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ENDS AND MEANS

THINKING about goals is the identifying characteristic of human behavior. A man totally lacking in purpose is a contradiction in terms. He is some kind of atom moved around by external forces. The quality of being human is absent unless the atom resists outside control demonstrating its individual identity and affirming the intention to move itself. Human life might be defined by saying it is a project in overcoming the obstacles to self-direction. The will to do this is called love of freedom.

Science is first of all an inventory of the obstacles to unimpeded action. Then it is a manual on the dynamics of the obstacles, so that we can move them around for our own purposes instead of being confined by *them.* Hence the conclusion of philosophers that freedom is knowledge of necessity. By understanding how the things (obstacles) in the world work, we open paths of free movement for ourselves, using whatever was in our way as stepping stones or even vehicles.

Today this technical mode of achieving freedom is being seriously questioned. It is claimed that we purchase access to our goals at too high a price. Our method of ordering the things in the world to suit our purposes raises other and perhaps insurmountable barriers to doing what we should. What, then, has gone wrong? Does physical freedom lead to moral imprisonment? Or have our purposes been at odds with the nature of things?

The question calls for some inspection of purposes. Just thirty-five years ago, the eminent historian, Arthur M. Schlesinger, wrote:

> When President Coolidge made his famous remark, "The business of America is business," he quite properly added, "The chief ideal of the American people is idealism. I cannot repeat too often that America is a nation of idealists." This dualism puzzled foreign commentators, who found it difficult, for example, to reconcile worship of the Almighty Dollar with the equally universal tendency to spend freely and give money away. In contrast to Europe, America has practically no misers, and one consequence of the winning of Independence was the abolition of primogeniture and entail. Harriet Martineau was among those who concluded that "the eager pursuit of wealth does not necessarily indicate a love of wealth for its own sake." The fact is that, for a people who recalled how hungry and ill-clad their ancestors had been through the centuries in the Old World, the chance to make money was like the sunlight at the end of a tunnel. It was the means of living a life of human dignity. In other words, for the great majority of Americans it was a symbol of idealism rather than materialism. Hence "this new man" had an instinctive sympathy for the underdog, and even persons of moderate wealth gratefully shared it with the less fortunate, helping to endow charities, schools, hospitals and art galleries and providing the wherewithal to nourish movements for humanitarian reform which might otherwise have died a-borning. (*American Historical Review,* January, 1943.)

That seems a fair and just account for someone writing during the first half of the twentieth century. The motives described were real and found expression, even though the fruits of all this decency have turned quite sour during the years since. One trouble has been, no doubt, that the "chance to make money" grew into an obsessive determination to make as much money as possible, drafting science and technology to amplify our skills. Using the technology of water supply for the American Southwest as an example, a thoughtful journalist, George Sibley, observed in *Harper's* for last October:

> . . . our faith in technology, science, and rationalized economy has a profane and tragic flaw: we have assumed an infinity of supply, capable of fulfilling an infinity of demand, if we can come up with the technology of production.

> Where we came up with such a notion, God only knows; everyone else in the world is not so deluded. . . . What we are beginning to learn about this business of technology as a cure-all could probably be formalized into a law: technological problems increase in exact proportion to technological solutions.

Other critics might argue that our purposes are fine—good Americanism—but that a faulty inventory deceived us, which was careless science or myopic economics. But still others would say that the trouble lies deeper—that we are out of tune with nature and life. Thinking in this vein, a contemporary philosopher, Henryk Skolimowski, recently suggested that we have neglected to listen to the "music of evolution":

> My body, my skin, my eyes are the tentacles through which life rolls in, through which we tune in to the music of evolution, of which we are a part. To be rational is to understand the music of the universe in the Pythagorean sense.

What does the music say? Does it instruct in purposes which are in harmony with nature? The fact that there are so many contradictory versions of the voice of nature suggests that whatever purposes nature may have, they do not include persuading humans to become simpleminded conformists. The study of nature excites wonder and awe, but produces no uniform certainty concerning the meaning of human life. The certainties we achieve, but then abandon in pain and disillusionment, are all derived from partisan or limited abstractions concerning the "reality" of the natural world.

Our most recent disillusionment is described by Prof. Skolimowski:

> You may think of life as mere chemistry. You may think of chemistry as mere physics. Consequently you may think of life as mere mechanistic interactions of physical bodies and chemical particles. And in so doing you will be "scientific" and clearly obeying the criteria of instrumental rationality. But will this scientific thinking touch upon life as you live it? In short, you may cheapen and brutalize the meaning of human life by translating it into mere physio-chemical matrices. But you may not escape the feeling (if you allow yourself the luxury of feeling) that there is something exquisite and awesome in the spectacle of life unfolding.

What is science? We have called it an inventory and a manual of dynamics. But it is also a social consensus reached by a class of experts, individuals who have undertaken to study nature or some portion of nature—and to decide what it is and say how it works in appropriate abstract language. One great question now before the modern world is: What does the scientific language leave out? What in nature is ignored by its impressive abstractions—which function like nets dipped into the sea of existence to catch "reality"?

There are other ways of encountering and studying nature. In *Man in a Mirror*—a novel revealing the impact of Western scientific and commercial habits on the culture of an African tribe—Richard Llewellyn embodies this comparison in the musings of an African leader with a Western education:

> Nterenke began to realize with an increasing dismay which he found almost comical that the Masai intellect held not the least notion of physical science, no philosophy, or sense of ideas in the abstract, or any mathematical processes higher than the use of hands and fingers. He amused himself in trying to imagine how he might teach Olle Tselene the theory of the spectrum. Yet every tracker knew the value of sunlight in a dewdrop because the prism told where the track led and when it had been made. How the eye saw the colors or why the colors were supposed to exist was never a mystery or problem. They had no place anywhere in thought. But all male Masai, from the time they were Ol Ayoni, had a sharp sense of color from living in the forest and choosing plumage for the cap. Color became a chief need in the weeks of shooting and comparing, and taking out a smaller for a large bird, or throwing away a larger for the smaller, more colorful. He wondered where the idea of color began, or why a scholar should interest himself. Mr. James had taught that sound politics led to a rich economy where people earned more money for less hours of work, and so created a condition of leisure needed by inventors, whether mental or physical. The Masai had always enjoyed an ample economy, if it meant a complete filling of needs, and after the animals were tended, there was plenty of

> leisure. Yet there were no inventors of any sort. There was a father-to-son and mouth-to-mouth passing of small items that pretended to be history, and a large fund of forest lore that might pass as learning, but there were no scholars, no artists, no craftsmen in the European sense.
>
> The effect was to lock a growing mind in a wide prison of physical action and disciplined restriction that by habit became accepted as absolute liberty.

In the Western reader, this account of Masai purposes and at-homeness with nature may excite both respect and condescension. The splendor of their natural life is enviable, yet the Masai had, it seems, no real "hunger to know." They were completely without those potent tools of scientific intellectuality—the abstractions formulated to such great practical effect by Galileo and his successors. The Masai remained content to ask no questions about the nature of things. "How the eye saw the colors or why the colors were supposed to exist was never a mystery or a problem."

Well, what do *we* know about how the eye sees colors, or even simple objects? The question itself is misleading. "We"—meaning the average person—hardly know more than the Masai tracker concerning how the eye sees what it sees. Nor does the optician who fits us with glasses know a great deal more, though his glasses improve our vision. We commonly suppose that scientists have learned pretty completely about how vision works, but if you turn to the literature on this question you find that the process is still wrapped in mystery. For example, Richard Held, professor of experimental psychology at M.I.T., at the end of a succinct history of Western theories of vision, observes that there has been little real progress in understanding how seeing works. All the explanations have either flaws or gaps. In his contribution to *Structure in Art and Science* (Braziller, 1965, Gyorgy Kepes, editor), Prof. Held gave these reasons for our continuing uncertainty:

> If we consider the more recent theories, we find that implicit assumptions vitiate their explanatory power. For example, the older psychophysical approach appears inadequate because of its assumption about the translation of punctate retinal excitation into localized sensation. The *Gestalt* theory of organization, as made explicit by Kohler, cannot readily account for the invariance of perception under the transforms of arrangement. Both the *Gestalt* theory and the new psychophysics have failed to take account of the possibility that extra-visual factors may influence correspondence. The implicit assumption that visual percepts are strictly a product of sensory input to the visual nervous system is a relic of the old identification of the visual Sensorium with the projection of the optic nerves in the brain.
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> We may be able to avoid vitiating assumptions if for a moment we regard the observer with all his capabilities as a machine having unknown rules of operation.

In short, humans make the basic contribution to seeing—called "pattern recognition"—which is simply not disclosed except in effect. Studying "nature" only sets the problem. It does not solve it and apparently has not the elements of the solution to show us. To understand vision we need to know more about ourselves. As Jacob Bronowski said in another connection: When the scientific system we are using breaks down, we have no choice but to make an act of self-reference in order to get started again. *We* are always the key to understanding nature. And the key to misunderstanding it, too.

Let us continue our inquiry by starting at the other end—with the human being and his purposes. These purposes are by no means simple and single. William James (in *Principles of Psychology*) has given us a catalog of human intentions which suffers not at all in accuracy for being lighthearted:

> Not that I would not, if I could, be both handsome and fat and well dressed, and a great athlete, and make a million a year, be a wit, a *bon vivant,* and a lady killer, as well as a philosopher, a philanthropist, statesman, warrior, and African explorer, as well as a "tone-poet" and a saint. The thing is simply impossible. The millionaire's work would run counter to the saint's; the *bon vivant* and the philanthropist would trip each other up; the

> philosopher and the lady-killer could not well keep house in the same tenement of clay.

To avoid listening to an American spokesman alone, we add a similar account of human intentions—given with tongue-in-cheek, but nonetheless valuable—by Ezekiel Mphahlele, an African writer who had a thorough exposure to Western education but survived unscathed. In an article on "The Fabric of African Cultures" (in *Foreign Affairs*, July, 1964), he wrote:

> Who is so stupid as to deny the historical fact of négritude as both a protest and a positive assertion of African cultural values? All this is valid. What I do not accept is the way in which too much of the poetry inspired by it romanticizes Africa—as a symbol of innocence, purity and artless primitiveness. I feel insulted when some people imply that Africa is not also a violent continent. I am a violent person, and proud of it because it is often a healthy state of mind; some day I'm going to plunder, rape, set things on fire; I'm going to cut someone's throat; I'm going to subvert a government; I'm going to organize a coup d'etat, yes, I'm going to oppress my own people; I'm going to hunt down the rich fat black men who bully the small, weak black men and destroy them; I'm going to become a capitalist, and woe to all who cross my path or who want to be my servants or chauffeurs and so on; I'm going to lead a breakaway church—there is money in it; I'm going to attack the black bourgeoisie while I cultivate a garden, rear dogs and parrots, listen to jazz and the classics, read "culture" and so on. Yes, I'm also going to organize a strike. Don't you know that sometimes I kill to the rhythm of drums and cut the sinews of a baby to cure it of paralysis?

If you blend James with Mphahlele, adding a few of the better human qualities omitted from their lists, doubtless for artistic reasons, the result should be a fairly symmetrical picture of human nature in its present condition. Does this need confirmation? Well, all these traits are fairly well consolidated and given definable profiles in the institutions of our time. (*Playboy?* the Mafia?) That these intentions, when catered to by determined entrepreneurs who put them on a paying basis, trip each other up hardly needs pointing out.

But all this is on the surface of things. There are deeper currents in human life, motives which have no reflection at all in the reflexes of commercial enterprise. There are those who, surfeited by the meaningless competition of appetites and conflicting purposes, draw back from their everyday activities to ask what is the meaning of their lives. When this happens, people find themselves very much alone. The world of institutionalized purposes is no longer any help. The goals proclaimed no longer attract. The well-intentioned counsels of friends relate to hopes no longer cherished. Only the vague half-light which lends forbidding shape to both ends and beginnings permits us to see anything at all. And so, as Hannah Arendt has said, we stop and think. We *stop* and think, for the thinking is not possible without the stopping.

What makes us stop?

Western thinkers have given us two answers to this question, and they may perhaps suffice. Plato regarded *wonder* as the prime cause of thinking. Hegel thought the cause was disaster. He said:

> The need for philosophy arises when the unifying power has disappeared from the life of men, when the opposites have lost the living tension of their relatedness and their mutual interdependence and have become autonomous. Out of disunity, out of being torn apart, arises thought. . . .

For Hegel, who was a very Roman thinker, this meant the disintegration of the State and the collapse of the historical entity to which we belong, but the idea surely applies to individuals as well. When human lives come apart, the yearning to know *why* becomes overwhelmingly insistent. It is then that the dialogue with oneself begins in earnest.

Well, has this conclusion brought us any closer to an understanding of ourselves and the world?

Let us return to the purposes—the various purposes—spoken of at the beginning. We can hardly separate purpose from some idea of a goal.

People talk to one another about their goals so that these, at least, are open to inspection. Practically all the goals given serious attention represent some order of harmony and satisfaction of longing. They represent fulfillment in terms of what the world—including heaven—has to offer. Some day . . . we shall be what we want to be and have what we want to have. All the longed-for unities will come about.

There are multiple levels of this dream. Labor organizers look to the day when there will be a guaranteed annual income for everybody; doctors think of the time when they will have a specific remedy for every ill; businessmen want a market of eternally prosperous purchasers for their products, and politicians want a populace that admits their merit and will retain them in office forever to accomplish ever-increasing good for all. For nearly everyone, the goal is always some kind of polished-up, reformed, and properly ordered improvement of the status quo. Heaven is a better sort of earth, with only goodness in power and only virtue in the people.

All this is really nothing more than the fulfillment, by the magic of the imagination, of the original "scientific" dream. The obstacles to our freedom will all be either eliminated or made to serve as structure for *the* ideal situation. We shall never hurt any more, or have reason to fear.

But what if the climax of our humanness is reached in that moment when we withdraw from the glamor of these ideal goals and begin to *think?* And what if the drama of struggle, the encounter with evil, the travail of birth and the advent of death are essentials of human growth? What if to get away from these archetypes of our present existence would mean the end of all the reality we are able to know?

Human beings are moral agents. They seek the good, but good is a relative thing. Josiah Royce once said something to the effect that the one thing a universe needs is a moral agent to make it better. This might be turned about: The one thing a moral agent cannot do without is a universe to improve. A completely improved universe, then, would have no place in it for us. Quite possibly, a completely improved universe could not even exist.

REVIEW

MORE OF PAUL GOODMAN

NOTICE here of the psychological essays of Paul Goodman, titled *Nature Heals* (Free Life Editions, 1977, $11.95), edited by Taylor Stoehr, will be mainly selection of a few passages that seem of particular interest. Goodman's psychology can be identified only by calling it Goodman's Psychology. The man was enormously bright, impressively conscientious, yet deliberately self-indulgent, and the reader—this one, at least—has the impression that he edited his account of psycho-dynamics to accommodate his own emotional inclinations. A talented individual often does this quite persuasively, the danger then being that other people who admire the talent will adopt his views without much critical inspection. There must have been a number of young Athenians who followed Alcibiades around for much the same reasons.

Yet Goodman was also an observant, perceptive man. What he writes is valuable for its independent insights, his casual asides. There is this, for example, in an essay on "The Psychology of Being Powerless":

> Being powerless as citizens, poor people have little meaningful structure in which to express, or know, what they are after. The concrete objects of their anger make no political sense: they are angry at themselves or their own neighborhoods, at white people passing by, at Jewish landlords and shopkeepers. More symbolic scapegoats, like either "the capitalist system" or "communism," do not evoke much interest. One has to feel part of a system to share its bogeymen or have a counter-ideology, and by and large the present-day poor are not so much exploited as excluded.

It is to be noted that Goodman's integrity seemed always to prevent him from exploiting popular images of "the enemy," or even intellectualist symbols of the "forces of evil." He simply would not invoke delusive slogans to make a point or win an argument. Like the rest of us, he had his weaknesses, but he wouldn't play on other people's susceptibilities to get his way. He was too decent a man. This quality may explain why his prose is often so good:

> But to fill the void, they [the poor] admire, and identify with, what is strong and successful, even if—perhaps especially if—it is strong and successful at their own expense. Poor Spanish youth are enthusiastic about our mighty bombs and bombers, though of course they have no interest in the foreign policy that uses them. (If anything, poor people tend to be for de-escalation and peace rather than war.) Readers of the [New York] *Daily, News* are excited by the dramatic confrontation of statesmen wagging fingers at each other. Negroes in Harlem admire the Cadillacs of their own corrupt politicians and racketeers. Currently there is excitement about the words "Black Power," but the confusion about the meaning is telling: in the South, where there is little Negro anomie, Black Power has considerable political meaning; in the Northern cities it is a frantic abstraction. Similarly, the contrary word "Integration" makes economic and pedagogic sense if interpreted by people who have some feeling of freedom and power, but if it is interpreted by hopeless resentment, it turns into a fight for petty victories or spite, which are not political propositions though they may be good for the soul.

How spite may be good for the soul is not here explained—perhaps Goodman means that some portion of the psyche is made to "feel good" by its expression!

> The anomie of the middle-class people, on the other hand, appears rather as their privatism; they retreat to their families and to the consumer goods—areas in which they still have some power and choice. It is always necessary to explain to non-Americans that middle-class Americans are not so foolish and piggish about their standard of living as it seems; it is that the standard of living has to provide all the achievement and value that are open to them. But it is a strange thing for a society to be proud of its standard of living, rather than taking it for granted as a background for worthwhile action.

Later, however, Goodman has something to say about the uses of spite:

> Commentators seem to be unwilling to say the word spite; yet it is not an ugly or useless passion. It is a means of preserving or even finding identity. Saul Alinsky especially has often tried to use it for community development, e.g., by organizing dispossessed and fragmented people simply to take

> revenge on short-weight grocers. But the trouble with spite, of course, as Alinsky also knows, is that its victories do not add up, and the letdown can lead to worse despair.

There is this on the young:

> Brought up in a world where they cannot see the relation between activity and achievement, adolescents believe that everything is done with mirrors, tests are passed by tricks achievement is due to pull, goods are known by their packages, and a man is esteemed according to his front. The delinquents who cannot read and quit school, and thereby become still less able to take part in such regular activity as is available, show a lot of sense and life when they strike out directly for the *rewards* of activity, money, glamour, and notoriety. And it is curious and profoundly instructive how they regress, politically, to a feudal and band-and-chieftain law that is more comprehensible to them. The code of a street gang has many an article in common with the Code of Alfred the Great.
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> It is disheartening indeed to be with a group of young fellows who are in a sober mood and who simply do not know what they want to do with themselves in life. Doctor, lawyer, beggar-man, thief? rich man, poor man, Indian chief?—they simply do not know an ambition and cannot fantasize one. But it is not true that they don't care, their "so what?" is vulnerable, their eyes are terribly balked and imploring. (I say "it is disheartening," and I mean that the tears roll down my cheeks; and I who am an anarchist and a pacifist feel that they will be happier when they are all in the army.)

Perhaps we shall have an army for as long as it is needed for such purposes—but no longer, since armies have hardly any other real use. One thinks here of George Russell's proposal for Ireland of conscription for the national welfare (instead of international warfare), under which the young would be required to work for their country for a year or two. Of course, any form of conscription is odious to anarcho-pacifists, but so long as there is a moral vacuum in the lives of people—and especially young people—the State will almost certainly devise some coercive way to occupy their time. It is no approval of conscription to point this out. Yet Gandhi once said that it might be necessary to conscript the educated youth of India to oblige them to go back into the villages as teachers of the people.

Goodman offered a concluding comment:

> This is a sad picture. Naturally; for it is always sad when you write about something, rather than do something. (Poetry is not sad, it is an action.) I do not think there is cause for indignation, nor for despair. Not for indignation, because so many people are doing their best and many of these difficulties that have arisen are surprising and must simply be addressed patiently. Not for despair, for my feeling is that we are in a stage of transition: to finding some kind of collective arrangements that will be rich with animal vitality and creative spontaneity and will be without Interpersonal Relations. Of course I cannot imagine such an apparently contradictory thing or I would be writing that instead of this.

Our remaining space will be devoted to an extract from an essay on "Designing Pacifist Films":

> . . . bad audiences cannot be relied on to respond to a whole work of art; they will select from it what suits their own repressions, and interpret according to their own prejudices, the very fact that they have been moved despite themselves. The lovely is taken as dirty, the horrible as sadistically thrilling. This derogation is partly revenge against the artist. Bad audiences follow the plot as a story; they do not identify with the whole work as the soul of the poet, but they identify with the actors of the story and take sides. Given a film about capital punishment, for instance, a Camus will notice, and be steeled in revulsion by, the mechanism of execution: he will deny the whole thing the right to exist because it is not *like us* (this is the reaction-formation, denial, that is characteristic of active compassion); but a vulgar audience will identify with the victim, get involved in the suspense, thrill to the horror, and weep with pity. The effect is entertainment, not teaching or therapy; and to be entertained by such a theme is itself damaging.

How did the Greeks handle this problem? The Mysteries—said to be the origin of all drama—began by generating feelings of *awe* in the spectators. Awe has an inhibiting effect on the responses of vulgarity—it practically shuts them out when the awe is deep. But what symbols known to the populace of our time would a dramatist use to awaken awe?

Goodman goes on:

> By a good audience, of course, a work of genuine art cannot be easily taken amiss and abused in this way. By definition the images of genuine art do not allow themselves to be detached from its idea, for the whole is solidly fused in the artistic activity. But this standard of excellence is useless for our present purposes, since such works are not conveniently had for the asking. And when they do occur, they are just as likely to be embarrassing to our rhetorical purposes. For example—I choose classics of literature that are beyond debate—both Homer's *Iliad* and Tolstoy's *War and Peace* are infused by, and teach us, a profound pacifism, a lofty and compassionate dismay at the infatuated violence of men in their armies. Yet they certainly also express, and even celebrate, the demonic in war, the abysmal excitement of mankind gone mad. This was interesting to these artists and it might be to any contemporary artist—how could one know? The counter to such demonism in a great artist would have to be a kind of saintliness. We are here clearly outside the context of planning pacifist films.

Some light on such puzzling questions might be obtained by considering the possibility that good and evil cannot be separated in a work of art without making it trivial and unimportant. In genuine art, as in life, the element of risk always remains.

COMMENTARY

THE HEALTH OF THE ARTIST

PAUL GOODMAN'S comment (see page 8) on the balance needed by artists—their celebrations of "the demonic in war, the abysmal excitement of mankind gone mad" must be countered by "a kind of saintliness"—has an interesting parallel in a letter by John Keats to his brother in America. In *The Opposing Self*, Lionel Trilling calls it "one of the most remarkable documents of the culture of a century."

"I see," Keats wrote, "a Man hurrying along—to what? the creature hath a purpose and his eyes are bright with it." Trilling observes:

> He [Keats] thinks of the disinterestedness of Jesus and of how little it has established itself as against the self-interest of men, and again he snatches at the idea that perhaps life may be justified by its sheer energy: "May there not be superior beings amused by any graceful, though instinctive attitude my mind may fall into, as I am entertained with the alertness of a Stoat or the anxiety of a Deer? Though a quarrel in the streets is a thing to be hated, the energies displayed in it are fine; the commonest Man shows a grace in his quarrel—By a superior being our reasonings may take the same tone—though erronious they may be fine—This is the very thing in which consists poetry—"
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> It is very brilliant, very fine, but it does not satisfy him; "amusement," "entertainment" are not enough. Even poetry is not enough. Energy is the very thing "in which consists poetry"—"and if so it is not so fine a thing as philosophy—For the same reason that an eagle is not so fine a thing as a truth."

All great artists seem moved by this longing for transcendence. The splendor of movement in "the natural economy of tooth and claw" may fascinate the writer—or the painter—exciting his aesthetic sense, yet there is a truth beyond sensuous beauty. For Keats this was the truth of what he called Soul-making. The world, he declared, is not a "vale of tears," but a "vale of Soul-making" where humans work out their own Salvation. Keats, Trilling says, "stands as the last image of health at the very moment when the sickness of Europe began to be apparent."

CHILDREN
. . . and Ourselves
EVOLUTION—AN OLD VIEW

BROWSING in an old book which appeared in 1931, unexpectedly titled *Plant Ecology*, by W. B. McDougall, and published by Lea and Febiger, we came across some passages which recalled the recent attempts of Fundamentalist Christian groups here in California to secure "equal time" for creation in the public school science courses teaching Darwinian evolution theory. This seemed a pretty mixed-up proposal, since the Creation story in the Bible is quite evidently a myth, and how can it help the understanding of children to make a myth compete with the supposed "facts" of science?

A much more interesting and more educational contrast would result from an array of biological facts which are almost impossible to fit in with Darwin's Natural Selection. If the idea is to prevent belief in Darwinism, there seems little point in ineffectual attempts to secure belief in the Garden of Eden story. A presentation of natural facts would be much more appropriate—as, for example, what McDougall relates about the strange relationship between the yucca plants which dot the hillsides of Southern California and the yucca moth, a small, fragile creature that flits about in the evening. Of her services to the yucca, Mr. McDougall says:

> Perhaps the most interesting of all cases of pollination by moths is that of the yuccas which are pollinated by small moths belonging to the genus *Pronuba*. The flowers of the yuccas are pendulous and the style hangs down farther than the stamens but it is impossible for the pollen to fall from the anthers to the stigma because the stigma is cup-shaped and the stigmatic portion is on the inner surface only. The female moths begin to work soon after sundown. Each one collects some pollen from the anthers and holds it in her specially constructed mouth parts. She then usually flies to another flower, pierces the ovary with her ovipositor, and, after laying one or more eggs, creeps down the style and stuffs a ball of pollen into the stigma. It is difficult to imagine what would cause a moth to stuff pollen into a stigma for one hesitates to believe that she knows what the result will be. Yet this symbiotic relation is obligate for both the yucca and the yucca moth, since in the absence of the moth the yucca produces no seed while without the yucca the moth cannot complete its life cycle, and if the moths should fail to pollinate the yuccas the result would ultimately be the extinction of both plant and insect. The yucca produces a very large number of ovules. Part of these are eaten by the moth and the remainder mature into seeds.

The science student who learns this romantic tale is entitled to ask his teacher how Darwin accounted for so ingenious an arrangement between plant and insect life.

There are other instances of extraordinary cooperation—the pollination of the fig tree, for one. Mr. McDougall is himself impressed:

> One of the strangest of the known cases of symbiosis between flowers and insects is that of the commercial fig and the wasps of the genus *Blastophaga* which pollinate it. The flowers of the fig are produced in composite inflorescences called syconia. A syconium consists of a fleshy receptacle which has developed into a hollow structure with a very small orifice at the upper end. The numerous flowers are arranged on the inner side, which is the morphological upper side, of the receptacle. . . . The pistillate syconia, which are called figs, contain only normal pistillate flowers with rather long styles, while the staminate syconia, called caprifigs, contain both staminate flowers and small, short-styled, pistillate flowers, which are known as gall flowers. Pollination of the fig is accomplished by the female wasps. The orifices of the syconia are so nearly closed by overlapping scales that the wasps have great difficulty in getting in and often tear off their wings in the process. After a wasp has entered a pistillate syconium she creeps over the flowers searching for a suitable place to lay eggs and while doing this the pollen on her body is rubbed onto the stigmas. The styles of the flowers are so long, however, that the wasp is unable to reach the ovaries with her ovipositor and so is unable to lay any eggs. She cannot get out of the syconium, however, and soon perishes, but the flowers, having been pollinated, continue their normal development and the syconium matures into a fig.
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> If, on the other hand, the wasp chances to enter a caprifig she readily reaches the ovaries of the short-

> styled gall flowers and lays her eggs there. She then perishes in the caprifig. When the eggs hatch the young wasps feed on the tissues of the gall flowers and, when mature, the males eat their way out of the ovaries in which they hatched and into those occupied by the females. After mating with the females the males soon die without leaving the caprifigs. The females now become dusted with pollen, make their way to the exterior, and fly to another syconium. Those that by chance enter figs will affect pollination but will not leave any offspring, while those that enter caprifigs will leave offspring but will not affect pollination. This symbiosis is obligate for both the plant and the insect yet the course of the evolution that has brought about so strange a relationship can scarcely even be imagined.

What is "Natural Selection"? In *The Origin of Species* Darwin noted that nature produces many variations in living things, arguing that those which present an advantage give the forms embodying them a better chance for survival in the struggle for existence. The result is the extinction, as Darwin put it, of the "less-improved forms." By this means "evolution" comes about: "Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of higher animals, directly follows."

Later biologists of course pointed out that while Natural Selection may help us to understand the *survival* of a species, it really tells us nothing about its *origin.* An eminent scientist, William Bateson, wrote in 1922:

> We cannot see how the differentiation into species came about. Variation of many kinds, often considerable, we daily witness, but no origin of species. Distinguishing what is known from what may be believed we have absolute certainty that new forms of life, new orders, and new species have arisen on earth. That is proved by the paleontological record. . . . In dim outline evolution is evident enough. From the facts it is a conclusion which inevitably follows. But that particular and essential bit of theory of evolution which is concerned with the origin and nature of *species* remains utterly mysterious.

What else might be said about Evolution?

Well, there is an interesting interpretation of the Christian doctrine of the origin of the world in *New Views of Evolution* (Macmillan, 1929) by George P. Conger, who says that "evolution" can be found in the first chapter of the Fourth Gospel, developed from non-Christian sources. Mr. Conger relates:

> The Fourth Gospel, or Gospel of John, like the Book of Genesis, opens with the words "In the beginning," and presents an account of the origin of the world; the Gospel account, although in some translations it employs the terms of creationism, is more open to evolutionist interpretations. Behind it evidently is the old Gnostic philosophy of some of the ancient cults, according to which the world originates by a succession of "emanations," or, as we might say, expressions, or radiations, from God, Who is the primary Source of everything. The first expression, or radiation, according to the Gospel, is "The Word" (Logos), which we may understand as a kind of reasonableness or intelligibility in things. It is that quality in the Universe which makes us able to understand it and talk about it. . . . According to the Gospel in the King James version, "all things were *made"* by this Word; but in the original Greek the root idea is rather that all things *become,* or "came into being through" the Word. Further on, in the translation, it is said that "the Word was made flesh," where again the word which may be translated "became" occurs in the original. In other words, the Gospel account can be read in terms of a cosmic tendency, the Word, or Logos, or Reasonableness, working through the developing Universe. . . .

In view of their confession of "mysteries," the scientists should have no objection to this philosophy of evolution, supposing, for the moment, that anyone really wants a *philosophy* of evolution, and not either a religious or a scientific dogma.

FRONTIERS

Locating the Frontier

A FEW years ago, E. F. Schumacher suggested to the industrial producers of the world that they transfer some of their attention—not all of it—to the possible advantages of alternative (small-scale) methods of production in behalf of the little fellow. Five per cent of their research and development effort, he thought, might be enough.

He probably didn't expect them to do it. What company is likely to invest money in research into activities normally ruled out by the profit motive? But then, on the other hand, here and there one finds businessmen who have thought about their methods and have discovered means of surviving despite changed objectives. Getting manufacturers to wonder in this way was at least worth a try, Schumacher must have felt. After all, Sicco Mansholt, author of the Mansholt Plan, publicly admitted he had been wrong in urging the further specialization and industrialization of European agriculture. After some looking around he told Mr. Schumacher, "I have changed my mind. I wouldn't do it again."

How do you get more of such people to look around?

This is certainly the question in the foreground for Donald Worster. In *Nature's Economy* (Sierra Club) he asks:

> Is it possible at all, two hundred years after Watts' steam engine, to abandon the Industrial Revolution, or has the chain of events bound us to a self-propelled technology? What would an alternative social order founded on the science of ecology look like—and would the middle class really accept such a world?

Interestingly, Mr. Worster at least hints that it might—given some encouragement by dire necessity—since he points out that the (ecology) "movement's strongest appeal is among the Anglo-American middle class." Why, then, is the awakening proceeding so slowly? An answer to this question is provided by Roy Rappaport, who has shown from anthropological studies of "primitive" people that what they learn from everyday experience is "masked from men in the state-organized societies by the sheer scale and complexity of these societies." The kind of "research" Schumacher was asking for might take at least a few businessmen beyond the deceptive curtain of existing arrangements.

Where, then, does the frontier really lie? It lies in a seldom explored region—the place where people decide *why* they are doing what they are doing. The basic change now called for is a move from "how to?" to "what for?" in our questioning. And it is ourselves who must be questioned. In a seminar on "Values and Contemporary Society (sponsored by the Rockefeller Foundation, March, 1974), Irving Kristol made this clear:

> I think we can all agree that the United States today—and Western civilization in general—is experiencing what we call a crisis in values.
>
> A hundred years ago, we would not have called it that; we would have called it a spiritual crisis. I think those two phrases are not entirely the same, and the fact that we call it a crisis in values is in itself a hint.
>
> A crisis in values is something that happens *out there*. It is something you can cope with through rational manipulation of institutions, of beliefs, of ideas.
>
> A spiritual crisis is something that happens to *you*—deep down—and that you have to cope with in some inward way.
>
> Therefore, the phrase "crisis in values" can mislead by emphasizing what is essentially a technological approach to a problem that is not technological; this technological approach asks: how do we look at society; how do we manipulate it; how do we shape it in such a way that we don't have a crisis in values? I don't think that's the way. Real spiritual crises are resolved not by social science but by mysterious cultural processes which somehow reach inside every human being. . . .
>
> I think we should be careful about emphasizing the unprecedented character of our problems. A good part of our problems is thoroughly precedented and previous civilizations have thought about them more profoundly than we have.

Both this analysis and the concluding observation seem quite accurate, yet there is a qualification to be made. Those "previous civilizations" which thought so deeply about the problems we face did so only in the reflections of a handful of distinguished men. When these exceptional individuals had reached some conclusions about what ought to be done, they were able, because they commanded influence, to design social systems that would get the right things done with the least obstruction from common human ignorance. (See cultural studies of the great traditional societies of the past—China, Egypt, India—and for a more recent example, Plutarch's life of Numa.) But today the problems are confronting the people at large. They need to be recognized and dealt with by everyone—not just sagacious philosophers and benevolent rulers.

What can the benevolent rulers of today do to help, supposing we have one or two leaders of this description? With this question in mind, Ruben F. W. Nelson wrote a report for the Canadian Government to ponder—*The Illusions of Urban Man* (published last year in a second edition by the Macmillan Company of Canada Ltd.) In his final chapter Mr. Nelson has this to say:

> Community action is part of our mythology, for example barn-raising, but the pervasiveness of that myth has blinded us to the incredible degree to which the present forms of society inhibit rather than reward community-based assistance. We have almost come to the point that any help which is to be given/received by persons within our society must be institutionalized and blessed by some government structure. For us, to help is to institutionalize. We establish a particular program with officers, a building, and a budget, and everything starts to become impersonal and controlled. On the one hand we bleat about "responsibility" and "private initiative"; yet we move relentlessly towards a society which is made up of only one size of institution—too large for human habitation—and one class of worker—employees of such institutions.
>
> We need to break out of our present imagination and encourage one another to engage in direct acts of healing.

Well, what, for example, would be "direct acts of healing"? We hardly know. We are out of the habit of knowing about such things. (We are reduced to asking, "Have you hugged your kid today?") So, when suggestions are made, they mostly propose that people give some money to a good institution. But how do you identify a *good* institution? We suspect that a good institution might be one that has built into, it the seeds of its own destruction—one that will deliberately go out of business when enough individuals have assumed responsibility for what needs to be done. In other words, honor with support or cooperation only the organizations that will *really* wither away!