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EXTINCTION OR RENEWAL?

THE number of people in the United States who lived on farms was once about 85% of the total of the population. Now it is down to about two and a half per cent. Is that triumph or failure for our civilization? Jefferson, were he among us, would regard it as disaster. Some modern observers would say that it is one of the supreme achievements of technology that so many can be fed by so few. And when people now old enough to remember their childhood on a family farm somewhere in the country express concern and worry about the decline in the number of family farms in every agricultural region—now a real crisis according to the figures and according to stories told about once comfortably fixed farmers who are now dependent on their social security checks, having lost their land—hard-headed businessmen declare the rule for farmers is "Get big or get out," as representing nature's way of bringing about necessary adjustments in the economy. But there are others who regard the bankruptcies of small and medium-size farmers as symptoms of a very sick society which for too long has been living by rules which are contrary to the laws of life; and we know better, they add, in our hearts.

There are books to read by the dozen on the subject, some of them very good, which say different things. Some of them are by farmers, men and women out on the land practicing what they preach. Wendell Berry and Wes Jackson are two of them who are getting some attention, but not enough. Yet little by little people's attitudes are changing. Needed is a growing realization on the part of great numbers of people that the way agriculture is carried on is a fundamental part of all our lives. The issues, in short, must be made clear.

In the Spring *1985* number of *Agriculture and Human Values,* Frances Moore Lappé, well known author of *Diet for a Small Planet* and co-author of *Food First,* takes on the task of showing that the crisis in agriculture is the direct result of policies which are in contradiction with the roots of basic human character and ideals. The rules adopted for the practice of agriculture, she says, are derived from Adam Smith's declaration in the eighteenth century (in *The Wealth of Nations*) that the driving force behind all economic undertakings is self-interest, and that all transactions involved are naturally governed by the processes of the "free" market. Individual self-development is the evolutionary goal served by the pursuit of self-interest, and in the nineteenth century Darwin added the competitive rule of the "struggle for existence" leading to the "survival of the fittest." How have these principles, which very nearly attained the status of "natural law," produced the present disaster in agriculture? Or, as Mrs. Lappé puts it:

> What happens when we apply these premises and their economic rules to agriculture in the 20th century?
>
> To recap, assuming that one's primary responsibility is self-development, being good Americans begins and ends with pursuing our own interests. This is not being self-centered. It is what makes the world go 'round!
>
> Thus in the 1970s, when many farmers bought additional acreage as land values were climbing, most didn't act out of "greed." They believed they were simply making *responsible* business decisions. They were doing what Americans are supposed to do—making the most of one's resources. *Not* to buy more land, if you can, when prices are rising, is to be a fool, a chump! It is to fail in your American duty.
>
> The young "ag" student is taught that farming is a business: "Go back to the farm and be a good entrepreneur." No wonder that many of those endangered today are relatively young farmers who went back to the farm and said, "Dad didn't know how to run a farm. Let's really make something of

this place! We need to specialize, modernize and grow!"

Sure, they took risks. Taking risks, we are all taught, is a positive value, inevitable if we are truly to develop our resources to the fullest and test our mettle as individuals.

I have talked with many farm families, now in trouble, who borrowed to buy additional acreage to bring an offspring into the operation. Were they greedy for doing what most parents would want to do—especially seeing their offspring grow up in a world in which middle-class livelihoods appear even more scarce?

Thus the tragedy for many who are losing their farms is that their *best intentions* were, in a sense, their undoing. The values they had been taught—the maximum development of one's self and one's resources—led to choices which ultimately undermined their hopes and dreams. . . or those of their neighbors. For the only way the values of one individual could be fulfilled was in the undoing of someone else, in what has been called the "cannibalism" of American agriculture.

And as farmers defeat themselves (or each other) in their drive to make the most of themselves, is there a *net gain?* Does society benefit?

I would say no, but as a society we have no way even to ask much less answer that question. *This is the tragedy.*

I am suggesting that the axiom on which we began—individual self-seeking—is inadequate, even to generate the conditions in which individual development is possible. This is the primary contradiction of our value system.

What about the market? It has long been a dogma for us that the market is much more than a common convenience in economic operations—the market is the testing-ground of natural reality in buying and selling. But for a farmer or anyone else, using the market in this way requires some degree of predictability—not certainty, but likelihood. Otherwise day-to-day decisions become almost impossible. Mrs. Lappé says:

But, predictability is absent in farming today:

—when land costs can rise, as they did in the 70s, because suddenly farmland looks like a prime speculative investment due mostly to uncertainties elsewhere in the economy;

—when IMF imposed—U.S. government backed—austerity measures make it impossible for poor third world economies to import our commodities; or, simply

—when big landowners in a country like Brazil can with impunity drive small producers off the land to grow cheap soy beans for export.

In other words, production costs and markets for our commodities are determined by factors largely unrelated to our inherent physical or human resources or the theoretical world demand for our commodities. Nevertheless, we continue to believe that farmers' fates should be ruled by the law of the "free" market.

Americans swallow the fiction of the free market, knowing full well that agriculture doesn't fit the dogma in yet another sense: Agriculture is competitive, while totally dependent on non-competitive sectors. Farming is sandwiched between a highly consolidated inputs industry which can protect its profits by passing on its costs to farmers and an equally consolidated trading sector able to play off producers on one side of the globe against producers on the other side.

So the reality of farming in America is, first, *unpredictability*, not due to some sort of automatic supply and demand balancing, but to human decisions often unrelated to agriculture *per se*, and, second, *vulnerability* because farming remains among the few truly competitive sectors in the U.S. economy.

In such circumstances, who survives in the competitive struggle for existence? The answer is—only the big farmers—those who are big enough to ride out the unpredictable changes in price of their products, and big enough to do business under contract with large users and are more able than small farmers to control their costs.

Today's crisis in agriculture provides the evidence. We need only look at who is surviving. In over a little more than a decade—from 1969 to 1982—only one group of farmers has not been decimated by boom and bust. They are the very biggest producers, roughly speaking those with at least $500,000 in gross sales. While they received 16 per cent of net farm income in 1969, they captured 60 per cent by 1982; yet they comprise only one per cent of all farms.. . my point here is simply that, taken as a dogma, the market and private property lead inevitably to the concentration of economic power, now in farming, just as in the rest of the economy:

> Now, one-tenth of one per cent of the corporations in America control two-thirds of all corporate assets. And in agriculture, where one per cent receive almost two-thirds of net income, many, many good farmers inevitably lose their life's work.

Mrs. Lappé asks:

> Don't these trends undermine the very *individual* development that was our original goal? Do they not suggest that something in our society's understanding of itself is inherently self-defeating?

Now we come to the hard part—what should we do? We need, Mrs. Lappé says, to go back to first principles and recognize the omissions and flaws in the rules we have adopted for economic enterprise. The economists took into account only one aspect of human nature, the way people behave in relation to the acquisition of material things and the desire to have property and then more property. But they ignored the larger and more fundamental purposes that people have, which lead to consideration for others, to working for common goals, to recognizing the needs of society—whole communities, regions, and peoples—and now, as we learn from experience, serving the welfare of all nature, which includes our own. These qualities are part of ourselves and they become primary in a happy and peaceful society. The reformers of the past, or many of them, did not recognize that the best qualities of human beings cannot be forced or coerced into stronger presence. We are now at that point in history where we are realizing that political systems cannot make people better than they are—that the moral struggle in human beings involves elements which are beyond the law, beyond everything except the will of the individual. Yet people are able to learn from the example of others and from experience. So this, from one point of view, is the age of the return of individual responsibility, or should be—because nothing else will work.

We need, consciously and deliberately, to go back to our cultural beginnings, Mrs. Lappé says, and remember that the Founding Fathers of the nation knew and said that its future depended on what they called "civic virtue," what Montesquieu spoke of as the integration of one's own good with the public good. This meant seeking the general good, and not, as today, working against it. Even Adam Smith spoke of the need for unselfishness, while Darwin, surprisingly enough, said in one of his letters to Wallace that he agreed "that the struggle between the races of man depended entirely on intellectual and *moral* qualities." Mrs. Lappé says:

> My point is that I believe a re-examination of our inherited philosophic and more recent biological interpretations of human nature—*as well as greater trust in our own experience*—will lead to one conclusion: individual well-being is impossible apart from the well-being of others.
>
> Thus we can end the fruitless debate about whether human beings are merely selfish; the question is which traits we reenforced by the rules that *we create.* We can't determine human nature but we can and do determine which aspects of human nature become socially dominant. . . Instead of laws of the market place and private property as our final arbiters, we can turn to our underlying moral values for guidance. They must become our guides.

There are various practical suggestions of things to do in this paper, having in mind the catastrophic failures of the two available rigid models, capitalism and statism, but no master plan. "No one," she says, "has the solution for us. We alone can discover solutions for our society," which means going to the root of our troubles in the principles we have tried to apply and then starting to apply other ideas in order to create an environment hospitable to the practice of values.

Interestingly, her own career makes a good illustration of how one person attempted doing this. She was a young woman of twenty-five living in Berkeley, Calif., when she wrote *Diet for a Small Planet.* She had made a study of natural foods available there and wanted to get it down on paper for her friends and anyone else interested. She thought Berkeley people might take an edition of 500 and she intended publishing it herself. Meanwhile her own diet changed as a result of this work, and her thinking naturally

extended to the connection between what we eat in this country and the problem of world hunger. Meanwhile *Diet* became a bestseller so she had an audience, and she and Joseph Collins did a lot of research and together wrote *Food First*, a large book filled with shocking facts and intense concern. She and her children—a boy of six, a girl of three—visited Guatemala for several weeks, seeing at first hand the contrast between the landed wealthy with huge estates and the people on the road who had no homes. In 1982 she answered an interviewer's question about "practical steps" by saying:

> One of the themes of all my work is that if we don't experience ourselves changing then we don't believe that changes are possible at a national level or in other countries. So the answer to your question really is that we must do that which changes us, and for each of us that is slightly different. If I offer people blueprints for that they wouldn't be changing themselves.

After *Food First* came out in 1977, she was invited by the revolutionary government in Nicaragua to come to Managua in 1980 and 1981 to consider with them their program of food and agricultural reform. They decided they could both increase their exports of coffee, sugar, cotton and meat *and* help the peasants and landless workers to increase the supply of corn and beans that they needed for daily food. She described Nicaraguan policies in some detail in No. 10 of the *Food First News* (issued by the Institute for Food and Development Policy which she established—2588 Mission Street, San Francisco, Calif. 94110) and issued pamphlets on what the Nicaraguans were doing and how it was helping the peasants. In *Food First News* she said:

> Creating a new way of life in the Nicaraguan countryside, and achieving self-reliance in the basic food crops, are difficult, long-range programs. But the pragmatic, one-step-at-a-time approach of the new Nicaraguan government offers dramatic hope to the people so long forced to live in misery.

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American farmers have other enemies besides the market system and driving acquisition. *National Wildlife* for December-January 1986 has a four-page article by James R. Udall, which begins:

> Normally on a warm spring day in southeastern Arizona, Roddy Hale would be busy planting cotton on the 2,200 acres he and his father own near the small town of Bowie. But this year the Hales are not planting any new crops.
>
> Driving past herds where only tumbleweeds are growing, Roddy explains that annual rainfall in the region is a sparse 21 inches. Like their neighbors, the Hales must rely on water from an underground aquifer, to irrigate their cotton. But now, after 15 years of pumping, that groundwater is almost gone.
>
> "The water level falls every year," says Roddy. "Recently, I had to go down more than 500 feet to find enough water to flush my toilet." As the water goes down, the cost of lifting it from deeper pools goes up. "We have fifteen electric pumps," he adds, "and they each cost $4,000 a month to run."
>
> Roddy Hale is one of thousands of western farmers whose livelihoods are threatened by dwindling groundwater supplies. Currently, agricultural irrigation uses nearly seven times as much water as all of the nation's city water systems combined. And most irrigation takes place in the West which generally gets only about a fourth as much rain and snow as do states east of the Mississippi River. As a result, groundwater withdrawals presently exceed natural recharge by some 20 billion gallons *per day* in the West. It can't go on forever.
>
> U.S. Department of Agriculture officials estimate that groundwater depletion will seriously affect farm production on some 15 million acres in 11 states by the next century. Texas alone may lose as much as half of its irrigated farmland—about three million acres—by the year 2000. Some landowners may attempt dryland farming—eking out crops without irrigation—but most will have to abandon their farms.

The decline has already begun. The Farmers Home Administration Director said recently: "Here in Cochise County we've recently

foreclosed on 18 farmers. There are 30 to 35 more, including the Hales, who won't last much longer." The farm land worked in that county has gone from 170,000 acres to less than 60,000 acres, and this trend is expected to spread over the entire West. There is a partial remedy—subsurface drip irrigation—which cuts the water needed in half, but it is very expensive to install—$1200 an acre. So the farmers, for one or another reason, will keep on disappearing.

The *Small Farmer's Journal* (Winter, 1985-86) discusses this dispassionately in a long article: "Should America Save its Peasant Class? Or Family Farmers From their Celebration to their Sterilization, 1940-1985." So the question is now being widely discussed. But only writers such as Wendell Berry and Wes Jackson offer any solutions at all. See their books, especially *Meeting the Expectations of the Land*, edited by Jackson, Berry, and Bruce Colman (North Point Press, 1984, $12.50), a volume which sounds a note of sanity and hope, with contributors of like mind.

REVIEW
A NATION ANNIVERSARY

THE *Nation*, a weekly magazine of social and political commentary, the first issue of which came out on July 6, 1865, founded by a group of Abolitionists, celebrated its 120th anniversary on March 22, 1986, with a 120-page issue filled with impressionistic discussion by individual writers of note who considered the relations of the United States with the rest of the world. There are nineteen such contributors, among them writers in a dozen or so countries, such as Carlos Fuentes (Mexico), Margaret Atwood (Canada), Michael Manley (Jamaica), George Konrád (Hungary), Willy Brandt (Germany), Yevgeny Yevtushenko (Soviet Union), Benazir Bhutto (Pakistan), E.P. Thompson (England), and a few other less known figures. U.S. writers include E. L. Doctorow, Gore Vidal, and the *Nation* columnist, Christopher Hitchens (an Englishman) .

Everything in this issue makes enjoyable and useful reading because the writers are totally free to say what they think, which is bound to be better than any sort of institutional stance. We should add, in illustration of this, the account given of the *Nation*, through the years, as seen through the eyes of the FBI, with an afterword by Fred J. Cook.

For one sample of the comment, we take the following from E. P. Thompson, British historian and a leader of the European Nuclear Disarmament movement:

> I do not expect that in thirty years' time the cold war will have ground to a truce because both parties to it will have constructed impermeable shields in space over their heads. On the contrary, if humanity cannot think of a better script than that, my guess is that by that time history will already have come to a terminus. This is one very obvious future, in the minds of old and young alike.
>
> That future, or nonfuture, is not only quite possible, but it also becomes more probable with each year that the powers of the world neglect to find a different script. I think we may be entering a time in which the structures established at the end of World War II will unravel. The unnatural bipolar division of the world is now held in place largely by unwieldy armories (as fact and as symbol) and by the alliances and strategies laid down in the late 1940s. In the future I imagine, we would see a smudging of the edges of both blocs and an increasing return to diplomatic pluralism, with alternative poles of influence. While this process will be, and indeed is being, resisted furiously by the North Atlantic Treaty Organization and the Warsaw Pact, eventually the peoples of both superpowers will come to realize that pluralism or polycentrism offers a better shield between them than do weapons technologies.
>
> I envision no human future in which one or the other side wins the cold war. In the more hopeful future that I am suggesting the cold war, as structure and expectation, would disappear as swiftly as the old European empire. I do not mean that it would give way to utopia or some happy federal world. It would give way to a different world, with new problems and, maybe, even with some revived national antagonisms coming back into play as the clamps of cold war uniformity are removed. A more pluralistic world would not necessarily be one in which competition between nations is subdued. We are coming to the end of the cold war epoch. The executors of that conflict will either destroy civilization in an attempt to hold their positions and power, or they will give way before one of those untidy transitional rapids of history, full of eddies and crosscurrents, in which choices between futures must be made.
>
> What we will need most of all in such a transitional time will be the discourse of a true internationalism. The human mind must go ahead of political realities and forms and beat a path which political relations may later follow. This is true, most of all, in exchanges between the political West and East.
>
> Indeed, it has long been happening. We are light-years away from the late 1940s or early 1950s, when ideologists battled between the poles of Zhdanovism and McCarthyism, and when agencies of the Cominform or the Congress for Cultural Freedom sought to fight out a battle of ideas across the globe. The stereotypes formed in the Stalinist zenith throw their ghastly shadows on the living mind and obscure the present view. But anyone alert to what young minds in the Soviet bloc are thinking knows that they are not following that worn-out script, any more than those in the West are.
>
> It is just possible that we are entering a period in which ideas will exercise force again. And the

> discourse of minds across national frontiers—but most of all across the military and ideological divide that separates East from West—will be critical to choices between futures.

Thompson is one of the most effective and influential thinkers of our time and it is pleasant indeed to encounter in him measured optimism of this sort—optimism in relation to the way people are beginning to think, not only in relation to events. He goes on:

> At best we might look forward to an exciting confluence of minds from greatly different national experiences and cultures. But this will never happen if the minds are suspected of acting as servants of armed states. To build the internationalism of the future, scientists, writers and scholars must come to that meeting as internationalists and not as vectors of national or cold war ideology.

After speaking pleasantly of America's hospitality to those who come here to live from other countries, and of America's unique capacity to assimilate those who join us in a short length of time, Thompson suggests that also we seem to be drawing away from other peoples of the world. Commenting, he says:

> There may be no harm in that. We may still admire one another and learn from one another, even as we grow more unalike. But the particular individualism of the American tradition, defended and enlarged by law in the name of each citizen's right to pursue the goal of ego-fulfillment, poses different problems from those of societies in which class or community goals and solidarities take higher priority.
>
> Moreover, it is not as clear now as it once seemed to be that even America can look forward to an "American future." As the competitive position of some American industry is weakening in the world markets, as the whole elaborate structure of civilization seems to rest on airy foundations of debt, and as the social problems of advanced industrial society become more apparent, one sometimes wonders whether even great America might not glimpse ahead of it a British or a Belgian future? . . .
>
> If we are to control our future we must understand and control ourselves. We must, as Shelley once wrote, "imagine that which we know." And if we are to imagine our place in the brief human record at a time of crisis so extreme that it threatens the record's continuance, then I suspect that it may be poetry that we will need most of all.

One thing that will impress the reader is the thinking and writing by those who have had or have a political role—the smaller the country that is their home, the better the work. We are thinking, say, of Michael Manley, who was Prime Minister of Jamaica from 1972 through 1980; or of Margaret Chant Papandreou, the wife of the Prime Minister of Greece. It is quite evident that it is possible to be a political person in a small country and still be extremely intelligent. Benazir Bhutto, daughter of the Pakistan leader who was executed by Zia, is another such contributor.

For a final example of the writing in this issue of the *Nation* we choose an extract from Carlos Fuentes, the Mexican novelist and former diplomat who was Mexican Ambassador to France. He writes about the United States as the "Land of Jekyll and Hyde":

> Having grown up in the United States, I was willing and able, in spite of catcalls from my compatriots, to praise the democratic process of the United States, its capacities for self-criticism, self-government, self-negotiation, even self-flagellation and self-consciousness. In the New Deal era I witnessed the best in the United States: the value it set on its human capital, its energy and enthusiasm for solving problems, its choice of dialogue instead of confrontation on Latin American issues. When the United States joined the effort to win World War II, Roosevelt's noninterventionist policies in Latin America had already won the support of most of the people there. We were finally willing to admit that there was a conjunction of the actions and the ideals of the North Americans.
>
> This illusion has been painfully shattered over the past thirty years. . . . So we are left with this final image of the United States: a democracy inside but an empire outside; Dr. Jekyll at home, Mr. Hyde in Latin America.
>
> We will continue to praise the democratic achievements and the cultural values of the United States. But we will continue to oppose its arrogant and violent policies in Latin America. We will do so painfully, because we love so many things in the United States. We will not confuse the United States and the Soviet Union, or indeed accept their moral

> equivalence. The problem is far more tragic: the Russians act as an empire inside and outside. They are perfectly coherent. The United States, by acting like the Russians in its sphere of influence, become profoundly incoherent and hypocritical.
>
> Latin Americans must simply not ship Mr. Hyde back to Washington. We must defeat him in his old stamping grounds, the Caribbean and Central America. Then we can all sit down and talk with Dr. Jekyll, his alter ego having been exorcised by his friends in this hemisphere.

A house ad on the back of the issue we've been discussing offers a year's subscription for $28.00. It should be sent to The Nation, Box 1953, Marion, Ohio 43305.

COMMENTARY
OPPORTUNITY IN COSTA RICA

WE have a letter from Bill McLarney, of *anai*, inc., in which he says:

> I also want to mention our volunteer program. I know MANAS is not the sort of publication that prints announcements from everyone, but if there is any way you could help me communicate with people who are surely out there somewhere, we would all appreciate it.
>
> We have a constant ongoing need for volunteer help on our farm in Costa Rica. Interested individuals should be
>
> —able to commit at least six months
>
> —in good physical health
>
> —fluent in Spanish, or at least half fluent
>
> —skilled or knowledgeable in one of various fields—agriculture, horticulture, aquaculture, forestry, photography. . . .
>
> —insured
>
> —able to work cooperatively
>
> —able to endure long periods of physical and/or cultural isolation
>
> —able to endure a hot, wet, buggy climate.
>
> What we have to offer is a lot of practical work experience in tropical agriculture and related fields, an opportunity to live in a Third World community, and a modicum of environmental education. We can supply housing, food from the farm, a small amount of financial assistance for other food, and some transportation within Costa Rica—not transportation to or from Costa Rica, or any wage. We don't want students with projects to do, but people able to commit their entire work time to our projects.
>
> Anyone interested in applying can begin by writing me a letter explaining what they expect to learn and why ANAI should want them.
>
> I think MANAS will attract the quality of persons we need to be hearing from.

Bill McLarney's address in this country is *anai*, 1176 Bryson City Road, Franklin, North Carolina 28734.

The experimental farm in Costa Rica is in Talamanca, a large county at the southern end of the country. The climate is tropical. The farm is helping the *campesinos* to develop a sustainable agriculture in a fragile environment by field testing species of crop plants, including food, spice, and medicinal crops, and introducing aquaculture (fish farming). They are also setting up a community-managed wildlife refuge in what is considered to be the most ecologically significant area remaining in Costa Rica.

Costa Rica, discovered by Columbus and probably named by him, lies between Nicaragua and Panama, has less illiteracy than any other land in Latin America. It is politically progressive and ranks among the leading nations of the world in public education. It became an independent nation in 1821. The *anai* farm has been developing for about ten years in this lowland tropical country. The people are mestizos, blacks, native tribal groups.

CHILDREN
. . . and Ourselves
SCIENCE AND THE HUMANITIES

THE difficult problem of introducing philosophy to high school students, or even younger ones, seems mostly the fault of modern philosophers. It seems impossible for one to be known as a "philosopher" in our day without speaking in the special language that philosophers have evolved. All a reader needs to do to persuade himself of this is to spend ten or fifteen minutes with a current book on philosophy which sets out to explain present philosophical issues. Or, as we did, read the first article in the Winter 1985 *Et cetera* by Edward Davenport, "Scientific Method as Literary Criticism." This writer clears up a lot of unnecessary confusion, although he by no means goes all the way back to ordinary language. His chief point is that all humans—not only "philosophers"—begin their thinking, sometimes explicitly, sometimes unconsciously, with assumptions which are commonly taken for granted in the time that they live. If questioned about them, they simply say, perhaps with surprise, "Those are simply the facts, things which everyone knows. No one argues about that." Some do, of course, and if it turns out in the course of years that they seem more right than wrong, there is finally what Thomas S. Kuhn, in *The Structure of Scientific Revolutions,* called a "paradigm shift," a new way of defining "Truth" as the result.

What does this mean? It means that the elaborately argued and empirically verified structures we call "scientific knowledge" have been erected on unstable foundations—assumptions which have been taken for granted but which are eventually found inadequate. The chapter on "Climates of Opinion" in *The Heavenly City of the Eighteenth-Century Philosophers* (1932) by Carl Becker would be good reading for background on how great changes in outlook take place by reason of the assumptions which come into play—assumptions which tell us what is worth investigating and what should be ignored. Galileo, for example, introduced one vast change of this sort. Becker remarks:

> Galileo. . . (not that he was the first by any means), did not ask what Aristotle had said about falling bodies, or whether it was reasonable to suppose that a ten-pound weight would fall to the ground more quickly than a one-pound weight. He applied to this problem the scientific method. He dropped two weights, differing as one to ten, from the leaning tower, and noted the fact that both weights reached the ground at the same time. In such a world as this, he said in effect, this is the way falling bodies behave. If that is not possible in a rational world, then the world we live in is not a rational one. Facts are primary and what chiefly concern us; they are stubborn and irreducible and we cannot get around them. They may be in accord with reason, let us hope that they are; but whether they are so or not is only a question of fact to be determined like any other.

In short, the scientific method would replace scholastic reasoning and put in its place the physical facts of life from which deductions would be made. As Becker says:

> It is needless to say that we live in a machine age, that the art of inventing is the greatest of our inventions, or that within a brief space of fifty years the outward conditions of life have been transformed. It is less well understood that this bewildering experience has given a new slant to our minds. Fresh discoveries and new inventions are no longer the result of fortunate accidents which we are expected to note with awe. They are all a part of the day's work, anticipated, deliberately intended, and brought to pass according to schedule. Novelty has ceased to excite wonder because it has ceased to be novelty; on the contrary, the strange, so habituated have we become to it, is of the very essence of the customary. There is nothing new in heaven or earth not dreamt of in our laboratories; and we should be amazed indeed if tomorrow and tomorrow and tomorrow failed to offer us something new to challenge our capacity for readjustment. Science has taught us the futility of troubling to understand the "underlying agency" of the things we use. We have found that we can drive an automobile without knowing how the carburetor works, and listen to a radio without mastering the secret of radiation. We haven't really time to stand amazed, either at the starry firmament above or the Freudian complexes within us. The multiplicity of

> things to manipulate and make use of so fully engages our attention that we have neither the leisure nor the inclination to seek a rational explanation of the force that makes them function so efficiently. . . .
>
> What can we do? Reason and logic cry out in pain no doubt; but we have long since learned not to bother overmuch with reason and logic. . . . Perhaps I have said enough to suggest that the essential quality of the modern climate of opinion is factual rather than rational.

But what are "the facts"? We thought we knew, in the days when Carl Becker wrote his book, but we have now recognized that "a fact" attains its status, not through its own intrinsic nature, but because of the operative assumptions of the age. In the practice of a science, if the practitioners in a certain field, say biology, can't see any way to make use of a set of proposed "facts" they ignore those facts. They are facts only if they are "relevant" to scientific interest at the time. And relevance is a changeable thing. For example, the abbot of a monastery in Moravia, Gregor Mendel, discovered by plant breeding in the monastery's garden the mathematics of transmission of traits by what are now called "genes." But he published his discovery in 1866, before biologists knew anything about genes or statistical methods, so that thirty-five years had to pass before genes were admitted to exist. This long wait was inevitable, Gunther Stent has remarked, because "the concept of discrete hereditary units could not be connected with canonical knowledge of anatomy and physiology in middle of the 19th century." Stent also points out that the argument about ESP among scientists depends upon reliance on different assumptions. "That is, until it is possible to connect ESP with canonical knowledge of, say, electromagnetic radiation and neurophysiology no demonstration of its occurrence could be appreciated." In short, what is or is not, depends on cardinal principles which are acceptable and fashionable.

Thoughtful critics have developed the implications of this view to the point where scientific theory and literary criticism are joined, which makes obvious hash of a great deal of "scientific certainty" and its iron law of objectivity. There is no such thing as pure objectivity. Years ago Whitehead pointed out that there are no "facts" at all, but only what he called "idea-facts." A fact becomes a fact through its interpretation. This, sooner or later, will oblige the scientists to move into the humanist camp, since, as experience has shown, we know nothing *for sure. As* Edward Davenport says in his *Et cetera* article:

> For discourse theorists science now becomes a process of attempting to read correctly a physical or social "text," much as humanists have always read—i.e., interpreted—philosophical or literary texts. This positing of a literary ambiguity in the facts studied by the so-called exact sciences as well as the inexact sciences has led to an analogy being drawn between scientific method and literary criticism. . . . Though few theories of the humanities have as yet been made testable, both the sciences and humanities begin with problems, and both use a mixture of interpretive and empirical methods to solve them.

Actually, the mechanistic, five-senses way of thinking can be regarded as a brave attempt, starting in the seventeenth and eighteenth centuries, to eliminate medieval superstition and careless theological extravagance from serious thought. It became a blatant metaphysical stance in opposition to metaphysics by ruling out from discussion not only conventional religious ideas but also any philosophy involving transcendence. Today, we are experiencing a natural and legitimate reaction, first in terms of spiritual starvation and various kinds of religious revival, second, in the effective criticism of science by such writers as Karl Popper, Michael Polanyi, and Kurt Godel. One result is the return of responsibility to the individual, who can no longer cite "authorities" as vindication of his certainties, but must rely on the inherent reasonableness of what he says. This should restore health to both science and the humanities.

FRONTIERS

The Gandhian Solution

IN 1981 Devendra Kumar, director of the Center of Science for Villages, Wardha, India, and editor of *Science for Villages*, often quoted here, gave four lectures at the Gandhigram Rural Institute. He spoke on the Gandhian analysis of the condition of the modern world and the changes which are both practically and morally required. These lectures are now available in a booklet, *Four Phases of Human Progress*, published by the Institute at Gandhigram in Madurai, Tamilnadu, India 624 302. The four lectures are titled Commercialism and Conquest, Industrialism and Indulgence, Technology and Tensions, and Ecology and Amity. Their value lies in Kumar's articulate generalizations of Gandhi's thought, making clear the stance of the Gandhian movement of today and the common sense as well as the crucial importance of its objectives. Such literature now grows in appeal with every passing year and needs to be spread around the world.

Commercialism, Kumar points out, has meant for Indians who learned it from the British, exploitation and increasing dependence.

> When the dependence is complete the exploitative potential becomes maximum. Take the examples of the patient in a hospital, prisoner in a jail or in certain communities the bride in the house of the in-laws. These persons are so completely dependent on those in whose care they are and obliged to exist that you find instances of utter cruelty manifesting themselves. The case of the landless labourer is not much different. His dependence for his work on those who have land is total. If the number of landless in a village is more than the availability of work, they will be virtually at the mercy of the landlords. The exchange of labour and money in this case is therefore not among equals and what ensues is exploitation of a high order. . . .
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> Gandhiji helped the world realize the folly of imperialism through his non-violent fight for the freedom of the country and India showed a way to demolish the empires. Yet the commercial law of conquest through imbalance in interdependence continues to function with great rapacity. To break this phenomenon of conquest through commerce and bring about a nonviolent social order the model that Gandhi presented was that of self-sufficiency.

In his second lecture, "Industrialism and Indulgence," Kumar shows that with the advent of steam power the age of industrial production began, which gave power over others to pioneer entrepreneurs, and with the discovery of petroleum, great wealth for a few, dependence for the impoverished many. This made a large gap between the rich and the poor, while the natural resources of coal and oil began to be exhausted. Ever-increasing production distorted the lives of everyone, and unceasing advertising and sales promotion transformed luxuries into necessities in the eyes of many. Self-indulgence and waste became commonplace, while the race for armaments became characteristic of industrial societies. Gandhi's view, in contrast, is represented by Kumar with a story told of Alexander the Great while on his eastward conquest.

> Alexander in his wanderings came across a saintly person sitting in the winter morning sun under a banyan tree. He approached him and, introducing himself, asked through his interpreter what was the secret of his serenity. The saint asked a counter question, saying now that you have travelled half the world, have you got what you have desired? Alexander said, "The more countries I conquer, the desire for more increases." The seer said, "I have no desires and that is the secret of my serenity."

Kumar draws the Gandhian moral:

> If India has to change the industrial growth of the country from the conventional model which has led to greater productivity but at the same time greater disparity, it must adopt the alternative provided by Gandhi. The conventional capital- and energy-intensive, centralized large-scale modes of production will have to give place to low capital and low energy (basically renewable—manual, animal, hydro, solar, etc.) . . . Gandhiji wanted the model which would increase production and decrease disparities simultaneously. If we cannot, the growing gulf between the affluent and the Third World, the urban and rural populations, and the rich and the poor of every land will continue to increase. The world has gradually begun to realize the truth of his

> pleadings. We can show the path through our institutions in a microcosm as to how this new model can work. At the same time we have to influence the thinking of the macro and make it amenable to accept our model. This will require both faith and patience. But this is the only way.

With his scientific background and extensive experience in intermediate technology, in his third lecture, "Technology and Tensions," Kumar is able to show how both practical and psychological tensions result from the almost universal speed-ups of life in a technological society. There is conflict and dispute everywhere, and ever more war—between interest groups, nations, and man and nature. Instead of being a preserver of nature's balances, man has become the destroyer of life in its multifarious forms. The earth is poisoned, the air impure, the water polluted, the atmosphere changed in content by too much CO_2. Gandhi showed the path to friction-free systems. Kumar concludes this lecture:

> As in the case of a high-speed vehicle, the system to reduce friction through lubrication is much more sophisticated, so also in the case of a highly technological society—the societal frictions should be drastically reduced by non-violent systems. The lesson is that sustained technological advancement is possible only in a tensionless society.

The fourth and concluding lecture, "Ecology and Amity," deals with the Gandhian resolution of the conflicts between Man and Nature. Kumar says:

> The whole concept of industrial growth as propounded by Gandhi and Kumarappa (the close associate of Gandhi who interpreted his economic philosophy in the most original and convincing fashion) is based on this harmony with nature. Gandhi wanted paper to be made from fibrous materials which go to waste in nature and not from forest trees and bamboos cut for that purpose.
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> Instead of sugar from sugarcane crops occupying the most fertile wetlands where other crops could grow, he wanted us to depend on sugar made from the sap of perennial trees of the palm family which grow in different land. It takes least from the soil and remains intact for many decades. Coconut trees give even better yield of nuts if every three years they are tapped for the sweet juice for making sugar. Much more work needs to be done on how fulfillment of our requirements from annual crops can be shifted to the perennial trees. Fruits, fibres, fats, sugar, etc., if obtained from trees will conserve natural resources much better and are of less strain to the soil.

Best of all, the reading of such material helps the reader to learn to think in another way.