowledge. The introductory courses which are taught are bulky and unimaginative. After the teacher throws the student a 600-page text book, the student still does not see the structure of the discipline.

Coming back to the question posed to me: I recommend that the structure of knowledge should slowly evolve as the child moves from grade to grade. By the time the child gets to the ninth grade, he should be ready to investigate the question: What holds society together? Then the teacher can help the ninth grader discover how the analytical tools of the economists, political scientists, anthropologists, and sociologists can answer this question. As the teaching in the ninth grade proceeds, the structures of the various social science disciplines will take shape.

Fenton: I understand your point about analysis and structure, but I am not sure the same approach is sound with respect to values. If students get the notion that the way to organize society is through a market, and get this notion hammered in, year after year, then they might, in the long run, think that other systems are quite wrong in some ways—and that conclusion will later hinder your efforts to teach analysis.

Senesh: In fourth-grade geography and history and in all the other grades, I open up all types of allocating mechanisms. This is the place where we show how society has organized one area that is entirely different from others. In history, for instance, we look at the American economic and political system, starting with mercantilism and moving to our mixed system. This puts economic

systems in a dynamic context that can be read vertically through history as well as horizontally in geography.

I have a good answer to Professor Fenton's question. In the interaction between government and market, the children discover exactly the opposite of what he holds. They are *disappointed* in the market economy when they realize that, through public policy, we abridge decisions of the market economy right and left. The children come out with a pragmatic view of the American economic system. They learn that in the market economy there are always at least three-quarters of our 200 million people who don't like its decisions for some reason or another. It may be that they don't like them because they are apostles for general welfare or because they are apostles to maximize their profits. Many businessmen are half socialist: they individualize profits and socialize losses. The market is not a holy institution; we modify it all the time. We have done so throughout American history, beginning with Hamilton.

Summary Comments

Taba: I started with two assumptions, and in the first I may have been wrong. It is that this meeting and that the activities of the Consortium are for the purpose of requestioning, reshaping, and supplementing ideas, not defending positions. Somehow we got into defending something.

The second assumption concerns learning: namely, that children's minds are shaped by the nature of the structure and concepts which they handle. Therefore, the way you put them together and the way you handle them are very important—not just whether they are substantively correct but what the concepts do to the minds of people as they go through the process.

I think this influence of the structure and concepts by which one has been trained is illustrated here in our own discussion. We have been faced with the triple dilemma (Professor Feigl will have to tell us whether there is such a thing, and whether dialectics can be applied to it!) of dealing with substantive content, process, and values. We have evaded the issue, even though it has been restated three times, because each of us is in his own cave and can't get out of it. We have dealt with illustrations, but not with the real problem of how these three important things should be related in education.

The future task of a Consortium of this kind is to create the kinds of minds that can break out of whatever the limitations of

those caves are. Let me add one more thing, namely, aren't alternatives and openness the most important thing, the chief qualities *whatever* we deal with substantively? I wish that Professor Feigl would comment on these matters.

Feigl: I think that Professor Taba has summarized the discussion very well.

I tried to propagate the philosophy of the open mind, of the critical approach, which is a golden mean between the dogmatic, on the something-more side, and extreme skeptics on the other side. Clearly a critical attitude is the sort of thing that is most conducive to fruitful results. The dogmatist, if he ever had his mind open, has swallowed something that he took for the truth and his mind is never open again. The extreme skeptic has his mind open on both ends, as it were, and everything flows through. So, clearly, a golden mean attitude is advisable, in regard to questions of fact or of knowledge as well as of personal evaluation. From my own philosophical point of view, I wish to make a logical distinction between questions of fact and questions of value. Both are of tremendous relevance to all educational problems. We all wish to stay clear of the stigma of indoctrination, both on the side of information and of evaluation. We try to educate our children to keep an open mind. But education must not be so fluid as to be unclear and lacking in substance. What can we do?

In the future, we may not only have vast political and economic changes, in addition to technological ones which are related to them, but also we will begin to tamper with human nature in biological engineering and eugenic planning. Here arise grave ethical questions, to which no one has a very definite answer, unless he is a dogmatist and tied to a particular system or creed. What will happen in the future when biological and psychological engineering takes place, when, heaven forbid, teaching will become brainwashing? I don't know.

In any case, what the philosopher can contribute is something very modest, namely, to look with an open mind at all these various alternatives and appraise the pros and cons as best as he can from our present framework of values. Here we are not even united because people have different fundamental commitments. I think one task of education is to help us all become clear about the commitments.

I am tremendously impressed with what Professor Senesh has pointed out, particularly because he thinks along the lines of the

unity of science. These old scholastic divisions of economics, sociology, anthropology, history and political science are closely interrelated, if you look at mankind in action. They are, at best, helpful divisions of labor, designed to create departmental divisions so that people know what department they belong to in the school or in the university. As soon as we can teach the children how these things are interconnected, schematic structures of this sort will be immensely helpful. To diagram political science as a systematic analysis of political life may now be too high a level of aspiration, but this could be enlarged to include the sociological, the psychological, the economic, and so on. The gestalt psychologists have shown that a very effective method of teaching and learning is to map out the territory first and then fill in the details.

I consider Professor Senesh's policy of education a successive, progressive enrichment of content built into experience. This much is psychologically clear. Nevertheless, the teacher should have this conceptual structure before him, and I think it will be very fruitful. Map out the country and then dip down, here and there. Illuminate this with substantive details. This seems to me a good pedagogic policy.

■

1 John Kenneth Galbraith, *The Affluent Society* (Boston: Houghton Mifflin, 1958).
2 The reference is to Joseph J. Schwab. See his "Structure of the Disciplines: Meanings and Significances," and "The Structure of the Natural Sciences," in G. W. Ford and Lawrence Pugno, *The Structure of Knowledge and the Curriculum* (Chicago: Rand McNally, 1964).
3 Lawrence Senesh, *Our Working World: Neighbors at Work; Resource Unit* (Chicago: Science Research Associates, 1964).