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OLD, UNANSWERED QUESTIONS

THE history of education in the United States does little more than underline the importance of the question first raised in the West by Plato: Can virtue be taught? Two articles in the Summer 1985 issue of *Teachers College Record* deal with this question. One, by David Tyack and Thomas James, is on "Moral Majorities and the School Curriculum"; the other, by William Profriedt, is on "Power, Pluralism and the Teaching of Values." Here we shall draw on both.

Tyack and James begin their discussion by saying:

> For over a century, state government has been in the classroom, mandating the values that inform the curriculum. From the last quarter of the nineteenth century onward, and especially during the two decades surrounding World War I, groups claiming to be moral majorities prevailed on state legislators to enact into law their own conceptions of what should be taught as moral certainty. Advocates of temperance, Bible reading, and patriotic instruction sought to insert their values by law into the curriculum and to prescribe for all children in the state the moral indoctrination that once had been the province of local school boards and educators.

The argument for this undertaking was clearly given by an advocate in 1891, who pointed out that by reason of extensive immigration the population of the country no longer had the cultural unity of the days of the Founders. The absorption by the newcomers of the standards of those who had given being to the country could no longer be left to time and community influence, which amounted to saying: "When custom failed to reproduce virtue and wisdom, law must enter to legalize virtue through the curriculum."

> As the United States became more urban, industrialized, and heterogeneous in its population and values in the late nineteenth century, politically powerful WASP groups concluded that they must find new ways to enforce traditional social controls once exercised informally in smaller and more homogeneous communities. They became worried about declining consensus on religious and political values, dismayed by drunkenness and urban ills, concerned about the assimilation and loyalty of new immigrant groups, and frightened by violent strikes and class conflict. Organized into effective pressure groups, they urged states to pass statutes that gave their convictions the force of law. . . . After the war, uneasy conservatives continued to promote orthodoxy through public education. Were Darwinism and skepticism undermining traditional patterns of faith? Then forbid the teaching of evolution and require the teaching of the Bible. Was the United States a nation of Hyphenates? Then outlaw the teaching of foreign languages in elementary schools. Were Bolsheviks plotting to corrupt the minds of the young? Then weed out teachers who could not prove their patriotism. Was a cynical spirit abroad in the land? Then pass laws requiring textbook writers and teachers to be reverential toward the Founding Fathers. If society seemed centrifugal, schools must be clamped into narrow circles of orthodoxy.

In the century or more of effort by power groups of Americans to morally prescribe what should be taught to the young in the public schools, as here described, virtually no one raised the question of whether or not it is actually *possible* to indoctrinate "correct beliefs" into the coming generations. Little effort was made to measure the effects of indoctrination, and the various groups engaged in the attempt to control the schools in this way continued their efforts in a series of waves to influence legislation toward teaching the evils of alcohol, the truth of Protestant Christianity, and loyalty to the political State created by the Founding Fathers. Morality, the protagonists of these efforts affirmed in effect, is an attitude that can be arranged and enforced by political means, thus throwing into the courts the issue of what is to be taught in the schools. This, as the writers of this article say, is the Legalization of Virtue. They conclude:

> Once the public schools had become well established, they were a ready target for lobbies that

> claimed to represent moral majorities and that wished to write laws to inculcate their version of truth and virtue in the rising generation. Educators typically shared the values of temperance, nonsectarian religion, and patriotism thus embedded in law.
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> Once placed on the books, such legislation was rarely challenged successfully in the courts, although sometimes it was reversed in electoral politics. Since it was easier to instruct the captive—and presumably malleable—audience of the young than to alter the beliefs or behavior of adult voters, WASP citizens found it more feasible to shift the burden of reform to the next generation, to define problems as educational rather than as injustices calling for immediate action. The fact that education was presumed to be "above politics" merely disguised the origins of conflict over public schooling and the sources of demands for ideological conformity. Not until the recent generation would excluded groups develop the power legally to challenge the precedents set by this earlier legalization of values in order to broaden the scope of schooling and legitimize their values as well as those of dominant WASPS. Then, ironically, the results of their efforts to secure equality of dignity in public education would be labeled legislative meddling and litigiousness, partly because the pressure came from people who had traditionally lacked power. And, once more, conservative groups in the 1980s are again seeking to assert by law in public schools the religious and political values long prescribed as the prerogative of traditional moral majorities.

One thing more should be added. While the results of indoctrination in religious doctrines and patriotism were hardly examined, the campaign for temperance, introduced into the schools by the efforts of the Women's Christian Temperance Union, long ago elicited a response from a committee of scholars who (in 1903) denounced the "scientific temperance in instruction" as—

> . . . "an educational scheme which is neither scientific, nor temperate, nor instructive." Another study of what children actually remembered from their physiology classes reported one pupil's response: Alcohol "will gradually eat away the flesh. If anyone drinks it, it will pickle the inside of the body." The gross inaccuracies and the scare tactics of the temperance crusade could only backfire when children grew up and learned the real facts, critics said, and the child who witnessed moderate drinking at home would have reason to doubt the teacher or to fret about parents' damnation.

The other *Teachers College Record* article takes up the question of how, if at all, "values" should be taught in the public schools. As William Profriedt puts it:

> The argument over how value issues should be taught in our schools is, to a large extent, an effort to set down the rules of conduct for this unique part of the intellectual marketplace. Should teachers be neutral? Should they be objective? Ought the schools to teach a set of common values, or might they best adopt a hands-off policy when it comes to the teaching of values?

There are problems arising from each of these suggested positions. Both teachers and administrators are, after all, human beings, and they can hardly suppress their convictions while teaching. Yet, as this writer suggests, they can make an effort to do so.

> Neutralist educators in America try to make a distinction between facts and values in the classroom. Teachers are admonished to teach only facts to the students and to leave the teaching of values to the family or religious community. The distinction is a practical one, designed, it seems to me, to diminish conflicts between the public schools and a variety of interest groups. It is buttressed epistemologically by the claim that factual statements are at least theoretically verifiable or falsifiable and value statements are not. This claimed impermeability of value issues to rational inquiry takes the school off the hook when it comes to these issues, but at the same time condemns the issues to a kind of second-class citizenship. What kind of an issue is it, after all, that is not open to rational/empirical inquiry? Families and religious groups often join the educators in embracing the fact/value dichotomy, simply because they prefer the public school not to meddle in what they consider to be their business.

This writer prefers what he calls the "philosophical solution," provided that there is "wariness about the way those in power tend to cloak their own beliefs in rationality."

> The philosophical solution goes beyond a passive neutralism. It asserts the primacy of rational inquiry and extends it to value issues. . . . If we pursue a comparison of the creationist and evolutionist hypotheses our results might have some real impact on the no longer compartmentalized beliefs of our students. In this view, we follow reason

where it leads us and, of course, it is likely to lead us into all sorts of questionings of revealed and socially accepted truths. Here, of course, the commitment to rationality shows itself profoundly at odds with the socialization function of the schools. For if we take seriously the notion that morality involves freedom, rationality, personal intention, and impartiality, then our moral education becomes focused on the development of such abilities in the learner. And a free, rational person is not one easily socialized to a given order. Of course, those in power can claim this rationality for themselves. They can and always have employed it in the service of their own sectarian interests. Young students in a classroom are particularly vulnerable to the apparently rational inquiries, questions, definitions, the distinctions made and the conclusions drawn by the teacher.

Further reasoning is clearly more than a formal apparatus of inquiry. Our reasoning capacities emerge with a social context. Language, as G. H. Mead has pointed out, enables us to give the point of view of another consideration. The particular sort of social context in which we emerge also alters the content of our reasoning and especially our capacity for impartiality, which the philosophers see as the key to acting morally. As Wilson and others have pointed out, rationality and impartiality do not arise in a vacuum. Our own society with its skewed individualism, its ideological support of selfishness, strikes me as an unlikely context within which to develop impartiality in young people. Impartiality includes, after all, the capacity to see the interest and desires of others as having equal importance with one's own. . . .

The ideas that are winning out today are hardly those of the small town, of religious people, or of concerned humanists. The predominant selfishness and narcissism seem the final aberration of the market ideology. Any serious changes that are to occur in what values are disseminated in the media and taught in the schools will have to be accompanied by a redistribution and decentralization of power in the larger society. The notion of a marketplace of ideas makes sense only if we can create and maintain a society in which access to the decision-making apparatus of the schools and the media is more widely distributed. The long-term goal of young people ought to be to determine what sort of political and economic arrangements in the larger society would provide the most promising context within which a philosophical approach to the testing of moral values might flourish.

This seems a good place for radical reorientation and a change of pace. We go, then, to an essay on education by Vinoba Bhave, the Indian scholar and follower of Gandhi who died recently. His essay appeared in *Time Running Out*, a collection of writings which appeared in the English magazine, *Resurgence,* from its beginning in 1966 to 1975. The book was published in 1976 by the Prism Press. In the closing paragraphs of his essay Vinoba emphasizes the great contrast between education as traditionally practiced in India and the system established by the British. He said:

> Throughout the world education is under the control of governments. This is extremely dangerous. Governments ought to have no authority over education. The work of education should be in the hands of men of wisdom, but Governments have got it in their grasp; every student in the country has to study whatever book is prescribed by the Education Department. If the Government is fascist, students will be taught fascism; if it is communist, it will preach communism; if it is capitalist it will proclaim the greatness of capitalism; if it believes in planning, the students will be taught all about planning. We in India used to hold to the principle that education should be completely free from state control. Kings exercised no authority over the *gurus.* The king had absolutely no power to control education. The consequence was that Sanskrit literature achieved a degree of freedom of thought such as can be seen nowhere else, so much so that no less than six mutually incompatible philosophies have arisen within the Hindu philosophy. This vigour is due to the freedom of education from state control.

What can we say about this? After we get a little used to the idea we may recognize its reasonableness in some respects. Take the conception that educators should be autonomous. That means that teachers are responsible to themselves for how they think and what they do. Since by cultural tradition they are held to be wise, it would be folly for anyone to presume to supervise them. Here in America, at present, the curriculum of the public schools is partly determined by schools of education, but controversial issues are settled by the courts, the result being that political clout has a lot to do with

what may be taught in the schools. Is this in any way superior to the judgment of the parents and teachers? We know that it is not, and some parents—a few—are working out a solution to this by teaching their children at home. This very largely removes the young from political indoctrination (and confusion) since what can be prescribed by a court will at best be a compromised solution. Other parents (usually in groups) may establish and pay for private schools of their own, somewhat subject to state supervision, and also a source of considerable political controversy concerning their support—should tax money be used to pay for private schools? Vinoba continues:

> The status of teachers has sunk so low that they feel themselves to have no authority at all. They must follow whatever path the Government directs. They are under orders, the servants of authority. They may perhaps modify the Government schemes by a comma here or a semi-colon there, but they cannot do more than that. Today there is an attempt to expand education and the number of schools and of teachers is being increased, but the spirit of the true *guru* is not there. A good teacher means one who is a good servant; a bad teacher means a bad servant; good or bad, he remains a servant. . . .
>
> Our forefathers had made a provision to enable villagers to have access to kinds of knowledge which no one in the village possessed. This plan must be carried on. It is the tradition of the wandering *sannyasi* (holy man). The *sannyasi* travels continually among the villages for the greater part of the year, remaining in one place only for the four months of the rainy season. The villagers thus get the full benefit of his knowledge. He can teach them both knowledge of the world and knowledge of the Self. A *sannyasi* is a walking university, a wandering school, who goes at his pleasure to each village in turn. He will himself seek out his students, and he will give his teaching freely. The villagers give him fresh, wholesome food, and he will need nothing else. They will learn from him whatever they can. There is nothing more tragic than that knowledge should be paid for in money. A man who possesses knowledge hungers and thirsts to pass it on to others and see them enjoy it. The child at the breast finds satisfaction, but the mother too takes pleasure in giving suck. What would become of the world if mothers began demanding fees for feeding their babies? . . .
>
> We must re-establish this institution of the wandering teacher. In this way every village can have its university, and all the knowledge of the world can find its way into the villages. We must also re-invigorate the tradition of the *vanaprasthashram* (a state of freedom from worldly responsibility) so that every village gets a permanent teacher for whom no great expenditure will be incurred. Every home must be a school, and every field a laboratory. Every *vanaprastha* must be a teacher and every wandering *sannyasi* a university. The students are the children and young people who want to learn; in every village there will be people who give an hour or two to learning and spend the rest of the day working. This seems to me to provide a complete outline of education from birth to death.

Could we possibly relate Vinoba's account of the old Indian forms of education to our current scene? Many may suppose that what he describes is too remote from our situation for any useful comparison, yet even so we might try. Vinoba, after all, was describing what he regarded as *real* education, which must be very different from what we have in the West today. Yet correspondences might be seen, if we look for them.

How, for example, would you classify Rachel Carson and her books? Then, at almost the same time, E. F. Schumacher emerged in England and began teaching about economics in a way the entire world needed to hear. Surely these two qualify on every account as *sannyasis,* and they certainly didn't work for money, but only because they hungered and thirsted to pass on to others what they had found out. Then there are people on the land who are teaching what we already have a name for—sustainable agriculture—with all that this implies. Some teachers travel a great deal, making them *wandering* sannyasis, who certainly are not pursuing either wealth or glory. The ancient modes of teaching in India—which produced a very great literature and many wise men—are surely being re-invigorated by these means. And many others are helping in this work—we have named only a few.

REVIEW
EATABLE DESERT PLANTS

THERE are some books, at least, which a reviewer finds it necessary to read not once, but twice, since until you absorb something of what the writer felt while writing it, you don't know what to say about it. *Gathering the Desert*, by Gary Paul Nabhan, is such a book, published by the University of Arizona Press in 1985 ($19.95). The author is a desert botanist, and his illustrator is Paul Mirocha who presents the plants Nabhan describes in the framework of Sonoran Indian tradition. The Sonoran desert stretches from California and Arizona to Sinaloa in Mexico and the southern tip of Baja California. The plants Nabhan focuses on are about a dozen edible species which the Indians raise and eat.

The mood of the book is conveyed by Nabhan's account of a meeting he attended of organpipe cactus "specialists," but looking around he didn't see anyone who knew much about that species.

> A game warden and a theoretical ecologist had been invited from Mexico, but neither could attend. No Mexican scientists, no students, and no enlightened amateurs who had lived in organpipe stands were in attendance.
>
> The talk went on, but it was hard to tell what it was about. There were phrases thrown out like "maximizing visitor use days in targeted environments while protecting the periphery" and "developing integrated methodologies to monitor rodent and cactus thief impacts on the demography of roadside population."
>
> Suddenly a grizzly bear rose up in the audience and started to roar.
>
> Well, not exactly a grizzly bear. Instead, a grizzled old desert biologist. But the effects were the same. The bureaucrats look frightened, queasy, and concerned. Some beast had barged in and spoiled the picnic. And he was still roaring.
>
> "Cactus! Rocks! Birds! Nests! Bats! Bugs! Snakes! That's what we should be talking about, that's what we should be learning about! If you guys want to set aside land for 'visitor use days' and 'roadsides,' count me out."
>
> The gray-haired, hulking figure in wrinkled khakis and dusty workboots pawed at his neck to open the collar of his shirt more, as if something was suffocating him. He sat down, looked around the room, and sneered:
>
> "And by the way, how many of you have ever seen an organpipe cactus? I don't mean through the viewfinder of your Kodak . . . I mean out in the boonies where you can't just snap a photo then trot back to your air-conditioned car! How many of you have ever taken the time to look at them away from the scenic-loop drives or nature trails? Do you guys ever go to Mexico, other than to visit the beach or to hear mariachis play in the border towns? How in the heck do you think you're gonna figure out what to tell the public about organpipes if you just sit around in rooms like this?"
>
> He glanced around the room again. Distraught bureaucrats were frantically writing notes to themselves, in case they were called upon to cover their peripheries. Then the bear lumbered out of his seat and over to the door. He turned around and looked at them one last time.
>
> "I shouldn't have been so impolite. Some of you are here in the Sonoran Desert for the first time, so I shouldn't expect you to know anything about organpipe. And I myself know a lot less than I should. So let's get a fresh start. I'm going out to my Carry-All there in the parking lot. I'm gonna straighten it up and make a little more room. I'll be leaving for Sonora in a couple of hours, and you are welcome to go with me to see some great organpipe stands about a half a day to the south. I'll loan you all the camp-equipment you'll need. In fact, I'll be happy to pay the way of anyone who wants to go down and learn a little about organpipe. As for the rest of you, I wish you a pleasant visitor use day. . . ."
>
> He held his paw up to them for a moment, gesturing farewell, then stormed out the door.

Well, what *is* an organpipe?

According to Nabhan, a good place to go to see one is south in Mexico, as far as Topolobampo in Sinaloa, about opposite on the mainland to the tip of Baja California. The first description that we have is by Andres Perez de Ribas written in his memoirs about 1644. Speaking of the Indians, he said:

> The fruit which they enjoy for the longest period is of the pitahaya, a tree unknown in Europe. Its branches are several centimeters in diameter and of the nature of thorny green striated wax tapers extending as much as ten meters in height.
>
> The fruit grows from these thorny ribbed branches and is, of itself, covered with thorns. It is similar in appearance to a chestnut or prickly pear. Its interior consistency is much like that of a fig, although softer and more delicate. Its color is at times white, at others red, or yellow. It is very savory, particularly when harvested before the rains come in the summer. The abundance of these pitahayas is such that one may travel among them for a distance of fifteen to thirty kilometers.

From the fruit of the organpipe the Indians make cakes of cheese-like consistency, and also a mild cactus beer. The Seri Indians of Baja California even make caulking for their boats by using the dried pulp, grinding it into a powder which they boil in water to a thick gummy mass which is then applied to the seams inside and outside their boats.

This book opens with a scene on the streets of Granados in the eastern side of Sonora, where the Opata Indians have been assimilated into the "melting pot" of *mestizo* culture for nearly two and a half centuries. Nabhan and Mirocha were looking for a little bootleg *mescal* to carry home, as well as a cool drink on the spot. They met a gray-haired woman who jokingly reproached them for wanting a drink so early in the morning, then offered them "some *atole de pechita* that had just been made." That is, if they didn't "mind a drink made of mesquite pods pounded on a crude old *batea*, a hand-carved mesquite wood metate." They didn't mind at all, but were curious about how the atole was made. The woman explained, and Nabhan said:

> "I wonder why more people don't continue to make it," recalling that even the Yavapai, Pima, and Yaqui, who once ate mesquite as their mainstay, seldom eat it on a regular basis anymore.
>
> "But it is easy to make," she said, shaking her head sadly. "It's good for you too. But I can tell you why most people here don't use the *pechita* any more. They're Lazies. They think food must come only from the CONASUPO, the V-H, El Gigante, and other big supermarkets. They'd rather waste their time driving to the costly stores in the cities to buy tasteless food than use what is right around them. . . ."

Nabhan remarks:

> It is easy to dismiss such remarks as typical of any oldtimer unsettled by the younger generation's enthrallment with the trappings of the material world. Yet these comments are from a woman who is perfectly willing to draw upon the benefits of twentieth-century medical care, transportation, and electronic communications. She is not some romantic back-to-the-land advocate in search of a natural lifestyle; she speaks as a hard-working woman whose family has lived in the same desert valley for generations. She has no philosophical bias for "Indian ways" as opposed to "White Man's ways." In short, she feels there is no reason to give up mesquite gathering or other traditional practices just because she accepts some things that are "modern."

The creosote bush—"the drug store of the Indians"—grows in concentric circles. The first plant dies, but the root sends up new shoots in a ring around where it was, and then, in time, comes another ring. A botanist, Frank Vasek, found a large ring northwest of Los Angeles and by computation (radio-carbon dating) figured out that it took in the neighborhood of eleven thousand years to develop.

> Vasek's more conservative age estimate for King Clone—9400 years—suggests that this plant began to grow when junipers still dominated the valley. Today, near Old Woman Springs, King Clone's creosote progeny mix with a scattering of bursage to cover the valley floor, while junipers have retreated upslope several hundred meters. Whatever King Clone's exact age may be, it is older than the most ancient bristlecone pine known to humankind.

It is one of the most powerful remedies known to the Indians. Nabhan says:

> *Larrea* [creosote] has been recorded as part of the treatment for at least fourteen afflictions and diseases: colds chest infections or lung congestion, intestinal discomfort, stomach cramps associated with delayed menstruation, consumption, cancer, nausea, wounds, poisons, swollen limbs due to poor circulation, dandruff, body odor, distemper, and postnasal drip. Sprigs of twigs and leaves are boiled

> as a tea, and drunk; placed over a fire to create steam that is inhaled in a sweathouse; dried, pounded into a powder, and pressed into a poultice on wounds; and heated into an infusion that is applied to the scalp or to the pits. What's more, it cures horses as well as humans.

Today health food stores sell creosote tea, but they call it "chaparral" tea, although the creosote bush never grows among true chaparral vegetation.

Unhappily, the diet of the Papagos and other Southwestern Indians has changed for the worse in recent years, and this becomes plainly evident from the fact that the Papago and Pima have, Nabhan says, "among the highest incidences of diabetes recorded among any population in the United States, roughly fifteen times the national average. This means one in every eight persons on the Papago reservation." What have they stopped eating? Mostly tepary beans, which are far more nutritious than the pinto beans they eat now.

Wandering with Gary Nabhan through Sonora, if you do it, becomes a pleasure you will not forget—he is much more than a "botanist," although he is very much that, too.

COMMENTARY
REALITY VERSUS ROMANCE

AT the beginning of the 1987 Sierra Club Engagement Calendar—a booklet filled with color photographs reproducing the breathtaking beauty of natural scenes—the Club's executive director, Douglas P. Wheeler, calls attention to the fact that organizations devoted to conservation such as the Sierra Club and similar groups, often base their fundraising efforts on the emotional appeal of "an attractive endangered species." The stately redwoods are a good example, the pandas another. "In a world under continuing stress due to environmental exploitation and degradation, it's not difficult to see why this opportunistic strategy is so often and so readily pursued." He then says:

> I feel it essential to emphasize that our tendency to respond only to the surface appearance of things may work against us quite dramatically in the next decade as we struggle to preserve our nation's most productive natural resource—its agricultural land. The decision to commit our energies to this task must be made soon, and made on the basis of its overwhelming importance to our health and our livelihoods, not on the height, length, girth, or anthropomorphic appeal of a single threatened species. For it is in the decisions we make regarding what will be preserved and what will not that our society defines not only its goals and priorities, but its values and its view of the future.

We have been wearing out our soil and over-burdening its fertility with shots of artificial fertilizer for many years. The poisons spread over the fields are now getting into our food, our water, and even the air, while the pollution of the oceans has become another emergency. The technological fixes are no longer working. As Wheeler says:

> The time to settle this account has come. If we continue to treat our soil like dirt, we will surely continue to pay the price for our neglect. Though far-reaching, fundamental changes in the structure of American agriculture are clearly required, it would be foolhardy to predict what form that structure will take a hundred years from now. It is probably unrealistic to speculate that we will abandon our foolish ways entirely, to create a variegated fabric of cities embraced and supplied by a network of family farms operating in exquisite ecological harmony with each other and with the nonagricultural society at large. The roster of challenges to be met before that dream comes reality is formidable indeed.

Mr. Wheeler lists a number of ways in which immediate self-interest must be overcome, "for the sake of our land and of our people." He concludes:

> In this struggle there is no panda, no redwood to focus our attention on—just the knowledge that our national heritage is at stake, and with it our hopes for a future not only of prosperity but of sufficiency.

Two factors may be expected to contribute to the realization of which Mr. Wheeler speaks. One is the growing impact of actual need, which will come first in the form of steadily rising prices for good food, the other the broadening realization on the part of more people that we can no longer live as we have in the past—indifferent to the welfare and health of everyone but ourselves. For a long time, nature seemed extremely tolerant of the careless, selfish behavior of human beings, but now we have apparently used up the margins of hospitality the natural world has afforded to us and are being forced to face the consequences of the policies of uncontrolled exploitation. The Worldwatch paper reviewed in this week's Frontiers is a clear example of this verdict—on the cost of decommissioning the nuclear power plants which have become enormous banks of accumulating poisons, some of which will last for practically forever.

We must begin to learn how to live on the side of nature and life, instead being feared and hated by all else that lives. Our life on earth is a fellowship of being, and there can be neither prosperity nor survival for those whose practices continually violate the laws of interdependent life.

CHILDREN
. . . and Ourselves
A RADICAL PROPOSAL

BACK in September, we quoted here an article by George Woodcock on the thinking of Paul Goodman about education. Goodman was a rare man who was not in the least embarrassed to deal with the fact that not all children have an inclination to become "academics." They may be able to learn to read and write as well as anyone else, and do arithmetic, but they are not drawn to sit at desks and read a lot of kooks. At the same time, they may be fully as smart as "good scholars." Such students would be benefitted by Goodman's program, which Woodcock summarizes:

> What Goodman really proposes is that education should once again be an extension of activities that normally take place in a healthy society outside the schoolroom, and therefore, for the majority of children (those with no aptitude for scholarship or the arts) of learning by experiencing and doing, which means being an apprentice more than a student in the academic sense, and in the case of town children, learning the processes of cultivation and growth by living and working for long periods on renovated marginal farms. The desystematization of education, the breaking up of the learning process into a multitude of improvised responses to particular situations, would allow such a flexible approach.

Well, if you are a teacher and want to take part in such "desystematization," where on earth are you going to find a job? Or if you are a parent with the same idea for your children, or one or two of them, how will you find a school that looks at the young in this way?

Actually, both things are quite possible. There is a former university teacher on Cape Cod (his headquarters is there) who is now teaching people how to fish more efficiently with a trimaran he invented that sails by sail. He is John Todd, and his wife, Nancy Jack Todd, tells about the trimaran—called the *Edith Muma*—in No. 2 of Vol. IV of *Annals of Earth.*

> In brief, the boat was launched in November 1982 and was tested first in New England waters and then off the coasts of Guyana and subsequently Costa Rica. It more than rose to all challenges including the six thousand miles of sea voyaging between the various testing areas. Since March 1984 the Pickup [informal name of the *Edith Muma*] has been based on the Caribbean coast of Costa Rica. The hidden item on the . . . agenda in Costa Rica and elsewhere is reforestation as the boats are constructed with thin veneers of wood from very fast growing trees, the planting of which is an integral part of the boat-building program.

John Todd, a marine biologist, elaborates:

> The *Edith Muma,* Ocean Arks' one-and-one-half ton sail-powered research and fishing vessel is currently undergoing sea trials on the Gulf of Nicoya along the Pacific Coast of Costa Rica. . . . The *Edith Muma* has a new and more powerful rig, a modified Lungstrom rig designed by Dick Newick. . . . The sail, which off the wind spreads over twice the sail area of the original gaff rig, is designed to make the boat a more effective working vessel where winds are flukier, as is the case throughout most of Central America. The advantage of a sail-powered vessel, especially in the tropics where diesel is expensive and often not available, is that the boat need only speculate with time and not with fuel. This could be a key factor in the revival of commercial sail in tropical fisheries.

How did Todd get into this work? At the start of the seventies he was teaching biology at San Diego State in California, taking students up in the mountains near the Mexican border. And then it hit him:

> It occurred to me that here I'd been in university since 1957, thirteen or fourteen years in academia—and many of these students had been in almost as long I had—and we simply weren't trained in sensitive stewardship. We didn't know anything. Science hadn't trained us to be able to answer the most fundamental questions: How do you make that piece of earth sing, and how do you make it support those that live there? Degrees in agriculture, disease, ethology, ecology . . . nothing!
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> So I decided we had to figure a way. I decided each student is going to study one component of this place. You're gonna do rocks, you're gonna do earthworms, you're gonna do grasses ... fourteen components. . . . Several months later . . . people

> were camping out, living in trees, stuff like that . . . and they grumbled like hell! Studying earthworms was not their idea of graduate school. But then they started to teach one another, and all of a sudden, like scales falling from our eyes, a piece of land came alive. . . . And here was this piece of land which was no longer an inhospitable enemy. Everywhere we were finding allies.

He got the idea of making an educational village out of such a place, but then he found "that all the things I wanted to do were not possible within the University of California system." So he and Nancy and Bill McLarney, another marine biologist, ended up starting the New Alchemy Institute on ten acres of wasted land on Cape Cod, and there they made their educational village, where they accomplished so many useful things we haven't the space to start telling about them. (See *What Do We Use for Lifeboats When the Ship Goes Down*, by My, Harper & Row, 1976, for a few details.)

Maybe the New Alchemy Institute was just too successful and grew too large, but whatever the reason John and Nancy Todd started Ocean Arks International in 1982 (10 Shanks Pond Road, Falmouth, Mass. 02540) and now publish *Annals of Earth*, which comes out three times a year ($10). In the issue we have at hand, Nancy Todd writes: "Ocean Arks and New Alchemy are based in close proximity on Cape Cod in Massachusetts in the Northeastern United States, They are bonded by many years of shared history, a common vision, and a fundamental ecological ethic."

The Todds are now doing what Paul Goodman proposed—carrying on "an extension of activities that normally take place in a healthy society outside the schoolroom." This is indeed the desystematization of education but it requires people like the Todds to do it. Here the emphasis is on a "healthy society," since there is hardly any point in pursuing activities in which most of the world is wasting its time and well-being.

Meanwhile, parents who don't want their children to grow up captives of a dying culture have their own choices to make. One is to take them out of school and teach them at home. That may sound heroic, but thousands of American parents have already found it within their reach. Families who are homesteading somewhere often find homeschooling the only reasonable way of educating their children, and sometimes neighbors are able to work together on this. In any event, parental ingenuity is spurred and mothers and fathers discover hidden talents they are able to devote to teaching the young. For inspiration in this, the reading of a single issue of *Growing Without Schooling*, the paper started nine years ago by John Holt, will probably be sufficient. (The address is 729 Boylston Street, Boston, Mass. 02116.)

In No. 48 of *Growing Without Schooling* a university graduate writes about his own homeschooling:

> My parents decided to homeschool their children on a matter of conviction. They believed that the home was the most ideal environment for fostering creativity, inquiry, and practical learning. Hence, I began home school at the age of eight. My mother, who was my teacher for the first eight grades, was a secretary. During this time, we were living in Latin America and so did not have to fight any legal battles. Nor did we have any support groups, which would have been helpful, I am sure, in the educational area. Beginning with grade nine, I continued studying at home on my own through Home Study International, through grade twelve. There was always so much more time to study music at the conservatory, farm, carry on projects in the community, engage in carpentry and construction endeavors, and in general learn about life and people.

He entered college without difficulty and is now completing a Ph.D.

> Looking back, I can attribute much of what I am to those years of homeschooling. I believe that they were the most significant years of my life.

FRONTIERS

Shadow and Light

A PAPER from the Worldwatch Institute—No. 69—that we have had for quite a while, but neglected, perhaps because its subject is unpleasant to write about, or even think about, is on decommissioning nuclear power plants when they are worn out. The Worldwatch writer, Cynthia Pollock, says at the beginning:

> Although nuclear power supplied 13 per cent of the world's electricity in 1984, not a single large commercial unit has ever been dismantled. Nuclear engineers have been attracted to the exciting challenge of developing and improving a new technology, not to figuring out how to manage its rubbish. But the problem will demand attention as a growing number of plants approach retirement age. Not one of the 26 countries currently relying on nuclear power is adequately prepared for this undertaking. . . . Utility companies and ratepayers balk at yet another large expense associated with using nuclear power.

In most other industries, disposing of old plants is no big problem. You just tear it down and put up something else. But this is not possible with a nuclear installation. Nobody really knows how it ought to be done. All the parts are saturated with poisonous radioactivity and these must be carefully isolated from public contact. "Some radioactive elements in plant components will decay quickly, but others will remain hazardous for millennia." Moreover—

> No one knows how much it will cost to decommission the hundreds of units in service and under construction around the world. Estimates range from $50 million to $3 billion per reactor. The reactor construction binge prior to 1980 means that much of the decommissioning bill may fall due shortly after the turn of the century—from 2000 to 2020. Although engineers are attempting to lengthen the life expectancy of reactors, economical operation may not be feasible for longer than 30 years. Numerous technical difficulties, including the constraints radiation-buildup places on routine maintenance and the inevitable embrittlement of the reactor pressure vessel, are likely to limit opportunities to extend plant life.

Most reactor owners will likely just put off decision of what to do. The first reactor in the U.S., a 72-megawatr installation at Shippingport outside of Pittsburgh, was closed down in 1982, and the Department of Energy will encase the entire structure in concrete, load it on a barge, float it down the Ohio and Mississippi rivers, through the Gulf of Mexico, then through the Panama Canal and up the Pacific Coast to Hanford, Washington, the government-run nuclear reservation, to be buried in the ground.

Who will pay for all the decommissioning of the plants still in operation? It seems clear that no one is likely to have saved the money for this job. As Cynthia Pollock says:

> If money is not collected from ratepayers during the years the plant produces power, the bill will be charged to future customers or taxpayers who did not use the electricity. In the event that regulators forbid the collection of decommissioning funds from customers who did not use the nuclear power, the expense might bankrupt utilities or result in decommissioning shortcuts that could endanger future generations.

Nuclear reactors have another problem that adds insult to injury. They all are accumulating radioactive wastes as they operate.

> No country currently has the capability to permanently dispose of the high-level wastes now stored at a single reactor. And the already daunting task of managing low-level operating wastes is only the tip of the iceberg. As reporters Donald Barlett and James Steele have observed "If the politicians and scientists in charge of nuclear waste had been running the space program, John Glenn (the first U.S. astronaut) would still be orbiting the earth today." And, if nuclear plant construction estimates made in the seventies had come to pass, lack of adequate waste sites might have crippled the industry. . . . Several countries now require utilities to submit decommissioning proposals at the design stage. But hindsight will only benefit the trickle of reactor orders yet to come, not the hundreds of units in operation.

Cynthia Pollock concludes her paper:

> Because many plants operated for years without collecting money for decommissioning, electricity

customers and taxpayers will suffer the "after shock" of paying for retired reactors. The less money set aside while the plant produces power, and the more actual decommissioning costs diverge from estimates, the greater the aftershock will be.

During the next three decades, more than 350 power reactors will be taken out of service. Immediately dismantling some of the largest or most problematic reactors as part of an international test case would yield valuable lessons for future decommissioning projects. . . . Taking full advantage of the learning experience offered by the reactors now coming out of service is sometimes viewed as a needless expense. But saving millions of dollars today could result in spending billions of extra dollars tomorrow.

Worldwatch Institute Papers cost $4.00. The address is 1776 Massachusetts Avenue, N.W., Washington, D.C. 20036.

We have a paragraph or two from the end of a talk that Wes Jackson gave last January that seems to fit with Cynthia Pollock's somewhat depressing review. He is considering what's wrong with farming in America, and says:

In 1776, this continent could absorb lots of bad human nature. The frontier was before us. But the land frontier came to an end. Rather than face our problems squarely we keep looking to expand our frontiers always for the purpose of exploiting them as we have. We have gone into the inner recesses of the atom and the nucleus of the cell. The exploitation of both is not at all unlike ripping open the prairies, the very heart of our continent. . . . About the time we were fresh out of longitude and latitude, we funded a space program and went for altitude. . . . Astronauts headed for orbit may be given more status than a farmer protecting a hillside from erosion but a farmer who is successful in discovering ways to arrest nutrient loss on his sloping farm has made a more profound discovery than all the colonizers of space combined. So has the farmer who is gradually weaning himself from costly input farming, who is shifting the ratio from being so much a consumer to more the producer side. These are people who comprehend the idea that the discovery of America lies before us that so far we have only colonized it.