

## A QUESTION OF RELEVANCE

TURNING the pages of an issue of the *Ecologist* which came out in the Spring (May-June), we found a report on the departure of Admiral Rickover from the Navy which contained information we hadn't seen. The story began:

The man probably most responsible for the large-scale use of nuclear power in America resigned in January amid bitter words for the program he helped so much to create. Admiral Rickover told members of the Congressional Joint Economic Committee that if he had his hand on the tiller, he would sink the subs he had responsibility for and try to eliminate dependence on nuclear power. Admiral Rickover directed the US nuclear submarine program for 40 years. Commercial nuclear plants were directly adapted from submarine reactor designs, and many leaders of the US nuclear industry learned at his knees and sold their products on the submarine program's experience.

Asked about commercial nuclear power, the retiring admiral told the Joint Committee:

We do not take into account the potential damage the release of radiation may do to future generations. Every time you produce radiation, you produce something that has a life, in some cases for billions of years, and I think the human race is going to wreck itself. It's far more important that we get control of this horrible force and try to eliminate it.

"Put me in charge of it [disarmament], and I'll get you some results," he added. (This, it seems likely, is precisely the reason why younger men with the same outlook never get anywhere near a decision-making role in relation to disarmament.)

The *Ecologist* is a British magazine, and like its American counterpart, *Environment*, it seems to publish mostly horror stories. The reader who, unwarned, picks up either magazine, hoping to find an article about pastoral simplicities and rural delights, or at least a quotation from Thoreau or Aldo Leopold, will usually look in vain for such serene material. Too much is going wrong, the editors would say, for giving precious space to

celebrations of nature. Nature must first be saved from its enemies. People need to be told the truth about our self-destructive course.

Judging from Edward Goldsmith's editorial in this issue of the *Ecologist*—concerned with the effects of pollutants in land, sea, and air, and other both planned and unplanned devastations—the provocations to pessimism are great and increasing. He describes some meetings he attended during the past year—one at Nairobi, two in London. He then says:

All three meetings left me profoundly depressed.

At the UN conference at Stockholm, ten years ago, I remember between two sessions Sir Frank Fraser Darling [eminent British ecologist and economist] sitting by himself on a chair in a corridor adjoining the conference hall. I remember too sitting down next to him and asking him what he thought of the proceedings. He shook his head and looked thoroughly miserable. "We are doomed," he said. At the time, I did not really believe him. Perhaps I was still (relatively) young and naive. Today, after having attended these three meetings, I know that he was right.

What led him to this gloomy conclusion?

It is not so much that we are systematically annihilating life on this planet, but that there is nothing really being done about it, and worse still, nobody cares. "For want of interest, the future has been cancelled," ran the title of Paul Ehrlich's film that appeared about a decade ago.

Indeed, for governments throughout the world, the environment is little more than an embarrassment. Their main preoccupation is to earn the necessary foreign currency required to assure the economic development on which their prestige, power and future must depend. To this end they will sacrifice anything—their forests, their land, their topsoil, not to mention their traditions, their culture, their religion, indeed all that their ancestors, for countless generations held to be most holy.

In short, the governments represented at such conferences refuse to encourage and support the agencies which might be capable of introducing both repair and change. "The behavior of the delegates at Nairobi," Goldsmith says, "faithfully reflected the callous and cynical irresponsibility of the governments they represented." He adds: "Each one of them had undoubtedly received specific instructions to underplay environmental problems in order to justify their government's environmentally destructive policies."

The warnings of the *Ecologist* and *Environment*, while urgent enough, are mild in comparison with the predictions of an American engineer and farmer, John D. Hamaker, who declares in his recent book, *The Survival of Civilization* (Hamaker-Weaver Publishers, Box 1961, Burlingame, Calif. 94010, \$8.00), that present agricultural practices and pollution are adding to the carbon dioxide in the air in amounts sufficient to precipitate another ice age. Hamaker says in his preface:

The increase of carbon dioxide in the atmosphere is man's most urgent problem. In order to save civilization, we will have to take immediate action on a worldwide scale of a magnitude never before undertaken by mankind. *The carbon dioxide curve must be reversed and started downward by about the middle of this decade.* It is so urgent because crop losses due to the carbon dioxide-induced severity of weather conditions are creating a world that has virtually no food surplus for customers who can pay, let alone for those who are hungry and those who are now starving to death.

Hamaker proposes a program to restore to the soil essential minerals on which microorganisms feed, providing fertility. Healthy plant life will absorb carbon dioxide.

Glaciation is nature's way of remineralizing the soil. It occurs automatically because as the plant life dies out for lack of protoplasm, large amounts of carbon move, as carbon dioxide, into the atmosphere. [By a series of complex effects, glaciation is considered to be a result.]. . . There may still be time to prevent the extermination of civilization for another 90,000 years of glaciation—or there may not be sufficient time.

If we are to survive we must remineralize all of the world's soils and double, triple, and quadruple the rate of growth of all plant life. We can then go on a solar energy cycle using food crops and tree crops for producing alcohol and methane and wood as fuels for our energy supply. Only in this way can we hope to reverse the flow of carbon dioxide into the atmosphere and ultimately eliminate the deadly effects of the onset of glaciation.

Hamaker predicts crop failures in the next few years and "calamitous losses" during the last half of the 1980s. Remineralization of the soil, by massive amendments of ground-up rock during "the next six or eight years," similar restoration of the jungle soils, and rapid reduction of carbon dioxide emissions into the atmosphere are required, he says, if humanity is to avoid starvation. In one of his appeals for action Hamaker wrote:

We can commit mass suicide in a number of ways. We can continue to pollute the biosphere with nuclear contaminants. We can do the same thing with non-biodegradable organic compounds. We can push the button on nuclear war. But the quickest and surest way is to fail to remineralize the soil.

There are, of course, differences of opinion among scientists concerning the "greenhouse effect" from additional carbon dioxide in the air. The experts, as a comment by Don Weaver, Hamaker's co-publisher, points out (quoting from *Global 2000*), "are more or less evenly divided over the prospects for warming or cooling, and most felt the highest probability was for no change." Yet under the heading, "Deterioration of Soils," the authors of *Global 2000* say:

. . . Whether the soils of the world will deteriorate further or be reclaimed will depend in large part on the ability and willingness of governments to make politically difficult policy changes. . . . Assuming no policy change—the standard assumption underlying all of the *Global 2000* study projections—significant deteriorations can be anticipated virtually everywhere including in the U.S. Assuming that energy, water, and capital are available, it will be possible for a time to compensate for some of the deterioration by increasing . . . inputs . . . (fertilizers, pesticides, herbicides, etc.), but the projected increases in energy (and chemical fertilizer)

costs will make this approach to offsetting soil losses ever more expensive. Without major policy changes, soil deterioration could significantly interfere with achieving the production levels projected in this Study.

What then would Hamaker have us do? Congress, he says, must take the initiative, and by law put a stop to the increase of carbon dioxide in the air, suspend space exploration, and establish an international coordinating agency to remineralize the soil. "If government," he says, "acts in a way in which it has not performed since World War II, we may be able to effect our survival."

But is there any ground for hoping—to say nothing of expecting—that the U.S. Congress or any government is capable of such undertakings? The question calls to mind the comment of the late Rene Dubos, who had much to do with organizing the huge international conferences held over the years (like the recent one in Nairobi) to deal with contemporary world problems. Dr. Dubos wrote in the Spring *American Scholar* for 1977:

Whatever the subject discussed, the mega-conferences were conducted according to much the same pattern, as if they had to follow a preordained ritual. They began with resounding statements of critical global problems and with a clarion call for international cooperation. As soon as the substantive deliberations began, however, they became platforms for political manifestos that generated intense political controversies. Any concern for concrete problems was hopelessly diluted in a flood of ideological verbiage. Then, in the last hours of the last day of the conference, frantic efforts were made to set down a statement of consensus. The final stage of the ritual was a declaration so broadly and vaguely worded as to save face for all the participants and avoid committing them to a specific course of action.

Why, one wonders, do eminent scientists still attend those conferences? Dr. Dubos decided to stay away from them, and Fraser Darling sat by himself, musing, "We are doomed." Why, finally, instead of telling governments what they "must" do, don't the experts tell the people how foolish it is to rely on governments for any sort of

concerted effort in behalf of the "general welfare," except for making war?

The answer, of course, is self-evident. The experts keep on calling for government action because only government it is believed, has the power to take the steps that need to be taken. Mr. Hamaker, for example, wants the air force to take care of remineralizing the depleted soils beneath the jungles of the world. But as the war in Vietnam showed, the air force is good at defoliation of forests, not helping them to grow. One doesn't need to consult history to know that turning swords into plowshares has never had more than rhetorical appeal.

Isn't it time to stop asking governments to do what they are psychologically unable to do, what they are wholly unprepared for, and what would soon bring them down at the hands of the stubborn and powerful interests entirely devoted to profits "in our time"?

But this question is rhetorical, too. The indifference, wrong-headedness, and downright *guilt* of governments make far too handy a target to be dispensed with. Count the magazines you read or have seen which are devoted to the stupidity, mistakes, crimes, and bad intentions of government: what would the writers have to talk about without this omnipresent scapegoat? Both newspapers and periodicals are filled with melancholy reports on the injustice and pain which results when government cuts off funding for this or that worthy project. Public opinion, as we can see, is wholly adjusted to expecting the exercise of government power for the correction of very nearly all problems human beings face, and while there is growing resistance to this habit of mind, the social and economic processes of the time are so involved in the rules made by government that we can hardly imagine any other sort of life. So, quite naturally, we inform the government of what it must do to ease or save our lives.

It will be pointed out that self-reliance is very fine—doubtless we need more of it—but that today we are confronted by extreme emergencies

which only governments have the power to deal with. That seems true enough. But if, on the evidence assembled—far more than suggested here—governments are either disinclined or unable to marshal their power to meet such emergencies, what then?

There is no answer to this question. None, that is, which seems worth repeating.

Actually, our discussion thus far has been a long interruption of the theme we had planned for this article suggested by a book published in 1955—Kenneth Richmond's *Socrates and the Western World* (Citadel Press). The author finds so many parallels between Socrates' time and ours that his work seemed worth recalling. Athens was then confronted by numerous emergencies. They were, however, social and moral problems, not ecological and planetary.

What could Socrates say to us today? Who would listen to him? Yet Mr. Richmond is persuasive:

Even if there were no better reason for looking upon him as the most significant figure in history . . . Socrates would still single himself out for our attention as the living embodiment of the spirit of his age. That age, like our own, was one of rapid and, in the event, cataclysmic change: an age of threatened values. Religion, culture, society, and government—the whole Athenian way of life—were in the throes of a life-or-death struggle between the forces of a world that was not yet dead and those of one waiting to be born, racked through and through with internal strains and divisions. . . . "Men believed nothing but that nothing was secure." Amid the strife of religious sects and party political cliques and the contradictory opinions of the Sophists, it was difficult to know what to think. . . . Like ourselves, they felt that their traditions had been dangerously undermined and that there was nothing much they could do about it. Like ourselves, they tried to make good their loss by becoming preoccupied with economic and political motives.

It was against this troubled background that Socrates lived and died. On the shifting ground of Athenian democracy he stands out, and stands firm, serenely asserting by his unshakable rationality, as well as by his own faultless conduct, the existence of

those absolute values without which human life must sooner or later relapse into pointlessness. Calm in the midst of all the stormy voices of anarchy, he alone speaks the word which can bring order. To call him, as we have done, the most significant figure in history, may appear to be highly extravagant, seeing that he was himself involved in the general collapse which was to follow and to which he may even be thought to have contributed. Not, however, if we are prepared to go to the heart of the matter and examine the causes, rather than the symptoms, of the disease which was to put an end to the glory that was Greece.

Well, how did Socrates deal with the issue that confronted him at the end of his life? He was, after all, condemned to death, which seems emergency enough. With his friends about him in his last hours, he discoursed on the immortality of the soul. After reviewing various conceptions of the after-life, he said (in the *Phaedo*):

But those who are judged to have lived a life of surpassing holiness—these are they who are released and set free from confinement in these [subterranean] regions of the earth, and passing upward to their pure abode, make their dwelling upon the earth's surface. And of these such as have purified themselves sufficiently by philosophy live thereafter altogether without bodies, and reach habitations even more beautiful, which it is not easy to portray—nor is there time to do so now. . . .

Of course, no reasonable man ought to insist that the facts are exactly as I have described them. But that either this or something very like it is a true account of our souls and their future habitations—since we have clear evidence that the soul is immortal—, this, I think, is both a reasonable contention and a belief worth risking, for the risk is a noble one. . . .

You Simmias and Cebes and the rest, will each make this journey some day in the future, but for me the fated hour, as a tragic character might say, calls even now. In other words, it is about time I took my bath. I prefer to have a bath before drinking the poison, rather than give the women the trouble of washing me when I am dead.

When he had finished speaking, Crito said, Very well, Socrates. But have you no directions for the others or myself about your children or anything else? What can we do to please you best?

Nothing new, Crito, said Socrates, just what I am always telling you. If you look after yourselves, whatever you do will please me and mine and you too, even if you don't agree with me now. On the other hand, if you neglect yourselves and fail to follow the line of life as I have laid it down both now and in the past, however fervently you agree with me now, it will do no good at all.

We shall try our best to do as you say, said Crito. But how shall we bury you?

Any way you like, replied Socrates, that is, if you can catch me and I don't slip through your fingers.

This is quite beautiful, some may say, even moving—but irrelevant to our condition. Is it? It may be irrelevant now—have *become* irrelevant—but was it irrelevant during the years of establishing our present plight? And if it applied then, why not now? Is the noble life of no importance to people who are about to suffer pain, or even death? This is a question those desperately anxious about "survival" might ask themselves. If the world—or the universe, or nature—has reason in its order, then what or who would you say is likely to survive, to be preserved, in a transcendental "economy"? Having an intelligent answer to this question might lead to a way of life that would have left most or all of our desperate emergencies behind. Which, then, has the greater importance—the life or the emergency?

## *REVIEW*

### AFRICAN PAIN

No one who has read something by Alan Paton—starting with, say, *Cry the Beloved Country* (1948)—will want to miss his latest book, *Ah, But Your Land Is Beautiful* (Scribners, 1981), a documentary novel which continues his lover's quarrel with South Africa. He brings the meaning and quality of one sort of religion to bear on the practices of another sort of religion, that of the Dutch Reformed Church of the people descended from the Boers. Raised in a Christadelphian (Christian pacifist) household, Paton, while freeing his mind of unacceptable dogmas, has remained a patient but determined non-violent human. He began his adult life (as he relates in *Towards the Mountain*) as a teacher, serving as principal of a reformatory for black boys under eighteen. He changed the place from a prison to a school. Meanwhile the South African policy of *apartheid* (separation of the races) was growing stronger, and during a visit to the United States (to study prison and reformatory systems) he was overtaken by an overwhelming compulsion to write. *Cry, the Beloved Country* was the result, and its immediate and lasting success gave him independence to continue his work in behalf of racial justice in South Africa. He founded the Liberal Party, later banned by the government.

*Ah, But Your Land Is Beautiful* records the words of South African politicians, bureaucrats, policemen; of Anglican clergymen and laymen; of Black people and Indians. All classes and all opinions are represented. Both good and bad consciences find expression, along with agonies of soul. The bad consciences recite the elements of what they have been taught, the good cry out with pain. There are heroes, semi-heroes, conformists and blackguards who play parts in the story, with continuity and context provided by the author, who speaks as a Greek Chorus. As in the following:

Ah, but your land is beautiful. That's what they say, the visitors, the Scandinavians and the Germans

and the British and the Americans. They go to see the Cape that is the fairest in the whole circumference of the earth, and Groot Constantia and the vineyards. They travel over the plains of the Karoo, bounded everywhere by distant mountains. They go down over the great wall of the Drakensberg, into the green hills and valleys of Natal. And if they are fortunate, they take the journey from Johannesburg to Zululand and pass through some of the richest maizelands in the world.

Some visitors are more inquisitive than others. They poke their noses—one is sorry one cannot use nicer language—into District Six and Orlando and New Brighton. They even go to the courts, to see Mrs. Katlana fined ten pounds for going to church without her reference book, and to see Mr. Tsoeli fined ten pounds for sitting on the roadside outside his employer's house without his reference book. He told the police that the book was in his quarters, and he could get it in a minute, but the police said that they were not interested. These things are very unfortunate, but surely when South Africans visit Stockholm or Washington, they don't go poking their noses into the courts.

Ah, but the land is beautiful. It is the land where Sister Aidan [who cared for the black sick in an urban area] met her unspeakable death [by burning in her overturned car, set on fire by an angry mob], and fourteen-year-old Johnnie Reynders hanged himself in his bedroom because the white school had turned him away, although his brothers and sisters had been there before him. It is also the land where white fisherman Koos Karelse of Knysna jumped overboard to save the life of black fisherman James Mapikela; the black life was saved and the white life was lost.

There is talk of another land too, where the tears have been wiped from every eye, and there is no more death, neither sorrow nor crying, nor any more pain, because all those things have passed away. But here in the land that is so beautiful, they have not passed away.

*Apartheid* is claimed by the spokesmen for South Africa to be even-handed justice, by Old Testament decree. A newly elected Premier in Alan Paton's story declares, "If meddling people keep their hands off us, we shall in a just way such as behooves a Christian nation work out solutions in the finest detail and carry them out. We shall provide all our races with happiness and

prosperity." This is to be accomplished by shutting the black off, apart, now and forever, while saying, "We mean nothing evil toward you." Thus will come South Africa's Golden Age.

The story is set in the years from 1952 to 1958, the time of the Group Areas Act, which made many Indians homeless and with similar injustice to those of mixed race called "Coloured." Some of the characters are real, some fictional. One of the former who figures throughout the story is Chief Albert Luthuli, winner of the 1960 Nobel Peace Prize, another man who began life as a school teacher, then was elected as a local chief, and in 1959 became president of the African National Congress (banned in 1960). By reason of the frequent presence of (Ex) Chief Luthuli in the pages of Alan Paton's book, we went back to Luthuli's autobiography, *Let My People Go* (McGraw-Hill, 1962). Born a little before 1900, Luthuli was brought up in northern Natal under the influence of Seventh Day Adventist missionaries, making him a pacifist and a Christian who took religion seriously. Later he was confirmed in the Methodist Church and became a lay preacher. Of his education, he said,

I have been taught by European mentors. I am aware of a profound gratitude for what I have learned. I remain an African. I think as an African, I act as an African, and as an African I worship the God whose children we all are.

In 1960 Albert Luthuli burned his Reference (Pass) Book as part of a campaign sponsored by the African National Congress. Twenty thousand Africans were arrested, Luthuli among them. At the time of his sentencing he had prepared a statement (not read) concerning the infamy of the pass laws, in which he said:

What I did, I did because I, together with the overwhelming majority of my people, condemn the pass system as the cause of much evil and suffering among us. We charge that it is nothing less than an instrument of studied degradation and humiliation of us as a people, a badge of slavery, a weapon used by the authorities to keep us in a position of inferiority. . . . Can anyone who has not gone through it possibly imagine what has happened when they read in the

Press of a routine police announcement that there has been a pass raid in a location? The fear of a loud, rude bang on the door in the middle of the night, the bitter humiliation of an undignified search, the shame of husband and wife being huddled out of bed in front of their children by the police and taken off to the police cell. . . .

If there is a law in any country in the whole wide world which makes it a crime in many instances for husband and wife to live together, which separates eighteen-year-olds from their parents, I have yet to learn of it. But the pass does so in the Union of South Africa.

Each year half a million of my people are arrested under the pass laws. Government Annual Reports tell of this tragic story. But statistics can tell only half the tale. The physical act of arrest and detention with the consequence of a broken home, a lost job, a loss of earnings, is only part of this grim picture. The deep humiliation felt by a black man, whether he be a labourer, an advocate, a nurse, a teacher or a professor or even a minister of religion when, over and over again, he hears the shout, "Kaffir, where is your pass?" fills in the rest of this grim picture.

In *The Dark Eye in Africa*, Laurens van der Post shows in what sense the race issue in South Africa is a religious phenomenon. His book reveals what belief in the claim of superior and inferior races does to human character and social order. Alan Paton's book gives insight into the resulting brutalization of white people. Luthuli's book is the work of an African Christian who tells of the struggle of black people to resist their degradation in the name of Christian dogma.

Still another perspective is provided by a book that has just come out in this country—*An Open Path* (Ross-Erikson, Santa Barbara, Calif., 1982, \$10.95), by Jack Beeching—a study of the lives, activities, and fortunes of Christian Missionaries from 1515 to 1914. The chapter on Africa begins:

The Dutch had maintained a station at the Cape of Good Hope since 1632 for their East Indiamen, and this the British took over in 1795, after the Low Countries had been occupied by a revolutionary French army. There were by this time 21,000 people living at the Cape, of Dutch or Huguenot descent, most

of them farmers providing victuals for passing ships: they were the Boers.

Marriages at the Cape between white and black had been acceptable in the seventeenth century, provided that both partners were church members. But by this time, half the people living in Cape Town were slaves, and almost all children born there to slave women were illegitimate. Fear bred prejudices, and prejudice fear: the penalty accorded by the Dutch code to a slave who raised a hand against his master was death by slow strangulation, impalement, or breaking on a wheel.

At the beginning of the nineteenth century—

Out in the country, most slaves were Hottentots kidnapped young and put to forced labor as cattlemen. As well as trying either to enslave or wipe out the Hottentots— the black people who were occupying South Africa when they themselves arrived there—the Boers were also obliged to carry on a running warfare with tribes of cattle-raising Bantu, whom they called Kaffirs, and who pressed down on them from the north-west. Kaffirs and Boers competed along the disputed border for water and grazing.

However, by 1809 the Hottentots were beginning to learn to read and write, and they started a library at Bethelsdorp. But then came another sort of trouble:

The law passed in the British Parliament in 1807 making the trade in slaves illegal was applied also in South Africa. This meant that Boer farmers could no longer recruit their herdsmen by the cheap and expeditious method of kidnapping them. But Hottentots must somehow be compelled to go to work on Boer farms, so the Pass Laws were invented. When moving from place to place, a Hottentot not carrying a certificate could at once be put to forced labor.

The Old Testament sanctions for these practices remain obscure.

Of the Beeching book, we should add that the writer is concerned with the best of the missionaries, not the worst, and provides a sympathetic account of many of their labors.



## *COMMENTARY* HABITS AND ATTITUDES

THE Summer issue of *California Tomorrow* would be a good one to read, for everyone interested in the efforts of people to control their future. It is published by an organization of the same name which came into being twenty years ago, announcing its presence with a report, *California Going, Going*, warning that the people of the state "were needlessly abusing their land, water, and air (and themselves)." Then, in 1972, one of the founders, Alfred Heller, offered the *California Tomorrow Plan*, which was both visionary and practical—practical enough to be still used as a university text. Now the members of the organization propose the California 2000 Project: To husband the land, make good use of available water, conserve energy, restore environmental quality, and protect human dignity. "These goals," it is said, "cannot be achieved by technical solutions or political solutions alone. In order to bring about the positive changes the goals imply, we, as individuals, will have to alter our habits and attitudes profoundly."

Well, if you stand around for a while in a movie theater lobby, ride a bus, or drive along Pacific Coast Highway, noticing what people seem interested in, you wonder how to go about altering "habits and attitudes." It seems fair to say that publishing a quarterly like *California Tomorrow* is one way. Another way is by planting trees where trees are most needed—in both the mountains where they are dying from smog and cities where the sterile streets need to be more than channels for hurrying vehicles. Magazines spread ideas. Groups like the TreePeople are actively organizing, planning and doing tree-planting on the streets of Los Angeles.

Students and the retired may join California Tomorrow (and receive the quarterly) for \$15 a year, others for \$25. The address is Monadnock Building, 681 Market Street, Suite 963, San Francisco, Calif. 94105. TreePeople are at 12601

Mulholland Drive, Beverly Hills, Calif. 90210, and what you do for and with them is plant trees. One can also subscribe to the *Seedling News*—to find out why, when, how, and where to plant—by becoming a member of the TreePeople: \$25 a year.

## CHILDREN

### ... and Ourselves

#### WHAT IS (THE) MATTER?

THE business of education, it is commonly assumed, is to tell the young what has been settled about the world we live in, and what has been found out about its inhabitants including ourselves. This transmission of facts is supposed to equip the coming generation for "life." Periodically, however, critics and ordinary people decide that the supposition is not supported by experience. Arguing from science, or religion, or common sense, they propose major changes.

It follows that most generalizations about proper education are likely to be false. That is to say, whatever is declared will, sooner or later, have to be revised. But perhaps *this* will be the surviving generalization—that the revision will go on forever. If, then, we explain this to the young, we at least won't make any irreversible mistakes. But won't that unsettle their minds? The answer is yes, with the comment that the only real failure of education is a settled mind.

But aren't there *some* things that we know to be true, and shouldn't these be taught with confidence? Well, yes. Arithmetic might be an example. Then there's gravitation, and similar laws of nature. And language. We *have* to teach that! Even if John Holt and Ivan Illich dispute that language needs to be taught, maintaining that speech is something that comes naturally around the home and may be spoiled or academicized by schooling, you would certainly need a teacher to learn Chinese.

But this argument may be beside the important point, which is that after you have learned the facts of contemporary belief, there is still the question of their meaning. A would-be teacher needs to ask himself: What unwarranted assumptions about meaning have crept into the account of the facts of life that we transmit to the young? Consider, for example, the claims of Comenius, seventeenth-century reformer of education, who is still sometimes referred to with respect. The title of his major work seems a sufficient summary of his assumptions. Published in 1657, it was called—

*The Great Didactic, Setting forth the whole art of Teaching of All Things to all Men, or A Certain Inducement to found such Schools in all the Parishes, Towns, and Villages of every Christian Kingdom, that the entire Youth of both Sexes, none being excepted, shall Quickly, Pleasantly, and Thoroughly Become learned in the Sciences, pure in Morals trained to Piety, and in this manner instructed in all things necessary for the present and future life.*

This authoritative statement (*mutatis mutandis*) became the blueprint for organized education. Commenting on Comenius in the *Teachers College Record* (December, 1971), Robert McClintock said:

He . . . set forth the techniques and principles by means of which teachers were to impart knowledge, virtue, and faith to empty minds "with such certainty that the desired result must of necessity follow." . . . Here is the basis for our cult of the degree; and Comenius' faith in the power of the school has no bounds: he even suggested that had there been a better school in Paradise, Eve would not have made her sore mistake, for she "would have known that the serpent is unable to speak, and that there must therefore have been some deceit." . . .

After noting that all "the basic concerns of modern Western education were adumbrated in *The Great Didactic*," Prof. McClintock turns to our own time:

Whatever the rationale behind it, the principle of compulsory schooling automatically puts the student in a subservient relation to his teachers, and it became most difficult to maintain the conviction that the student provides the motive force of the whole process. The principle of compulsion proclaimed to each and every person that there was something essential that he must allow one or another school to do to him between the ages of six and sixteen.

Well, suppose someone asked you to teach "science" in the grades or high school, and you decided to try to do it right: how would you prepare? There are good current examples of what some teachers confronted by this opportunity have done (Roger Jones's *Physics as Metaphor*, Minnesota University Press, 1982, is one report), but a book first published in the nineteenth century (1892) might be the best place to begin, simply for the reason that there have been so many changes in scientific theory since that time. We are speaking of Karl Pearson's

*The Grammar of Science*, still a very good book to read, mainly because it is a treatise on how, rather than what, we know, or think we know. Since "Matter" is what modern learning identifies as Reality, we turn to Pearson's chapter on this subject, which begins:

An old Greek philosopher, who lived perhaps some 500 years B.C., chose as the dictum in which he summed up his teaching the phrase: "*All things flow.*" After-ages, not understanding what Heraclitus meant—it is doubtful whether he understood himself—dubbed him "Heraclitus the Obscure." But today we find modern science almost repeating Heraclitus's dictum when it says: "*All things are in motion.*" Like all dicta which briefly resume wide truths, this dictum of modern science requires expanding and explaining if it is not to be misinterpreted. By the words "All things are in motion" we are to understand that, step by step, science has found it possible to describe our experience of perceptual change by types of relative motion; this motion being that of the ideal points, the ideal rigid bodies, or the ideal strainable media which stand for us as the signs or symbols of the real world of sense impressions. . . . the "motion of bodies" is not a reality of perception, but is the conceptual manner in which we represent this mode of perception and by aid of which we describe changes in groups of sense-impressions; the perceptual reality is the complexity and variety of the sense-impressions which crowd into the telephonic brain-exchange. . . .

Wherein lies the advance from Heraclitus to the modern scientist? Why was the dictum of one not unjustly termed obscure, while the other claims—and rightly claims—to find in the development of his dictum the sole basis for our knowledge of the physical universe? The difference lies in this: Heraclitus left his flow undescribed and unmeasured while modern science devotes its best energies to the accurate investigation and analysis of each and every type of motion. . . . The whole object of physical science is the discovery of ideal elementary motions which will enable us to describe in the simplest language the widest ranges of phenomena; it lies in the symbolization of the physical universe by the aid of the geometrical motions of a group of geometrical forms. To do this is to construct the world mechanically; but this mechanism, be it noted, is a product of conception and does not lie in our perceptions themselves. . . . Yet so far as our *sensible* experience goes, these geometrical ideals have no phenomenal existence! We have clearly, then, no

right to infer as a basis of perception things which our whole experience up to the present shows us exist solely in the field of conception. It is absolutely illogical to fill up a void in our perceptual experience by projecting into it a load of conceptions utterly unlike the adjacent perceptual strata.

In short, we don't really know what matter *is*, and perhaps cannot ever know. Science is concerned with what is knowable about what it studies—what matter does—but not why. The value of the knowable behavior of matter is obvious enough.

A second book we might go to—for science in our own time—is Erwin Schrodinger's *What Is Life?* in the Anchor edition which includes the essay, "Our Conception of Matter." He begins by declaring that modern physicists no longer distinguish between matter and "something else." The subject of matter, therefore, includes "the total picture of space-time reality as envisaged by physics." Seventeen pages later he concludes:

If you finally ask me: Well, what are these corpuscles really, these atoms and molecules?—I must confess honestly I know the answer just as little as I know where Sancho Panza's second donkey came from. . . . at the most, it may be permissible to think of them as more or less temporary entities within the wave field, whose form (Gestalt), though, and structural manifold in the widest sense, ever repeating themselves in the same manner, are so clearly and sharply determined by the wave laws that many processes take place *as if* those temporary entities were substantial permanent beings. Mass and charge of the particles, defined with such precision, must then be counted among the *structural* elements determined by the wave laws.

These isolated quotations may have the misleading effect of giving science short shrift. Reading the books has an opposite effect. Very few works generate the respect for scientific inquiry and scientific minds that results from study of thinkers like Karl Pearson and Erwin Schrodinger.

## *FRONTIERS*

### A Relevant Comparison

THERE is a curious parallel between the problems of India and the problems of the United States. For a characterization of India's problems, we turn to an interview with Dwarko Sundarani, a Sarvodaya worker and Gandhian educator who has been developing schools for the children of Bihar since 1954. The editor of *Resurgence* (July/August), Satish Kumar, asked him about his work in the villages. Sundarani replied:

Even the government admits that after 35 years of Independence, the rich have become richer, the poor have become poorer. This is not the fault of this person or that person. It is not the fault of this party or that party, this government or that government. The main problem of India is poverty and ignorance. Because of poverty there is ignorance and because of ignorance there is poverty. Government started community development projects to fight against poverty. They started an education department to work against ignorance. But the number of illiterates and the number of poor has increased. The problem was that we did not change our education system.

I will tell you an interesting story: On the first day of Independence, the fifteenth of August, 1947, it was resolved all over the country to hoist the national flag instead of the Union Jack. Vinoba was the chief guest of the function of Wardha [center of Gandhian education]. When Vinoba signalled with his hand the Union Jack was lowered and the national flag was hoisted. Then Vinoba stood up and said: "I will give a speech, but first I want permission from you that for five minutes we are to lower the national flag and hoist the Union Jack." So people said he was a crazy man. "How can you hoist the Union Jack?" "For five minutes only," Vinoba said. "Then I shall lower the Union Jack and hoist the national flag again." People said, "No, no, how can you hoist the Union Jack now?" He said, "O.K. I understand that you are not now ready, because this is the Indian nation now, a free nation, and you are not ready to tolerate the Union Jack even for five minutes. Now I want to appeal to the country and its leaders, that as we cannot tolerate the British flag we should not tolerate the British Education system in India. From tomorrow morning, all the schools, colleges, universities, must be closed. We should sit down together and decide the new education system. If for

a year or two the schools and colleges are closed it will do no harm. We must have our own education."

But this was not done. From the president, and the prime minister, to the common man, everybody condemns this education but nobody has the courage to change it. Now I say that we have to find an education system that solves ignorance and poverty simultaneously. For that reason we have made our schools a medium of village development. And we are giving education through development and work. This is called Basic Education.

Sundarani is speaking of the work pioneered by his school, Samanvaya Vidyapith, where Gandhi's conceptions are put into practice work combined with learning, helping to make the school self-sufficient. (This school was described at length in *MANAS* for Jan. 6, 1971.) Today, in an area where land was regarded as non-productive, there are dozens of villages growing out of Sundarani's project. "We take," he said, "all the children in a village. We have thirteen villages where we have schools and 95% of the children come to our schools." They start at five and work and study for twelve years. "After that they marry and go to the village as a family. So our school is the center of development, we work with the parents and we work with the children."

But India is a country of hundreds of thousands of villages, where 80 per cent of the people live. Basic Education is a program for decades and centuries.

In the United States, you could say, the problem is affluence and ignorance. In a talk she gave late in 1980, Joan Gussow, who teaches nutrition at Columbia University and heads the Teachers College program in nutrition, made this plain. Our present methods of food production and processing are heading toward disaster—in the name of scientific progress and technological magic. "It seems clear to me," she said, "that if we go on as we are, we shall by the year 2000 be wondering as a nation whether to bankrupt ourselves importing food or oil (assuming that somewhere in the world someone will have both for sale at a price we can afford) and that as

individuals we shall be scrabbling to find enough affordable food to eat." After years of study of food production and distribution in America, she concluded:

These efforts have led me to the conclusion that the food future we face—whatever we do—is going to be considerably different from the food past and considerably different from the effortless technological nirvana implied by the present direction of food supply. . . . The simple fact is that those persons who are seriously attending to the interface between the environment and the food supply are convinced, as are my students, that Business-as-Usual *will* lead to disaster. But I see no evidence that those of us who are educators are making serious attempts to help either our students or the eating public understand that fact. . . .

I had the experience, recently, of sitting around a table with a group of nutrition people who were discussing educational programs. None of the people around that table—with the possible exception of one fellow backyard gardener—could understand how growing vegetables might have anything to do with nutrition education. I would suggest to you that in the coming decades, knowing how to grow vegetables may have everything to do with having fresh produce to eat and that, alas, more ordinary people than nutrition professionals understand (and are acting on) that fact.

Our system, in short, is manufacturing ignorance, and we have embraced our ignorance as scientific progress. Mrs. Gussow says:

We have "bought into" progress now for generations, assuming it could only take us in one direction—toward less and less personal effort in the maintenance of our own food supply, in the maintenance of our own homes and families. The most eloquent statement I know about this sort of progress has been made by a poet and a farmer Wendell Berry, who has pointed out that while our slide into dependency has been easy, it had a cost. "We can simplify our minds and culture only at the cost of an oppressive social and mechanical complexity," Berry has written. "We can simplify our society—that is, make ourselves free—only by undertaking tasks of great mental and cultural complexity." To move toward such mental and cultural complexity is progress. To grow 85 per cent of our tomatoes in California is not progress—it is folly. . . . To what extent is the fact that the home no

longer produces anything the culture considers worth paying for (and hence, *valuing*) but counts merely as a consuming unit, a contributor to the home's decay?

In the Indian villages, the barrier to development and education is the apathy and hopelessness resulting from poverty. In America the barrier is a shallow and ephemeral prosperity and its accompanying conceit. The common denominator is ignorance. Which country, one may wonder, has the greater problem?