

nation will suffer heavily from the present loyalty program.

Even if the Loyalty Order were to be continued without revision of its underlying philosophy, important changes in administrative methods are urgently needed. The present loyalty boards discharge simultaneously the functions of advocacy and adjudication. The content of the charges they issue and the conduct of the proceedings over which they preside do not assure that the facts and their implications will be fully explored. The organizations with which an employee may be identified are finally and conclusively characterized by the Attorney General without either the employee's or the organization's having any opportunity whatsoever to establish that the Attorney General was not fully informed. These and other procedural deficiencies can be corrected readily. So long as they remain, they accentuate the possibility of error in the loyalty program.

The fundamental shortcomings in the Loyalty Order, however, are not procedural. Rather, they are to be found in the very conceptions which the Order expresses. Refinement of administrative methods and gentility of official behavior are important, to be sure. But they are not basic. Until the Loyalty Order deals with the way employees act, rather than with the way they supposedly think, we shall inhibit the freedom and encourage the insecurity of our public servants. The cost will in the end be borne not by the employees who are deprived of their normal freedom to believe and behave as they wish within the limits law has set. It will be borne by the nation as a whole.

As President Truman recently asserted, "Continuous research by our best scientists is the key to American leadership and true national security. This work may be made impossible by the creation of an atmosphere in which no man feels safe against the public airing of unfounded rumors, gossip, and vilification."

Challenge to Social Science

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THE INDUSTRIAL REVOLUTION is a term that the elder Toynbee used to describe the historical shift in the basis of human culture from agrarian to industrial. The student generally learns a few names of men associated with this period—Watt, Whitney, Hargreaves—and their respective inventions, but only rarely does he discern their relationship to the problems before which the world now trembles. The fact is, however, that the revolution is moving on more rapidly during his lifetime than ever before, and engineering, chemistry, electronics, aviation, biology, and many other sciences are contributing to it.

The intellectual equipment for making this change was perfected by the labors of a host of men, scattered over a period of two thousand years. The scientific method that they applied to the material world has loosed a torrent of discoveries.

Many results of these discoveries were beneficial and brought higher standards of living. Mass production could succeed only on a base of mass power to consume, more leisure, and the broadened knowledge and experience that stemmed from mass communication and transportation.

One profound change has been the shift from independence to interdependence. When the simple life prevailed, contacts were individual, relationships were uncomplicated and characterized by a high degree of self-sufficiency and independence. Today we know the paralysis that can occur with the breakdown of any of the numerous lines of supply within a nation.

Nations are as interdependent as their citizens. Vitally needed products must be exchanged throughout the world, and an economic depression in any leading nation means that all others will be similarly affected. Any science or organized knowledge is the joint product of men all over the world.

This interdependence has led to an extension of moral values from the personal and community level to the national and international level. Individual morality becomes inadequate when it is possible for a person to refrain from stealing from his neighbor, lying to him, cheating or killing him and yet advocate national or international policies that lead to mass destruction of peoples. The most humane and kindly individuals may be greatly disturbed at the suffering of one child but innocently contribute to wholesale suffering and death thousands of miles away.

Mass civilization has impersonalized relationships between men. When one killed with the sword, he saw his antagonist fall, saw his blood, and heard his dying gasps. To the killer this was real. In modern war a plane flies over a city, a man in the plane presses a button, and ten or ten thousand people may die. The killer himself is only the final link in a long, mechanized, and impersonal chain of events, and even he does not witness the deaths of the people he kills. Successful war now means total war, and the civilian comes to suffer more than the soldier.

Being moral involves, therefore, much greater knowledge of national and world events. It makes greater demands upon the intelligence of people who have become citizens of the world whether they happen to like it or not. Good intentions are less and less adequate to the situation.

Natural science has become "dehumanized," as James Harvey Robinson (7) so clearly described. Its adherents have in large measure become so specialized that they give little consideration to the effects of their discoveries on the population or how their techniques and knowledge might help solve problems. In this unawareness they have been burrowing into nature and throwing up great heaps of specialized information and expending little effort on organizing and utilizing it to best social advantage. As Robinson said a quarter century ago:

We are forced to ask ourselves whether it is safe, since our life has come to be so profoundly affected by a dependence on scientific knowledge to permit the great mass of mankind and their leaders and teachers to continue to operate on the basis of presuppositions and prejudices which owe their respectability and currency to their great age and uncritical character and which fail to correspond with real things and actual operations as they are coming to be understood. Even the more magnificent scientific discoveries, especially those of recent years, have not penetrated into our general education and are entirely disregarded in most discussions of social problems.

This has led to what a symposium of British scientists called "The Frustration of Science (2)." The original aims and basic intentions are clear enough. The physicist Harold Urey (8) says:

I believe I speak for the vast majority of all scientific men. Our object is not to make jobs and dividends. These are a means to an end, merely incidental. We wish to abolish drudgery, discomfort and want from the lives of men and bring them pleasure, comfort, leisure and beauty. Often we are thwarted but in the end we will succeed.

One sees on every hand, however, that Bacon's gunpowder, for example, can be used either for food or for homicide; Nobel's dynamite, as he discovered, for engineering or for bombs; the automobile and ship

for the spread of culture or for tanks and destroyers; the Wrights' airplane to bind the world more closely together or blow it to pieces; organic chemicals for life-saving drugs or incredibly potent poisons; knowledge of microorganisms for the conquest of disease or bacteriological warfare; and radioactivity for medicine and power or for the obliteration of cities and nations. How are we to determine what the alternative will be? We cannot follow our present rate of destruction very far and survive.

Men have begun to ask themselves, "What can we do to solve the frightening difficulties into which our distorted ingenuity has led us?" Since the rise of biology, psychology, sociology, and anthropology during the last century we have been compelled to recognize that it is possible to apply scientific procedures to the problem of comprehending, predicting, and intelligently controlling human behavior. The old stereotype of science as frozen content, limited to a small number of fields, persists, however, despite the fact that its history shows, in the words of Karl Pearson, that it "is not peculiar to a certain subject matter."

More specifically, a series of writers have maintained with increasing effectiveness that scientific methods are applicable to social problems—during the last century John Stuart Mill, Auguste Comte, and Karl Pearson; more recently Graham Wallas, James Harvey Robinson, Harry Elmer Barnes, and John Dewey. The last five years have brought the publication of Lundberg's *Can science save us?* (3); Williams' *Human frontier* (9), expressing the approach of the biochemist; *Human nature and enduring peace* (6), the psychological analysis of the war, edited by Gardner Murphy; and Stuart Chase's *Proper study of mankind* (1), giving the coordinated approach to man of many social scientists. We should not omit Lynd's admirable *Knowledge for what?* (4) and Mayo's *The social problems of an industrial civilization* (5).

Organizations, too, have been active—among them Yale University's Institute of Human Relations and the Society for the Psychological Study of Social Issues. Several foundations for humanities and scientific industrial relations are in process of development throughout the country. All these efforts point in the direction of a new synthesis of information from many fields, information which is relevant to the solution of modern problems.

The American sociologist Ogburn devised the term "cultural lag" to describe the failure of the social phase of culture to keep up with the physical. It is now a platitude to say that scientific methodology must be applied to human problems if we wish to reduce this ominous lag. What will this mean in the development and growth of the social sciences?

Social science is a flexible term, embracing history, economics, political science, and sometimes education, sociology, and psychology. Some institutions of higher learning are beginning to classify psychology with the biological sciences. Only in sociology and psychology have scientific methods been practiced systematically. If the social sciences are to grow—as they must if man is to survive—certain improvements are necessary.

(1) The success of the natural sciences can be credited very largely to the constant reconstruction of ideas. Proponents of the *status quo* are the villains of their history, when known at all. The experience of these sciences has been that there is no progress unless someone is continually finding fault with things. Only in this way can old concepts be strengthened and new ones discovered. Fending off criticism weakens a cause by denying it the opportunity to grow and to keep in close contact with a changing world.

It is not easy to invite criticism even in the physical sciences, where most data are inanimate objects. In the social sciences, where data are the intangible thoughts and emotions of people, this difficulty becomes the primary concern. What is its source?

In social inquiry we tend to identify our own ego with various concepts which we accept, and to regard criticism of ideas as destructive criticism of the personality holding them—as it too frequently is. It is tragic to see reputable social scientists falling victim to this tendency.

The solution has already been found, not only by physical science but by many ordinary people who have achieved the capacity to dissociate judgment of the man from the ideas held. There is need for social criticism if it is offered in a constructive spirit. Everyone should seek it eagerly and be able to profit from it, gaining the advantage of a great positive force. We agree that everyone is fallible. Science has shown how this fallibility may be combated most effectively in a way that preserves mutual respect and offers the thrilling experience that accompanies a joint search for truth.

(2) One of the primary objectives of criticism is stimulation of new ideas. Social science has heretofore looked too much to the past for answers to its problems. This does not mean that there is no value in the past. It does mean that the complex problems of an interdependent and technological universe are unique in human history and that unique solutions must be devised.

We venerate leaders of the past precisely because they were courageous and farsighted enough to challenge old concepts with new ones for a new age. The

fact that a problem exists is proof that old concepts have proven inadequate to the situation. The universe is dynamic and change is eternal. Human institutions and problems are the most rapidly evolving segments of it. Refusal to recognize and guide this change will merely insure greater confusion.

If history demonstrates anything it is that a frigid reception is invariably accorded new social proposals. The social sciences stand now in their development where the physical sciences stood in 1600 and its innovators may expect a similar fate. Will we again require 400 years to achieve our goal?

It is interesting to compare attitudes in the physical and the social sciences. We take pride in the newest and most modern gadget or technique. We are disturbed if the doctor evidences the slightest suggestion that he is “behind the times,” since this may mean needless suffering. But in social matters we are equally proud of beliefs which were current when diseases were treated by boring holes in the head. Barnes puts it picturesquely when he says, “The only place we prize antiques more than in our living rooms is under our hats.”

It is true, as many maintain, that we should show a healthy skepticism toward new propositions until they have been proven. It is interesting to note, however, that those who advocate such experimental testing of new concepts frequently do nothing to assist it and in fact may do a great deal to prevent it. We must devise ways to keep the intellectual concrete from setting too early and too hard.

(3) In the natural sciences we have learned the tremendous value of subsidizing the search for objective truth. This means criticism and new ideas against which there is determined opposition. Why?

Change in human institutions is thwarted by several forces. First is the immense power of custom; one discovers early in life that things are done according to a set pattern and that fundamental deviation from it will surely be accompanied by ridicule and social disfavor. Closely related is that intellectual inertia which manifests fear of anything new. This fear cannot be inborn, since the same people will show no such fear of new physical concepts or devices once they have become habituated to the idea of change. There is also a lack of the information necessary for enlightened action. Finally there is special interest in the *status quo*, which is a tremendous force.

How many agencies can the reader name that subsidize the analysis and reconstruction of human institutions without respect to the results? Yet the value of objectivity has been demonstrated in the physical sciences. Newton had no patents on gravitation, nor

did Pasteur and Koch have an investment to protect when the virus was discovered to be another cause of disease besides the bacterium.

The NAM will sponsor an investigation whose conclusion has already been established, and the CIO will spend money to prove the opposite. People in such organizations do not invite even the most helpful criticism. Lobbies, pressure groups, and influential business interests represent highly effective instruments for thwarting scientific attack on problems.

(4) Before any reliable information can be communicated we must be sure that our words symbolize something that really exists and furthermore that they convey the same conception to everyone who is influenced by them. This is the principal aim of semantics and propaganda analysis, which, together with logic and statistics, are the indispensable tools of the social scientist.

Although the original purpose of language was to communicate accurate information, its present misuse contributes to prejudices, destructive criticism, and frustration of new concepts. History uncritically preserves in its texts the most emotionalized and misleading language imaginable. Political economy and political science abound with sacred cows and verbal demons. Perhaps no language reform could succeed in making a true science of social problems but there is no doubt that decided improvement can be made.

In the natural sciences, use of Greek and Latin has provided a symbolism to avoid the changed meanings and affective connotations of popular usage. It is too much to expect that such a symbolism could be applied extensively to social problems. The reason is not far to seek. Those who support government by the majority must recognize that this majority is not likely to adopt such a mode of expression.

Fortunately, however, we do not have to resign ourselves to the nightmares of distorted meaning which the semanticists are able to select as examples of our everyday speech. The average person can grasp a few simple rules that will avoid the present confusion.

Let us illustrate one difficulty by returning to the word *criticism*. It denotes constructive analysis and yet hearing the word evokes a mental picture of an ill-adjusted, complaining egotist because these connotations have been built up through popular use. The semanticist would probably advise the use of another word, such as reconstruction. In a moment we will consider the operational approach to meaning.

(5) Social science tends to get lost in a forest of particulars. Facts, although they are indispensable, can never tell us anything by themselves. Conclusions must be drawn from them. Disciples of the monographic school of historians of a half-century ago

supposed that they could found a true science of history upon a massive accumulation of facts on the subject. But history as the record of human behavior can be understood and interpreted successfully only when there are some clearly defined standards for evaluation and objective techniques for processing data. Only in this way can the historian capture even partially the forces shaping events as they occur.

A few fundamental principles of human behavior are greatly needed for use in organizing its data. Institutions fail because they violate these principles—governments fall, parties go out of power, economic and social systems disintegrate. History lacks objective standards for evaluating its immense accounts. Facts are all things to all men and can be made to point in any direction.

Without a guide to their meaning, facts alone, however compendious, are almost useless. Historians select from a stockpile of past events (which make their own appear trivial) those showing what they wish to show. Thus we see the tremendous scholarship of Toynbee and Gibbon and of von Ranke and Robinson producing opposite theories, and the only basis for selection we have is our own prejudice and desire.

We have not yet realized the full significance of the elementary principle that there are causes for social phenomena. If we applied that principle we would renounce such attitudes as blame and condemnation of sin. These attitudes lead us away from an attack on causes and therefore away from cure and prevention of human ills. No physicist would kick his apparatus because it didn't work right.

What should we think of a medical science that concerned itself primarily with recording one-tenth degree fluctuations in the patient's fever, as economists chart their business cycles? What should we think of the physician who treated smallpox by covering up sores with flesh-colored cream? Yet this is what we are doing when we institute home relief.

Recognizing the principle of cause would mean also abandoning the prevalent attempt to interpret social phenomena in terms of what is "right" or what "ought to be." The scientific approach does not begin with ideas in mind about what nature "ought to do," but recognizes that fundamental laws operate to cause events to take place in the observed way. We are compelled to discover these basic realities and adjust our own acts accordingly so as to derive the maximum advantage and control of nature.

Science is pragmatic. Much scientific knowledge is based on what works, even when we lack exact information on how it works. But those who think they can get by with violating laws of human behavior, denying basic human needs, because "it works," will

soon find out that it does not work for long and that the cost of such short range pragmatism is very high.

(6) After investigation and criticism have disclosed tentative conclusions, expressed in accurate language—after the hypothesis has been established, what then?

What an idea really means to people, the true measure of its relative significance, can be discovered only by observing how their actions are affected. This truth has found many expressions from “by their fruits ye shall know them” in the Sermon on the Mount to the dictum of the physicist Bridgman that answers to questions can be realized only in terms of actual operations. If the difference between philosophy and science could be defined the distinction would probably have to be made on this action basis.

What we can get people to say and what we can get them to do are often very different things. Most legislators denounce lobbies and trusts. In view of their agreement their lack of action might at first be surprising. A federal judge recently spoke of the trust question as “a problem for Congress.” But the yearly appropriation Congress makes for such prosecutions is less than what *one* corporation has spent on *one* antitrust suit. A bill on lobbies was recently introduced in the Senate but was stalled in subcommittee and has not even been able to reach the debating stage on the floor. There might be legitimate room for doubt about the most effective approach but there is no excuse for not undertaking some action that might produce results, even if several methods had to be tried.

The most frequent objection to the application of scientific methods to human problems is based on the belief that knowledge is certain and permanent in the natural sciences, whereas behavior difficulties are so complex that definite conclusions cannot be reached. People who hold this paralyzing belief do not realize first how much change is constantly occurring in the

principles of physical science and second, how successful we have already been in the analysis, prediction, and control of behavior. Our analysis is based upon the observed reality of fundamental motives which constantly direct our actions. Our real problem is to find what types of institutions can be most successful in terms of these realities.

The do-nothing attitude in respect to the social sciences often falls back on the “two sides to every question” stereotype. There may be any given number of hypotheses worthy of consideration when little evidence is available. As the evidence accumulates the number of tenable hypotheses decreases. It soon becomes clear which one is the most probable. We cannot avoid acting on some assumption. It is the constant purpose of science to make assumptions explicit and to relate them to facts as closely as possible.

Apathy about human affairs is tragic, because the reasons for it are perfectly apparent and remediable. Most people believe that modern problems are insoluble, at least for them. When they turn to social science they are crushed by the weight of details and bewildered by the indefiniteness and contradiction of authorities. The physical sciences, on the other hand, are forbidding because they are so technical and abstruse that the average man hasn't a chance. Fortunately, however, it is not necessary to understand the physics of the chain reaction in order to grasp the real social significance of atomic energy.

If the ordinary person had to become an expert in social technicalities to fulfill his duties as a citizen we might well forget all about having the majority exercise control over public affairs. But we do not all have to be experts if we get down to working agreement on some basic principles and encourage the critical ability to apply them. Only then can we look forward to a world made safe for human life.

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