man as he really behaves. I have no thought of disparaging Newton or his conception of the scientific conscience. I am simply suggesting that some of the phenomena that Newton rejected may now be incorporated within a broadened conception of science. These are the phenomena of form and purpose. Let us look at them as facts.

Some of my physicist friends object to my capping the history of scientific revolutions with a reference to an Einsteinian revolution, and they may be right. Einstein may not have revolutionized our conception of the physical world; but for us, social scientists, he is sufficient as a symbol. Einstein means to us not only the revolt against the rigidity of the Newtonian system but also the correction of a superficial relativism that has lulled too many social scientists into easy generalities. We usually think of Einstein's challenge as a challenge to our theory of space. For the social scientist it is *time* that is more important, for time is an essential dimension of purpose. If time runs in a straight line, then the only things we can consider as the causes of an event are the antecedent and concomitant conditions. The Newtonian system restricts us to these. If, however, we question the absoluteness of time and play with the idea that, in different frames of reference, the relationship between antecedent and consequent may be reversed, we may be left free to think that something that has not yet happened may be an essential condition of something that is about to happen. If the temporal relationship is relationally, rather than absolutely, determined, we might conceivably reincorporate purpose as a natural fact into the stream of natural causation.

Conclusion

My present feeling is that, if we were to reintroduce final causes now, we would be moving too fast. Some day we may have a natural science that is broad enough, both in its concepts and in its methods, to include the facts of human purpose. For the time being, I think it is expedient to concentrate on Aristotle's formal causes, and I suspect that the solution of formal causality may automatically resolve the problem of final causality.

One's thinking is always culture-bound. My own bias is against any sort of teleology. I do not want to admit transcendent, or even immanent, purposes into the universe. This may be a relic of my Newtonian upbringing. Nevertheless, the facts of human behavior and experience reveal purposiveness. Shall we consider these as facts of nature, or shall we deny them? If we accept them, shall we reduce them to "purposeless" terms, or shall we try to discover a unified science that is broad enough to encompass the full richness of experience?

Scientific Outlook: Its Sickness and Cure

Michael Polanyi

In the days when an idea could be silenced by showing that it was contrary to religion, theology was the greatest single source of fallacies. Today, when any human thought can be discredited by branding it as unscientific, the power exercised previously by theology has passed over to science; hence, science has become in its turn the greatest single source of error.

In saying this I am not rebelling against the preponderant influence of science on modern thought. No, I support it. But I am convinced that the abuses of the scientific method must be checked, both in the interest of other human ideals which they threaten and in the interest of science itself, which is menaced by self-destruction, unless it can be attuned to the whole range of human thought.

Lest these opening words sound vague and exaggerated, I shall nail down their demonstration forthwith by one name of two syllables: by the name of Lenin. The voluminous writings of Marx may point in various directions; the unspeakable deeds of Stalin are bordering on the pathological; but Lenin's doctrine is fairly clear and consistent. Let me show that the intellectual power by which it so widely triumphed both over its rivals and opponents was its claim to scientific certainty.

R. B. MacLeod has drawn a line directly from Newton to Bentham, and thence to modern sociology (*1*). This line is indeed the very axis of modern social theory. But the Newtonian outlook, as prefigured by Galileo and Gassendi, had established—by the work of Hobbes—a mighty bridgehead in political thought, even before the advent of Newton. In his *Leviathan* Hobbes founded for the first time a theory of society on the utter selfishness of its members, and his genius already foreshadowed there the monstrous tyranny that this conception of society may justify. On the other hand, MacLeod's axis should also be extended forward beyond Bentham, directly to Marx and Lenin. Dialectical materialism is a radically utilitarian conception of a progressive society that is advancing through conflict. It sees history moving inevitably toward greater productivity and regards this movement as the result of the rise of new classes over the dead bodies of obsolete social systems. It claims also that each new revolution of this kind is accompanied by comprehensive changes in law and morality, in philosophy and the arts, and, indeed, in every branch of human thought. This inexorable historic process bears the features of a new leviathan. It is the leviathan of Hobbes equipped with jet propulsion. Its driving force is supplied by a fierce demand for social justice—but these moral motives remain curiously concealed inside the monster.

Morality in Disguise

Herein lies a characteristic feature of all Marxist theory and Marxist policy: moral passions are masked as scientific laws which, by defining a historic necessity, sanction the machinery of violence which fulfills the necessity. Engels said that Marxism had transformed socialism from a utopia into a science. But actually, Marxism still relies on the emotional force of its utopian aspirations and

The author is professor of social studies (formerly professor of physical chemistry) at Manchester University, Manchester, England. This article is based on the fourth paper presented during a symposium on "Fundamental units and concepts of science" that was held 27–28 Dec. 1956 during the New York meeting of the AAAS.

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merely disguises them as scientific predictions.

It is important to understand this peculiar structure. The scientific disguise provided by Marxism not only protects its moral aspirations from being discredited as mere utopianism but actually enables these aspirations to dominate from inside the pronouncements of Marxist theory and thus to direct its political machinery. Marxism establishes thereby a coupling between moral motives and political action, which is the exact opposite of that usually described as *rationalization*. There is no question here of concealing greed behind moral pretenses. Quite the contrary: genuine moral motives are given a chance to operate by concealing them within a scientifically respectable machinery of acquisitive violence.

I regard this as the ultimate stage of utilitarianism. Bentham justified morality by its usefulness. Marx agreed but changed the emphasis by saying: Morality is *nothing but* a disguise for greed. *All* sheep, he said, are but wolves in sheep's clothing. Bourgeois morality is the sheepskin for capitalist wolves to hide in; wolfishness is the real objective force in history. Marx despised socialists like Fourier and Owen, who appealed to the noble sentiments of the ruling classes, for in his view they were but sheep appealing to wolves. I would agree that Marx effectively superseded the utopians by his allegedly scientific socialism, but I would add that this scientific socialism was merely a disguised utopianism rendered scientifically acceptable by being cast for the part of a wolf—the wolf of merciless class war. The moral passion of utopianism lived on within the wolf, its hunger for righteousness being transformed into the rapacity of the wolf. Such is the Marxian leviathan.

This is how the curious structure was formed—fatefully characteristic of our age—of high moral motives disguised as scientific predictions, and secretly injected into the engines of merciless power. This is moral man's flight into captivity, a process which I have described elsewhere as a "moral inversion" (2).

However, it might be objected that Marx, or his executors, did not really proceed scientifically, the very fact that they became such fanatics being proof that they did not preserve their scientific detachment.

But then, what about Bentham? Bentham, whom MacLeod rightly acknowledges as the very fountainhead of a "Newtonian" social theory? From his utilitarianism flowed the most powerful intellectual force for the reforms which changed the face of England during the first four decades of the 19th century. This shows that Bentham, like Marx, used his scientific analysis of society as a disguise for his moral aspirations.

The progression from Bentham to Marx was due mainly to the intensification of the moral demands made on society in the course of the French Revolution and of the subsequent rise of Utopian Socialism. The moral dynamism of the 19th century had to be cast into a more violent conception of historical progress than that which could satisfy the reformers of the 18th century. There is a parallel progression in the development of nihilism. Bentham's contemporary, the Marquis de Sade, reacted to the mechanistic conception of man by a sweeping contempt for all morality, expressed by devoting his life to the practice and his writings to the apologia of sexual debaucheries. By contrast, the Russian nihilists of the mid-19th century, guided by the same supposedly scientific view of man—and deriving from it the same contempt for all accepted morality —turned this contempt into a hatred of all existing society and thence into a total dedication of themselves to the task of a merciless social revolution. This is why the doctrine of totalitarian terror, which was not prevalent in the Western interpretation of Marxism, was unhesitatingly proclaimed by Lenin as the true teaching of Marx. He responded to the example of Russian nihilism.

Results of Detached Analyses

Thus it would seem that for better or for worse—for better in Bentham, for worse in Lenin—the supposedly detached analysis of morality always comes out heavily charged with moral, immoral, or "morally inverted" impulses. And I think this has a simple explanation which confirms MacLeod's apprehensions concerning the "Newtonian" study of human beings.

For surely, there are a great number of things our knowledge of which dissolves if we look at them in a thoroughly detached manner. The meaning of a word vanishes if I cease to mean anything by it; the proof of a mathematical theorem dissolves if I cease to trust it; and, likewise, a moral ideal dissolves if I stop respecting it. I cannot know that someone, say Lincoln or Gandhi, was a great man unless I revere him. You need reverence to observe human greatness, just as you require a telescope to observe spiral nebulae. But reverence is not an objective approach in the tradition of Newton, and hence our ideals—along with the greatness of men who embody these ideals—must cease to be visible if they are approached objectively in this Newtonian sense.

From this moment a process of moral inversion sets in. For once the frank expressions of our moral passions are discredited by a detached scientific approach, they will seek some outlet which is protected against our scientific self-doubt. The various forms of scientifically denatured morality which have emerged during the past two centuries are but different outlets for frustrated moral passions. These passions may break out in an abject sensualism à la Sade, culminating in frenzied destruction, for only such Satanism may appear completely honest and entirely safe from any suspicion of bad faith. Many threads of this Satanism are found woven into modern Continental thought, and they are prominent in modern French existentialism.

The English-speaking peoples favored less radical methods for rehousing the moral passions rendered homeless by the scientific outlook. Following Bentham's guidance, they endowed some relatively neutral vocabulary, like that of utility, or social adjustment, or mental health, and so on, with the meaning of the moral terms for which they were to serve as scientifically respectable substitutes. This pretense safeguarded good sense and benevolence under inadequate scientific designations, and thus allowed moral passions to operate effectively by stealth.

Yet though the draping of moral life in the terms of a nonmoral language can protect moral ideals against destruction by scientific analysis, such a situation might finally prove unstable. Men may not pursue their moral ideals indefinitely within a conceptual framework which denies reality to them. Not because they will become indifferent to morality—which is rare—but because they may slip into the logically more stable state of complete moral inversion. A great upsurge of moral passions is likely to cause a break-through in this direction. This is what happened, as we have seen, under the impact of modern dynamism in the totalitarian revolutions of our time over immense areas of Europe and Asia.

Social Sciences

However, am I not neglecting the social sciences in the academic sense, which MacLeod had primarily in mind in voicing his apprehensions? Not quite—for my survey of the contemporary scene has prepared my criticism of academic sociology and social anthropology. It has reminded us that all the live issues of our tumultuous age originated from the upsurge of a new moral dynamism. And it has exposed thereby the incongruity of adopting at this moment, as modern social anthropology has done, a strictly detached observation of society.

I am referring to the prevailing functionalist method in social anthropology.

This approach regards any institution, custom, or idea as fulfilling its function to the extent to which it contributes to the stability and coherence of the existing society. No matter how cruel, treacherous, or abysmally stupid a custom may be, it will be presumed to fulfill a social function in this sense. For example, the butchery of innocent people on the charge of witchcraft is said to solve the problem of satisfying hate, while keeping the core of society intact (*3*). The headhunting of the Eddystone islanders is said to have kept their economic system functioning (*4*). Such views, though highly speculative, may be true and even interesting within the framework that they set to themselves. But at the same time, this approach produces a set of terms in which the most important distinctions are eliminated. It replaces morality by conformity; if an action falls short of conformity it is a "maladjustment" or a "deviance." Pickpockets and prophets, Hitler and Gandhi, Jesus of Nazareth and Judas Iscariot, are all classed together as deviants; a functionalist anthropology cannot distinguish between them.

At least it could not do so if it were strictly consistent. For admittedly, some moral sentiments are allowed to break through in the disguise of certain supposedly descriptive terms: terms like *aggressiveness* or *competitiveness* or *authoritarian personality*. Sociologists join forces here with psychiatrists in disguising their condemnation of social wrongs as the diagnosis of a mental disease. Thus, 20 years ago when Hitler's rise fatally challenged our courage and intelligence, a whole literature of analytic treatises poured forth, propounding that wars were the result of pathological aggressiveness, caused mainly by training infants too soon to cleanliness (*5*). This literature may sound foolish today, but it is not mentioned here in order to make fun of its authors. It should demonstrate, on the contrary, that even the most distinguished minds can produce nothing truly relevant to human affairs if they restrict themselves by the kind of detachment which is currently supposed to be the mark of scientific integrity.

In his recent Josiah Mason lectures, Sprott pleads that since man has been studied for so long in the past it is "no wonder [that] modern sociology brings so few surprises" (*6*). But surely the last 40 years have brought many surprises in the doings of men in society. Nor have revealing studies of these been lacking: Sidney and Beatrice Webb, F. A. Voigt, von Hayek, Rauschning, Heiden, Alan Bullock, Orwell, Koestler, Hannah Arendt, Czeslaw Milosz, Mitrany, Schumpeter, Carr, Churchill—no one can go through this list of names without recollecting some books which have profoundly affected his outlook on contemporary society. Other authors of similar gravity come easily to mind, but there are admittedly few sociologists who qualify to this class.

Participation

I would suggest that we might begin to remedy this weakness by prohibiting the use of the term *scientific* in praise of a study of human society, for a trial period of, say, 10 years. And in the meantime we should try training ourselves to study human affairs by intense participation in human problems instead of by detachment from them. We should know by now that the most powerful moral influence flows from the terms in which morality is interpreted and that the interpretation of history is a decisive force of history. A self-consistent society must therefore include within its orthodoxy the terms in which it states its orthodoxy. A consistently moral society must foster a moralizing sociology and historiography, and it must sustain a philosophy justifying morality and moralizing, as well as its own role as the justifier of these. I think we must depart all this way from the ideal of detachment in order to meet the challenge voiced by MacLeod concerning the Newtonian approach to human affairs.

Biology

And now I should like to level a similar anti-Newtonian challenge on R. W. Gerard's paper (*7*). I do admire his paper, but I am afraid that this compliment is somewhat left-handed. For I am inclined to consider the fact that a so learned, ingenious, and imaginative survey of living beings should deal so perfunctorily with some of the most important questions concerning them, as indicating a fundamental deficiency in biological thinking.

Gerard says that every higher type of organization is "understandable in terms of the units and their relations of which it is built" and adds that if we fail to predict their properties from those of their units, this is due to lack of information about the circumstances, subject to unspecifiable chances. What does this mean? Of course, if the "relations" of the units from which an organism is built include their relations *within* the organism, then the statement says no more than that the organism is composed of parts. If, on the other hand—as it would seem—the relations which explain the organism are thought to be those which the parts are known to manifest *outside* the organism, then the statement is certainly untrue. Electrons and nucleons are not known to be sentient, while the higher animals are. If a rat laps up a solution of saccharine, the rational explanation of this lies in the fact that the solution tastes sweet and that the rat likes that. The tasting and liking are facts that physics and chemistry as known today cannot explain.

And this conclusion gives the whole show away. Because it acknowledges a conscious desire by an individual capable of such desire, it leads on further to the recognition of deliberate actions by individuals and the possibilities of error on their part. Thus a whole series of conceptions emerges that are absent from physics and chemistry as known today. Indeed, nothing is relevant to biology, even at the lowest level of life, unless it bears on the achievements of living beings: achievements such as their perfection of form, their morphogenesis, or the proper functioning of their organs; and the very conception of such achievements implies a distinction between success or failure—a distinction unknown to physics and chemistry.

But the distinction between success and failure is present in, and is indeed essential to, the science of engineering; and the logic of engineering does substantiate in fact what I am saying here of biology. No physical or chemical investigation of an object can tell us whether it is a machine and, if so, how it works. Only if we have *previously* discovered that it *is* a machine, and found out also approximately how it works, can the physical and chemical examination of the machine tell us anything useful about it, as a machine. Similarly, physical and chemical investigations can form part of biology only by bearing on *previously established* biological achievements, such as shapeliness, morphogenesis, or physiological functions.

A complete physical and chemical topography of a frog would tell us nothing about it as a frog, unless we knew it previously *as a frog*. And if the rules of scientific detachment required that we limit ourselves exclusively to physical and chemical observations, we would remain forever unaware of frogs or of any other living beings, just as we would remain ignorant also by such observations of all machines and other human contrivances.

The achievements which form the subject matter of biology can be identified only by a kind of appraisal which requires a higher degree of participation by the observer in his subject matter than can be mediated by the tests of physics and chemistry. The current ideal of "scientificality" which would refuse such participation would indeed destroy biology but for the wise neglect of consistency on the part of its supporters.

But again, as in social theory, it is perilous to rely indefinitely on a conceptual framework that denies reality to the things we actually believe in. Shall we

continue, for example, to think of ourselves as automata? Speaking at a symposium of unrivaled distinction on the subject of "Cerebral mechanisms in behavior" in 1948, K. S. Lashley declared: "Our common meeting ground is the faith to which we all subscribe, I believe, that the phenomena of behavior and of mind are ultimately describable in the concepts of the physical and mathematical sciences" (*8*). Gerard, who was one of the participants on whose behalf this was said, has—it seems to me—reaffirmed this faith in his paper.

It is in fact taken almost universally for granted among neurologists, who regard its acceptance as inherent in their claim to be scientists. Yet I do not think that anybody can hold this belief. It assumes, for example, that Shakespeare's conscious thoughts had no effect on the writing of his plays; that the plays have been performed ever since by actors whose thoughts had no effect on what they were doing, while successive generations of audiences applauded them without being affected by the fact that they enjoyed the plays. Awareness, of which Gerard speaks only in skeptical quotation marks, was granted to Shakespeare apparently only to keep him quiet while his nervous system got through the job of getting his plays written.

Ideal of Scientific Detachment

Once more, I do not say these things here in order to ridicule the great scientists who insist on the necessity of holding such curious beliefs, but to make you aware of the terrific compulsion under which they stand: the misleading compulsion exercised today by the ideal of scientific detachment.

If this ideal could be removed by a revised conception of scientific merit, the relation between mind and body could perhaps be reconsidered on the following lines. Admitting that no process known to be governed by the present laws of physics and chemistry is also known to be accompanied by consciousness, we might yet suppose that a future enlargement of physics and chemistry might account for the sentience of certain material structures. It would seem unwarranted to retain for such structures the conception of automatic functioning, which is derived from our *present* physics and chemistry. Action and reaction usually arise together in nature. Hence, it would seem reasonable to expect that the new physics and chemistry, which would account for the production of consciousness by material processes, would also allow for the *reverse* action, that is, of conscious processes acting on their material substrate.

Only such a conception of the human mind can acknowledge our claim to responsible personhood and account for the obligation to treat our fellow-men as responsible persons. It alone makes it possible to acknowledge the inherent independence of a mental growth which—though conditioned by circumstances—is never determined by circumstances. It confirms, therefore, men's capacity, and their right, to serve the growth of thought; to seek the truth, aiming at universal validity according to their own lights. It permits us to hope that the firmament of ideals, from which we seek guidance for our judgments and actions, may reflect to some extent the proper meaning of our existence; and that other men, everywhere, are guided in fact in their own way by the same endeavors. Thus it makes it possible to conceive of a free society in which these independent strivings will compete without mortal conflict. It makes it possible to understand that the Soviet empire, founded on the assumption that thought should be fashioned by the government in order to provide itself with intellectual support, is now shaken by the rebellion of a people suffocated by the imposition of a system of slipshod, dreary falsehoods.

Behavioral Science

But I will be accused of wandering far beyond the responsibilities of science. The question for science, I shall be told, is simply, what can and what cannot be observed. I shall be told that all that can be observed in a fellow-human being is behavior, and that there is no occasion therefore to refer to mental states which not being observable are no concern of science. This is the behaviorist argument, and I think that both MacLeod and Gerard dislike it, though they do not actually refute it. Let me show how I would try to meet this argument and would establish the observability of another man's mind by an epistemology based on an extension of Gestalt theory.

I think the behaviorist argument goes wrong by failing to take into account the difference between observing the workings of a mind as mere events, as distinct from reading them as the signs of a mind's working. It is the same difference as that which obtains between focusing on the individual letters in a written text and reading the text. The first is a detached observation, the second I would call a convivial appreciation. I would go on from here to assert that the objective, "focal," observation of an intelligent mind's workings is impossible. You simply cannot keep track of the mind's workings in this manner. It is not possible to specify the particulars of an intelligent behavior, and in fact you cannot even recognize the course of such behavior, except by following its particulars comprehensively as the manifestations of an intelligence at work through them. But the moment you take in the totality of the unspecifiable particulars which compose intelligent behavior, you are not focusing on these particulars, you are not observing them in a detached manner, but are focusing on the mind beyond them, on the mind that is at work in these particulars. You are actually observing the mind "convivially" in terms of particulars of which you remain only subsidiarily—and often only quite vaguely—aware (*9*).

Behaviorists claim falsely that they observe the particulars of learning or intelligence without relying on their previously established mental context. This is sheer pretense. The terms used by them would be unintelligible but for the fact that we appreciate the achievements of their subjects by the exercise of our imaginative fellow feeling. It is this direct observation of the mind that is primary, and the objectivist terms in which it is cast are merely a subsequent elaboration of it which, though not without interest, must not be allowed to serve as a disguise and a substitute for the direct cognizance of the mind from which it is derived and by which it remains guided.

Admittedly, the observation of another mind involves a participation in our subject matter which clearly exceeds the limits which the ideal of greatest possible detachment would set us. But this in my view only demonstrates once more the falsity of this ideal. The observation of the ascending levels of organization surveyed by Gerard requires a steadily increasing degree of participation of the observer in his subject matter. And only by acknowledging this fact can the observer recognize the consecutive levels of integration as consecutive levels of new being, not specifiable in terms of lower level particulars.

Then it will be possible also to acknowledge that the human mind, though conditioned by the nervous system, is pursuing in essential independence its own nonmaterial objectives. And science can thus be attuned to the other domains of human thought and cease to threaten them by its false standards of detached objectivity. Science can be reconciled then once more with the truth.

Physical Sciences

I shall not try to show, though I believe it to be the case, that the false ideal of Newtonian objectivity has caused as much harm to psychology as it has to sociology. I propose to close on a happier note by congratulating the exact sciences, so attractively represented by Jerrold Zacharias (*9*), on being free from this kind of trouble. They seem to be doing splendidly, in spite of being—in my view—generally mistaken in what they *think* they are doing. The lighthearted manner in which Zacharias dis-

cussed the possible alternatives which his measurements of time may reveal is not merely an expression of his modesty: it flows from the current view that scientific theories are but convenient summaries of observed facts, or mere working hypotheses, or interpretative policies.

This noncommittal view of scientific theory can be traced back to antiquity, and it came into prominence first in the conflict between theology and Copernicanism. Pope Urban VIII insisted that Galileo should regard the Copernican theory as a mere practical device for computing planetary motions and not as a real explanation of the facts. Indeed, right from the publication of the Copernican theory in 1543, the Copernicans fought bitterly against his positivistic view of the theory, on which Catholic and Protestant theologians equally insisted. It was Newton who finally dealt the death blow to this view by his theory of gravitation, published in 1687.

This conception of science, which had been used so far only to reduce the status of science and to uphold the supremacy of religious dogma, was revived two centuries later by Mach for the purpose of strictly limiting the claims of science to observable facts. It has since become universally accepted. Yet this theory of science is but another pretense, practiced in deference to a false ideal of science. Take the theory of general relativity for which the project of Zacharias promises to supply a decisive test. Since its first publication 40 years ago, general relativity has held a position of supreme interest in science. But it would be grotesque to describe it as the most convenient summary of the facts predicted by it. There are hardly any such facts, and such as there may be can be memorized in a few minutes, while the understanding of these facts by means of the general theory is a task requiring years of preparation even by specially gifted students. Actually, the program of the general theory was first set out by Mach in 1883, without any experimental evidence to support it. It has held the allegiance of science and of the whole world by the intellectual beauty of its representation of the universe. Its rationality was regarded as a token of its truth, exactly as the rationality of the Copernican theory was so regarded by its early adherents who fought and suffered to uphold this truth.

Let us drop these pretenses. No scientist is ever concerned with producing the most convenient summary of a given set of facts. This is the task of the editors of encyclopedias and the compilers of telephone directories. It is of the essence of a scientific theory that it commits us to an indeterminate range of yet undreamed consequences that may flow from it. We commit ourselves to these, because we believe that by our theory we are making contact with a reality of which our theory has revealed one aspect. It is this commitment that lends universal intent to a scientist's most original solitary thoughts. By acknowledging this frankly, we shall restore science to the great family of human aspirations, by which men hope to fulfill the purpose of their existence as thinking beings.

So it would seem that by abandoning the false ideal of detachment in the epistemology of the exact sciences, we are led back to the point once more which we had reached by a critique based on a similar revision of our scientific ideals in respect to sociology and biology.

References and Notes

1. R. B. MacLeod, *Science*, this issue.
2. M. Polanyi, *The Logic of Liberty* (Chicago, 1951), p. 106; expanded in *Encounter* 7, No. 6, 5 (1956).
3. C. Kluckhohn and D. Leighton, *The Navaho* (Harvard Univ. Press, Cambridge, Mass., 1946), p. 176.
4. V. G. Childe, *What Happened in History* (Pelican, London), p. 15.
5. E. Glover [*War, Sadism and Pacifism* (London, 1935), p. 38] explains war as follows: "Tearing up 'scraps of paper,' 'violating' an 'innocent little country,' defending the 'mother' country, however much they refer to current realities, are but echos of many phantasies in which the 'good' mother or child is defended against the sinister (mostly sexual) designs of the phantasied 'bad' father." In the chapter entitled "The problem of prevention," we find on page 108 the following suggestion: ". . . to find out . . . how many dictators, foreign secretaries, diplomats and peace delegates suffer from psycho-sexual impotence or have a secret fear of impotence. A prerequisite is the common recognition of the important facts that impotence in some cases contributes to pacific tendencies, whilst unconscious fear of impotence is a common cause of war-mindedness and grandiosity." For a textbook summing up 11 years later the results of this movement, with a special emphasis on the role of early toilet training, see Kimball Young, *Social Psychology* (New York, 1946), for example p. 44.
6. W. J. H. Sprott, *Science and Social Action* (London, 1954), p. 5.
7. R. W. Gerard, *Science* 125, 429 (1957).
8. K. S. Lashley, in *Cerebral Mechanism in Behavior. The Hixon Symposium*, L. A. Jeffress, Ed. (New York and London, 1951), p. 112.
9. This conclusion controverts also G. Ryle's thesis, expounded in *The Concept of Mind*, that it is meaningless to speak of the mind as distinct from its workings.
10. J. Zacharias, *Science* 125, 427 (1957).

F. W. Hodge, Anthropologist and Editor

On 28 September 1956, there died in Santa Fe, New Mexico, a man whose work will never be forgotten—Frederick Webb Hodge. He combined a deep knowledge of the archeology, ethnology, and history of the Southwest with a rare gift for writing and editing. He had a wonderful memory, a lively sense of humor, and talent as a raconteur.

"Téluli," as he was affectionately called by the Zuñi Indians and many of his other friends, was born at Plymouth, England, in 1864, and was brought by his parents to the United States at the age of 7. He was raised and educated in Washington, D.C., attending Columbian (now George Washington) University.

His first interest in the Southwest was aroused while he was field secretary for the pioneer Hemenway Archeological Expedition, from 1886 to 1889. This gave him the opportunity to see historic towns, meet living Indians, and study the ruins left by their ancestors. From that time on he never forgot the Southwest.

After his return to Washington he was employed by the Smithsonian Institution, at first in the office, then in the Bureau of American Ethnology, where he rose to the post of ethnologist-in-charge in 1910—a position he held for 8 years.

It was during his earlier years at the bureau that he accomplished the work for which he will be best remembered—the creation of the *Handbook of American Indians*, in two thick volumes, containing together more than 2000 pages. This handbook includes all kinds of information, alphabetically arranged, on the first Americans, with many illustrations. Hodge collected this material from various sources, writing some of the items himself and handling the editorial work, which must have been a heavy task. The *Handbook* still remains the best reference work on the American Indian, although the second volume was published in 1910, 46 years ago.

In addition to his work for the bureau he edited the *American Anthropologist*, as well as most of the American Anthropological Association's *Memoirs*, from 1898 to 1917.

Hodge left the Bureau of Ethnology in