

MORAL DEVELOPMENT AND EDUCATION

IN his seventh epistle, to the friends and companions of Dion of Syracuse, Plato explained why, in his youth, he gave up his active interest in politics and the attempt to take part in government. He found politics hopelessly corrupt and determined to spend his life in an inquiry into the best philosophy for ordering human affairs, and then into education of the young in that philosophy. By this means he hoped to alter both the ideas and the ways of the people of his time, so that, eventually, they might originate a truly good community. The fruit of Plato's effort may be briefly indicated by the remark of Alfred North Whitehead to the effect that all subsequent philosophy has been but footnotes to Plato. It is notable that he not only taught men how to think, but how to think nobly. The keynote of Plato's philosophy is found in the question: Can virtue be taught? His dialogues revolve around this question.

There is ample evidence that today this Platonic—or basically human—inquiry needs to be deliberately renewed. Some quotations will make this clear. First, then, from the humanistic psychologist, A. H. Maslow:

The state of valuelessness has been variously described as anomie, amorality, anhedonia, rootlessness, emptiness, hopelessness, the lack of something to believe in and to be devoted to. . . . We too are in an interregnum between old value systems that have not worked and new ones not yet born. . . . We need a validated, usable system of values, values that we can believe in and devote ourselves to because they are true rather than because we are *exhorted* to "believe and have faith."

Next, from Louis Halle's *The Search for an Eternal Norm*:

What is basic to human life, as distinct from all other life, is a discrepancy between a normative order in men's minds and the existential circumstances in which they actually find themselves. . . . When it

comes to conduct that is not purely instinctive, each of us has to have a normative order in his mind on which to base it. He has no other way of deciding what he ought to do and how he ought to do it.

Then, Bruno Bettelheim in *Harper's* for last October:

What our society suffers from most today is the absence of consensus about what it and life in it ought to be. Such consensus cannot be gained from society's present stage or from fantasies about what it ought to be. For that, the present is too close and too diversified, and the future too uncertain, to make believable claims about it.

From Wrich Kahler's *Out of the Labyrinth*:

Entangled in such gigantic mass relationships, the individual sinks into hopeless insignificance, impotence and ignorance. . . . Through the rapid communication and interaction of events, everything occurs much faster than before. . . . Who can be aware and keep abreast of all this? . . . What single man, even in our governments and parliaments, has a comprehensive view even of the momentary situation, let alone of what is looming up from the depth and breadth of daily events to form the future? . . .

This trend implies a decline of morals, a moral degeneration. For morality is nothing else but the attitude toward the whole—positive or negative, furthering or hindering and disturbing. When knowledge of and orientation in the whole are no longer possible, then the individual must, in his consternation, be carried away by the nearest wave of impulse or opportunity. To whomever human history and events are no longer a living whole and a oneness, to him the brotherhood of man cannot have any meaning.

Finally, from a great educator, Arthur Morgan:

In a country like the United States, there has been a truce among competitive theologies, resulting in tacit agreement that "the church" shall convey "the meaning of life" as determined by tradition, while public education shall instruct in practical ways and means. This cultural failure to relate ends and means has meant uncritical reliance on biological drives,

emergence of vacuum-filling cultural tendencies, and acceptance of residues of traditional belief—a policy of drift balanced somewhat by free, critical inquiry. But unless strong concern for purpose and significance introduces an ordering principle for both life and education, sustained effort will be lacking, and there will be a tendency to lapse into biological hedonism.

In our skeptical yet morally hungry age, certain questions need immediate answer. What, for one, does "moral" mean? Can there be moral standards which are more than the customs which vary around the world? How would it be possible to teach morals without "indoctrination"? Can, indeed, morality be taught at all? What has science to say about this idea? Can science contribute, or should it remain silent because morals are outside the ranges of competent scientific method?

Fortunately, there is now a book which examines and develops all these questions. It does not settle them, but shows what may be involved in obtaining acceptable answers, and evaluates the various conclusions that have been reached and the means of reaching them. This book is the first in a series of three volumes called *Essays in Moral Development*, of which volume I is titled *The Philosophy of Moral Development*. The author is Lawrence Kohlberg, professor of psychology in the graduate school of education at Harvard University. Kohlberg has been working on the theme of this series of books for about twenty years, starting in 1958 with a study of seventy-five boys in a school in Chicago, tracing their "moral development" over a period of twelve years, from the time they were ten to sixteen years old to when they were from twenty-two to twenty-eight. His fundamental conclusion, later confirmed by research with other children in other cultures, is that these youngsters went through six developmental stages of moral attitude—changes which he speaks of as "natural," although not inevitable. Not all reach the higher stages.

This book is considerably more than an account of the twelve-year experiment with some

schoolboys. The author engages in justification of the theory of moral development and debates extensively with his critics in academic terms. All this is no doubt necessary—in order to wear away at scholarly prejudice and to expose the futility of value-free science in relation to human beings—yet one cannot help wishing that the author would provide a simple, affirmative account of his thinking, with the general public for his audience. (Perhaps this will come later.) Meanwhile, Dr. Kohlberg is openly Platonic and his education and lifework have fitted him to introduce the idea of a morality such as Maslow described—"a validated, usable system of values, values that we can believe in and devote ourselves to because they are true rather than because we are *exhorted* to 'believe and have faith'."

Following Plato, Kohlberg's conception of moral values or principles is both intuitively and rationally grounded, and he believes that the scientific spirit is essential in verifying intuition in experience. He ends his preface:

This is not the first time in which the weakening of traditional morality has led to serious dialogue about moral education. The first time was the Athens of Socrates, Plato, and Aristotle. I hope that these volumes serve some purpose in reviving the dialogue in contemporary North America and Great Britain.

In his introductory chapter, Dr. Kohlberg adopts "the implications of Socratic dialogue as an approach to moral education":

Socrates was not impelled only by an "inquiry learning" approach to values. For him, Socratic dialogues rested on a sense of some personal virtue in himself that was displayed not by preaching but by implicit convictions of belief and action. These convictions were:

- *First*, virtue is ultimately one, not many, and it is always the same ideal form regardless of climate or culture.
- *Second*, the name of this ideal form is justice.
- *Third*, not only is the good one, but virtue is knowledge of the good. He who knows the good chooses the good.

- *Fourth*, the kind of knowledge of the good that is virtue is philosophical knowledge or intuition of the ideal form of the good, not correct opinion or acceptance of conventional beliefs.
- *Fifth*, the good can then be taught, but its teachers must in a certain sense be philosopher-kings.
- *Sixth*, the reason the good can be taught is because we know it all along dimly or at a low level and its teaching is more a calling out than an instruction.
- *Seventh*, the reason we think the good cannot be taught is because the same good is known differently at different levels and direct instruction cannot take place across levels.
- *Eighth*, then the teaching of virtue is the asking of questions and the pointing the way, not the giving of answers. Moral education is the leading of people upward, not the putting into the mind of knowledge that was not there before.

If *justice* is to be taken as the basis of all moral thinking, then what is Justice? Kohler gives a discussion-definition:

I appeal to the reader's intuitions by discussing dilemmas in which there is a conflict between the principle of utility as the greatest good for the greatest number and the principle of justice as respect for individual human dignity. I claim that justice as reversibility (moral musical chairs) resolves these dilemmas by recognizing utility within a framework of respect for individual dignity expressed as the willingness to trade places with others, that is, the Golden Rule.

We might expand on this by suggesting that justice means supplying, as best we know, the sort of experience each one needs in order to learn or grow. Since actual justice remains obscure, the intent to do this sort of justice is about all we can hope to achieve. Yet the intent, even if imperfectly carried out, may accomplish more than we think. Humans are at least able to understand and appreciate the attempt to do justice, if it is truly sincere. Plato believed that to be treated like humans, fairly, is all that anyone

with his own instinct for justice is likely to ask. This is the "reversibility" Kohlberg speaks of.

He begins the chapter on moral education—for "justice"—by comparing the Socratic approach with that of two schools of modern psychologists:

It is usually supposed that psychology contributes to moral education by telling us appropriate methods of moral teaching and learning. A Skinnerian will speak of proper schedules of reinforcement in moral learning, a Freudian will speak of the importance of the balance of parental love and firmness that will promote superego identification, and so on. When Skinnerians or Freudians speak on the topic of moral education, then, they start by answering yes to Meno's question, "Is virtue something that can be taught?" and go on to tell us how. In *Walden Two*, Skinner not only tells us that virtue comes by practice and reinforcement but also designs an ideal republic that educates all its children to be virtuous in this way.

My own response to these questions was more modest. When confronted by a group of parents who asked me, "How can we help make our children virtuous?" I had to answer, as did Socrates, "You must think I am very fortunate to know how virtue is acquired. The fact is that, far from knowing whether it can be taught, I have no idea what virtue really is." Like most psychologists, I knew that science could teach me nothing as to what virtue is. Science could speak about causal relations, about the relations of means to end, but it could not speak about ends or values themselves. If I could not define virtue or the ends of moral education, could I really offer advice as to the means by which virtue should be taught? Could it really be argued that the means for teaching obedience to authority are the same as the means for teaching freedom of moral opinion, that the means for teaching altruism are the same as the means for teaching competitive striving, that the making of a good storm trooper involves the same procedures as the making of a philosopher-king?

This indeed, is the core problem for one who contemplates the project of moral education.

Dr. Kohlberg seems to have been able to extricate himself from this dilemma after encountering the *fact* of the stages of moral development in the population of boys. There are three main stages, each divided into two, making six, with possibly a transcendent seventh. The

three are called Preconventional, Conventional, and Postconventional. The other three are intermediate or halfstep transitional stages.

One could think of these stages as each embodying one set of ideas about the locus of power, and about the authority which defines obligation. Where is the power or authority to which one must answer? Is it inside or outside the self? At the preconventional stage, it is always outside. You do what you ought to do because God says so. You are subject to Divine Command, and you'd better not try to *reason* about it—as Galileo was angrily instructed by the Pope and the Inquisition. You do what you do to avoid pain and enjoy pleasure, and to get what you need. In this sense, plain power from the outside runs your life, dictating moral decision. I do what is right because I'll be whipped if I don't. If I please my friends, they'll be nice to me.

At the conventional level there is a kind of generalized projection of good/bad categories of behavior, requiring conformity and loyalty to the expectations of the group. "Right behavior consists of doing one's duty, showing respect for authority, and maintaining the given social order for its own sake."

Stages five and six belong to the postconventional level. Here the movement is toward principled decision with reference to moral ideas. Constitutional government illustrates this level, with emphasis on the "legal point of view." The obligation is to the law, although the law may be improved upon through inspection of its working in terms of social utility.

Stage six recognizes in Conscience a higher authority than man-made laws, and the principles of behavior here are self-chosen, independent of external claims.

Tentatively proposed is a seventh stage, where conduct has a religious quality or sanction. For illustration Kohlberg offers Marcus Aurelius:

We choose him partly because he is outside the Judeo-Christian tradition, which helps define

universals in religious thinking. And we choose him partly because in the world of the Roman empire, in which absolute power corrupted absolutely, this man with absolute power was the only man who was absolutely incorruptible, absolutely principled. In days that at times seem like the decline of the American empire, in which there are so many examples of power corrupting, we need to look at universal foundations of integrity.

Marcus starts with the conviction that the universe is "lawful, knowable, and evolving," and he does not separate God from Nature. He said in his *Meditations*:

You yourself are part of that universe. Remember always what world-nature is and what your own nature is and that your nature is such a small fraction of so vast a whole. Then you will recognize that no man can hinder you from conforming each word and deed to that nature of which you are a part.

In short, by thinking like the universe we become moral. In stating this cosmic perspective, Dr. Kohlberg proposes, Marcus Aurelius "succeeds in illuminating how, in any culture, a person without special gifts or inner light, but with the courage and thoughtfulness to think through the human condition, can achieve moral and spiritual maturity." Spinoza, another example of the seventh stage, declares that moral achievement or wisdom or love "involves the discovery of the union of the mind with the whole of nature." Kohlberg comments:

The pains of life are caused by the disappointments or losses in our loves of particular people or aims. But if we are aware of the relationship of all people and all things to the whole of Nature or to God, then we continue to love the whole in spite of the disappointments or losses. And if we love life or nature, we are even able to face our own death with equanimity, because we love life more than our own particular and finite life. The demand for our survival can be met only by identification or union with something more eternal. The knowledge of, and love of, Nature or God are a form of union. In a sense, half-poetic, half-logical, but never supernatural, our mind is part of a whole, Spinoza claims, and if we know and love the eternal we ourselves are in some sense eternal.

It is needful to go from these sublime considerations—which are nonetheless necessary as foundation for the structural development of Dr. Kohlberg's thesis—to the lower levels where most of us live. It was here, and especially in the transition stages, that the psychologist saw the boys he was studying—and later many other subjects—*move*, however uncertainly, from one stage to the next. The progressive development in moral attitude was so clear, and repeated so many times, that it became for him a scientific fact. This, he says, is the natural role of science in such studies. It provides confirmatory facts in actual experience, and also introduces necessary qualifications. Thinking about what is right *needs* the checks of experience, the settings provided by life. Science is indispensable as critic. Moral development, then, involves intuitive, cognitive, and scientific thinking.

It became apparent to Kohlberg that no stage could be skipped. An individual might stop for the rest of his life at stage three or four, but he could not get to four without going through and assimilating the values of stage three. Yet he could think about the next stages before reaching them. This is how development takes place.

Dr. Kohlberg's most important contention may be that morality is not derivative in essence. It is a unique realm of independent thinking, no matter how interlaced with other modes of inquiry. Humans, then, have, express, and develop moral intelligence, and this intelligence is not reducible to any other way of thinking about ourselves.

Lawrence Kohlberg's book may help to start a wave of thinking along these lines. He has had great forerunners and he will have great successors, yet this work (and doubtless the other two volumes to come) stands in our time as a pioneering contribution to a change that may be finally recognized as prerequisite to all the other achievements we long for, and are working hard to reach.

REVIEW

TWO KINDS OF BALANCE

IT is a good idea, we have found, to pick up for further inspection books published years ago—especially epoch-making books—to see why they were worth reading, and now, worth remembering. Our row of Lafcadio Hearn's volumes gets frequent rereading, and it is the same with Ortega (with a passing thought of gratitude to his publisher, Norton, for keeping his books in paperback print). One fairly recent writer who should have continued attention is Rachel Carson.

Her book came out in 1962, creating a stir and a lot of irritated, aggressive, and condescending criticism, as Frank Graham showed in *Since Silent Spring* (Houghton Mifflin) in 1970. Finally the criticism died away, mainly from general recognition of how right she was. Turning its pages today, one feels both the power and the beauty of *Silent Spring*, which ought not to be lost to present-day readers because it is a mere twenty years old. Even the chapter headings have classic appeal, and the last of these, "The Other Road," had the same source as Amory Lovins' epoch-making article, "The Road Not Taken," in *Foreign Affairs* for October, 1976. Both writers found in Robert Frost's poem the symbolism of what they had to say.

Rachel Carson began her final chapter with flowing prose that deserves periodic rereading:

The road we have long been traveling is deceptively easy, a smooth superhighway on which we make progress with great speed, but at its end lies disaster. The other fork of the road—the one "less traveled by"—offers our last, our only chance to reach a destination that assures the preservation of our earth.

The choice, after all, is ours to make. If, having endured much, we have at last asserted our "right to know," and if, knowing, we have concluded that we are being asked to take senseless and frightening risks, then we should no longer accept the counsel of those who tell us that we must fill our world with poisonous chemicals; we should look about and see what other course is open to us.

The remaining pages review the diverse avenues of research opening up possibilities of "biological" pest control, which would, if developed, eliminate or greatly reduce the amount and variety of poisons in our food-growing fields and forest lands. Interestingly, it is generally agreed that Erasmus Darwin, grandfather of the famous evolutionist, was the first to propose biological control by using insect enemies of the pests. After a long account of ingenious ways of controlling pests—alternatives to the shotgun chemical method—Rachel Carson said:

There is, then, a whole battery of armaments available to the forester who is willing to look for permanent solutions that preserve and strengthen the natural relations in the forest. Chemical pest control in the forest is at best a stopgap measure bringing no real solution, at worst killing the fishes in the forest streams, bringing on plagues of insects, and destroying the natural controls and those we may be trying to introduce. By such violent measures, says Dr. Ruppertshofen, "the partnership for life of the forest is entirely being unbalanced, and the catastrophes caused by parasites repeat in shorter and shorter periods. . . . We, therefore, have to put an end to these unnatural manipulations brought into the most important and almost last natural living space which has been left for us."

Through all these new, imaginative, and creative approaches to the problem of sharing our earth with other creatures there runs a constant theme, the awareness that we are dealing with life—with living populations and all their pressures and counterpressures, their surges and recessions. Only by taking account of such life forces and by cautiously seeking to guide them into channels favorable to ourselves can we hope to achieve a reasonable accommodation between the insect hordes and ourselves.

The current vogue for poisons has failed utterly to take into account these most fundamental considerations.

Rachel Carson ends with the forceful expression of a scientist who knows what she is talking about and is fully aware of its importance:

The "control of nature" is a phrase conceived in arrogance, born of the Neanderthal age of biology and philosophy, when it was supposed that nature exists

for the convenience of man. The concepts and practices of applied entomology for the most part date from that Stone Age of science. It is our alarming misfortune that so primitive a science has armed itself with the most modern and terrible weapons, and that in turning them against the insects it has also turned them against the earth.

One reason for keeping *Silent Spring* current as a manifesto—which not only informs and arouses, but generates respect for life—is clear evidence that the abuses the book describes are not only continuing but getting worse. There is for example this report in *The Circle of Poison* (published by Frances Moore Lappé's Institute for Food and Development), in which the authors speak of "the export of banned pesticides from the industrial countries to the third world."

Massive advertising campaigns by multinational pesticide corporations—Dow, Shell, Chevron—have turned the third world into not only a booming growth market for pesticides, but also a dumping ground. Dozens of pesticides too dangerous for unrestricted use in the United States are shipped to underdeveloped countries. There, lack of regulation, illiteracy, and repressive working conditions can turn even a "safe" pesticide into a deadly weapon. According to the World Health Organization, someone in the underdeveloped countries is poisoned by pesticides *every minute*.

Turning to another front, we might note that the writers of *Silent Spring* and *Food First*—works of extraordinary importance—are both women. (Mrs. Lappé is co-author of *Food First*.) Achievement of this sort should help to dissolve some of the argument about male and female capacities. Forty years ago there was a perceptive letter on this question in the *New York Times Book Review* (Oct. 7, 1940), in which the writer, Emily Barto, said:

The depression is due to the violent, all-male aggression of a war-ridden world of twenty-five years ago, since when the mind of men vibrated too swiftly between feminine and masculine extremes for men to become stabilized through balance of leisure—so necessary to the imaginative genius. In the field of literature our men have produced much of importance in journalism, economics, and social sciences—all purely masculine subjects, while the novel is that

branch of literature where men and women have had the opportunity to rub shoulders, as it were: a sphere of activity which is intuitive and creative, and essentially feminine as well as masculine. Such balance in men and women is not a matter of choice, but a protective law of necessity to meet evolutionary processes.

Well, it now seems evident that reaching this balance is a matter of choice, since Hazel Henderson is an economist, Rachel Carson a biologist, and Frances Lappé, who began as a dietician, has developed into a campaigning specialist in world food supply, becoming an effectively critical social scientist. Actually, the really fine writer has both a masculine and a feminine side—and in the best writing you can't tell whether it is by a woman or a man. It would be wrong to say that Willa Cather writes like a man, but quite accurate to say that she has high and balanced human intelligence. Here Emily Barto seems altogether right:

Compare the literature of Theodore Dreiser with that of Victor Hugo, as an extreme example. The first limits his American scene by an all-male view, while Victor Hugo's genius had a depth of understanding of the principles governing his world, not only philosophical, but intuitive to almost a maternal degree. The women of Dreiser are varied, but to the male taste and opinion. His men seem built upon the same mold—purely physical, all male. One might say built purely for the masculine mind. No man could conceive of Jean Valjean but a man of extraordinarily feminine as well as masculine balance. His men are varied, seen through the eyes of a woman as those of men.

Further evidence that balance between the masculine and feminine elements can be sought as a matter of choice is provided in a book published in 1966, before there was so much talk about such questions. In *Journey Toward Poetry*, Jean Burden, a poet and poetry editor, writes of the woman as artist:

Let me state the theory again, simply: *The artist is essentially androgynous, psychologically. . . . It does not take much analogizing to see that the creative act in art is essentially an expression of a masculine drive. . . . It occurs whenever a woman puts paint on canvas, composes a sonata, conceives a*

ballet, writes a novel, or chips out a piece of sculpture from the granite of her imagination. . . . It was Jung who made convincing through his case histories (and particularly his research into dreams) the premises that each sex carries the homologues of the other, and that both male and female have a difficult time recognizing the characteristics of their own sex in the opposite.

If this is true, how is it manifested in modern woman? Let us take first the large body of women who are not "anima-type" women, but who are not artists. How do they live out this "man" within them, this animus? Sometimes, of course, it is ignored completely, with frequently resulting distortions of personality, neuroses, etc. Often, for better or worse, it propels her into a career. Perhaps it sends her back to college when her children are all in school; it may even suggest she go into public life in a small way (or sometimes in a large way), as a friend of mine has recently done who became a delegate of her political party to the state convention. These solutions—and others like them—will work to the degree that the woman herself understands what is driving her—that she is not competing with men, but living out her latent side in order not only to prove it exists but finally to gather it into her larger, and more productive, individuality.

If this could be generally recognized as a plank of underlying meaning and validity of the women's movement, a great deal of controversy and acrimonious argument might be abandoned as beside the point. Authentically human intelligence and expression go beyond the polarizing differentiations of sex.

COMMENTARY

MOUNTAIN MAN SENSE

ONE rather exciting form of self-education is reported by David Thomson, now a Wilderness Service guide in Montana, in a Bantam book, *The Shining Mountains* (\$3.95). The writer reports his dreams, and then his disappointments and what he made out of them. For a taste of troth, showing the mood of this adventure story, these are his opening words:

I always wanted to be a mountain man, so one day a few years ago I packed up my outfit and headed out west. Wide-open spaces and freedom, I thought, the ledges and crags of the wilderness, that was my calling. I'd build a cabin back on some little creek, put a pack on my back, and make it on my own in the mountains. Be a free man.

I wound up working as a night clerk in a motel in Denver.

Denver is like a miniature Los Angeles with rabies. . . . it is the place where the rising plains first meet the mountains. For hundreds of miles a gently rolling flatland collides with a wave of mountains along that front, foothills begin to rise with a new and exciting abruptness. The city itself is growing in a sprawl to the north and south, as if great bushel baskets of cars, warehouses, high rise apartments, and corporate office buildings were being dumped further and further along the base of the mountains, leaving slums festering back near the middle. It wasn't exactly the clean-aired gateway to the Rockies that I had imagined.

One day when he had some time he took an ax and went out into the hills to pick a site for a log cabin. After locating a spot he looked for trees, and found one.

Then I looked above me. There, in the seventh branch of the tree I was about to hit, sat a young man in a green uniform with yellow patches on his shoulders. His hair was blond and well groomed; my mountain man sense told me that he was from southern California and had just graduated from college. He was a Forest Ranger. He had a brown paper bag next to him, and he was eating a peanut-butter-and-banana sandwich, watching me with scarcely any expression on his face, except that of observation. Finally I spoke.

"What would happen if I built a cabin here?"

He picked a banana slice out of the peanut butter and flipped it into the air, like a coin. It landed neatly on his tongue. Chewing it up, he said, "You'd get put in jail."

That's what I thought.

"Don't work too hard," I said, and I walked away.

CHILDREN ... and Ourselves

A FORM OF INCARCERATION

As a kind of "preview" of Wendell Berry's latest book, *The Gift of Good Land* (North Point Press, cloth \$16.50, paper \$8.50)—a collection of his recent magazine articles—we take a passage from the chapter called "Family Work." It should be obvious by now that a fresh approach to education is urgently needed, guided by common sense and free of habitual assumptions. Berry argues initially for the restoration of the home as a place of interest, work, and teaching. Many present-day homes are stripped of these activities, becoming barren of shaping influences for the young. The home is no longer a production center, only a consumption center, and this reduces close to zero its educational function.

Berry says:

. . . most people now do seem to think that family life and family work are unnecessary, and this thought has been institutionalized in our economy and in our public values. Never before has private life been so preyed upon by public life. How can we preserve family life—if by that we mean, as I think we must, *home* life—when our attention is so forcibly drawn away from home?

He turns to public education:

The idea that the public should be educated is altogether salutary, and since we insist on making this education compulsory we ought, in reason, to reconcile ourselves to the likelihood that it will be mainly poor. I am not nearly so much concerned about its quality as I am about its *length*. My impression is that the chief, if unadmitted, purpose of the school system is to keep children away from home as much as possible. Parents want their children kept out of their hair; education is merely a by-product, not overly prized. In many places, thanks to school consolidation, two hours or more of travel time have been added to the school day. For my own children the regular school day from the first grade—counting from the time they went to catch the bus until they came home—was nine hours. An extracurricular activity would lengthen the day to eleven hours or more. This is not education, but a form of

incarceration. Why should anyone be surprised if, under these circumstances, children should become "disruptive" or even "ineducable"?

If public education is to have any meaning or value at all, then public education *must* be supplemented by home education. I know this from my own experience as a college teacher. What can you teach a student whose entire education has been public, whose daily family life for twenty years has consisted of four or five hours of TV, who has never read for pleasure or even *seen* a book so read; whose only work has been schoolwork, who has never learned to perform any essential task? Not much, so far as I could tell.

If education is preparation for *life*, and if the circumstances of our lives are almost certain to change, perhaps a great deal, in the next twenty years, then the young of today will need education of another sort, and since institutions are notoriously laggard in any sort of change, the responsibility reverts to the family—in short, the parents.

Already there are several new and perhaps fragile institutions working on education for future needs—one is Ecology Action, 2225 El Camino Real, Palo Alto, Calif. 94306, which publishes a valuable series of pamphlets about its work, which is small-scale food-raising. The pamphlets or booklets are called the Self-Teaching Mini-Series, and we quote here from No. 9, concerned with education in big-intensive food-raising. The writer, John Jeavons, says:

The late Dr. E. F. Schumacher, noted economist and author of *Small Is Beautiful*, predicted some years ago that there would be three sequential crises: oil, food, and health. We have observed the first crisis, are becoming increasingly aware of the second, and will learn of the third as population and resource pressures meet. Happily, we have an exciting opportunity to minimize the second and third crisis with all of our work. In the United States, in light of the fact that we are only 6% of the world's people consuming at home close to one third of the world's food, we have a responsibility to help!

It can be argued that education in care of the land ought to be a part of the education of every child in the country. The intelligent members of

our society are rapidly reaching this conclusion, as an article on the corn belt in the midwestern United States, in the January *Atlantic*, will illustrate. The writer points out that the chief obstacle to correcting erosion-producing farming practice is *prejudice*—prejudice and habit.

A general comment in the *Ecology Action* pamphlet: The United States has even been likened to a developing nation in its "exportation" of soil in the form of food to obtain oil (two out of every five acres of U.S. farmland are reportedly used to raise crops for export and this pays for over 50% of our oil imports). One third of all the topsoil of U.S. croplands has been lost in the last 200 years and the organic content of Midwest soils has declined 50% in the last 100 years. California's San Joaquin Valley where 25% of the total food and 40% of the fruits and vegetables consumed in the United States are grown is in the early stages of Sahara Desert-like desertification according to state reports. In 1977, the U.N. estimated that by the year 2000 one third of the world's agricultural land might well be desertified.

The pamphlet begins with an account of educational activities concerned with soil conservation and organic gardening in various places and around the world. These may be regarded as very small beginnings, but all fundamental reforms—usually opposed or ignored by existing institutions—start small, yet sometimes grow rapidly by reason of dedication, imagination, and example-setting practice. Jeavons says:

The most important progress in small-scale bio-intensive food-raising in the last five years has been in the increased skill and the increased numbers of practitioners. Our estimate is that over half a million new individuals in 60 different countries have started using this food-raising approach since 1974. This is in addition to about one billion individuals whose traditional food-raising practices are (in whole or part) based on similar principles. These are some of the things which have been happening: Columbia University is performing nutrition and application studies; the Farallones Institute in California is running yield and nutrition tests; Cabrillo College in California is developing a 1 to 20-acre approach to truck farming using small tractors or roto-tillers; the Rodale Research Farm has been performing tests and giving comparative technique tours to the public; the Asian Vegetable Research and Development Center

will soon begin side-by-side trials of big-intensive practices comparing them to standard techniques.

Jeavons' list of places where conservationist and biological (organic) agriculture is being taught goes on for a page and a half, with this conclusion:

The high cost of energy inputs is even causing the World Bank to explore big-intensive approaches as a more cost-effective alternative to the Green Revolution; and the massive amount of information coming out about soil deterioration is causing a closer look at the increased use of organic matter in farming practices. In fact, former Secretary of Agriculture, Bob Bergland, stated about big-intensive mini-farming that it's "probably ten years ahead of . . . the times, but given the soul-searching now going on, I'm convinced the structure you're investigating not only promises new opportunities—but will make more sense as time goes on."

FRONTIERS

The Inadequate and the Inaccessible

IN *Building a Sustainable Society* (Norton) Lester Brown assembles figures which show beyond doubt the disaster course of the "always more" growth economy which dominates policies around the world. Production of food and other necessities is in the hands of aggressive companies which are mining our resources for quick return, making it increasingly difficult for people to feed and clothe themselves as self-reliant individuals. Meanwhile, production figures have stopped getting larger. They are now going down, while world population is still growing. Lester Brown says:

Until world population reached the three billion mark in 1960, the yields of the three basic biological systems [forests, seas, and grasslands] expanded more rapidly than population. At that point, however, the margin began to narrow. By the time the population had moved beyond four billion (reached in 1976), the per capita production of wood, fish, beef, mutton, and wool was declining.

The fish catch started going down after 1970, and has now fallen 13 per cent. Wool production peaked in 1960, and is now down 27 per cent. Since 1976 beef production is off 9 per cent. Today, Lester Brown says, "With human demand outstripping the sustainable yield of natural biological systems that support the world economy, the output per person of virtually every major commodity produced by these systems appears to be declining."

The major producers were not indifferent to the declining figures, but assumed that "technology would find a way," and it did for a while. Chemicals could be used to take the place of declining production. As Brown says:

During the last two decades, we have been sheltered from the full effects of the lag in output of commodities of biological origin and of the growing scarcity of new cropland by the extensive substitution of petroleum products for natural products. . . . Where agriculture has been mechanized, oil has in effect been substituted for the land once used to produce

feed for draft animals. . . . To meet the continuously expanding demand for food, farmers lacking new land increased their yields by using petroleum in the form of fertilizers. Between 1950 and 1980, the world's farmers increased their use of energy-intensive chemical fertilizers nearly eightfold, from 15 million tons to over 114 million tons.

The use of pesticides, many of them made from petroleum, also went up. For years, as someone, perhaps Schumacher, said, we have been "eating oil." And now the cost of oil is going up fast, which drives up the price of food.

We are wearing oil as well as eating it:

Off the farm, too, synthetic materials from the petrochemical industry were substituted for natural materials following World War II. While per capita production of wool, cotton, and other natural fibers has leveled off or fallen, the use of synthetic fibers has climbed, partly because synthetics have cost relatively less and partly because many consumers prefer a blend of natural and synthetic fibers. In 1950, synthetic fibers accounted for only 1 per cent of world fiber use, but by 1979 their share had climbed to an estimated 36 per cent—compared to 47 per cent for cotton, 5 per cent for wool, and 12 per cent for rayon. Overall, fully one third of the clothing and textiles the world's four billion consumers buy are now made of materials not found in nature.

Mr. Brown concludes:

The use of oil in the form of fertilizer and synthetic substitutes for natural materials has served as a safety valve, alleviating the pressure on natural systems. The potential for lessening pressure on natural systems has been keyed to the availability of oil and the evolution of a vast petrochemical industrial capacity. But as oil reserves dwindle, this safety valve will close, reversing the substitution process and putting even more pressure on croplands and the basic biological systems. (From a section of *Building a Sustainable Society*, reprinted in *Not Man Apart* for last November.)

Other natural products that have been largely replaced by processing petrochemicals include rubber. Today's rubber is two thirds synthetic, while plastics have replaced so many natural sources of raw material that, back in 1971, in an article in *Environment* (April), Barry Commoner said that these synthetic products have since

World War II become second (after chemical fertilizers) as a source of pollution of the environment.

The obvious offense of these several developments is that they have been both wasteful and polluting, and as the statistics of world production show, they are now subject to diminishing returns. What may be worse, if somewhat behind the scenes, is that the techniques of industrial and chemical agriculture are dispossessing peasants and subsistence farmers around the world of their means of independent support and survival, while a wide variety of "cottage" industries, with production in or near the home, have been almost destroyed.

The time has come, in other words, for a different kind of scientific research and a change in the meaning of technology. Intermediate and Appropriate Technology are already familiar terms to many, but to underline the desperate situation of small farmers and craftsmen, it might be well to speak of Technology for Autonomy.

This is the subject of a book we have for review from India—*Rural Technology*, edited by A. K. N. Reddy, director of ASTRA (Application of Science and Technology to Rural Areas), which is a part of the Indian Institute of Science, located in Bangalore 560 080, India. (The publisher is the Indian Academy of Sciences, with the same address.) Dr. Reddy has put together a large book of 330 pages, with twenty contributed papers, mostly by Indian scientists. (An exception is Theodore Taylor's contribution on storage of solar energy.) Naturally enough, most of the papers focus on sources of energy, the area of extreme and immediate need. The general purpose of the book is to give a new meaning to the concept of *development*, defining it as "(1) the satisfaction of basic needs, starting from the needs of the neediest; (2) an endogenous self-reliance based on social participation; and, (3) harmony with the environment to ensure sustainability of this development."

The editor says in his Foreword:

In the years after World War II, science and technology had become increasingly preoccupied with the satisfaction of the demands of the affluent, in the industrialized as well as in the backward countries, and with the development of the military hardware necessary to protect this affluence. As a consequence, the bulk of humanity has not fully enjoyed the benefits of science and technology, and still ekes out its life in abysmal poverty and squalor. The set of traditional technologies, which this section of humanity had evolved over the centuries, and depended upon for its survival, has become increasingly inadequate in the context of rising expectations, changed circumstances, proliferating populations and depleting resources. At the same time, the technologies of the industrialized countries seem to have become too demanding in their use of capital, energy, and non-renewable resources to become available to all sections of humanity—they appear to be inherently exclusive. This situation, in which the traditional is invariably inadequate and the modern is largely inaccessible, can only be overcome by the proliferation of alternative solutions through massive inputs of science and technology. Hence, for the vast millions of Asia, Africa, and Latin America, the hope lies, not in a rejection of science and technology, but in its radical reorientation.

Rural Technology is a splendid illustration of the trend in this direction, carried on by pioneering Indian scientists who see what must be done, and have begun to do it.