

IS A SCIENCE OF MAN POSSIBLE?

THERE are substantial comforts in reliable uniformities, as well as many practical advantages. School children are pleased to learn that while the peoples of the world are divided by widely differing languages, they all use Arabic numerals. Scientists and engineers have much in common, regardless of nationality, and agreement on meanings is a source of psychological security as well as a utilitarian requirement in practically all cooperative undertakings. The first thing the pioneers of a new science must do is agree on terms and definitions. For the sake of clarity in communication, they must severely limit the possible interpretations of what they say.

So there is a very strong argument for establishing fixed meanings through precise definitions, and for accumulating as many such definitions as we possibly can. Only after a body of unambiguous definitions is established can men go on to the discovery and formulation of laws, and then of the rules through which action can be made to serve human purposes. Control and prediction result from this sort of knowledge, a knowledge which, in its purest and most rigorous form, is called science. Northrop Frye has put the matter simply and explicitly:

It seems to me that it is peculiarly the function of science to objectify reality, to present the world in its aspect of being there. The world of science is the world of space: as has often been noted, science deals with time as a dimension of space. The subject itself becomes an object in this process, for there is nothing inside the scientist, from the structure of his spine to his infantile complexes, which is not also available for scientific study. Everything is there: nothing is really here except the consciousness with which he studies nature. And this consciousness, or scientific intelligence is ideally disembodied. The theory of physics, for example, has been complicated, in its more rarefied aspects, by the fact that the scientist possesses a body, and cannot comprehend nature without physical contact. To see the world as an objective field of operation is also to quantify reality,

to make it something measured rather than simply seen or heard.

What is it, then, to objectify? It is to select from the totality of what a certain "something" is, those qualities which are relevant to the general and specific purposes of the investigation, and then to say that those qualities are the reality of that something. A careful man might say, "the reality of that something for our purposes," but after a while he may not bother to add this, since "our purposes" may come to seem to him the only purposes worth considering.

We may now say that a system of objectification is based on a theory or doctrine of relevance. Because, within broad limits, ideas of relevance are subject to change, the systems of objectification called the sciences are also subject to change and addition and, often enough, subtraction. A rounded piece of uranium ore would have been a rock responsive to the laws of motion to Galileo, but to a modern geologist with a Geiger counter in hand, its relevance would be quite different. And different, again, to a paramilitary technologist. Yet for all these scientists, the principle of objectification is still the means of determining what he wants to know. They will all "interrogate" the rock, the radium particle, or whatever, by some manipulative means, in order to make their definitions as complete as possible, and from those definitions will follow rules for prediction and control. The idea is to know the object through and through, for their purposes. Of course, the "object" may also be a process or a relationship—anything that can be conceived of as having a fixed or definable nature and be made subject, perhaps with narrow limits, to prediction and control. In some areas, of course, such as astronomy, only prediction may be the goal, but learning to predict in one area may make possible a species of control in some other region. Northrop Frye hardly exaggerates when he says:

Isaiah praises a God "who hath measured the waters in the hollow of his hand, and meted out heaven with the span, and comprehended the dust of the earth in a measure, and weighed the mountains in scales, and the hills in a balance." In science man takes over this traditional function of God, replacing the divine balance by the mathematician's equations.

The activities of the scientist need not, however, be thought of as blasphemy. All this "prediction and control" could conceivably be made entirely constructive if it were pursued and practiced with full regard for enough "other purposes."

This is no novel comment or criticism. Especially in recent years it has been pointed out that the neglect of the subject, man, and of the riches of his inner life, is in all likelihood responsible for the distortions and dissatisfactions of modern civilization. Actually, the ills of the scientific and technological society have become so acute that there is already a noticeable swing away from the worship of objectivity. No one who reads the newspapers and magazines needs an inventory listing the extravagances of some of the contemporary "returns to religion," or of the frothy mixtures of Eastern lore with Western merchandising techniques that collect a surprising number of at least temporary believers. These are all phenomena of vast and precipitate cultural change, and are probably unavoidable. Our present inquiry is directed toward the popular idea of applying the "scientific method" to the uncharted regions of subjective exploration, with expectation of providing some order for this long-delayed search on the part of a religiously and psychologically hungering mankind.

The simplistic argument for extending science in this way is that since science has worked so well in determining the nature and attributes of the physical world, and made possible the comparative mastery of so many natural forces, why should we not turn this admirable tool of investigation to the study of the non-physical world as well? How can we go wrong in trying this? Scientists are known to be cautious, prudent, skeptical, and insistent on looking before they leap. And they rely on a consensus of trained researchers rather than the wild

guesses of prophets or the dark sayings of sybils. Science may be slow, but it is at least sure.

Well, suppose this argument be accepted—as indeed it has been in various quarters, and with quite serious and sober intentions. What are already, or likely to be, the first steps in such an enterprise? It would be entirely natural for such researchers to start out by seeking the same sort of preliminary certainties that were established in study of the physical world, on the basis of which definitions were tried out and eventually adopted. From this sort of thinking it follows that an effort must be made to objectify the subjective, for this, if it can be done, would provide the groundwork for a consensus on correct definitions.

It is hardly remarkable, then, to find that there is today greatly expanded activity in brain-wave research, linking it with "meditation," and a curious blending of pharmacological inquiry with borrowed leads from certain sources in Eastern psychology. Already hard-core scientists are intimating the possibility that the entire range of so-called super-normal or psychic powers may be brought within the scope of objectifying techniques, and in that sense absorbed as part of the body of traditional scientific knowledge. No doubt a great many things will be "found out" by all this surging activity—at least, a great many papers will be published, with simplified versions of "exciting discoveries" provided by the up-to-date magazines. Such developments are apparently a part of the "wave of the future," and will doubtless be the inspiration of more than a few messianic groups that will bloom for a time like exotic tropical flowers.

One could say that while this urge to convert the subjective into the objective for the purposes of scientific inquiry is understandable, there is a sense in which it amounts to the reduction of the normal "I-Thou" relationship between human beings to an "I-It" relationship. An "object," scientifically speaking, cannot be an "I" or a "Thou"; it must be an "It." Both I and Thou have incommensurable qualities—the terms represent "Selves" or the ultimate reach of subjectivity. And the pure subject cannot be "objectified."

An illustration of the difficulty in objectifying the subjective may lie in the fact that, so far, there is really no such thing as a "science of education." Teaching is essentially an interchange between subjects, and here, science, as we know it, has exactly nothing to say. We could argue simply that education is an art, and leave it at that; but it may be worth while to add a quotation from the Report of the Harvard Committee on this question, titled *The Graduate Study of Education* and issued in 1967. The Report said:

We are, in effect, rejecting the notion of a special science of education as a basis for integration. such a notion has, on occasion, been looked to as the basis for an independent status for schools of education, or, at least, as providing the common core of the work of such schools. Such hopes for a science of education seem to us to rest on quicksand. . . . A science is counted by its peculiar ideas, instruments, and procedures but, most importantly, by its distinctive laws and theories. Education has no such distinctive laws and theories. To be sure, educational phenomena may be studied in a scientific manner, but the current attempts to study education scientifically proceed from a wide variety of questions, and use a multiplicity of concepts, procedures, and research styles. It is unlikely in the extreme that they will coalesce into, or be superseded by, a unified science.

At this point it seems well to lay down two guidelines for the remainder of our discussion. First, any investigation of man's subjective life has or ought to have an educational motivation or character. This hardly needs support or argument. The inner life is the area of growth. The term describes the region in which what flowering or maturation or increase in understanding that is possible for a human being takes place. The study of man's inner life is, then, the study of his becoming. The reality of this inner life is what differentiates an "I" from an "It." Second, the object of this inquiry cannot ever be permitted to be "manipulation" of any sort. The most general definition we can make of achievement in education, or self-education, is that it leads to Transcendence or Autonomy. These are abstract terms which stand for human freedom. To the extent that a human being can be or is manipulated, he is unfree.

It is manifest, of course, that every human has an "It" aspect. He has for example a body. His "I" or subjective reality and identity has continuous and changing dynamic relations with the "It" aspect of his embodied existence on earth, and the study of those relationships very well might be termed the as-yet-unborn science of man. Is it conceivable that, contrary to the usual scientific assumption, an "I" hides behind or within every "It"? We do not know. We are hardly prepared to consider such propositions, so pragmatically assured are we by the impressive achievements of the physical sciences that the abstractions and principles which make them up are indeed all the knowledge we can have or require concerning the "objective" world around us. Yet a great deal would be accomplished in the right direction simply by allowing this to be an open question.

What might be the characteristics of a supposed "unborn" science of man? Well, first of all, it would dare to encounter subjective experience in its own terms, even though, at the outset, there could be no clear idea of what those terms are. We spoke, for example, of the basis for forming scientific definitions as being a consensus of scientific opinion as to proper terms for the "facts" involved. But the choice of "facts" depends upon ideas of relevance. What makes a fact relevant? Galileo was concerned with the movement of bodies through space. He wanted to achieve orderly understanding of matters like the Copernican hypothesis. Whatever was relevant to that understanding, or seemed to promise relevance, became a fact for Galileo to examine. The tools of the examination were his abstractions of the primary qualities of bodies and his method was experiment. Other men could do those experiments, and other men could look through telescopes, and so, in time, definitions were agreed upon and adopted.

Now let us take what is sometimes called a human science—history—and consider Ortega's comparison of it with physics, with its exact definitions and precise laws. In *Man and Crisis*, Ortega wrote:

If history, which is the science of human lives, were or could be exact, it would mean that men were flints, stones physiochemical bodies, and nothing

else. But then one would have neither history nor physics; for stones, more fortunate, if you like, than man, do not have to create science in order to be what they are, namely stones. On the other hand man is a most strange entity, who, in order to be what he is, needs first to find out what he is; needs, whether he will or no, to ask himself what are the things around him and what, in the midst of them, is he. For it is this which really differentiates man from a stone, and not that man has understanding while the stone lacks it. We can imagine a very intelligent stone; but as the inner being of the stone is given it already made, once and for all, and it is required to make no decision on the subject, it has no need, to go on being a stone, to pose and pose again the problem of self, asking itself "What must I do now?" or, which is the same thing, "What must I be?" Tossed into the air, without need to ask itself anything, and therefore without having to exercise its understanding, the stone which we are imagining will fall toward the center of the earth. Its intelligence, even if existent, forms no part of its being, does not intervene in it, but would be an extrinsic and superfluous addition.

Such an intervention, we might add, would also be a highly disturbing phenomenon to a modern physical scientist, who might unhappily resign himself to purchase of a conical hat in order to stay in business!

Ortega did add, in another place, that no one can substitute for the individual man in making these decisions as to what to do next. By accepting the judgment of another in crucial matters, he turns himself into a mere mechanism, or an "It," as Buber would say. For men make themselves into "Its" as much as they are shrewdly manipulated by others. In relation to some decisions, of course, we may be quite willing and sensible to accept help or guidance. But for deciding when to accept help and when to stand alone, the man himself is the only legitimate authority.

These are some of the conditions or rules of the inner life. But how does a man amplify and enrich his human understanding of the world and of other people? A wise psychologist once noted that natural scientists study what is uniform in the behavior of the objects before them, while the psychologist is condemned to study what is *unique*. Men are unique. The better the man, that is, the greater his

distinction, the more he stands out from the crowd. You could also say that the better a man is, the less predictable he is in one sense, and the more predictable in another. The course that will be chosen by a man of exceptional intelligence and moral insight through a difficult and perilous situation is on the whole unpredictable. Only mediocre forms of behavior are predictable. On the other hand, you know the good man won't do anything contemptible or mean; that much you can predict with complete certainty.

General ideas about the behavior of such men are gained from the study of good literature. Something of what they have thought is learned from the books they have written. It might be argued that the life of such men is a continual *becoming*. Isn't that what we mean by originality? By creativity? People actively engaged in becoming have vital inner lives. Probably they never say the same thing twice in exactly the same way. Always there is an increment of growth, or a reason for saying it differently. The world of becoming is not a static world, but one that is alive with growth processes.

It is natural to ask: Are there degrees of inner growth, levels of achievement? Not only is this a natural question, but there is also a great hunger for information about the "advanced" stages of development along these lines. Fortunately or unfortunately, we know very little about this. If there were an explicit and established tradition on the subject, we should probably have by now an elaborate theology attached to it, with diagrams and labels and lists of prerequisites for each step along the way. There is evidence that past civilizations have had records of this sort, and who is to say how much truth is or is not in them?

What we do know, however, from both historical and personal experience, is that acquaintance with a vocabulary of growth evolved by other men too easily becomes the facile substitute for individual understanding. Take for example the vast resources of manipulative knowledge, reaching from the principle of the lever, through all the branches of mathematics, up to the presently speculative areas of modern physics. We—nearly all of us—go about our business, conducting our affairs with the help of

the conveniences and semi-necessities provided by modern technology, knowing that all this knowledge on which our lives have come to depend exists in books in technical libraries and in the heads of a handful of men, while we remain almost completely ignorant of it ourselves, except for a few elementary ideas. Why are we able to do this? Because the knowledge is almost entirely manipulative; it relates to things, not to men. The conditions of our environment have been enormously altered by this objective knowledge, and we can enjoy those conditions—or suffer confinement by them—without knowing anything about their production or maintenance. That is, for the time being, manipulative knowledge can be applied "over our heads" in this way.

But the same style of life with respect to the subjective world and inner progress or growth will not work at all. A man who wants to know what he must do next, which is what he must *be*, can't delegate the decision to surrogates or experts. He can't become a better, wiser, more intelligent man by copying the "laws" found out by somebody else. What other men have found out concerning these matters cannot be conveyed the way the laws of physics can be conveyed, because the world of becoming, of inner growth, is in constant flux or change. Its elements, and the learner, too, are undergoing transformation. So the wisdom of the wise has to be recorded in a kind of metaphor, or in an allegory, which is a sustained and elaborate metaphor.

Human life is multi-faceted; it is not like Ortega's stone, whose nature is fixed. The inner life requires nourishment, but its growth is not automatic. The inner growth of human beings—all growth which is significant in human terms—requires a fusing contribution by the learner, a creative, original, and synthesizing act on his part.

Since human life is multi-faceted, the educational materials most useful for human growth are also multi-faceted, which means that they speak to the human condition. The relevancies are there, but they must be selected, often from a tissue of ambiguity. In teaching someone a practical art, you may first show him a few solutions, a few answers,

but the *teaching* doesn't begin until you present him with a problem instead of a solution.

Science, you could say, is the elimination of ambiguity to the point where there is one and only one right or best answer to a question. Then, for the duration of the epoch of this science, that answer remains a once-and-for-all answer. This is the rule for study of objects whose nature is given once-and-for-all. But man's nature is not given once-and-for-all. His nature is a changing and partly self-determined thing. Yesterday's answer is not today's answer. The principle may be the same, but the application is different, because the subject has grown, and the field has today's topography. Why are the humanities often said to be the best resource for human development? Because they are the rich heritage of metaphor concerning the meaning of human life. The use of metaphor is different from the application of formula. To follow a formula, you simply obey directions; no thought is required, except in a technical sense. But metaphor, unlike formula, appeals to the imagination. To learn from a metaphor, the learner must *take charge*; he must act and make some decision, take some risk. He does not manipulate, but invests something of himself, so that growth may result.

The raw material of science as we have known it is static, fixed, in a sense "dead"; while the raw material of human growth is alive, becoming, self-existent, and aware. The future science of man will surely take this difference into account.

REVIEW

MAN OF THE COUNTRY

MEN like E. F. Schumacher, who use their technical knowledge to show that founding economic policy on moral principles is completely practical, and that, in the long run, no other scheme of economic relationships will serve the common good, have a spontaneous constituency among intelligent people who come to the same conclusion from personal experience. Such persons act responsibly all their lives and, now and then, as in the case of the author of the book we have for review, tell how they feel about these things.

Road to Ophir (London: Hutchinson, 1956) is made up of pages out of the life of Rex Tremlett, a mining engineer who was born in the Transvaal, educated in England, and now lives quietly in Cornwall with his family. From the age of eighteen into full manhood, he wandered over Africa on various mining assignments. He knew the Zulu language from childhood and picked up knowledge of other dialects. Since he happened on what may have been the fabled mines of Ophir, mentioned in the Bible, the book gained a romantic title, but the search for lost mines is not its theme nor of any great interest, except for Tremlett's decision when it dawned on him that he might have located the Ophir region.

Road to Ophir is a pleasurable tale of adventure with unexpected bonuses along the way. One of the latter comes in the account of a prospecting trip into Uganda. Tremlett and his party were on a mission to locate copper and tin for Sir Robert Williams, apparently an ideal employer who had many mining interests in Africa. (Tremlett's father, also a mining engineer who had been associated with Cecil Rhodes, had spoken admiringly of Sir Robert, saying that if he had come to Africa earlier, he might have tempered Rhodes' ruthless exploitation of the land. For this reason Rex Tremlett was delighted to work for him.) Having reached some of the

territory to be investigated, Tremlett was camping in sight of the snow peaks of Ruinzori when the Ruanda tribesmen he had hired to do the excavating were badly frightened by an airplane that thundered overhead. He explained that it was a flying machine with white men in it. This changed the wonder in the sky into just another sample of "European magic," which the Ruandas regarded as incomprehensible, and so of little interest. The incident brought Tremlett other reflections:

Some day, I thought, planes will land in places like this. From their cabins men will step, determined to organize everything. Clerks would creep about the land, gathering statistics; while, leading them, an economist gazed shrewdly at us, estimating our earning power in terms of man-hour productivity, so that when he had created local industries to help us raise our incomes, he could import goods to sell us.

I was not against progress as such, or because it changed things: many things needed change: but because much of it had come too quickly. Trade must inevitably follow the flag, but the results of this had been happier for African peoples when colonial administrators (stiff-shirted and high-hatted although they may have been) had the power to vet all those who sought to establish trading centers, and to deport them summarily if they misbehaved themselves.

To be of use, however, such ideas need to be practical and personally applied, and I had already decided that in my work in Uganda I had two loyalties. One was to Sir Robert. The other was higher. The development of a country's natural resources was in itself good. If I found payable minerals here it would be to everyone's advantage to have them worked, especially to the local people. That is, if the minerals were not *too* payable.

A few small mines, dotted about the veld like the ones at Sabie, were good things. The vast network of gold-mines and uranium plants surrounding Johannesburg had created such appalling degradation in the black people, and such unbridled avarice in the white, that it was about as evil a thing as man had ever done.

I determined that if I found a mineral deposit in Uganda which appeared capable of supporting one large mine, or several scattered small ones, I would report it. But if I found indications of another

Witwatersrand or Northern Rhodesian copper belt, I would remain silent.

Rex Tremlett practiced what he preached. When he discovered that a development company he was working for was really owned by De Beers, which was one of the names for the vast complex of interests controlled by Sir Ernest Oppenheimer, he decided he couldn't in conscience stay on that job. As he was under a year's contract, he found the only possible escape was to send a "studiously insulting" letter to the general manager, who had no choice but to fire him. Tremlett explained his feeling:

Sir Ernest Oppenheimer, with his Kimberly diamond mines, his Johannesburg and Orange Free State gold and uranium MANOFT his Northern Rhodesian copper and cobalt network, his dynamite factories, and his finger in almost every other South African pie was, to me, another name for just the type of industrial empire I most detested. . . .

Bigness, it seemed to me, was the root evil. I knew the arguments in favour of huge enterprises: union creates strength in adversity; amalgamations cut overheads and unify direction; mass production needs capital beyond the reach of individuals. If that was true, then I believed that the cure was worse than the disease. When industry becomes so large that it dominates the private lives of its workpeople and the politics of nations, then it is evil; no matter how benign the intention of its masters.

Anything which destroys individual responsibility and initiative is, to my mind, wrong.

To illustrate how this works in practice he recites the history of a small gold-mine near Sabie in South Africa. It was owned and operated by one man for twenty-five years. This man had roots in the town and felt an obligation to the people who lived there, so he never developed what was probably the richest yet most dangerous underground section. Finally, he sold to a corporation. The directors, most of whom knew only what they read in engineers' reports, decided to mine the dangerous area. Two directors voted against the decision, but did not resign in protest or publicize the corporate act. "The section was

opened on Wednesday. Twenty-three miners were dead on Thursday."

The concluding chapter strikes the same note. While uncovering a site where tin-bearing material had been found, one of the workers brought Tremlett a rectangular piece of stone which had been cut to nine inches long, three inches wide, and two inches thick. He had the crew clear away the surface deposits to a depth of three feet and found at that level many more such shaped stones, all alike. It seemed that they might have once formed a paved road, constructed thousands of years ago. After studying the lay of the land, he was able to expose other sections of the paving, making clear that it was indeed an ancient causeway, laboriously fashioned to withstand very heavy traffic. Why?

If the road continued in the direction indicated by the compass, it led in one direction to the Belgian Congo and, in the other, to Abyssinia, the Sudan and Egypt. Supposing, I thought, just supposing that this was King Solomon's road to Ophir. Where did it lead? South-westwards lay the fabled gold-mine of Kilo Moto, the personal property of the King of the Belgians; strongly guarded, one heard, for fifty miles around. . . . The road, I estimated, looking at my maps, led exactly in that direction. . . . Did Ophir lie buried somewhere in that awful place? Was Kilo Moto just a golden outpost of other, more fabulous wealth?

Tremlett looked about him at the African landscape. Not far off some African maidens were bathing in a lake. The setting was beautiful, the people happy. He stared at the paving stone in his hand, the first to be discovered, and a feeling of horror swept over him. In his mind's eye, he saw the bulldozers come to "develop" the region, "to make a hell of the quiet land." Other pictures followed. He ordered his men to fill up the trenches, to leave the land just as they found it, and to tell no one of what they had unearthed. "I believe it is evil," he said. Even the archaeologists would not be told of the road, for after the archaeologists those others would come. . . .

His premonition of the raw evil that would result from reporting what he had uncovered was

too strong to ignore. "I have often found," he said "that if I can hold in my hand some object connected with the problem, and allow my mind to rise; above the earth, it seems; there comes into my head an answer so real that although it may defy logic and ignore previous notions, I am compelled to follow

Another part of the book describes the extraordinary abilities and beneficent wisdom of a healer woman who saved the life of one of Tremlett's workmen. She was an African, but spoke university English and had served as a nurse for five years in a London hospital. The village where she lived was a healthful place, neat and orderly. She was loved and honored by all the people, whom she taught many useful things. She had peculiarly effective diagnostic powers, which she explained to Tremlett as resulting from "a very sensitive electrical system," and could do water-divining simply with her fingers, needing no branch or twig, and was able to determine both the location and depth of the flow. In evidence of this, perhaps, when Tremlett tried to pay for her services, she refused money but asked him to dynamite a rock formation in the village. She felt, she said, "a strong spring of water beneath the rock" That afternoon Tremlett and his men reached the village, found the outcrop, drilled a hole and blasted. One shot, deeply placed, was apparently enough, for after the dust had settled they saw a spring of clear water welling beneath the broken stones.

These rather wonderful happenings come into Rex Tremlett's story quite naturally. He does not make a great deal of them, perhaps because of his own sensibility and his life in a land where such things are not regarded as strange or impossible. For the Western reader, this is an attitude toward "magic" which seems just right.

COMMENTARY

LOST ARTS?

READERS may be interested in another instance of "African magic" not mentioned in this week's Review. One night Tremlett was awakened by the sound of wailing. Leaving his tent he found his cook, Mopembe, kneeling, beating the earth with his palms, weeping and crying to Allah. The African explained:

"My brother is dead. While I slept my sister's spirit came to tell me so. He has died of a terrible illness, and all Chiromba is weeping and afraid."

He fell to wailing again. I returned to bed. There was nothing I could do to help him, for I was in the presence of an occult power accepted as natural and normal by most Africans, yet seemingly denied to us. Although this was the first time I had had actual experience of it, I did not for a moment doubt Mopembe. There were too many stories told by too many reliable people, to doubt that thought transference, especially at moments of distress, was practiced by Africans hundreds, and, indeed, thousands, of miles apart.

Tremlett tells of cases of massacres—of both blacks and whites—which Africans thousands of miles away knew about immediately by this psychic telegraph. In the morning, Mopembe was calm and asked Tremlett to write the district magistrate near his home, requesting him to deliver a message to his sister and family, in which Mopembe offered to return if he was needed. Tremlett asked him: "Why cannot you give that message yourself to your sister's spirit, instead of sending it by letter and word of mouth?"

"I am not *towezi*," he replied. "I can only give and receive simple messages when there is great sadness or joy. The sister who comes to me in the night is *towezi*. To those who are also *towezi* she can speak on any subject, so long as it is in the quiet of the night."

"How do you become *towezi*;"

"You do not become it. You are born *towezi*. The midwives and witch doctors know a *towezi* baby the moment it is born. It has the look."

In the chapter on the curing of his workman, Tremlett tells about learning remarkable things. "Your own impulses," the healer woman told him, "are quite different from those of African people: not so earth-bound, nor distorted and muffled by fear and superstition." She spoke of his emissions as being "exceptionally clear," telling him he could learn much of the aptitude she possessed. He felt that this was the origin of many of the strange feelings that he had had about other people.

CHILDREN ... and Ourselves

MORE ON THE OPEN CLASSROOM

IN one of his articles on education, Paul Goodman remarked that the ancient Greeks did not think it appropriate to teach subjects involving abstractions and difficult philosophical inquiry to young people still in their teens. Such matters, they believed, were better encountered later, when a man had reached even his thirties and had some experience behind him as the basis for such thinking. Similarly, a teacher of sociology has said that he would never introduce the special terms of this discipline without first developing in the students a sense of *need* for terms, say, like "alienation." He would spend enough time discussing situations in which the psychological deprivations behind this term grew tangible, not allowing the generalization to be adopted until there was a generous content of meaning for it. "I found," he said, "that if you supply the terms as 'titles,' first, the students stop thinking and use them like empty bushel baskets which they carry around, trying to fill them up." Words, in short, ought to represent vital meanings, especially when they are learned. These various illustrations of how learning takes place came to mind while we were reading still another book on the English "Infant" schools. Such books are now quite popular, almost the "in" thing, yet in this case the popularity is all to the good, since these books—the ones, that is, we have read—are all good. They are good, we think, because they are concerned with the restoration of natural relationships between adults and small children—an extension of much that is good in the activities of the home life of the young.

The book we have now is *Children Come First* (American Heritage Press, 1971) by Casey and Liza Murrow. The part that brought on our recollections deals with teaching children to read. Whether or not they learned it from Piaget, the English teachers seem well aware of the rule that "words are internalized and are available for use again only insofar as they were, in the first instance, accompanied by action." So reading, with the children, is not separated from talking and writing.

An effort is made to stir the child to talk about whatever he is doing. Then, he early begins to think about writing:

In a number of schools the child has a book of about twenty pages, made by the teacher of unlined paper, in which to draw pictures and to write. When the child first enters school, he learns that words stand for things. He may be fortunate enough to know a great deal about this already. All the materials in the classroom are clearly labeled. A sign looped over the water tub reads, "Two may play with water." The child's own name appears on a drawer and on his paintings. He quickly begins to paint large pictures, and he expresses many of his ideas and feelings with his paintbrush early in his school career. Talking about his pictures is the next step.

The teacher helps the child to decide what should be written under the pictures, and a writing lesson may begin with the child's effort to trace the words the teacher has written out. The next step is to copy them in position under the picture. After a child has made a dozen or so books like this, he may be ready to try a story of his own—perhaps a one- or two-sentence story. The pictures are a vital link between writing and the world of visual experience:

The pictures form useful aids to reading. The story the child has told is all there in the picture. We saw one six-year-old, a fine writer, stumble over the words "full moon" in reading a story he had written a week before. He turned his attention to his picture, and touching some of the things he had portrayed, looked for the words he needed. For this boy, the tactile experience of tracing the full moon in the drawing was as important as seeing the letters. It was his own method. Low on the horizon he found his moon, returned to his story, and read it through with ease.

The children keep track of and manage their own development of language use:

By the time children in many English infant schools begin to write, they have substantial dictionaries of their own. In these small booklets the child writes the words he wants to know how to use. He may ask the teacher to spell a needed word, but he will usually have to sound out its initial letter by himself. This provides some training in phonics as well as spelling. It is not unusual to see a group of children working at a table, talking about their stories and occasionally asking one another about spellings. "How do you spell Joseph?" asked one boy of his neighbor. The friend patiently spells it for him, twice, while the boy adds it to his dictionary and then to his story.

In these situations, the child's first books are of his own making. His dictionary is full of words he wanted to learn, not words that his teacher thought he ought to know. This means of learning—evoking words that are vitally important to the child—is very similar to that described by Silvia Ashton Warner in her book *Teacher*, to which some teachers in England occasionally refer for ideas and support.

These things are not all "new," but the *continuity* of how the teachers work in the infant schools is distinctive and the heart of the matter. The teachers are building toward an objective described by Charity James in *Young Lives at Stake*, and quoted by the authors:

How much more profitable productive and critical thinking would be if it were demanded by the nature of the child's engagement, that is if the need for rigour arose from the creative purpose rather than the apparently arbitrary decision of the teacher; if the answer to the question, "Why are you doing that?" were not, "Because I was told to," or "Because we always do," but "Because I need to," whether the need is to test a hypothesis, to make one's dancing more skilful and expressive, or to get a pot ready for firing.

The fact that the children in the infant schools are not often segregated by age groups but are more or less together, whether they are five, six, or seven, makes individual attention to the children of obvious importance, and this individual attention has valuable fruits. The factor of "competition" plays little part, for one thing, and teachers discover things too:

"Sometimes," said a teacher in London, "I am dying to write a lot of problems on the board and tell them all to sit down at once and do them—because it would be easier for me. I could relax a bit and keep them very quiet. But now that I've seen how much more they learn when they work individually and how much better I understand where each child is and what his needs are, I could never go back to the old way. It would be terribly unfair."

There are other advantages:

The teacher who can follow each child through two or more years of school is able to watch his progress. She knows his interests, his likes and dislikes. In addition, she knows the stages of development he has achieved and is sure of the next steps he should take. She does not face the frustrations of teachers who are on the verge of success with a child, but never gain it because he leaves at the end of the school year. She can establish deep and

understanding friendships with the children and maintain them over a period of time.

Furthermore, it is easier to cope with absences under this system. Although no teacher is happy when children miss school, the child in a family-grouped class does not have to worry about catching up with the others when he comes back. He works at his own rate of speed, and thus takes up his work where he left it.

While the children make a great many decisions about how they will spend their time—

This does not mean that the teachers avoid planning. On the contrary, classrooms that appear totally free are really skillfully engineered. They must be if they are to succeed. The teacher needs to be clear about what each child has accomplished and what sort of work he needs to become involved in during the coming days. She must watch him carefully, noticing the kinds of play in which he engages and the development of manual skills. She records what he has accomplished. . . . on this day he had done some writing, worked on two kinds of math, and done a great deal of building. On the following day she may encourage him to devote more time to reading. . . .

The flexibility of the day and the lack of a rigid curriculum allow the teacher to reorganize a few days of a week around a special goal if it seems needed. One teacher we observed in Yorkshire was concerned that her class of predominantly five-year-olds grasp the concept of number and its value. She knew that many of her children could count from one to ten, but they had little understanding of the meaning of numbers. As one solution to this difficulty, she organized each of ten days around a number. On the fourth day, for instance, she asked the children to group themselves in fours for short periods of time. They sang four songs before lunch, counted out the milk bottles in fours, and drew four pictures on a sheet of paper. When we visited the class, the children were clear that the number 4 accurately described four beans, four chairs, or four days. They had also come to grasp more abstract groups of four, such as asking four questions.

We have given a lot of samples from this book to illustrate its value. There is also plenty of general discussion of the primary and junior English schools.

FRONTIERS The American Scholar

WE have on several occasions spoken of the excellence of the *American Scholar*, the quarterly published "for general circulation" by the Phi Beta Kappa society, now in its forty-first year. Having just read most of the Winter 1971-72 issue, we again reached this conclusion, thinking mournfully of the recent decline of certain once highly respected magazines that now seem more frothily "fashionable" with every issue. Meanwhile, the *American Scholar* has resisted all such tendencies, yet has lost none of its liveliness or contemporaneity as a result. (The *Scholar* costs \$5.00 a year, which may be sent to the circulation office at 1811 Q Street, N.W., Washington, D.C. 20009.)

The opening pages of the current number are occupied by Rene Dubos, a literate scientist if there ever was one, and in this issue he devotes himself to great movements of history and the men who are sometimes behind them. As individuals who exercised vast influence on those who lived after them, he selects Mohammed, Peter the Hermit, and Abraham Lincoln, sketching their careers and offering these generalizations:

The origin of some of the most spectacular and far-reaching movements of human history can be traced to a particular person, or more precisely to a view of the world seen by that person. The uniqueness of the initial visionary concept accounts in part for the fact that natural sciences have contributed so little of importance to the prediction or explanation of great historical events. The scientific method is most successful when dealing with phenomena that can be repeated and manipulated by experimentation.
...

We know a great deal concerning physico-chemical phenomena that make life possible, and we can formulate reasonable hypotheses concerning their origin and evolution. We can imagine, even though we do not completely understand, how each particular living thing is shaped by genetic constitution, experiences and environment. But this kind of knowledge does not help to pinpoint the particular events in the mind of Mohammed, Peter the Hermit

or Lincoln that made them take a stand at a critical time and thus trigger social movements that changed the course of human history. Free will may not be compatible with scientific determinism—at least as we understand it today—but it is certainly the strongest and most interesting force in human life.

In the body of the magazine, Evelyn Kossoff, an English teacher, writes on the folly of attempting to "evaluate" college professors by "scientific" methods. Her illustrations of the breakdowns and misfires of this approach to measuring good teaching are anecdotal and effective. She tells about a lecturer in literature who bored a class for weeks with dull material from stale notes on the Shakespearean theater, but then put her notes away and read the plays to the students, line for line. Her voice was bad, but she was an extraordinary dramatic performer and electrified her hearers. Shakespeare lived forever after for those students. Miss Kossoff, then a sophomore, would have judged her: "This teacher reads Shakespeare magnificently! All other criteria are irrelevant!" She points out that this comment could hardly be "programmed into a computer along with statistical data and the checkmarks," adding:

The authors of evaluation questionnaires apparently assume that the order and uniformity that exist in the physical world are also characteristic of human phenomena. They assume that there must be "principles" of teaching, comparable to the laws of nature, that can be identified and codified, and that all teachers must exemplify these general principles.

This writer is not opposed to "teacher evaluation," but to mechanistic attempts to do it:

Human beings—not questionnaires, not evaluation instruments, not computers—produce evaluations. I have no objection to evaluation of teachers by human observers. Criticism of humans by humans I consider fair play. I object only to evaluation of humans by "instruments and "mechanisms" to which are attributed superhuman powers of perception, precision and perspicacity.

And even in human observation, time is needed:

We observe what a teacher *does* in a classroom, but has anyone ever observed the process of communication by which knowledge and mental skills are transferred from teacher to students? . . . What happens during that moment of truth when the student's face lights up with understanding? What did the teacher say or do the twenty-first time that he failed to do the first twenty times? The subtler phenomena in teaching may be difficult to detect, measure or grade, but we cannot therefore assume that they are irrelevant to the evaluation process.

A paper by Gerald Holton, who teaches physics at Harvard, provides a rather extraordinary portrait of Albert Einstein at work. Prof. Holton's title is "On Trying to Understand Scientific Genius," and the paper is almost entirely devoted to Einstein. "Words" were not very important to Einstein. He thought in terms of visual imagery, often "translating" into words only what he wanted to communicate. This reality of Einstein's subjective life seems at least partly the basis for Gerald Holton's opinion that "*there is a mutual mapping of the mind and life-style of this scientist, and of the laws of nature.*" The world of nature and its laws was where Einstein was most at home—where he really lived. Speaking of the rare individual who has this capacity, Holton refers to "his insight into the phenomena of science in a way that amounts almost to special perception of a kind that can hardly be communicated to others, or a tactile coexistence with natural phenomena: sometimes the mind seems to move into the problem of nature as if it were a hand slipping into a glove."

Intimations of these qualities in Einstein are given in Marianoff's book published in 1944, *Einstein: Intimate Portrait of a Great Man*. Prof. Holton makes indispensable additions to this book for the general reader.