

## INTERMEDIATE TECHNOLOGY

[This two-part article by E. F. Schumacher is reprinted by permission from the February *Center Magazine*, issued by the Center for the Study of Democratic Institutions, Santa Barbara, Calif. The address of the Intermediate Technology Development Group, Ltd., to which inquiries for further information should be directed, is 9 King St., Covent Garden, London WC2, U.K. Dr. Schumacher is author of *Small Is Beautiful* (Harper & Row paperback).]

### I

ONE of my activities sails under the name of intermediate technology. It began nearly twenty years ago, when, for the first time, I got a short-term assignment to advise the Prime Minister of Burma on his country's development policies.

What I saw in Burma I did not like. Burma was running itself into the ground trying to modernize in a hurry, primarily on the basis of the rich man's technology. At the time I could not think my way through it, but I just felt that unless Burma remained Burma, it was going to become a nothingness. With the exception of some mainly immigrant Indians in Rangoon, the people in Burma were very well fed, beautifully dressed, living in delightful houses built precisely to suit the climate, and appeared to be the jolliest people one could ever meet. Something did not fit.

It was not until a few years later when the Prime Minister of India asked me to come to India and consult with him on the rural areas, and only after I had traveled the whole of the country, that something clicked in my mind; namely, that for developing countries there is, on the one hand, a very low level of technology which does not keep people going except in relative misery, and, on the other, the rich man's high-level technology which is outside their reach.

Of course, high-level technology can be implemented at this or that point in developing

countries, but the points tend to be the big cities. That technology cannot eradicate the three-fold disease of mass migration into cities, followed by mass unemployment, and finally the threat or actuality of mass hunger, because, in the end, food is produced not on balconies in the cities but in the vast rural areas. In India, development efforts were bypassing the rural area, where eighty-five per cent of the people live, thus exacerbating this three-fold disease, making the problems larger and more unmanageable.

Between low-level technology and high-level technology, there is a great vacuum which must be filled with what I have called intermediate technology. But I received a very bad reception when I got back to Delhi and talked about intermediate technology. I was accused of being an imperialist, a fascist, a racist, a beast who had come to India to keep the country down and to withhold—as if I could withhold anything—the glories of modern technology. I got angry and said, "Well, bye-bye." If you ask the doctor to come, and he gives you good advice, and you abuse the doctor, the doctor leaves. Still, you never know what will happen.

Fifteen months later, there was an all-India conference on intermediate technology, and a leading Indian economist said, "This is what we must attend to."

So, for a number of years I have been talking and thinking and lecturing about intermediate technology. Then comes the awful moment—with some people this moment never comes—when you ask yourself, or your friends say, "Are we only talkers or are we doers?" But what can one do? Talking and giving lectures is not illegitimate, but if one wants to do something one sets up an organization.

We set up an organization, and we called it the Intermediate Technology Development Group, Limited. It's still very limited. I happened to have earned an inordinately high fee from an article published in *The Observer*. I used that hundred pounds to start the organization. Many people—particularly young people—think that before you start anything you must have a lot of money. We started with an idea and without money. Now, the Intermediate Technology Development Group involves more than a thousand people.

Needless to say, I do not have a thousand people on my payroll. I've got thirty people on the payroll, and to raise the money for that is difficult enough. But we have adopted, quite consciously, a decentralized mode of operation. We said to ourselves from the start: we can't build up technological workshops (that is vastly expensive), but plenty of technological workshops already exist. We must get them to work for us.

This has worked; it has worked magnificently, not only with academic institutions, but also with industry. Virtually all the work, except for that of the over-all direction, which must be done from headquarters, is performed by other people on their own behalf, if I may put it that way, but for us.

Our first thought was, how can we start? We hit on an idea that some people in California in a quite different context also hit upon when they produced the *Whole Earth Catalogue*. Cataloguing is always a good idea for starting. We said, we'll make a catalogue, suitable for the rural areas of the world, of small-scale equipment that is still available from British industry. We confined ourselves to British industry because we had no money to travel. We could reach the British organizations from London without having to travel.

We got the Association of Agricultural Engineers to do the cataloguing on agricultural equipment, and various other associations to catalogue other equipment. We compiled this

catalogue without money. Indeed, people who wanted to get into the catalogue had to pay us.

We called the catalogue *Tools for Progress: A Guide to Small-Scale Equipment for Rural Development*. The catalogue itself was a tool. It helped the poor find equipment relevant to their problems. Once you are out in the bush, you cannot find anything. *Tools for Progress* traveled the world. It even became economically self-supporting. It is now sold out. When we looked at it again, we found it was too superficial, so we decided to take problems up, subject by subject, as the wind blew and as opportunities arose.

We set up voluntary specialized panels to advise us. The first subject we tackled was building. There can't be any development unless there is some building. Why don't people get on with their own building, let's say, in Africa? There are architects, surveyors, and civil engineers in Africa, and, at a lower level, there are bricklayers, electricians, plumbers, carpenters. Still, most of these people remain unemployed in Africa, or else they try to find a job with a foreign contractor. Our advisory panel on building said that the missing factor in this situation is the building contractor. We decided to train indigenous contractors.

We started in Nigeria, and developed a great stock of teaching material. We found, in fact, that the contractor is the forgotten man in Nigeria. When we discovered him, he was delighted, delightful, and eminently teachable. These courses have been put on throughout the country without the aid of the government. They have been very successful, and the teaching materials have been verified.

Once we have produced the knowledge of how to do something, we let the knowledge roll, by the laws of gravity. The Nigerian courses have leapfrogged to Kenya, to Tanzania, to Zambia, and other countries. The materials are freely available, although they are not free of charge because it costs some money to produce them. Then we leave it alone, because that particular

knowledge gap has been filled. We are not an aid organization in the conventional sense, but a knowledge organization.

Now, the building panel has advised us to give attention to local building materials and upgrade both the materials and their use. We are doing that work in conjunction with the engineering department of Cambridge University in England. That is a central part of our whole organizational idea: to use facilities that already exist, rather than duplicating them.

All our advisory panels are built on what we call the ABC combination. A is for administrators, people from government. They know how to pull the ropes. You have to have them on your side, or they may stop you. But they can't do it alone. A governmental development policy is ineffectual because civil servants do not live a life that produces the particular abilities needed to make a thing viable. For that you must have businessmen with you. That's the B factor. It is not difficult to find highly enlightened and generous businessmen. But the businessmen can't do it alone either; they are under their own constraints. We need communicators, the people of the word, the academics, and research people. That's the C factor. None of the three groups can do it alone, but bring them together and you will get a synergic effort.

It is also an enjoyable experience for all three groups. A normally has a rather poor opinion of B and C; B feels the same about A and C; and C has a poor opinion of the other two. But when they meet, they discover that actually they are all quite able and decent people.

Our second advisory panel was on water. Here again, was exemplified our ideology of intermediate technology. The good Lord sends water to most places where it is wanted. But in arid countries the water runs away into rivers and out to sea. Modern intelligence suggests the building of a desalination plant. But even if you get the money for it, and even if it is built, it is

monstrously expensive and energy-consuming, and you still have it in only one place, when what is wanted is water throughout the country.

So we developed various small-scale technologies to hold the water where it is wanted (particularly for human requirements) and where it has to be protected. This meant underground water catchment tanks. We adjusted the technology to the level of the poor; in economic terms that means that outgoing expenditures to build the tanks must be minimal, ideally zero. The labor content can be what it has to be, because there are a lot of workers who for a long stretch of time during the year have nothing to do. These tanks can be built by the villagers. The expenditure is minimal; it is the price of, say, one cow for a twenty-thousand-gallon tank.

In this case, funded by an aid organization, Oxfam, we demonstrated these tanks in Botswana. The Botswana government told us that having water where it is wanted had changed their entire prospect. They asked us to train the villagers. We said we do not train the villagers. If we train them they come into a European environment and will not return to the villages. They will become government clerks. But we are prepared to train the primary school-teachers from the village, because they have enough motivation to go back into the village. And with that knowledge these teachers, at least to start with, can build rainwater catchment tanks for their schools.

The water panel advised us not only on these catchment tanks, but on all problems of water lifting, and water in and water out. We also recommended that the dimensions of the tank be such that there would be enough water for all human requirements and something to spare for micro-irrigation of horticulture as practiced in Israel. Then the whole thing was fully documented, we produced a handbook on self-help water and sewage technology, and that was the end of our activity.

This is now usable knowledge. As I say, knowledge follows the law of gravity. Knowledge

is free. It travels across frontiers. There is no customs duty on it. I was recently in quite a different part of Africa and I found these catchment tanks being built there. They are also being built on a large scale in Jamaica, and in other non-African states.

A third advisory panel deals with agricultural equipment. Here again, technology has zoomed out of reach of the poor. British tractors—and no doubt even more so in the United States—are such complex artifacts that the British farmer cannot risk letting volunteer workers run them. They can't even let engineering graduates on the tractor. If you push the wrong gear on a twenty-four gear tractor, the owner is between five hundred and a thousand pounds out of pocket. In poor rural areas the question is whether a tractor is in every case necessary.

So we studied the whole range of agricultural equipment from the point of view of poverty. We couldn't do it ourselves, so we approached the National College of Agricultural Engineering, in Bedfordshire. They were delighted. They wanted ideas for their students to work on. Their intermediate technology unit first made a worldwide search for low-cost simple equipment that can be locally fabricated. They came up with seventy such items of equipment and we published this information. This is down-to-earth knowledge. We give the chap who feels he needs a particular item the drawings so that he can fabricate it himself. To him it is immensely exciting to discover he can do certain things so much better than he had ever done them before.

Unfortunately, the mainstream of technological development is using this fabricating knowledge to make things bigger and more complex. We try to use this intelligence to make things smaller and simpler. For example, we were up against the problem of metal bending: how to get the metal around the wooden wheel of an oxcart. That is no problem in Pittsburgh or Sheffield, but how do you do it in a small town in Africa, or in India? Well, our forefathers knew

how to do it. They had a most intelligent tool, but it had fallen into oblivion. We discovered one of these tools in a French village, and we took it to the National College for Agricultural Engineering and asked them to upgrade it, put modern mathematics into it, and get the curvature just right.

The upshot is that this tool has now been redesigned. Any village blacksmith can make it and do the job perfectly. The cheapest modern equipment that we could locate anywhere in the world to do this job costs seven hundred pounds and requires an electric drive. Ours costs seven pounds and works with human power. It is a symbol of what is now possible, namely reducing the capital cost of a piece of basic agricultural equipment by the factor of a hundred—from seven hundred down to seven—and at the same time doing away with a need for electricity, because in most of these places there is no electricity.

We have fifteen advisory panels in all—on cooperatives (why do they so easily fail, for instance?); on rural health (that has been effective, but it's never been funded, so we have never been able to get full-time people on it); on wood and woodworking; on transport.

E. F. SCHUMACHER

*(To be concluded)*

## *REVIEW*

### POETS ON MODERN POETRY

MANAS praises Poetry yet prints no poetry, or practically none. If this seems a contradiction, then Robert Boyers' *Contemporary Poetry in America* (Schocken, 1974) may be a good book to read. It was for us. At any rate, it helped the reviewer to understand his suspicions (with a few exceptions) of the entire area of modern poetry. Why, then, does MANAS have so much to say about the importance of Poetry and the poetic? A footnote by Harold Goddard in *Alphabet of the Imagination* suggests an answer:

I hope it is superfluous to note that I use the word *poet* in its widest derivative sense, with no special reference to the artisan in verse. "Poetry," Matthew Arnold has well said, "is simply the most beautiful, impressive, and widely effective mode of saying things."

A further explanation might be taken from Howard Nemerov—a modern poet who contributes the opening essay, "Poetry & Meaning," to Mr. Boyers' book. "Poetry," he begins, "is getting something right in language." Later he proposes that the virtue of poetry is richness of meaning—"the power to handle a great many meanings at once, the power of poetry to be somewhat more like a mind than a thought." He adds:

What is important to each of us is to have the idea of rightness, to grasp it feelingly. If we do not have it, perhaps poetry is not for us; music goes on though many are tone deaf and few have absolute pitch; absolute pitch has never been accused of being subjective on that account. If you are in the presence of a greater vision than your own—Shakespeare's for instance—and do not see what he is talking about, you don't say he sees nothing, for that would be like telling a microscope that it exaggerated.

This may be enough quotation from Mr. Nemerov to make you want to look up some of his poems (part of one was quoted in MANAS for Feb. 26, 1969). Here we want to repeat some of his thinking about what has happened to both poetry and practically all art in our own time. If

we read him correctly, he is concerned with the progressive outlawing of human meaning by the conventionalized forms of science—starting, centuries ago, with Galileo and Locke. Then, turning to the present, he says:

For one thing, the posture of the literary mind seems these days to be dry, angry, smart, jeering, cynical; as though once people had discovered the sneaky joys of irreverence they were quite unable to stop. This is one typical process of Shakespeare's tragedies. Where the intelligent and crafty young destroy the stupid old and, with them, the sacred something that these complacent dodos by some accident had in their charge, and the intelligent and crafty young at last, as Ulysses says, eat up themselves.

. . . the public discussion, the criticism, that attends on poetry, has appeared to me as coming close to the point at which a smart shallowness and verbal facility will jettison meaning altogether; and the same thing has been happening in poetry itself . . . Everyone who thinks much about poetry will have observed how in the early years of this century it abruptly became much harder to understand. Not all of it by any means, but I need mention only Eliot, Pound, Hart Crane, as instances. By heroic efforts of criticism and exegesis Eliot's poems, which seem to have impressed many of their first readers as being written in Linear B, were made part of the common language, so that even ball games may now end not with a bang but a whimper. The same has not happened to the *Cantos* of Ezra Pound, and I am inclined to doubt it will happen.

What I am calling the slow collapse in the idea of meaning, which made poetry so very hard to understand and consequently conferred on English Departments a large part of both their real and their spurious importance, evidently did not happen in poetry alone. It happened even more conspicuously and about the same time in physics, in painting, in music; the whole world suddenly became frightfully hard to understand.

It is a world in which we are overwhelmed with endless facts, and with the number of facts grows their incomprehensibility. We are beset by the terms of numerous technical languages, and confronted, everywhere, by signs which suggest and insinuate, or simply instruct and order. There are, Mr. Nemerov proposes, two consequences:

For one, the public language of press and other media imposes upon us a public dream, a fantasy written in a language that is neither right nor wrong but, say, serviceable. Not so much that it tells us what to think, though it tries to do that as well, but it makes of no avail our freedom of thought by telling us what we must have these thoughts about, and by progressively and insensibly filling us with a low, dull language for thinking them.

The second consequence seems to be that the languages of art and of learning grow ever more recondite, as if they were distorted mirror-images of the public language, which they relate to, perhaps, more or less as a dream relates to a newspaper.

Yet here too the opposites coincide, for the public dream that is the daily dream of all appears as no less insane, and no less under the threat of an ultimate meaninglessness, than the private dream that is the nightly dream of each one alone. And if the languages of the arts and sciences grow progressively harder to understand, the matching phenomenon on the other side is that in the public language it is getting progressively harder to say anything that refers to reality.

I think I can give a name to the period that is over. I shall assert that it lasted from the middle of the last century to the middle of this one, and I shall call it The Age of Art, or The Aesthetic Age. Its dominant characteristic was the claim that salvation was by art alone. What that salvation would be, or would be like, was specified in ever so many different ways by different artists, but it scarcely ever failed to be asserted that the way and the truth and the life was art. . . . I would remind you that even if I am somewhat right about what is happening, it may not be altogether a disaster. The world is a very deep place, no matter how much of it we explain, and explain away, and the end of a particular form of experience does not mean the end of experience. Forms are there to be transformed, and of all this something kind and good may come one day.

This is a poet's seriousness and directness—a thorough vindication, it seems to us, of the poetic mode. One recalls, here, what Octavio Paz wrote in the *Atlantic* a year ago (May), and what Wilhelmina Van Ness said in last spring's *American Scholar*, both on the subject of art (reviewed in *MANAS*, June 12, 1974). What is back of this loss of a sense of meaning, and the multiplying obscurities of language and

communication? There cannot be, after all, a cabal of malignant forces conspiring against us. Behind these failures, it seems almost certain, is simply the loss of significant human purpose, a weakening of the energy of vision, so that inflated ciphers of sterility have marched in to fill the vacuum. Art has become the embellishment of these empty forms. Compliantly, we have learned to admire the skillful imposition of fraud. But now the skill is self-degraded, no longer admirable at all.

Another contributor, Joyce Carol Oates, writing on the poetry of Sylvia Plath, shows that this brilliant, pathetic, agonized young woman was captive of "an old, dying, ungenerous conception of man and his relationship to nature." Representative of a new and wiser generation, Miss Oates cannot admire the content of the work of Sylvia Plath, although its forms embodied a "deadly accuracy."

The same [Miss Oates says] can be said for the reading of much of contemporary poetry and fiction, fixated as it is upon the childhood fears of annihilation and persecution the helplessness we have all experienced when we are, for one reason or another, denied an intellectual awareness of what is happening. For instance, the novels of Robbe-Grillet and his imitators emphasize the hypnotized passivity of the "I" in a world of dense and apparently autonomous things one must never ask, "Who manufactured these things? Who brought them home? Who arranged them?"—for such questions destroy the novels. Similarly, the highly praised works of Pynchon, Barthelme, Barth (the Barth of the minimal stories, not the earlier Barth), and countless others are verbalized screams and shudders to express the confusion of the ego that believes—perhaps because it has been told so often—itself somehow out of place in the universe, a mechanized creature if foolish enough to venture into Nature, a too-natural creature for the mechanical urban paradise he has inherited but has had no part in designing.

The self of Sylvia Plath is forlornly, ferociously, tragically separate and alone:

. . . so relentless [is] the pursuit of the solitary isolated self by way of the form of this poetry, that stasis and ultimate silence seem inevitable. Again, lyric poetry is a risk because it rarely seems to open

into a future: the time of lyric poetry is usually the present or the past. "This is a disease I carry home, this is a death," Miss Plath says in "Three Women," and, indeed, this characterizes most of her lines. All is brute process, without a future; the past is recalled only with bitterness, a stimulus for present dismay.

When the epic promise of "One's-self I sing" is mistaken as the singing of a separate self, and not the universal self, the results can only be tragic.

. . . poetry—like all art—demands that its subject be made sacred. Art *is* the sacralizing of its subject. The problem, then, is a nearly impossible one: How can the poet make himself sacred? . . . Most of modern poetry is scornful, cynical, contemptuous of its subject (whether self or others), bitter or amused or coldly detached. It shrinks from the activity of making the profane world sacred, because it can approach the world only *through* the self-as-subject; and the prospect of glorifying oneself is an impossible one. Therefore, the ironic mode. Therefore, silence. . . . Most lyric poets explore themselves endlessly, like patients involved in a permanent psychoanalysis, reporting back for each session determined to discover, to drag out of hiding, the essential problem of their personalities—when perhaps there is no problem in their personalities at all, except this insane preoccupation with the self and its moods and doubts, while much of the human universe struggles simply for survival. If the lyric poet believes—as most people do—that the "I" he inhabits is not integrated with the entire stream of life, he is doomed to solipsistic and ironic and self-pitying art in which metaphors for his own predicament are snatched from newspaper headlines. . . .

What need for writing "reviews" when material like this can be quoted?

## COMMENTARY

### A TIME OF DECISION

THAT we are witnessing and taking part in the end of an age seems beyond doubt. All the articles in this issue reflect some aspect of either the death or rebirth of what we think of as civilization. Review is concerned with both processes in poetry and literature. The "Children" article quotes Walter Webb on the end of "boom" culture in America, with Howard Odum giving ecological parallels and pointing to the "steady state" relationships that must follow if the human race is to enjoy any sort of maturity. The new spirit comes in at various levels. The outlook of the New Alchemy Institute has attention in *Frontiers*, with John Todd advocating revival of the scientific spirit of Giordano Bruno, and Solzhenitsyn representing a new awakening of the conscience of the world. In the lead, E. F. Schumacher gives the specifications of the new technology—a technology designed for working *with* both nature and man.

Since these are the themes of this issue, it is especially appropriate to call attention here to a book that has come in from England for review—*The Black Rainhow* (Heinemann, £3.8—or, at the moment, about \$8.12), edited by Peter Abbs. Mr. Abbs presents the work of ten essayists on "the present breakdown of culture," including, as the first contribution, Herbert Read's critique of present-day art—a lecture given four months before his death in 1968. Mr. Abbs is a teacher and writer, and he edits *Tract*, a quarterly offering commentary along the lines of the content of this book. (A paper contributed by Leopold Kohr to *Tract* for last summer was quoted in *MANAS* for Feb. 26.) In an introductory note to *The Black Rmnbow*, Peter Abbs remarks that while there has been ample public discussion of the dangers of pollution, "the arguments have tended to overlook an even more fundamental consideration: a consideration as to what makes life *worth living*."

We have not asked seriously enough about what sort of cultural and social conditions are needed if

human life is not to lose an inner sense of purpose, of genuine well-being, of personal zest. We know that countries which have highly advanced economies, with high levels of production and consumption, countries like the United States of America Switzerland, Denmark and Australia, have also the highest rates of drug addiction, suicide, and death from violence. It is, thus, the crassest nonsense to delude ourselves into thinking that merely an *unpolluted affluence* would make one iota of difference to the quality of human society. We know it would not, and could not. And yet discussion on all those deeper questions, concerning *meaning* and *worth*, which now confront humanity on all sides, are constantly evaded. . . .

These essays dealing critically with modern culture—art, poetry, the novel, serious and popular music, language, philosophy, and even architecture called to mind something said, somewhere, about brain-damaged people. An observer noticed that when brain-damaged persons tried to draw, they almost always began in a corner of the sheet of paper, using little space, as though they feared to occupy the large central area, and their drawings were small and labored. So it is with most of the cultural expressions examined in this book. They are limited to a marginal side of existence, which is elaborated in great detail, as though there were nothing else to celebrate. Herbert Read has this paragraph:

What in Joyce was a masterpiece of sick humour became in his imitators a simple failure to communicate any meaning but the meaninglessness of all forms of communication, and therefore the meaninglessness of social existence, indeed, the meaninglessness of life itself, individual or communal. Samuel Beckett has been the chief instigator in this permissive process—again a process with its-moments of tragic or comic vision, but from a stylistic point of view leading to an apotheosis of futility.

Turning to the "anti-novels" of Robbe-Grillet and some others, Read said:

Always a vital word-play, a glimmering imagery, a sense of despair or loneliness or futility, but no forward movement, no organic growth, no dramatic tension, no resolution of a tragic destiny such as we find in the great literature of the past. The



creative imagination of the poet sinks in a sea of words.

Read concludes this essay by saying, "What we seek is 'a renaissance beyond the limits of nihilism'."

The kinship of the criticism throughout this volume with the poets quoted in Review will be evident. And ten years ago, the English novelist, Storm Jameson, provided similar comment in the *American Scholar*:

Alain Robbe-Grillet sees human beings as a kaleidoscope of moods, and communication between them little more coherent than a conversation on crossed telephone wires; to pass judgment on their acts, thoughts, feelings, is senseless or impossible. This irrational philosophy lays an ax to the roots of any intelligible visions of reality, so that by an ironical paradox the New Novelists devalue man, rob him of his identity, as fatally as does the most menacing product of technology.

The contributors to *The Black Rainbow* all seem to be saying things like this—almost more, one might think, than is necessary, since criticism, when so extensive, dignifies with attention what hardly deserves notice in the first place. Yet the justifiable excuse is that a great many people seem to take quite seriously a lot of what now passes for art and literature.

The concluding essay, by Mr. Abb, demonstrates the emptiness of a cultural life based on the mechanistic assumptions of the modern scientific world view. This is a life in which all values have been externalized, all goals are finite and acquisitive, and all striving is driven and compulsive. An anxious devotion to things and power is the practical religion which grows out of these assumptions. When this can be made so clear, a time of decision is upon us.

## CHILDREN

### . . . and Ourselves

#### ON LEARNING FROM HISTORY

ARE we what we have been, or are we, essentially, the capacity to change what we have been into something else? History, if it has importance, is a light on the ingredients which go into the various answers to this question. Obviously, if the matter is to have discussion, we need to know something about what we have been, and to know it in terms which have relevance to the question raised.

There is plenty of material for study. In fact, far too much. This is the impression one has from the nine or ten articles on Texas—as a region, a state, and as a metaphor for the entire U.S.—in the March *Atlantic*. The *Atlantic* editors confess, in introducing this sometimes instructive and entertaining collection, that "there is really too much of Texas to accommodate in one issue of a magazine." All too true—the material needs distillation, and this, when it comes to the subject of history and our question, requires art. So, after reading and reading about Texas in the *Atlantic* we turned for help to an artist—J. B. Priestley, who, after a couple weeks in Texas in the 50s, said that—

there may be found the latest men, living in what are for their size the richest and most expanding cities in our Western world. If our newest urban civilization cannot be found here, then where can it be found? Dallas and Houston represent the newest, the most prosperous, the most "progressive" America, just as American life itself represents a pattern of society to which all our urban Western civilization is beginning to conform. Here, you may say, is the cultural pattern of the mid-twentieth century.

This is from *Journey Down a Rainbow* (Harper), which Priestley and his wife Jacquetta Hawkes wrote in 1955, and you hardly need more than Mr. Priestley's portion of this book for forming an impression of the historical role of Texas, although the elaborate documentation in the *Atlantic* articles has its uses. In one of them Larry McMurtry, a novelist who lived and worked in Texas for more than thirty years, says:

If I were to choose one example of the Texas penchant for ludicrously overestimating local achievement, my example would certainly be the city of Austin. The Texas intellectual community treats Austin not merely with fond regard but almost with reverence; this, in my view, is the intellectual equivalent of thumb-sucking. My own feeling about Austin is that it is a dismal, third-rate university town, the "dismal" in only my own opinion, but the third-ratedness is attested to constantly by the books, music, and pictures that are produced there. The only indigenous first-rate mind that Austin can claim is the late Walter Prescott Webb, and his last major book was published in 1952.

Well, that is enough of the endlessly ridiculing and denigrating things said about Texas. They are doubtless all true, more or less, but their pertinence falls into place only if some conception of meaning, of what is really happening, can be developed from the *Atlantic's* welter of information and jibes. By happy coincidence we have from the library Mr. Webb's "last major book" (borrowed for some forgotten reason a couple of weeks ago), and we find it amply fulfilling of Mr. McMurtry's opinion about its quality. The title is *The Great Frontier*. In his last chapter the author says in review:

This book is based on the hypothesis that the Great Frontier as defined has been one of the primary factors in modern history. The major premise is that the sudden acquisition of land and other forms of wealth by the people of Europe precipitated a boom on Western civilization, and that the boom lasted as long as the frontier was open, a period of four centuries. A corollary of the major premise is that our modern institutions, as distinguished from medieval, were differentiated and nurtured during a boom, and are therefore adapted to boom conditions. . . . It was in this atmosphere and under these conditions that democracy, capitalism, and individualism of the modern type came to their dominant position.

The evidence tends to show that the frontier closed in the period between 1890 and 1910. . . . There would seem to be little room to doubt that our entry into a new age, which remains to be named, will be accompanied by basic changes in the nature of the institutions which grew up in the earlier one. The changes should be especially marked in those institutions which best fulfilled the needs of a frontier society.

What happens to "boom" institutions which no longer have a function? This is part of what Mr. Webb's book is about; he writes well, unquestionably an artist at his trade, as might be illustrated by the following, in which he considers the initial—and largely depressing—transformations in culture as the boom subsides:

There is no room in the present world for such as the stuff our modern literature was made of. The imagination cannot play any more with the mystery and uncertainty of a half-known world, for there is no such thing. The map is finished, the roads are surveyed, and all the paths to that kind of adventure are plainly marked and tended. Da Gama would have a score of ports of safe call, and no hope of his voyage bringing glory to his country. Robinson Crusoe would be picked up by an airplane before he could make a pirogue or tame a goat. The Eldorados are sought by geophysicists and men with Geiger counters. The noble savage would be exposed in the next Sunday supplement by a sociologist or anthropologist who had seen him and measured his head both ways. The Ancient Mariner would be thrown out of the court of credibility if he claimed to be the first that ever burst into any sea. Cooper's Indians are drinking Coca-Cola on the reservation, Tom Sawyer would be lucky to escape a camp for underprivileged children, Russell and Remington would be painting horses that would frighten one—pictures that no saloonkeeper would tolerate, Audubon would be teaching ornithology to a few disinterested students and hoping for a grant from a foundation, and Walt Whitman would probably turn his savage genius on the frustrations of the democratic vista.

Just this morning, the daily paper described a new and flourishing business: making fiberglass bodies of old car models—1920 Rolls Royces, Model-T Fords, the Bearcat Stutz—and putting sturdy Volkswagen motors under the hood, technological studies in nostalgia that people are buying and driving around just to get a faint feeling of the good old days. Would anyone have done things like that *in* the good old days?

But one important point remains to be made. A few weeks ago we quoted Howard Odum on what the ecologists know but the economists don't. Ecologists are well acquainted with nature's "boom" institutions, and with the fact that they don't last and

are not meant to last. Prof. Odum said in his paper, "Energy, Ecology, and Economics":

We observe dog-eat-dog growth competition every time a new vegetation colonizes a bare field where the immediate survival premium is first placed on rapid expansion to cover the available energy-receiving surfaces. The early growth ecosystems put out weeds of poor structure and quality which are wasteful in their energy-capturing efficiencies, but effective in getting growth even though the structures are not long-lasting. Most recently, modern communities of man have experienced two hundred years of colonizing growth, expanding to new energy sources such as fossil fuels, new agricultural lands, and other special energy sources. Western culture, and more recently, Eastern and Third World cultures, are locked into a mode of belief in growth as necessary to survival.

We are now, Prof. Odum says, in transition to a "steady-state" economy, and are finding it bewildering and painful. It will probably grow a lot more painful, until we recognize what is happening:

Most economic advisors have never seen a steady state even though most of man's million-year history was close to a steady state. Only the last two centuries have seen a burst of temporary growth because of temporary use of special energies that accumulated over long periods of geologic time.

Now, apparently, the Fausts are going to have to go to school to the Fuddy-Duddies, and the Movers and Shakers learn from the Taoist Philosophers.

Are we merely what we have been, or are we the capacity to change? Aldo Leopold implies an answer which fits the facts of modern history:

To the laborer in the sweat of his labor, the raw stuff on his anvil is an adversary to be conquered. So was wilderness to the pioneer. But to the laborer in repose, able for the moment to cast a philosophical eye on the world, that same raw stuff is something to be loved and cherished, because it gives definition and meaning to his life.

## *FRONTIERS* Changes in Outlook

IN one of his books, Paul Goodman pointed out to technology-hating youngsters that if education in technology is sought and pursued only by technocrats, there are unlikely to be any of the sorely needed changes in the applications of engineering, chemical, and electronic know-how. This, in a way, is also the point of Robert Persig in *Zen and the Art of Motorcycle Maintenance*. Again, E. F. Schumacher says that intermediate technology calls for the best that scientific knowledge can devise, involving the right solutions of technical problems. "Any intelligent fool," Schumacher remarked, "can make things bigger, more complex, and more violent." But it takes a touch of genius to move in the opposite direction.

A lavishly illustrated article on the New Alchemy Institute in the February *Smithsonian* magazine will be of particular interest to readers who have wondered what the farm and experiments of the New Alchemists near Falmouth, Massachusetts, look like. At the end the writers, James Page and Wilson Clark, describe the future plans of the Institute and quote John Todd on the practice of science:

This spring the Institute plans to build a larger food-growing complex—the Ark—to analyze more closely energy budgets and the micro-economics of backyard fish farming and to investigate the limits of scale versus volume. They intend also to build a seven-kilowatt wind power system—enough to power a house in average winds of six to seven miles per hour. And they are developing plans for a family-sized food, energy and housing complex for Prince Edward Island in Canada.

John Todd is a marine biologist who, with William McLarney, a fish ecologist, decided to work together on the needs of small-scale farmers and the possibilities of fish culture. The New Alchemy Institute was the result—a place where an early meaning of alchemy is being applied: "an ancient science of nature that says that the sun, the

soil and man, working together, can create a whole that is greater than its separate parts."

Asked how his former scientific colleagues felt about what he is attempting, Todd replied: "Scientists simply say we aren't doing science. That's how they handle it. A problem scientists have with us is that anyone who comes here can look around and say to himself, 'I couldn't do that.' There's none of the usual mystery about our kind of science. We publish our results for people, not just for colleagues. Another problem is that we bring in excellent people who aren't scientists—theologians, musicians, a poet.

"We aren't antiscience or technology. I think it's essential to save science and technology—but it can and must be done on a human scale. We believe that the quality of the whole depends on the quality of the smallest parts, so we concern ourselves with what we hope are micro-solutions. We are looking back again to the Renaissance alchemist Giordano Bruno, who saw science as a sacred discourse with nature. I like that attitude—I don't believe it is the kind that produces hydrogen bombs.

A review of the second volume of Solzhenitsyn's *Gulag Archipelago* (published in Paris last December in French) in the *Manchester Guardian* (Jan. 18) reports another kind of change in outlook and understanding. The reviewer, Piotr Rawicz, says:

While he [Solzhenitsyn] sums up the disastrous results of Soviet practices which, in his view, inflicted damage on a scale hitherto unknown in Russia ("perpetual fear, concealment, bondage, ignorance, mutual spying, cruelty, and lying as a way of life"), he refuses to give up hope. He makes use of the life stories of a few people to build up a spiritual resistance all the more praiseworthy in that "it was less dangerous under Alexander II to keep dynamite in one's home than to shelter the orphaned child of an enemy of the people under Stalin; and yet, many children in such circumstances were taken in and saved."

Western intellectuals are bound to be upset by this second volume, for it attacks values which seem sacred to them it attacks Marx socialism in all its forms, the dishonesty implicit "in all the revolutions of history: they are content with eliminating contemporary agents of evil (and, in their haste, blindly do away with the agents of good as well), but the evil itself visits subsequent generations in worse form."

Thanks to Solzhenitsyn, concentration-camp lore becomes a major branch of anthropology. Henceforth it will be impossible to take part in the controversies rending this planet to proclaim oneself Communist or anti-Communist, Socialist or anti-Socialist, without having absorbed and taken to heart the lesson flowing from it. *The Gulag Archipelago* should have a pre-eminent place in any small collection of books which would be saved for posterity in the event of a world holocaust.

Another far-reaching change in conventional ideas can be noted in the general outgrowing of the conceptions of psychoanalysis. A Dutch writer, C. Weggelaar, points out in *Etc.* for last December that Freudian psychoanalysis has serious shortcomings and fails to deal with the subtleties of our psychological life. A principal reason for the failure, this writer says, "is that psychoanalysis tries to describe 'mental' events in terms of forces."

According to popular metaphysics, rest is somehow more natural than movement. When a human being is not quietly sitting in a corner there has to be some force (will, drive instinct, etc.) that is making him move and act. When he shows neurotic symptoms there has to be some force that is causing them. But "force" and "psychic energy" are metaphors. When we accept them as descriptive statements we silently introduce a set of unknown postulates. "The language of cause and effect (of which "force" is a particular case) is . . . merely a convenient shorthand for certain purposes; it does not represent anything that is genuinely found in the physical world" [Bertrand Russell, *The ABC of Relativity*]. This statement applies not only to modern physics but also to psychology. Science does not ask why things are happening, it only tries to describe their logical structure.

Furthermore, psychoanalysis and related forms of therapy try to change the conceptual map of the patient, but they never tackle the underlying intensional attitude. They tend to replace one map by another. The patient is more or less implicitly taught what he is to believe, but not how he can arrive at more mature evaluations by himself. . . . To quote an anonymous therapist cited by E. Gendlin: "of course interpretation is not enough. Of course the person does not change only because of the wisdoms the therapist tells him. The change comes through some kind of emotional digesting; but then you must admit that none of us understand what *that* is."