

## REBIRTH OF SCIENCE?

A NEW kind of thinking about man and the world is slowly emerging on the modern scene. The pioneers are several, but their thought has in common one noticeable quality—it originated in awareness of vital human need. Whether we speak of Frankl or Maslow, Michael Polanyi or L. L. Whyte, John Holt or Ivan Illich, there is a hunger of the heart which gives direction. The idea of the dignity of human selfhood is either declared or implicit. There is, moreover, a splendid restoration of common sense in the work of these men. When they think, they think like ordinary men, but with greater order, increased clarity, and a more conscious impartiality. One might say that authentic Humanism is being reborn in the work of those who represent this new spirit of the twentieth century, since these men have generated a field of discourse in which man has a natural part as causal agent—a role he has not occupied in scientific thinking for several generations.

It is a curious commentary on the mind-set of the age that a man who writes with common sense, yet in the framework of some science, tends to excite the reader's suspicion. He neglects the jargon of the specialist. He does not seem to care that the mark of scientific acceptability is an inhuman sort of prose. It is as though human affairs had too long been under the dual management of two very different regimes—one, the ordinary human one, which is ineffectual and undisciplined, yet in which morality, choice, and feeling have a recognized part; while the other is a kind of social-insect culture which has a steely finish and a rigid infallibility in all its procedures—in which the individual is never more than a moving part, totally subordinate to the whole, and not really an individual at all, since the perfection of the process is alone important. This latter system is the system of science, or what men think

of as science, and when they deliberate in terms of scientific ideas they hardly exist at all as men. Yet the exactitude of scientific knowledge is so enormously impressive in the limited area of its operations that there has been common expectation that "some day" all human affairs will be assimilated to and controlled by the scientific order.

So, when a man who calls himself a scientist talks simply as an enlightened human being, we wonder about his "credentials." Yet it is now beginning to be urged that it is the scientific epistemology which needs reconstruction, not the common sense of human beings. For it is true that the language and grammar of science deliberately exclude the human qualities of man. Two weeks ago, in *Review*, a passage from Michael Polanyi's *Knowing and Being* gave the view of consciousness held by three eminent psychologists of the present: they all denied its reality. Polanyi remarked: "The manifest absurdity of such a position is accepted by these distinguished men as the burden of their scientific calling." Yet in *Science, Faith and Society*, Polanyi shows that the freedom of science to pursue its investigations is based upon a libertarian tradition which declares the worth of the individual, the preciousness of truth, and the right of all men to seek it in their own way. So the very foundations of the social order which relies upon science include transcendental assumptions concerning the nature of man. Polanyi urges the importance of these assumptions and points to the nihilism implicit in a science which attacks their validity.

How is it that we have gone so far in our scientific development without realizing this deep contradiction? The prevailing intellectual attitude, Polanyi shows, goes back to the Renaissance struggle for freedom of thought against religious dogma and theological authority. Cartesian doubt

and Lockean empiricism were the weapons of liberation. As he says:

These philosophies and those of their disciples had the purpose of demonstrating that truth could be established and a rich and satisfying doctrine of man and the universe built up on the foundations of critical reason alone. Self-evident propositions or the testimony of the senses, or else a combination of the two, would suffice. Both Descartes and Locke maintained their belief in the revealed Christian doctrine. And though the later rationalists succeeding them tended toward deism or atheism they remained firm in their conviction that the critical faculties of man unaided by any powers of belief could establish the truth of science and the canons of fairness, decency, and freedom. Thinkers like Wells and Dewey, and the whole generation whose minds they reflect, still profess it today, and so do even those extreme positivists who profess the philosophy of logical positivism. They are all convinced that our main troubles still come from having not altogether rid ourselves of all traditional beliefs and continue to set their hopes on further applications of the method of radical scepticism and empiricism.

It seems clear, however, that this method does not represent truly the process by which liberal intellectual life was in fact established. It is true that there was a time when the sheer destruction of authority did progressively release new discoveries in every field of inquiry. But none of these discoveries—not even those of science—were based on the experience of our senses aided only by self-evident propositions. Underlying the assent to science and the pursuit of discovery in science is the belief in scientific premises to which the adherents and cultivators of science must unquestioningly assent. The method of disbelieving every proposition which cannot be verified by definitely prescribed operations would destroy all belief in natural science. And it would destroy, in fact, belief in truth and in the love of truth itself which is the condition of all free thought. The method leads to complete metaphysical nihilism and thus denies the basis for any universally significant manifestation of the human mind.

The answer to the earlier question—how have we managed to live so long with this contradiction?—is that a great tradition such as that represented by the search for truth can survive a great deal of rhetorical rejection. It is only after the last shreds of the tradition wear

away that the self-destructive character of the denials begins to be revealed. This happened, first, in the West, in the totalitarian countries, where open defense of truth could finally lead to purges and executions. The fate of Hungarian Communists who were also humanists and dared to say that objective truth was more important than political or "party" truth may have led Polanyi to pursue these reflections and to seek the ground of both science and society in the moral assumptions of human beings. Neglect of these assumptions is bound to prove disastrous. As Polanyi says:

A society refusing to be dedicated to transcendent ideals chooses to be subjected to servitude. Intolerance comes back full cycle. For sceptical empiricism which had once broken the fetters of medieval priestly authority, goes on now to destroy the authority of conscience.

This is Polanyi's critical conclusion. His affirmative view is also well put:

I believe I have shown that the continued pursuit of a major intellectual process by men requires a social dedication and also that only in a dedicated society can men live an intellectually and morally acceptable life. This cannot fail to suggest that the whole purpose of society lies in enabling its members to pursue their transcendent obligations; particularly to truth, justice, and charity. Society is of course also an economic organization. But the social achievements of ancient Athens compared with those of, say, Stockport—which is of about the same size as Athens was—cannot be measured by the differences in the standard of living of the two places. The advancement of well-being therefore seems not to be the real purpose of society but rather a secondary task given to it as an opportunity to fulfil its true aims in the spiritual field.

Polanyi's sense of human need took him out of his role as a chemist and gave him reason to become a reformer of scientific epistemology and a sociologist. He is very convincing on the subject of the essential ingredients of the *morale* of a free society. Further, his contributions to the psychology of perception, in its bearing on human knowledge, are becoming foundation-stones of humanistic psychology. Man as a creative being

and a moral agent are primary realities in Polanyi's thinking, and it is this which constitutes him one of the founders of the serious thought of the future.

Lancelot Law Whyte, an English thinker who first came into prominence with publication of his *Next Development of Man* (1948), deserves attention for similar reasons. He says early in a paper in the *March Bulletin of the Atomic Scientists*:

Single items of knowledge are of no use, for we need clarity on basic issues. What is man's supreme faculty? What is at the core of his mind? Are the fundamental laws for or against him? Can we see the logical germ of life of mind in the most general laws, that is, in a feature present in all four realms?

At critical moments ultimate issues are crucial. Man is busy creating hell on earth, and if we are to hope we must see a possibility of history changing its direction. Man must be given a shock, be startled and fascinated by something he has never understood before. Man must look deeper into nature and himself and find joy and strength in what he sees. This is much to expect, but less will not serve.

Mr. Whyte's recent writings are all concerned with questions of synthesis. As we know, the preoccupation of the modern mind with analysis has been very nearly obsessive. We having been taking things apart and cutting them up in order to learn how they work. The tendency of scientific analysis has been reductive, and the corresponding sense of reality of modern man has been focused in the reduced and unorganized conditions of matter, with no attention at all to consciousness. We have been building an "atoms-and-the-void" conception of the universe for hundreds of years, and a kind of "death-wish" has developed as the atmospheric background of physical theory. The second law of thermo-dynamics has probably been given more attention than any other physical principle. Reality, we have come to believe, is tough and indifferent, if not mean and nasty. Facts are either "hard" or "cold," never lovely and beautiful, although elegance is conceded to the equations of mathematicians, and now and then some scientist writes poetry to prove the humanist

lining of his make-up. L. L. Whyte is a far more serious campaigner for regeneration and growth in scientific thought. In his paper in the *Bulletin*, he speaks of a side of reality which has been systematically neglected:

We are fundamental ignoramuses. A partial science hinders our gaining balanced self-knowledge, and this accounts for part of our troubles. There must exist a healthy organic core in our minds. But what is it like? and why has it failed us?

Neglect of the formative potencies of nature is one answer:

For a hundred years physical scientists have paid much attention to a class of processes which move toward states of greater dynamical disorder (thermal entropy), and little to any other natural tendency. As a result of this bias influential scientists have even suggested that the physical universe displays only one tendency: toward disorder. (That was risky, in a world pervaded by opposites!) This entropy dogma was on many grounds unfortunate. For example, it implied that organisms, and so men, were arbitrary freaks or sports of nature with no roots in general laws.

The entropy curse troubled many. In a purely entropic universe man would be a misfit struggling to push things uphill, while the most powerful laws were everywhere driving them down. The idea is absurd. Billions of years of successful emergence and evolution of organisms prove that man, with his partly unconscious ordering passion, is not a lonely Sisyphus, but one of a myriad of successful species doing the same at their own levels.

Mr. Whyte proceeds by naming many of the natural processes of synthesis as they appear in vast hierarchical array, from atoms to galaxies, suggesting that there is "one general ordering tendency operating at many levels," and holding "the key to human nature: when not pathological (a crucial restriction), man is the supreme ordering instrument in the known universe." He says:

It is these ordering processes which make it possible for organisms to appear in an inorganic universe, to grow, to evolve and to repair themselves, and for man to imagine and to think, unconsciously and consciously. This is the core of human nature and of the healthy mind, and this is what man needs to be told by science. . . .

So this great category of formative processes which underlie life and mind has not yet entered the collective awareness of its supreme expression and instrument—man! The ordering processes are not yet recognized as being not merely as extensive as ordinary thermal entropy, but the very core of organisms and minds. Thus today, scientific self-knowledge is not possible.

Mr. Whyte thinks of knowledge of all these processes, and of the underlying general law, which he names "morphic," as a kind of gospel of natural, organic, and creative synthesis, which may be expected in time to provide a conception of man "more reliable than that of recent 'scientific' humanism (which was not scientific, since it could not describe man correctly)." He considers this knowledge the means to bring into being "a new kind of social instrument," one which is "preferably not a journal or society but a network of like minds, treating issues more fundamental than those with which existing political institutions and good-will societies are concerned—not a world brain, but a world heart judgment—exerting its will on primary matters, with the intellect its instrument." Such a network would focus on the underlying issues appropriate to the remaining years of this century. "We," he says, "who already share intimations of this emergent attitude, must become aware of one another, strengthen our judgment by pooling ideas, collect allies by timely signals—this essay is one—and work gradually toward a program of action, for the dangers will not vanish before words."

While the reader who has not generated for himself a similar sense of reality for what Mr. Whyte terms "morphic understanding" may have difficulty in grasping how this program will work, it should help to consider his appeal as an expression of a feeling, now coming to be widespread, that the life of the planet is one, that all sentient life is related and interdependent, and that all share in the being and welfare of one another. The deliberate shaping of form and the integration of energy for constructive purposes are for him the means of getting more directly at

the organic and vital realities of which men need to become more conscious, in both nature and themselves. Following is the concluding thought of this paper:

We should not waste our energies or insult our will by meditating on the chance of mankind achieving the necessary degree of social therapy in time. Such prognosis is, fortunately, beyond our powers. Enough that the new awareness is abroad, emerging simultaneously in many places like flowers in the spring, beneath the ugly wreckage of a past civilization. For the discontent of youth is, in my view, an expression of a widespread determination to reconstruct our way of living in the light of a new and richer conception of what man is and should be.

More light is thrown on L. L. Whyte's conception by an article he contributed to the Winter 1970-71 *Hudson Review*, "Towards a Science of Form," which is dedicated to Herbert Read. He and Read were kindred spirits of the same generation. Both were in the British Army during World War I, and both were moved by that holocaust to brood on what was wrong with the Western world. Read recorded his solution in *Education Through Art* (1943), which meant for him that stirring the spontaneous aesthetic imagination would bring a healing influence for mankind. For Whyte, this meant learning about and fostering the "formative faculty." In this article, Whyte asks:

Why is an understanding of forms and their genesis one of our greatest social needs? Because it should provide so compelling a biological image of the esthetic imagination that the world must willy-nilly take notice and improve its education, the stifling of a young imagination being then seen to be every whit as wicked as choking a baby. . . . Here we reach the kernel of my faith in a simple idea, and my conviction that it is timely. There are moments in intellectual history when a corner is turned and new vistas light up the human mind. As I see it, we are near to such a corner today: we are on the eve of understanding inorganic and organic forms. When such a far-reaching event of this kind is close at hand it must already have been long in preparation. It is not difficult to know what is in the air many years before the Newton, Darwin, or Freud achieves the authentic step and irrevocably changes man's situation. . . . It is for the morphic science of

tomorrow to trace the continuity which runs through the morphogenetic processes of embryological development and the self-organizing operations of the emerging nervous system and brain-mind, to the formative activities of imaginative thinking at all levels from which good things have sprung.

Again in this article, Whyte speaks of the awakening to formative process as "a long-prepared revolt against inhumanity," which may bring about "in the remaining decades of this century one of those seemingly sudden social transformations which are a commonplace of the past and evidence of the workings of the unconscious in history." He seems to think, however, that the agency of the awakening is principally an advance in the science of biology. Yet it is at least possible that the workings of the formative hand of nature in the fashioning of organisms is but an analogue of still higher creative intelligence, and that the very self-consciousness which will have the major role in social transformations to come is itself the primary and independent reality to be considered. This was the Platonic doctrine, and it is here, it may be, that the self-knowledge necessary to the great synthesis must be sought.

## *REVIEW*

### STORIES OF SEA AND LAND

GOOD adventure stories are harder and harder to find, these days. While there are probably more writers making a living out of fiction than ever before, stories that deal with human beings instead of with the pieces, parts, or merely the appetites of the characters, sometimes seem a thing of the past. A book by Richard Hughes, *In Hazard* (Signet), we came across recently made us think that maybe a new current was developing in storytelling, but then we noticed that this reprint first appeared in 1938. (Mr. Hughes also wrote *A High Wind in Jamaica*.) *In Hazard* is about a cargo vessel which encountered a hurricane in the Caribbean, and what happened to the ship and the men who were sailing her. The story becomes a revelation of human character. In a tale like this, each reader will have his own selection of passages he will not soon forget. One we keep coming back to is an interchange between the chief engineer, named MacDonald, and another engineering officer, Soutar. The storm had long since passed the point of seventy-five-mile winds—which mark the beginning of hurricane force—and was now blowing with a velocity of about two hundred miles an hour. No anemometer could register this wind. After two days of exposure, everyone on board was thinking about death, for the ship could hardly last much longer. MacDonald, for one, was not well equipped for the religious dimension of such reflections:

When he was fifteen, and being prepared for Confirmation, the idea of God which was presented to him was . . . a sort of impersonal Omnipotence Who never interfered with Science (not that He could not, but simply because He was above that sort of thing, and meant us to learn Boyle's Law and so on): a vague limitless Holiness, Who really preferred the Church of England to anything else but Who failing that was also the Best Elements in all religions (especially Buddhism and Islam). In short, not at all the sort of God you asked for small material benefits, like looking after your watch for you, or helping you to win a football match.

MacDonald wonders about how it feels to die—and why an old person doesn't go more easily. Remembering an old woman who fought death to the last gasp, he tries to see some sense in her point of view:

After all, which would you rather lose: an empty purse, or one you had spent laborious years in filling? Look what she was losing: memories of more than eighty years. But when a child dies, people get quite lyrical in their pity. Yet it is a very small loss to the child, his life: a small shimmering bagatelle. A purse with only twopence in it, and an I.O.U.

All the old know this in an inarticulate way: Mr. MacDonald knew it: and revolved it, in deep indignation, as he paced the engine-room. But then a sudden new thought struck him. Was death in fact the end?

All his life he had been a religious man: had believed in God: had believed in Sin. But did he believe in a future life? He had hardly considered it. He believed in Heaven and Hell, of course. But was that a real future life, or was it just a manner of speaking, a sort of Sanctions? Yes, this was a new idea altogether. When his body went down in the deep, would his soul come out of it like a bubble, and rise to the top? Not only an impersonal soul, a wisp of spiritual vapor, but the actual essential him, the only William Ramsey MacDonald? Mighty me! If there was any real hope of that, things were not quite so dark as they looked, not by a long chalk! He began, for the first time in his life, to wonder just what sort of place Heaven really was.

"Mr. Soutar," he said, when the two sentries met on their beat, "dae ye believe in a future life?"

Mr. Soutar paused and considered carefully before answering.

"Aye," he said brusquely, and went on with his beat.

But the next time they met, it was Soutar who stopped MacDonald.

"It's nae see easy," he said, "the subject is crammt wi' deeficoolties. Ye mean a future life o' a personal kin', A tak' it? Me, William Edgar Soutar, and you, William Ramsay MacDonald?"

"Cairtainly," said Mr. MacDonald.

"A future life for every man born o' wumman?"

"For every Chreestian," Mr. MacDonald amended.

"Weel, noo. Are we to tak' it that a human Chreestian is compoundit o' three pairs; his body, his min', an' his speerit?"

MacDonald grunted.

"The body dees, the speerit reeves?"

MacDonald grunted again.

"Than whit o' the min'? That's nayther speerit nor body. Yet it's vera boons up wi' the body. A disease o' the body can disease the min'. A blow on the body can blot oot the min'. The min', like the body, grows auld an' decays. The daith o' the body, then: is that the daith o' the min' tae?"

"Alooin' it to be," said MacDonald.

"Than the future life canna be of a vera pairsonal nature, A'm thinkin': it is a saft, imbecile sort o' thing ma speerit would be witoot ma min': nae William Edgar Soutar at a'."

He turned again on his beat: for an hour they talked no more when they met. Then MacDonald stopped him with a hand on his shoulder:

"Mr. Soutar," he said, "the human min' is hingt on reason: whit is ayont reason, reason canna comprehen'. Mebbe in the Next Worrl' we shall cast reason, as a growing bairn casts his pappies."

Soutar tore himself free and passed on. It was not till they met again he could allow himself to speak: and when he did his words burst out in passion:

"The Almichty gied us Reason tae be the only paitis in Diveenity he hae, not to be despitit! Man, ye're taukin' lik' a Sotheran!"

Once more the two men glared in each other's faces with apoplectic hate; and then passed by each other on their endless round.

What has become of this breed of men? Are they only in stories?

Western stories took a turn away from stereotypes with Elliot Arnold's *Blood Brother*, the novel based on Thomas Jefford's attempt to make peace with Cochise, the Apache leader. Western fiction has been getting better ever since. One story that has just come out (Bantam) and has been made into a movie is Alan Sharp's *Hired*

*Hand*. The West is still tough and brutal, but the characters in *Hired Hand* seem real, like people whom you might meet some day. It tells about a man who married too young and left his wife and small child to wander from job to job for six years. He acquires a partner while away, and when he decides to go home—to see if he still *has* a home the partner comes along. The two men are used to each other and they stick together. His wife is still there and the child is growing up. She is suspicious of him and won't take him back except as a hired man, so he and his partner offer to work just for their keep, and they begin to put the small farm in better shape.

There are delicacies in this story, along with the strength of the pioneer life. One day a basic reconciliation begins between the man and the woman he had married:

Almost absently he took her hand, began to walk with her along the edge of the field.

"Way I've come to see it, Hannah, all anybody's got is time. Not a lot at best and damn little at worst. I rode up and down the country for six years and for all it meant I could've been dust blowing. I was pouring my time into a bag with a hole in the bottom. I seen some things made me want to sit still, see if I could make some mark. That's why I come home. I didn't come home to you, 'cause I didn't rightly know who you were. I come home to put down some root 'fore I just blow clean away."

Hannah heard him and the words touched her. They had a good sound to them, not just pretty but clean words, not used a lot, not easy in the mouth. He sounded like a man who'd thought his own thoughts, reached his own conclusions. He sounded like someone she hadn't known but would want to. She took her hand out of his. "Needs thinking on, Harry. Let me think on it."

"Sure enough."

She turned and left him in the field.

In Collings, as he watched her go from him, there was a new sense, something he hadn't known in himself before, a kind of calmness. Not like when you held a good hand and could pretend indifference, but a better thing, a feeling that everything was part of everything else and that nothing got wasted in the end. He watched her walking slowly back to the

farmhouse and he loved her, just a single moment of singular love, love free of need or conditions, just love for the woman carrying life back to her stove, trying to make things come out right, make the best choice. He loved her for being human, like him, and Arch, and like Dan must have been, like everybody was probably if you had time and chance enough to find out.

This story has all the "action" anyone could want, yet something of the "reality-testing" of the new generation is in it, too. It makes better reading than a lot of the "serious" fiction of the present.

## COMMENTARY

### ENOUGH FOR A BEGINNING

AFTER reading through the proofs for this issue, it seemed that L. L. Whyte is exactly right. "We are fundamental ignoramuses." We have cues and clues, longings and dreams, but no real self-knowledge. We have lots of reliable information about a lot of things that don't matter. We don't know much about our children. Instead of letting them mess around when they are little, we mess up their lives hurrying them along. And to what? Love and death are two other things we don't know about. And health—we don't know much about that, either.

Yet there is so much pretense to knowledge, so much spurious certainty. Why does it take an almost fatal disaster to make a man begin to ask the right questions? And when he does, he discovers that he has no practice at all in real thinking. He has just been going through the motions. When will the best men get a chance to tell the rest how little *everyone* knows?

What a world it would be if everyone would tell the truth about how little he knows! How full of kindness and patience! No more figures about "progress." No more rivalry, an end to competition, to all rat-races.

Then all the things we *can* do would appear in a better light. We might even begin to understand ourselves. Man is not an animal. Man is not a god. Obviously, he is something in between, cursed and blessed by self-awareness, by dreams both true and false. Call him a half-god. A clumsy, junior apprentice, no journeyman he.

Drawn on a mythic scale, Prometheus is the most suggestive figure we know for representing man—Prometheus in chains. In less formidable dimensions, he is Ivan Karamazov, who will settle for nothing less than the Promethean destiny. Well, Prometheus was a Greek. Ivan a Russian. Who else? Galahad? He belonged to King Arthur. We could choose Henry Thoreau, but we

might get Willy Loman instead. Or some anonymous astronaut with a computer brain.

Fortunately, we have some history left to make. Already there is a lot of truth-telling about life and love and growth. There may not be enough truth-telling to change the world, but enough, perhaps, to make some new beginnings.

Starting out right, the sense a man has of having in him the capacity for some rounded perfections, might not prove so misleading. We might discover that our dreams do not lie if we give them no shallow readings, no finite conclusions. A man's feeling of knowing timeless and spaceless realities brings no betrayal to the one who makes no attempt to confine what is forever free.

## CHILDREN

### . . . and Ourselves

#### THE ENGLISH INFANT SCHOOLS

LEICESTERSHIRE is a county in England which is becoming known to American teachers and educators by reason of what seem unique achievements in educational reform. We don't know who first brought the word of what was happening in the Leicestershire Infant Schools to America. Probably there have been several reporters. Our first acquaintance with this development came through reading the article on these schools by Joseph Featherstone, which appeared in the *New Republic* and was reprinted in *Radical School Reform* (Simon & Schuster, edited by Ronald and Beatrice Gross). We now have another account of elementary school education in Leicestershire, this one by Bill Hull, which was published last year as an Occasional Paper as part of the Early Childhood Education Study of the Educational Development Center, 55 Chapel Street, Newton, Mass. 02160 (\$1.00).

Bill Hull will be remembered by readers of John Holt's *How Children Learn*. He is known as "a teacher, a mathematician, a teacher of teachers." A note by the editor says that he first visited the Leicestershire schools in 1961, and has returned there several times since.

In this paper he explores what may be essentially a mystery, and will perhaps remain so, yet his observations are valuable in any case. Leicestershire is a county in England where there are about 250 Primary (Infant and Junior) Schools, with a student population of about 40,000. As he studied what is going on there, two questions became important. Why did it happen in Leicestershire? The other question is, Why hasn't something similar happened in the United States? Bill Hull's answers are probably better than most, although he leaves you wondering.

First of all, what *has* been happening in Leicestershire? Self-reliant learning on the part of

the very young is going on there. He saw children of six and seven working industriously all day, more or less on their own initiative, and sometimes without any supervision. He watched some four hundred children gather for a brief morning assembly without any guidance or policing:

The scene reminded me of an adult audience waiting for the beginning of a concert. When it was time for the assembly to begin, the children, well aware that something was about to happen, stopped talking, though we could not detect the signal to which they were responding—perhaps it was merely that everyone had now arrived. I had never before seen a community of young children behaving with such freedom and self-restraint. They demonstrated an awareness about the group and a sensitivity to it, together with an ability to control their own behavior. I have never come across this combination of characteristics in a comparable group of American children.

Everything about the schools in Leicestershire seems more natural than the familiar scenes in America. The Primary Schools have much in common, Bill Hull thinks, with what Progressive Education started out to be, here, some forty years ago, but did not or could not continue with. He asks:

Why is it that the Primary Schools in Leicestershire have moved forward while so many American schools, including those which once pioneered in Progressive education, have been going in quite a different direction? Part of the answer seems to lie in the widespread revolution in the teaching of Infants, a revolution which is now old enough to have established traditions in many parts of England. The Infant Schools have shared, as have many schools in the United States, in the enlightenment which has come from studies of child development. They have been highly successful in establishing more humane and effective forms of education. The organization of the schools and the age-span encompassed under the term "Infant" are probably important factors. Children are admitted three times a year, near their fifth birthday, but move on into Junior Schools only once a year, in September, near the age of seven and a half. All children, thus, have at least two years of Infant education and many have three years. They will be

exposed over a considerable period of time to a unified pattern of teaching—in some instances they may have the same teacher for all, or most of their Infant School lives. In the United States, of course, children will normally have but one year of kindergarten before first grade intervenes, usually with quite a different set of values and expectations.

The differences between the Infant Schools and our kindergartens extend beyond matters of organization and age-spread. In the best of them children learn to read, write and work with numbers when they are ready. They are not held back and protected from such activities as they so often are in our kindergartens, nor are they coerced, face forward in formal classes, as they are in our first grades. Such flexibility is successful beyond question, whether one judges by the spirit and involvement of the children or by their ability and readiness in dealing with written English or systematic mathematics. In the best Infant classes most children learn to read because reading and writing are part of the atmosphere in the room. If they do not learn readily, however, they are not fussed over or worried about. The result is that Leicestershire Junior schools have few reading problems. We felt, nevertheless, that the technology of some of the work with language could be improved. There was, for example, little opportunity for the children to develop skills in phonetic analysis. But whatever the shortcomings, they are clearly offset by a philosophy and setting which encourages children to learn and gives them the freedom to do so in their own style, at their own pace.

Mr. Hull's speculations concerning why Leicestershire County has been so much of a pioneer in educational innovation are of particular interest. The progress there, he says, is not typical of England in general. It should be realized, when comparing these schools with American schools serving the same age groups, that the Leicestershire schools take all the children in their neighborhoods, including those who come from the low-cost housing developments known as council housing estates with residents who have come there from the slums of the inner city, whereas American teachers active in introducing better methods are familiar mainly with the children of middle- and upper-middle-class families. "The comparisons," Mr. Hull remarks, "are shocking indeed for Americans, and help to

point out the sickness that has been growing in our ambitious, prestige-oriented schools." His explanation of the excellence achieved in Leicestershire involves a curious paradox:

I suspect that we are seeing the direct results of the influence of a small group of people, the County Director of Education, the Advisors for Junior and Infant Schools particularly, but also a number of heads of schools and individual teachers, a group which has worked together informally as well as formally in an atmosphere relatively unaffected by parental concerns and pressures as we know them in our middle-class schools. The lack of involvement of parents in schools seems to be true in England generally, although this pattern is changing slowly. What happens as a result is that changes can be made which do not necessarily accord with over-all public sentiment. Obviously changes can be good or bad, and the lack of contact between parents and school could result in the implementation of poor educational policies. In Leicestershire, however, unusually enlightened and able administrators and advisors were ready and able to encourage the best of what was being accomplished and to introduce far-reaching innovations. The influence of these people appears to have been a major factor leading toward educational reform in County schools.

From one point of view, the most notable single attribute of the Leicestershire schools is that they are not oriented toward grades, tests, and examinations. The primary schools of the County are now under what is known as the Leicestershire Plan, through which the hated eleven-plus examination has been abolished and another secondary school program put into effect. To fail the eleven-plus exam was a kind of academic doom for school children, condemning them to second-rate status. "In the eyes of many segments of society, and too often in their own eyes as well, these children were labeled failures at the age of eleven and a half." One could say that through the beneficent influence of the Infant Schools, gradual reforms have been taking place at the next level of education in the County, showing that the desperate, rat-race mood of aiming all teaching at the passing of tests and examinations is not at all necessary for good work, and that the children learn more things, and more freely, when not

under pressure from their parents or from their own fears. Again, Mr. Hull asks his question:

Why has elementary education in the United States been evolving so differently than it has in Leicestershire? Several factors stand out clearly. First, the impact of Infant School education on teaching at higher age levels in Leicestershire has had no real counterpart in this country. Second, there is a lack of deep dissatisfaction in this country about regressive educational practices which could be identified and modified. Few educators in the United States have yet realized that our nationwide standardized achievement testing program, for example, is exerting the same destructive influence on elementary schools that the eleven-plus examination has had on English Primary schools. We have been too proud of our skill in devising reliable tests to worry much about their validity in terms of any meaningful criteria.

A third factor may have to do with ambition. The pioneers of progressive education were reacting against practices which could readily be improved upon. They did not need to worry in those days about whether their students would be "prepared" for acceptance by the next school in line. Entry into private secondary schools and colleges was largely a matter of ability to pay. Competition for available places and a greatly elaborated testing program have changed this situation radically, and the change has ramifications right down to the kindergarten level. Few school heads have had the perspective and the strength to resist the current pressures. The chief function of our independent schools, and many of our public schools as well, has become that of preparing the child so that he will be accepted at the college of his choice, such acceptance being largely contingent on grades achieved in school and upon the results of competitive nationwide examinations. The progressive education movement in the United States was limited to relatively few schools, most of them attracting middle-class children: Unfortunately, these schools have proved peculiarly susceptible to pressures for achievement.

There is a lot more analysis of this sort in Bill Hull's paper, all pointing to the conclusion that basic cultural reform, not just of the schools, is what needs attention.

## *FRONTIERS*

### The Vitamin "C" Controversy

BOOKS which invite the medical profession to pay some attention to nutrition have never been popular with doctors, although they may gain a large readership among those who, for one reason or another, have become disillusioned with orthodox medicine. When the authors are themselves physicians, it seems to come to them as something of a shock to learn that the profession as a whole is simply not interested in their findings. We think of two excellent books in this category, both by M.D.'s, and both influential except in medical circles. One is *Diet Prevents Polio* by Benjamin Lee Sandler, published in 1951 by the Lee Foundation for Nutritional Research. Dr. Sandler was practicing in a town in North Carolina when a polio epidemic began. He found that if young people would stop eating excessive amounts of starch and sugar, they didn't get polio. With the help of local radio stations and newspaper editors, he launched a diet reform which broke the typical pattern of a polio epidemic in that region. One reason was, he said, that he had been successful in causing "a sharp and significant drop in the sales of soft drinks and ice cream in North Carolina and adjoining states." His findings were published in the January 1941 *American Journal of Pathology*, but have hardly been noticed since. But parents who read his book are in a position to protect their children from polio infection.

The other book is *Low Blood Sugar and You* (Constellation, 1969), by Herman Goodman, M.D., and Carlton Fredericks, Ph.D. This book, one could say, is written especially for Americans, whose diet is heavy in starches and sweets. There is much in it on the tendency to mistake the symptoms of low blood sugar for some form of psychiatric disorder, and again, a shocking account of the failure of the medical profession to take nutrition seriously. Back in 1947, a series of editorials in the *Journal* of the American Medical Association disclosed that nutrition was not then

taught as a separate subject in medical schools. Since the medical students of those days are the medical "authorities" of today, it is perhaps understandable that so much resistance to the findings of nutritionists still persists.

Latest evidence of this resistance appears in the reception accorded Linus Pauling's new book, *Vitamin C and the Common Cold* (W. H. Freeman & Co., San Francisco, \$3.95). Dr. Pauling is probably the most famous living chemist in the United States and perhaps in the world. For most of his life he worked in research and taught at the California Institute of Technology, where he earned his doctorate in 1925. Now professor of chemistry at Stanford University, he was awarded the Nobel Prize in Chemistry in 1954, and another Nobel Prize for his efforts in behalf of world peace in 1962. He is the author of basic texts in his field.

Counselled by a biochemist friend to investigate Vitamin C or ascorbic acid as a remedy for common colds, he put himself on the suggested regimen and experienced a striking decrease in infection and in the severity of the colds he caught. He researched the subject thoroughly and wrote this book. He found that tests of the efficacy of Vitamin C for curing colds were often unreliable because not enough was prescribed to have the desired effect. (A great many other people have found this out, too, simply by personal experiment!) Dr. Pauling reviewed the literature and decided that the small amounts used were basically responsible for the failure to discover the value of Vitamin C in treating colds. He wrote to Albert Szent-Györgyi, who first isolated ascorbic acid, asking his opinion. Dr. Szent-Györgyi replied:

As to ascorbic acid right from the beginning I felt that the medical profession misled the public. If you don't take ascorbic acid with your food you get scurvy, so the medical profession said that if you don't get scurvy you are all right. I think that this is a very grave error. Scurvy is not the first symptom of the deficiency but a pre-mortal syndrome, and for full health you need more, very much more. I am taking,

myself, about 1 g a day. This does not mean that this is really the optimum dose because we do not know what full health really means and how much ascorbic acid you need for it. What I can tell you is that one can take any amount of ascorbic acid without the least danger.

Dr. Pauling attributes medical opposition to taking large amounts of Vitamin C to the general feeling that drugs should be administered in the smallest possible intake; but, he says, ascorbic acid is a *food*, and it is normally present in the human body; it is not an "invader," and it is not toxic. He adds: "Another factor has probably been the lack of interest of the drug companies in a natural substance that is available at a low price and cannot be patented." He contrasts the simplicity and safety of Vitamin C as a remedy with those now on the market:

The drugs that are used in tremendous amounts for treating the common cold, and that are advertised to an irritatingly great extent in television and radio and in newspapers and magazines, are different; they are harmful and dangerous, and are themselves responsible for much illness and many deaths.

Aspirin is the prime example. This drug, which is the chemical substance acetylsalicylic acid, is present in most cold medicines. The fatal dose for an adult is 20 g to 30 g. The ordinary aspirin tablet contains 324 mg (5 grains), hence 60 to 90 tablets can kill an adult, and a smaller amount can kill a child. Aspirin is the most common single poison used by suicides (it is second only to the group of substances used in sleeping pills). About 15 per cent of accidental poisoning deaths of young children are caused by aspirin. Many lives would be saved if the medicine chest contained ascorbic acid in place of aspirin and the other cold medicines.

Readers who are puzzled by the fact that an eminent chemist is arousing so much opposition from established authorities would do well to read two books in connection with Dr. Pauling's volume. One is Thomas Kuhn's *The Structure of Scientific Revolutions* (an MIT paperback), which provides background on how slowly scientific opinion changes, the other, Ralph Nader's Study Group Report on the Food and Drug Administration, *The Chemical Feast*, by James S.

Turner (Grossman paperback). Then, for a very specific discussion of the Vitamin C issue, see Norman Cousins' carefully researched review of the book by Linus Pauling, in which the editor of the *Saturday Review* (May 15) weighs the evidence and urges that Dr. Pauling's findings be taken seriously and that further research be undertaken to determine "what the body's needs are with respect to ascorbic acid, under ordinary and extraordinary circumstances."