The Need for General Laws in the Social Sciences

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SINCE 1850 MEMBERS of informed scientific circles have been spared much toil inventing perpetual motion machines because of the existence of the law of conservation of energy. In the same way immense effort in the fields of business and politics will be saved once the existence of analogous general laws in the social sciences has been demonstrated. It is now important that we find such general laws because the world is becoming more and more highly integrated.

Man, his works, his world of ideas, his environment, and his society together constitute a totality that has not been consciously comprehended as a thing-in-itself. This totality, for want for a better name, we call the *sociocosm*. Two of the more important properties of the sociocosm are its high degree of integration and the great rate at which this integration is increasing. Man is a biological organism embedded in the sociocosm, and the two are growing at different rates. Stresses thus set up between man and the matrix in which he is embedded cause tension, helplessness, and strife. Because of its fundamental properties the sociocosm is continually outgrowing man's ability to cope with it. Dilemmas in the fields of business, politics, and economics, which have arisen in the past and will continue to arise, have their source in our failure to comprehend the existence, let alone the properties, of the sociocosm. Only a study of the sociocosm, together with a determination of its fundamental laws, will show whether these surface dilemmas can be resolved.

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The different views as to how men are to be arranged into the good society have precisely the same status. They are merely the expression of individual preferences, which in turn are the results of different environmental and hereditary conditions. *All* these theories, we suggest, are probably mistaken, because they are erected on foundations that consider only a small fraction of the factual data now available. If one happens to be right, it is nothing more than an inspired guess.

In much the same way, for two hundred years before 1850, such learned journals as the *Philosophical Transactions of the Royal Society* had their pages crammed with methods for attaining perpetual motion. Machines were being invented, not by crackpots, but by the best scientific minds of the generation—men of the caliber of Newton, Huygens, and Hooke. An immense amount of labor went into the design and construction of such machines, and into the individual criticism of theories and mechanical embodiments that accompanied their publication. Toward the middle of the nineteenth century this debate (which had been carried on in a desultory fashion since the time of the ancient Greeks, and intensively since the rebirth of physics that came with the Renaissance) came to an abrupt end. Such work as Count Rumford's experiments to show the equivalence of heat and work and Joule's numerical calculation of the mechanical equivalent of heat permitted a great generalization: the law of conservation of energy. This general law permitted men to solve questions dealing with energy on a theoretical level, without building a mechanical model, and without wasting time on the criticism of individual mechanical embodiments. The relatively advanced state of the physical, as opposed to the social, sciences is largely the result of this law. The law of conservation of energy is still immensely useful for cutting through the mass of detail surrounding a problem and coming up quickly with the correct answer based on theoretical considerations alone.

Today we stand badly in need of some general laws dealing with the dynamics and statics of society—something analogous to the "law of conservation of energy" and "principle of least action" in physics. Some of our best minds are engaged in studying the multitudinous detail of the social sciences, and often an entire lifetime is devoted to the study of one small aspect of one society. The monographs and learned articles pile up, and the social sciences become more complicated every day. To cut through this increasingly thick jungle of detailed reports, we need some fundamental laws. If we had such laws we would be able for the first time to give *direction* to research. We would know immediately what was possible and what was not possible, without having to perform costly experiments to establish the field. In the social sciences many experiments are inconclusive, and others require decades for results, when quick solutions are of vital importance.

What is needed is study of the totality—the superintegration we call the sociocosm—with a view to discovering some of the general laws governing its operation. We believe that such laws exist, and that even the elementary discussion of the totality that follows brings some of them to light. Once formulated, these laws can be used for the criticism of modern social theories on a scientific basis; for the formulation of a basic policy for research in the social

sciences; and for the eventual development of social theories that have a demonstrable scientific relationship with the facts.

The element we are accustomed to call "society" is itself a complex organization of man, his works, and his environment. It is, to coin a word, the *integron* of man, machines, institutions, products, accumulated culture.[1] The particular integron that is the result of the interplay of environment, the dynamics of institutions, individuals, and ideas, we call the sociocosm. The sociocosm, of course, is the "world" as seen from the point of view of man; it is a homocentric view of the universe.[2]

Dilemmas in the fields of business, politics, and economics, which have arisen in the past and will continue to arise, have their source in our failure to comprehend the existence, let alone the properties, of the sociocosm. History is the description of events resulting from the interplay of forces between and among the elements making up the sociocosm. The multifarious interactions of the constituent elements mean that, to understand them properly, we must treat them as components of a still greater and more universal type of integron—namely, the sociocosm.

There is probably a whole group of laws governing this integron. The determination and study of these laws, and their application to problems in the various aspects of social science might lead to a more rational world or, at least, would provide greater opportunity for rationality to operate. As a minimum, such research would probably tell us which problems are ultimately soluble, and which are not. But the formulation of such a set of laws is not the purpose of this paper. We propose merely to describe the five properties of the sociocosm which seem to us most significant, in the sense that they appear to have the most immediate application to today's needs.

Some Properties of the Sociocosm

The sociocosm is a unique type of integron—different from the biological organization[3] of cells into a living organism, and also different (because of the different order of integration) from the organization by means of which men act together in an institution or in society. Although the sociocosm has always been with us, it is not a familiar concept. Therefore, to describe its properties, we propose to compare it with something that is well known—namely, a biological organism such as man. The five properties that are deemed especially significant are (1) degree of homogeneity of the components; (2) degree of integration; (3) rate of change of the degree of integration; (4) degree of organization; and (5) degree of approach to man's own ideals.

1. Degree of homogeneity of the component parts. One striking difference between the biological organism and the sociocosm lies in the uniformity of the component parts. In the biological organism various cells have various functions, such as defense, control, alimentation, repair, reproduction; but they all belong to the same *class* of thing. They are all cells. In social organizations, on the other hand, the components that perform the different functions are often not members of the same class. A bus, for example, is not the same as a man, yet both are components of the transport system.

As society becomes more complex, there seems to be a definite tendency toward mixed components. In transportation, men first used their own legs and then, later, were carried by animals. Up to this point all the components of the system were at least living creatures and belonged to the same general class. But now the transportation function is performed by an odd combination of machines and men, to the astonishment of the gods and the occasional undoing of man himself.

The function of protecting the organism from external enemies shows the same divaricate tendencies. The crab has its own specialized cells that form a protective plate; societies take several different classes of entities—machines, chemicals, words, and men—and form them into a complicated protective device.

The recent development of so-called thinking machines shows this same tendency to get some sort of nonliving entity that is different from man to perform one of man's specialized functions. Instead of developing our own brain cells to the point where they can work at the speed required, we work up a different class of entity—an aggregation of electron tubes, wires, resistors, and condensers—to do our "thinking" for us.

The sociocosm therefore differs from the living organism in that its components include *different* kinds of things, whereas the individual components of an organism are all the *same* kind of thing.

2. Degree of integration. One of the main elements of the sociocosm is the individual human being. One of the main elements of the biological organism is the individual cell. It is obvious that a human being is intrinsically a more complicated element than a cell and, moreover, it has the ability to stimulate other human beings over a longer time, through a greater distance, and in a greater number of different ways, than one cell has to stimulate another. In view of our

[1] So little thinking has been done about this totality that there is no word for it in any of the modern languages. In this paper, to "integrate" various elements means to arrange them in such a way that they affect each other. A highly integrated group is one in which the components influence each other in multitudinous ways. The entity that results from integrating (which may be only a concept, and not a physical thing at all) we call an *integron*.

[2] By this we do not intend to support Berkeley's contention that the world is a thought phenomenon of man. We mean simply that the geometry of the sociocosm is warped to emphasize man's peculiar interests and desires. To give a graphic example: Say the cosmos were laid out on a grid of Cartesian coordinates drawn on a rubber sheet, and a pencil were shoved up at one point on the sheet, stretching the rubber into a sharp peak. Man is at the top of the peak looking down, so the squares nearest him seem immensely large and important, and those farther away seem small.

[3] It is important to distinguish between organization and integration. In this discussion, a highly organized group is one in which the line of control is clearly drawn, and the dominance of some of the elements clearly established; a highly integrated group is one in which every element affects every other element.

definition of integration, as depending on the degree to which interstimulation is possible, the sociocosm, on this basis alone, is more highly integrated than any biological organism.

In addition, when we consider the extent to which man has turned the inanimate world to his own purposes, and the effects that the resulting products and environment have in turn upon man, it is apparent that there is still further interstimulation, increasing the disparity in degrees of integration between the biological organism and the sociocosm. Therefore, considering *all* the elements of the sociocosm and their interactions, the degrees of integration as between a biological organism and the sociocosm will be seen to be of different orders of magnitude. For example, the transfer of information from one place to another is achieved both by biological organisms and by technology, which is one element of the sociocosm. The organism uses nerves: technology has settled, for the moment, on the use of copper wire and electromagnetic waves. The use of inanimate things instead of nerves for the transmission of intelligence has permitted greater distances to be covered and more information to be sent in a given time.

3. Rate of change in the degree of integration. Comparing a biological organism (such as the physiological man) to an organization, from the point of view of the rate at which the degree of integration of the two is changing, it is apparent that the development of organizations is taking place at a different order of speed. Judging by the human skeletons dug up by archaeologists, man of 250,000 years ago was not vastly different physiologically from modern man. On a smaller time scale, artifacts of the Egyptians and ancient Greeks show that the men and women of those days were essentially the same as men and women today. If, by some accident of time, they were to appear on a bathing beach, we would pass them without a second glance. On the other hand, the basic organizations (which are among the slowest entities that change in the sociocosm) were certainly of a very primitive type 100,000 years ago and cannot be compared to those existing today. Even the institutions that were in existence 6,000 years ago are only very feeble foreshadowings of the modern type in degree of complexity.

The same tendency can be seen operating in the world of ideas. The various concepts of men—justice, truth, liberty, social responsibility, humanitarianism, equality—have grown up at an amazing rate in the past three hundred years. In fact, some very fundamental ideas in our society have developed in the past fifty years.

That the biological organism (man) changes at a much slower rate than do most components of the sociocosm is evident in the products of human industry, such as the automobile, motorized wheel chair, and various methods of communication, which could very easily make legs unnecessary within fifty years. Obviously, no type of biological evolution that we know of could possibly eliminate human legs in fifty years. Comparable biological changes have taken place, but only over periods of time of the order of perhaps a million years. Biological evolution cannot possibly keep up with the development of products of our industrial organization.

The products of our embryo machine civilization and the machines for making these products are developing at such a tremendous rate that they cannot be compared to those of only fifty years ago. Surely, then, the sociocosm, which is the totality of all these machines, products, men, and organizations, is changing at a much faster tempo than man, the most adaptable biological organism known.

4. The degree of organization. In *Brave New World* Aldous Huxley described a society in which human beings were deliberately modified in the pre- and postnatal period so that in life they would be capable of performing a very limited range of functions, and those functions only. This is the true biological method. The degree to which this seems ludicrous or horrible is the measure of the distance separating the biological and the social forms of organization.

The parallels between the organization of a group of cells in an organism and that of a group of men in a society are numerous enough to have attracted the attention of philosophers, but, when examined, they turn out to exist chiefly on the superficial level. When we go behind these surface similarities, fundamental differences appear at once. For example, under the microscope even the layman can see a radical difference between a bone cell and a muscle cell. But on a Sunday excursion boat it is very difficult to tell the difference between a day laborer and an artist. The biological *method of organization* is to warp individual cells so they can each perform one separate function in an integrated whole; the social method of organization is to take individuals all essentially the same and leave them as unchanged as possible.

Individuals in our society are so similar that a man may be a laborer in his youth and a captain of industry in middle age. The idea that all men are equal is very tenaciously held in our society, partly because it is an essential ingredient of the democratic ideal, but also because it contains this core of truth: the most striking differences between men are completely insignificant when compared to the differences between specialized cells.

When we compare the control systems of a biological organism and a social organization, we see an even more striking difference. The simplest organism is far more highly organized than the strictest totalitarian state. In spite of the well-known fact that the cortex is influenced by the rest of the body, in any sane individual the cortex controls behavior more or less explicitly. In the social organism, on the other hand, the explicitness of control is not only poorly defined, it is commonly not certain that it exists. Interactions up, as well as down, the control structure are the normal thing in social organizations—a fact that accounts for de Maistre's remark that "every country has the government it deserves." No society has anything really

corresponding to the central nervous system of biological organisms. There is no single control element, corresponding to a brain, which determines the course of our actions. On the contrary, as a society we are pushed this way and that according to the vagaries of pressure groups, mass hysteria, or sheer accident.

The biological organism is so completely and intimately organized that only cells could possibly be members of such an organization. The lowest slave under the most ferocious totalitarian state could never achieve the degree of submission required by the organic type of organization.

5. The degree of approach to man's own ideals. When the biological organism (man) is compared with one aspect of the sociocosm (society) from the point of view of their respective degrees of approach to man's own ideal of conduct, human dignity, social responsibility, and justice, it is found that the biological organism is very far from this ideal, and the sociocosm relatively near.

Man is an intelligent creature for a very short period each day, an emotional creature for a somewhat longer period, and a plain unfeeling and unthinking animal for most of the day. Since we can harbor humanitarian or intelligent ideas for only a very short period, and since the time of occurrence and the duration of these periods are not predictable, we have been led to set up rules and organizations to perform these functions for us when we are otherwise engaged. Organizations of this type are governments, police departments, humane societies, libraries, churches, social service groups, schools, and universities. By means of these and similar organizations, society caters to the ideals of the individual. The organizations provide man with continuity of operation, over-all policies, and day-to-day functioning in the field of humanity, human discipline, general housekeeping, education, and religious life.

That the social conscience is closer to the ideal than the average individual conscience (averaged over a reasonable time interval) can be further shown by contrasting the official government attitude toward minority groups with the attitude of the average individual. Here in Canada our government has no official policy of persecuting the Jews, but most of the individuals in our society who are not Jews privately want them persecuted and do it in various small ways, as opportunity offers. Since our government and all the institutions mentioned above are components of the sociocosm, it follows that the latter more closely approaches the ideal set up by man for himself than does the biological aspect of man.

The sociocosm, then, differs in every aspect we have examined from the biological organism. It has a much greater variety of components; its degree of integration is so much higher it is of a different order of magnitude; the rate of change of this integration is very much faster; the degree of organization is far lower; and, finally, the sociocosm has been found to exhibit a relatively close approach to man's own ideals. These points are enough to establish the fact that the sociocosm is a distinct type of entity—an integron of organizations, of a complexity unlike anything we are familiar with in our own lives.

The Sociocosm and Contemporary Problems

Any society is more complex than the individuals of which it is composed, since the very fact of organization adds something that was not there before. The higher the form of social organization, the greater is the gap between the developmental level of the society and that of the individual. The rate at which an organism changes is a function of the number of interstimulations that can occur per unit time. As time goes on and the organization increases in complexity, obviously the number of interstimulations per unit of time must increase also—i.e., the rate of change must increase. In the case of biological organisms the number of different ways in which interstimulation can occur is relatively small, and the growth of the organism is more a matter of organization than of integration. But with the sociocosm the number of different ways in which interstimulation can occur is large, and its growth has been more in the field of integration than of organization. Hence the number of ways in which interstimulation can occur is rising at a very rapid rate. The disparity between the two is a measure of the difficulty man experiences in coping with the problems presented by the sociocosm.

It is often said that political organization is behind the times, but it is not. It is only behind the peak level of thought of certain highly gifted individuals who appear only rarely in each generation. Political organization is always well above the level of average thinking of average individuals. Some evidence to support this belief can be seen by comparing the way even a small state government runs its affairs with the way the average voter runs his life. The latter, by comparison, is a shambles.

The rapid development that is characteristic of complex structures makes man unable to cope with his environment. Obviously, "formula" solutions are incapable of realization. The statement of a problem is the first step to its possible solution. The problem is this: Since, by their very nature, organizations must develop faster than their components, the dilemmas caused by the difference in developmental rates cannot fail to arise. If man wants to increase the degree of advancement of his civilization, or even survive at the present level, he is faced with a greater and greater necessity of finding an escape from, or diversion around, this fundamental law of organizations. One possible escape from this dilemma is to conceive of the organization as being external to the individual; then the individual can extricate himself insofar as is possible from its exorbitant mechanical demands. The tendency should be for individuals, instead of trying to integrate themselves with the machine civilization, to stay outside it, enjoying its material provisions, but avoiding its stultifying effect on the spiritual and creative faculties.