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PROMETHEAN OR EPIMETHEAN PROGRESS?

PROMETHEUS, as Greek mythology tells us, looks to the future, while his brother, Epimetheus, is bound to the past. Epimetheus, you could say, has an anxious fondness for certainty, so he reflects carefully on what has already happened—how could anybody change *that?* His greatest virtue is doubtless prudence. He is a bird-in-the-hand philosopher; the risks chosen by his daring brother are not for him.

There is a sense in which the methodology of science is Epimethean. Discovery may involve Promethean adventure, but verification brings Epimethean security. Verification removes the daring from scientific investigation. By establishing a limited sort of certainty, it gives an after-the-fact direction to further attempts at discovery. Established science can be regarded as an elaborate series of signposts telling investigators where they must now look, if they are to find out anything of importance. The fact is, however, that this limited certainty, which has practical value at one level of awareness, may also function as a blinder, hiding the potentialities of other levels.

The chief virtue of certainty, in addition to various byproducts for technologists and manufacturers, is its ostensible removal of ambiguity. There is no longer any blurred focus on unknown possibilities where scientific certainty has been established. As to that, we *know*, the scientist says, and he looks in other directions. And the world, being impressed by such things as modern plumbing, electric lights, and atom bombs, will hardly take seriously any large project which has not received the stamp of scientific approval. The world believes in and accepts the conclusions of science somewhat as some liberals accept Karl Marx, without quite knowing the measure of their faith and the extent of his influence on their thought.

Every once in a while some shining scientific certainty is obliged to give up the ghost. And then, for all except the very great among scientists, there is a kind of scandal, and inevitably a vast rewriting of the basic texts. There is in science a generalized hypothetical uncertainty which hangs over the entire undertaking like the doctrine of Grace—you speak of it, but you can hardly apply it. This principled uncertainty gets mainly lip-service. What would happen to the self-confidence of the rank and file if science were taught as a consistent sort of high-level guess-work—honored, in fact, much more for its utility production and its energy slaves than for its "truth"?

Well, it *is* taught that way by a few wise men, but it is not understood that way by very many.

But periodically some great discovery throws the universe, or some important aspect of it, back into primeval flux. When Einstein first published his paper on the Special Theory of Relativity, Marie Curie and Henri Poincare wrote:

> Herr Einstein is one of the most original minds that we have ever met. . . .
>
> He does not cling to classical principles, but sees all conceivable possibilities when he is confronted with a physical problem. In his mind this becomes transformed into anticipation of new phenomena that may some day be verified in actual experience. . . .

Photographs of the total eclipse on May 29, 1919 confirmed his theory. But when a friend pointed to one of the photographic plates and said, "You must be a happy man. There, in your hands, is the proof of your theory," Einstein exclaimed, "Proof! *They* needed it. I never did."

What a cavalier attitude toward the glorious certainty of scientific method! Is it really possible that for a century or two we have, like Epimetheus, been admiring the wrong thing?

But we, it will be said, are not Einsteins. We must walk before we run. *We* needed the proofs to be sure of Einstein's genius. Perhaps so. But does that give us the right to define the meaning of science in our terms instead of Einstein's? This may be only massive bourgeois presumption. When Einstein was asked by a Cal Tech professor how he came to formulate the Theory of Relativity, he replied: "By refusing to accept an axiom."

A less splendid but quite important illustration of the abandonment of a long series of scientific certainties is found in the paper, "Object and Effigy," by Richard Held, in *Structure in Art and in Science* (Braziller, 1965) edited by Gyorgy Kepes. Dr. Held, who is professor of experimental and developmental psychology at M.I.T., reviews the entire history of optical science, showing that each theory, based on what were regarded as unambiguous physical principles, became, for the period of its acceptance, the barrier to better understanding of how human beings see with their eyes. The fundamental difficulty, it now seems apparent, was that the "physical descriptions and laws" used to account for vision rested on an erroneous assumption:

> Though stated by human observers, such laws were presumed valid in a universe without observers. Because perceived objects in the world appear to be independent of scrutiny by the observer, they were assumed to be correlated with the entities of physics. These physical entities were then conceived as the underlying source of continuity of the perceived world.

This assumption continually got in the way of the realities of perception. Yet without it, other problems arise. If, instead of the object itself, "attention is focused on the plethora of stimulation that can be compounded by a higher-order analysis," the result is that a door is opened "to an unlimited set of stimulating conditions without providing a rational principle for selecting from this set likely candidates for correspondence." Thus:

> A research program based on this approach will inevitably be piecemeal and dependent on hunches of the experimenter. The aim of defining the organizational process has been replaced by the equally elusive goal of defining principles of selection.

The upshot, for Dr. Held, is that "extra-visual factors may influence correspondence." The human observer, in short, is endowed with a capacity for "pattern recognition" that has no familiar explanation. "We are forced to conclude that having been presented with a relatively small sample of instances, the [human nervous] system can recognize an unlimited set." We can say, then, that a rich ambiguity has been restored to this important branch of science—the study of perception—through exhaustion of the Epimethean definitions and pseudo-stabilities.

This "pattern recognition" is plainly what Michael Polanyi calls "tacit knowing" and which he regards as lying at the root of all scientific discovery. It also seems closely related to the findings of Adelbert Ames, Jr.'s studies of perception, which led him to say, of the observer—

> that his perceptions are not the result of a causal chain of events originating in the environment but are his own contribution to the perceptual situation, and may or may not correspond to what he is looking at as it is perceived and known to others. . . . Perhaps as far as we can go at present in answering the question "What is the inherent nature of environmental phenomena?" is to say "God knows." Certainly the findings of modern physics not only show that the answer is not as simple as it used to be thought, but that the more that is discovered, the less likelihood there is of finding the answer.
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> In connection with the methodology of modern physics the conclusion of these [Ames's] inquiries, that there are no aspects of perceptual awareness that are not significances contributed by the observer, is of interest. In the last analysis all scientific observations are based on observations, i.e., perceptions, so that they cannot avoid containing at least some aspect of human significance.
>
> A noted modern physicist (Bridgman) has said in substance: "The shadow of the investigator is discerned in the most abstract scientific findings."

We have quoted Einstein as saying that he found his way to the theory of relativity by rejecting an axiom. But he also replied to the same question by his son-in-law (Dimitri Marianoff, author of *Einstein—an Intimate Study of a Great Man*) by saying, "In vision." And other great discoverers have offered similar explanations. Could we say, then, that in such men "tacit knowing" is a more refined and even schooled affair than it is for the great majority? That men capable of such "vision" have in themselves a highly developed corresponding symmetry, enabling them to read off intuitively some hitherto unknown symmetries of nature?

Polanyi has quite abandoned the idea of scientific knowledge as made up of laws "presumed valid in a universe without observers." As he puts it (in *The Tacit Dimension*):

> The declared aim of modern science is to establish a strictly detached, objective knowledge. Any falling short of this ideal is accepted only as a temporary imperfection, which we must aim at eliminating. But suppose that tacit thought forms an indispensable part of all knowledge, then the idea of eliminating all personal elements of knowledge would, in effect, aim at the destruction of all knowledge. The ideal of exact science would turn out to be fundamentally misleading and possibly a source of devastating fallacies.

Again:

> The anticipation of discovery, like discovery itself, may turn out to be a delusion. But it is futile to seek for strictly impersonal criteria of its validity, as positivistic philosophies of science have been trying to do for the past eighty years or so. To accept the pursuit of science as a reasonable and successful enterprise is to share the kind of commitments on which scientists enter by undertaking this enterprise. You cannot formalize the act of commitment, for you cannot express your commitment non-committally. To attempt this is to exercise the kind of lucidity which destroys its subject matter. Hence the failure of the positivistic movement in the philosophy of science. The difficulty is to find a stable alternative to its ideal of objectivity.

Let us turn, now, to another contemporary thinker, the mathematician J. Bronowski, who has recently thrown a great light on the meaning of science. In a paper, "The Logic of the Mind," which appeared in the *American Scholar* for the Spring of 1966, Bronowski draws on the work of Godel, Turing, Church, and Tarski to show that logical systems of any richness (on which the developed branches of science all depend) have in them undiscoverable imperfections and are certainly incomplete. In Bronowski's words:

> Indeed, it could be said that theoretical science is the attempt to uncover an ultimate and comprehensive set of axioms (including mathematical rules) from which all the phenomena of the world could be shown to follow by deductive steps. But the results I have quoted, and specifically the theorems of Godel and of Tarski, make it evident that this ideal is hopeless. For they show that every axiomatic system of any mathematical richness is subject to severe limitations, whose incidence cannot be foreseen and yet which cannot be circumvented. . . . an axiomatic system can never be guaranteed to be consistent: any day, some flagrant and irreconcilable contradiction may turn up in it. An axiomatic system cannot be made to generate a description of the world which matches it fully, point by point; at some points there will be holes which cannot be filled in by deduction, and at other points two opposite deductions may turn up.

In other words, the blessed ambiguity of the moment of discovery, or of creation, will come back and *force* the apparently closed system to open itself up to novelty and fresh impregnation. Why? Because, Bronowski explains, such systems, constructed by human intelligence, are always capable of a double reference—to the field of objects which it is devised to match, *but also to itself*. Thus a moment of discovery in science is a return to the parent of science in philosophy—it is a return to some incommensurable aspect of the self, followed by a new birth by means of some new axiom which could not have been deduced or anticipated in the terms of the old system. Now comes a crucial point:

> In mathematics and science, it is a surprise to find oneself bounded by these theorems [Gödel and Tarski]; it is not at all obvious, and indeed is unexpected to learn that mathematical and scientific statements cannot be wholly cleared of self-references

> (or of some equivalent recursive regress). But it is evident that philosophy is full of self-references, and therefore that, if the breakdown in the machinery of logic has its origin in self-reference, then philosophy is surely subject to it. Indeed it is clear that, while mathematics and science are subject to it only from time to time, philosophy is subject to it severely and constantly—because self-reference is built into its very method.

We have here, in fairly simple words, the foundation for an education in science which shows its relation to other modes of cognition; which buries forever the "two cultures" argument; and which could surely be put into terms having a simplicity appropriate for high school students, or even younger children. With great clarity, Bronowski shows the point where the analogy of the mind or brain with a machine—a computer—breaks down:

> . . . the brain as a machine is certainly not the kind of a machine that we understand now. It is not a logical machine, because no logical machine can reach out of the difficulties and paradoxes created by self-reference. The logic of the mind differs from formal logic in its ability to overcome and indeed to exploit the ambivalences of self-reference, so that they become the instruments of imagination.

Further:

> Neither science nor literature ever gives a complete account of nature or of life. In both of them, the progress from the present account to the next account is made by the exploration of the ambiguities in the language that we use at this moment. In science, these ambiguities are resolved for the time being, and a system without ambiguity is built up provisionally until it is shown to fall short. This is why the results of science at any given moment can be presented only on an axiomatic and deductive machine, although nature as a whole can never be so presented because no such machine can be complete. Whatever kind of machine mind is, it is different from this.

In literature, however—and except for theology, which is a devious attempt to create closed systems where none can exist—the connection with fundamental ambiguity is never broken. The arts know no happy interludes of temporary certainty, unless we count academicians as artists. As Bronowski says:

> . . . in literature, the ambiguities cannot be resolved for even the time being, and no provisional system of axioms can be set up to describe the human situation as the writer and the reader seek to see it together. Here the brain cannot act as a logical machine, even for the time being: by which I mean that it cannot take in the information, sort out its ambiguities, and turn it into unambiguous instructions. That is not what a work of art does to us, and we cannot derive such instructions from it.

Thus science and literature are essentially two modes of self-reference. One is permitted by its practical, finite ends to escape for a time from self-reference, in order to take off some total at a level where self-reference seems to be unimportant—and in order, also, to make some kind of a "product" with the limited rules we have found out. But in leaving the field of self-reference—going AWOL, you could say—science risks delusions of grandeur, and often succumbs to them, because its shaman skills easily awe and frighten people, drawing on its wonderful if temporary closed-system certainties. Historically, however, these are periods of cultural *hubris*, and they are usually terminated by some practical collapse. Nemesis is unavoidable. It follows that, for people who indulge themselves in blind belief in science, culture will oscillate according to the manic-depressive phases of scientists who believe in their own myth of final, objective certainty. For these scientists inevitably involve the rest of us in their adolescent dreams as well as their Faustian debacles.

So, looking at the scientific enterprise in a critical mood, and judging it by its delusions rather than by the faint lines of intuitive perception seen in the reflections of the scientifically great, we may say that popular and applied science represents a cash-in propensity which exploits the constructions of human vision. It is the side-effect of true science, the bonus of wonderful tools and manufactured articles, that gets the masses on the side of science, and in a properly suppliant mood; and then, through the psychological stability of a

popular faith, the delusions of grandeur get their innings.

The best thinkers of our time are now recovering from a long cycle of rule by delusions of grandeur. These men are now pointing to the fact that the hypothesis that science can be a sure-thing, closed system is a way of prohibiting human growth and stultifying the idea of truth. This insight is coming from so many directions that before long it should be seen as an inescapable reality. It already has enough clear instances to justify making it into a central plank of education.

We should not conclude this discussion without calling attention to a new paper by Michael Polanyi, "Life's Irreducible Structure," which appeared in *Science* for June 21. Summarizing is not possible, but it is easy to see that here Prof. Polanyi has attempted to answer his own question (noticed earlier): where shall we find a stable alternative to the old scientific ideal of objectivity?

Polanyi divides the universe up into Platonic "joints," according to major levels of organization. Physics and chemistry set off one great area, biology another. The self-conscious capacities of man form still another. Polanyi's point is that it is never possible to explain a higher range of organization by analysis of some lower level, on which the higher one rests and in whose "mechanistic" processes its own functional needs are involved. Polanyi writes in one place:

> I have mentioned how a hierarchy controlled by a series of boundary principles should be studied. When examining any higher level, we must remain subsidiarily aware of its grounds in lower levels and, turning our attention to the latter, we must continue to see them as bearing on the levels above them. Such alternating and integrating admittedly leaves open many dangers. Detailing may lead to pedantic excesses, while too-broad integrations may present us with meandering impressionism. But the principle of stratified relations does offer at least a rational framework for an inquiry into living things and the products of human thought.

Without the context, this may be difficult to follow, but the point, we think, is that there is no easy way to a substitute for scientific objectivity—which was not true "certainty" at all, but grew into a rather rigid delusion. Here Polanyi has simply defined the reality of the human situation in the language of a new scientific epistemology. On the one side is the danger of the spurious entrapping lucidity of knowledge of detail; and on the other, the trap of warm-hearted generalization which lacks the discipline of precise limits, of functional recognition of boundary facts.

How shall we prepare for these difficulties? Obviously, by adopting those disciplines of thought which *accept* ambiguity, which welcome the lonely, risky course of self-discovery. For a start, we could go back to the dialogues of Socrates, and then pick out, from history, various of his disciples who give evidence of having known the way. The rule of selection would be to establish as reliable teachers only those who have never said that certainty is easy or even finally attainable, and who above all have denied that it can be found out by "somebody else."

This is not, of course, a replacement for "scientific objectivity." But we do not want that. What good would be a replacement for the most tyrannical self-delusion of the modern age?

REVIEW
WORK BY MEN-IN-MOTION

THERE are many things in the latest book of Robert Theobald which make it worth reading. Chief of these are his warm-hearted humanity and his acute intelligence—qualities so infrequently associated that their union makes something of an event. This book is a collection of recent talks and articles by Mr. Theobald, and is titled *An Alternative Future for America*.. (It is a paperback published by the Swallow Press—a firm started years ago in Denver, Colorado, by the late Alan Swallow, who published several of the works of John Collier. This book by Mr. Theobald is worthy of the Swallow publishing tradition. The present address of Swallow Press, which has a new ownership, is 1139 Wabash Ave., Chicago, Ill. 60605.) The book was edited, with some help from students, by Noel McInnis, of the faculty of Kendall College, Evanston, Ill.

The issue, in any argument with Mr. Theobald, is bound to be a question of priorities rather than ends. In today's arena of socio-economic planning, his name is practically a synonym of the guaranteed annual income. He is doubtless the most persuasive expounder of this idea, and the only real objection to his argument, apart from matters to be discussed a little later, is that he makes it with such enormous confidence that you are intended to look like a fuddy-duddy if you should dare to disagree with him. This is an attitude which may create more opponents for him than he needs.

Mr. Theobald is not alone as an admirer of Edward Bellamy. Arthur Morgan, in his life of Bellamy, spoke of the great nineteenth-century reformer as a "social engineer," and the changes wrought by the influence of Bellamy's books, particularly by *Looking Backward*, are probably far from finished. But one might say of Bellamy that he wrote his Utopia in the Hans Vaihinger tradition—*as if* mankind had taken a great (social) therapeutic leap—after which he described the society which might be expected to result. Bellamy doesn't tell you how the people actually reached this desirable state, but devoted his efforts to an absorbing account of a wonderful *fait accompli*.

It seems fair to say that it must have been by the practice of the dynamics of moral reconstruction that the people of Bellamy's dream, in the progress of time, created the society he describes. We feel that we understand those dynamics as exhibited under ideal conditions, but how do you make them work in an alien environment? That is what we do not know, and have difficulty even in imagining. So, with the dynamics of transition remaining obscure, one tends to by-pass this problem and to concentrate on the institutional *arrangements*, which all can agree seem very good. This is perhaps justified, so long as you don't make the fatal mistake of supposing that the arrangements generate the dynamics, instead of the other way around. Too often, since we have great skill in describing arrangements, but are quite ignorant of the dynamics of characterological change, we do a good job on selling the virtues of the arrangements and make up for our ignorance of dynamics by raising the decibel level of moral exhortation.

The ground for Mr. Theobald's general thesis lies in the following:

> It is now quite dear that a new view of the nature of man is developing, as many people re-examine the emerging data. This view can be briefly expressed in Abraham Maslow's thesis that human beings begin to drive toward self-actualization as soon as their basic needs for food, clothing and shelter are satisfied. . . . We have no choice, therefore, but to create a new social order, one where powerlessness has been abolished. For only then will man's drive toward self-actualization be capable of fulfillment and his destructive tendencies, generated through failure to honor the fundamental necessity for self-actualization, be eliminated.

The logic here is plain: give all these people basic economic security and they will begin to self-actualize. And if you *don't* give them this

security, you stand convicted of inexcusable indifference to the common good.

Yet it is still reasonable to ask why all those people of our affluent society who have plenty to eat and more clothes and other things than they need are not exemplary self-actualizers right now. *Post hoc, propter hoc* reasoning is not made valid simply by adding moral urgency to its appeal. It is quite possible that a fairly uniform condition of self-actualizing can be recognized without being identified as its *cause*.

Of course the Bellamy society would be great. Of course the people who live in that society would tend to learn from its wonderful environment that dog-in-the-manger self-interest is stupid, that the common good is also the good of each individual. So why don't "we" install the Bellamy society without wasting any more time?

But who is this grandiloquent "we"? You'd think "we" had a rational, coherent identity that can be reasoned with like some bright graduate student who responds to syllogistic reasoning and is deeply sensitive to authentic moral appeal.

How do you draw the profile of this "we" that ought to get on with the utopian program? One might insist that, deep down, "we" are really "good guys" who need only a little help from our friends—from the smart people who know what everybody ought to do. Well, maybe so. But if that help is *primarily* conceived as ramming through some better form of "arrangements," then, quite obviously, the plan has its cart before the horse.

There is a sense in which Mr. Theobald anticipates this criticism. In one place he says:

> My basic invitation is to get into the business of being world-problem-solvers. However, I would hope you would play this role with two things in mind. The first is that we know very little indeed: well over 90 per cent of what passes for knowledge and wisdom is false. If you assume that simply because someone is a teacher, or a businessman or a member of the government, then he must know more than you know, our chances of getting intelligent solutions are very low. The second thing to keep in mind is that we can move only in terms of our own knowledge, which is limited but which can be increased by listening to the people around us.

Again, on the poverty program:

> The present program assumes that poverty can be eliminated through Federal action. I, on the other hand, believe that poverty can only be abolished by motivating the individual and the community.

The sense of both these quotations seems more concerned with dynamics than with arrangements. Surely it is the dynamics we need to understand. We need to know more clearly why relief from poverty is not an automatic cause of self-actualization, but only a form of environmental permissiveness for moves in that direction.

Great societies have been characterized by conditions approximating Mr. Theobald's Basic Economic Security—the Peruvian civilization ruled by the Incas, for example. We have even had some psychological preparation for moving in this direction. Radical activity in the nineteenth century, as Staughton Lynd has pointed out, "demythologized" the idea of private property, which is now recognized as a social convention, not an article of faith in "natural law." But to develop in the present social community the sort of morale that is required for men to trust in one another, instead of their own acquisitive drives—well, we still have a long, long way to go. Only blind optimists can fail to see this.

Let us note that Bellamy was a great admirer of the Army, and that the structure of his utopia is a civilian copy of military hierarchy. The present-day version of this sort of social organization is the corporate state—with moral qualities that would have turned Bellamy's blood to ice, could he have been present to watch them in operation. The corporate state, you could say, amounts to Bellamy's arrangements without his more or less secret dynamics. So what we ought to do is to learn the secret of the dynamics before playing around with legislation to install his arrangements.

(It is quite possible that Bellamy himself didn't know the dynamics consciously—look what happened when he allied himself with the eager-beaver Populists.)

One might argue that we are going to get the arrangements anyhow—"history" will compel us to adopt them. The masses are tired of their powerlessness and are going to demand a change; and, furthermore, computer-guided technology is now available as an efficient means—something which we haven't really had until now.

All these arguments have their validity. But compulsive pressures and ingenious means are not substitutes for moral vision, and they will not take the place of "motivating the individual and the community." Merely admitting that we have been backed into a corner by moral failure is not really a way to launch or establish utopian reforms.

Well, we have spent too much space arguing with Mr. Theobald. There are rather wonderful passages in his book. For example:

> Using a computer is a good way of getting away from responsibility. We use it in California as a justification for logging redwood groves. The way that this gets done is to instruct the computer to build the best road, and then to inform the computer that the best road is the cheapest road. Next one feeds into the computer the values for the various strips of land, and of course you put in a very low value for the redwoods because, after all, they are not doing any good, are they? The computer then designs a road which goes through the redwood system. Then one says "It wasn't our fault. You know, logic compels us to build the road through the redwood groves. We regret this as much as anybody else."

Another passage:

> Perhaps the basic reality, however, is the convergence, coming from many different perspectives, on the need for fundamental spiritual values. We now know that we must develop these values or we will not survive. Let me prove this from cybernetics, the science of communication and control. Cybernetics shows that there are four necessities if any system is to function. The first necessity is that there be accurate movement of information; in human terms this means honesty. The second necessity is that some parts of the system be willing to bring about change when change is needed: in human terms this means responsibility. The third necessity is that no part of the system try to take over the rest of the system: in human terms this means humility. . . . The fourth necessity is that no part of the system try to preserve its exact place in the system but be willing to be flexible as conditions change: in human terms this means love.

Concerning the future:

> If conditions continue along present lines, if trends continue to develop as they are presently developing, we will move into a fascist police state in this country. Let me make it clear that I am not arguing that anybody wants a fascist police state. There are few evil men around: our problem is a lack of imagination rather than a problem of evil. We are being forced toward a fascist police state by events and we will continue to be forced by events unless we change our attitudes. The fact that the development of such a police state will be unwilled does not make it less real. . . .
>
> Our problems come from our inabilities to live our own lives with wisdom and courage, our own inability to think through the problems with which we are faced. We must therefore announce to the world, to quote Pogo: "We have met the enemy and they are we."

The final essay in this book, "A Plea for Damaged Children," is by Noel McInnis, of the Center for Curruculum Design at Kendall College. Its content grew out of discussion with Mr. Theobald and with Kendall students. It has a quality of responsibility, commitment, and vision that gives the reader hope that, in some colleges, at least, new and good things are happening in education. In any event, this book has an internal momentum of thought; it is written and edited by men-in-motion.

COMMENTARY
SELF-REFERENCE

THE time may come when various conceptions of the God-idea (see this week's Frontiers) will all be recognized as struggling efforts toward self-reference. One might even say that the evolution of man is represented in the evolution of the God-idea, which, in any epoch of history, is far more influential on how men treat one another than any other cause.

Speaking of the medieval belief in a God who would condemn vast numbers of humans to eternal damnation, Lecky wrote in *Rationalism in Europe:*

> If you make the detailed and exquisite tortures of multitudes the habitual object of the thoughts and imaginations of men, you will necessarily produce in most of them a gradual indifference to human suffering, and in some of them a disposition to regard it with positive delight. If you further assure men that these sufferings form an integral part of a revelation which they are bound to regard as good tidings, you will induce them to stifle every feeling of pity, and almost to encourage their insensibility as a virtue. If you end your teaching by telling them that the Being who is the ideal of their lives confines His affection to the members of a single Church, that he will torture for ever all who are not found within its pale, and that His children will forever contemplate those tortures in a state of unalloyed felicity, you will prepare the way for every form of persecution that can be directed against those who are without.

While belief in actual hell-fire has died away, racist persecution and egotistical cultural separatism are still functions of Fundamentalist belief in one form or another; while, on the other hand, faiths with a pantheist tendency, such as Quakerism in the West and Buddhism in the East, are notable for inspiring the practice of brotherhood toward all men, and bringing compassion to daily human relationships.

Perhaps the authentic history of mankind will eventually be written in terms of the cumulative effect of those personal experiences of awakening and growth which belong, as Alfred Reynolds says, not to any race or social system, but to the individual. And true religion would then be regarded as the striving by each one for that universal self-reference through which "man becomes aware of his potential and actual identity with the Divine."

Curiously, this seems the implication, in an entirely different vocabulary, of what J. Bronowski says concerning discovery in both art and science. Both are external reflections of self-knowledge, while religion and philosophy seek self-knowledge in terms of itself.

CHILDREN
. . . and Ourselves

A NEW SYSTEM OF PUBLIC EDUCATION

PROBABLY no one has brought before the American people the agony of California's migrant farm workers as clearly as John Steinbeck, in his distinguished books, *In Dubious Battle, Of Mice and Men*, and, most of all, in *Grapes of Wrath.* Mr. Steinbeck's considerable talents made the reader feel the human tragedy of men willing to work, but without land, and who were forced by circumstances to submit to the ruthless labor policies of the agricultural baronies of California. No political partisan, Steinbeck revealed by his art the brutal realities of the lives of these people more faithfully than any sort of sociological report. He made the reader *feel* what happened to the victims of a double rape of the land. They were driven from their farms in the Middle West by the dust-bowl's soil-destroying erosion, and in California—land of hope!—they met with socially organized forces which mined the land and were as destructive of defenseless human beings as the plough, the sun, and the wind had been to the Oklahoma prairie.

Mr. Steinbeck dramatized the moral outrage of this encounter. Then Carey McWilliams, who had been intimately concerned with the problems of the migrants as a state official, published his extensively researched study, *Factories in the Field,* so that we learned from both art and science what it meant to be a homeless farm laborer. After Steinbeck and McWilliams wrote their books, no one could say he "didn't know" how bad things were for the human victims of aggressive, industrial farming in California.

Something of a parallel to these revelations exists in respect to the failures of present-day public education, as a result of a recent book and a recent article. The book is Jonathan Kozol's *Death at an Early Age* (Bantam, 95 cents). While an account of Mr. Kozol's personal experience in the public school system of the city of Boston, and not a novel, this book provides the intense focus of a work of art. Through the writer's love for the children he tried to help, the terrible cruelty of an impersonal, bureaucratically controlled educational system is felt by the reader. The children in Mr. Kozol's book are real people, and its title is no exaggeration. There is slaughter going on in these schools. People are being extinguished by bland administrative arrogance. So *Death at an Early Age* corresponds to Steinbeck's *Grapes of Wrath.*

The work which reviews the broad facts of injustice and anti-human abuses in public education (parallelling the McWilliams book) is a paper by the educational psychologist, Kenneth B. Clark, which he presented at the National Conference on Equal Educational Opportunity in America's Cities, in November, 1967. (It was later printed in the *Harvard Educational Review* for the Winter of 1968 [Vol. 38 No. 1]) The paper begins with an unchallengeable indictment of public school education in the United States:

> It is now clear that American public education is organized and functions along social and economic class lines. A bi-racial public school system wherein approximately 90 per cent of American children are required to attend segregated schools is one of the clearest manifestations of this basic fact. The difficulties encountered to desegregate public schools in the South as well as in the North point to the tenacity of the forces seeking to prevent any basic change in the system.
>
> The class and social organization of American public schools is consistently associated with a lower level of educational efficiency in the less privileged schools. This lower efficiency is expressed in terms of the fact that the schools attended by Negroes and poor children have less adequate educational facilities than those attended by more privileged children. Teachers tend to resist assignments in Negro and other underprivileged schools and generally function less adequately in these schools. Their morale is generally lower; they are not adequately supervised; they tend to see their students as less capable of learning. The parents of the children in these schools are usually unable to bring about any positive changes in the conditions of these schools.

> The pervasive and persistent educational inefficiency which characterizes these schools results in:
>
> (1) marked and cumulative academic retardation in a disproportionately high percentage of these children, beginning in the third or fourth grade and increasing through the eighth grade;
>
> (2) a high percentage of dropouts in the junior and senior high schools of students unequipped academically and occupationally for a constructive role in society;
>
> (3) a pattern of rejection and despair and hopelessness resulting in massive human wastage.
>
> Given these conditions, American public schools have become significant instruments in the blocking of economic mobility and in the intensification of class distinctions rather than fulfilling their historic function of facilitating such mobility. In effect, the public schools have become captives of a middle class who have failed to use them to aid others to move into the middle class. It might even be possible to interpret the role of the controlling middle class as that of using the public schools to block further mobility.

Well, the situation is just as Tolstoy said. Education which is not energetically devoted to making pupils *equal*, not merely to other pupils, but to the teachers as well, becomes a formula for maintaining obedience and submission to stratified inequality. That is the kind of a public school system we have, and we are not, Prof. Clark says and shows, about to change it. The "interests" are too deeply entrenched, the bureaucracy too secure, the public too indifferent.

Prof. Clark says the only sensible thing to say. Let the existing system alone. It is hopeless. If the ideals of the civil rights movement are to get any practical embodiment at all, this will have to be in a new educational system independent of the old one. He is of course right in proposing this, and facing the fact that he is right is the first step toward creating the conditions that will make his proposal a possibility.

He is also right in saying that this new educational system must be a government responsibility. On the scale he envisions, and in relation to the nation-wide dimensions of the problem, there is no other way to do it.

However, it seems certain that such an alternative program of national public education will never get off the ground without numerous, even if small, voluntaristic efforts in this direction. Models developed in a spirit of freedom will be the best, and lawmakers need something to copy. The cumbersome actions of the national state require this kind of encouragement and direction, and Prof. Clark needs this kind of spontaneous support.

His paper also needs to be read in full. It is thorough, professional, and has the right kind of restraint for something written in uncompromising honesty. It ought to become a watershed in thinking about public education in the United States. Any other kind of thinking, in relation to the facts as he describes them, may be beside the point.

FRONTIERS

About Religion

WHEN man began to grasp the idea of the Divine, he was still unable to refrain from externalization. He sought the powers which elude his senses in external things to which he could ascribe magical influence. Trees and rocks became objects of veneration; animals embodied the powers of the universe; meteorites like the Kaaba of the early Arabs, were given divine attributes. However, *becoming man* meant a development of his intellect; and the intellect "stepping out from among the vital forces," became more and more distinct from "mere" nature and led to an inner growth. From the world of the senses came meaning, image, and the union of these two, the symbol (image of meaning). Man awakened to a sense of affinity between himself and the world, to the experience of identity between external forces and his inner spirit. This sense was not yet an awareness, a clarity, a willed endeavor. Even the new symbol, the "part of God," was only one aspect of the Divine, only one manifestation, not a unity. This is how gods were born—just as you see yourself in dreams, so man's religious experience perceived himself in dream-forms embracing both the power of nature and the power of the intellect. Apart from all this he was still haunted by the object, the animist element: hence cult, rite, and the hallowed *sting.*

The gods were human, subject to nature, and by no means infallible. Even nature makes mistakes, creates abortions; only the intellect—to the extent it frees itself from nature—recognizes the pure concept, that which is perfect in itself. Peoples who venerated their teachers (*i.e.*, peoples who saw in the intellect the highest value) elevated their tribal gods (Jahweh, Ormuzd) or their teachers (Buddha, Lao-Tzu, Jesus) to ideas which, in themselves, united the world and the spirit, and they called this unity God. Gods die; the spirit, now elevated to divinity, lost its human attributes to the same extent that man's intellect gained in power to conceive the Divine. Yet, there were still the residues of his previous stages of development: he continued to observe the traditional rites and ceremonies, and again and again he relapsed, imposing anthropomorphic forms upon the pure spirit.

The process leading from one concept of the Divine to another has probably lasted for thousands of years and was hardly noticeable. The appearance of a great teacher and his articulation of a new understanding merely placed the crown upon a period of intellectual development. His formulations inspired these patterns of thought which entered the world under the name of a new religion. That explains why the religious systems which dominate even our own age, were born about the same time (seventh to sixth century B.C.): Tao, the teaching of Confucius, Buddhism, the Zend-Avesta and semitic monotheism.

Spinoza initiated the great struggle for a new concept of the Divine, and one of its most outstanding teachers, still hardly recognized, was Goethe. This struggle is far from complete, but the broad outlines of the new comprehension are clearly visible. It would be unwise indeed to speak of anything as *final* when contemplating the development of comprehension (I like to avoid the word "history"), but our contemporary horizon of thought shows as its last achievement: the spirit frees the concept of the Divine of all objective and anthropomorphic attributes, while man becomes aware of his potential and actual identity with the Divine.

This "spiritualization" of man and the purely conceptual "vision of God" accompanying it—man's growth into a unity with his idea of the Divine—are not historic, but personal experiences, which means that both his awakening and growth do not take place in mankind, but in the individual. The great teachers all experienced it in the distant past, while even today the majority of people still hold on to the outworn and outdated phases of development and attempt to

impose the chains of the past upon all minds that aspire to the highest forms of comprehension.

Viewed from this angle, one need not worry about the conflict with his environment. Its religious sense is still undeveloped and although heaven is a mirrored image of the earth, the earth is yet far from being a mirrored image of heaven. "The Kingdom of God" can only become a reality when heaven and earth mutually reflect each other and man no longer creates God in his own image, but strives to change his own countenance to express the human idea of the Divine. In simpler terms: only when man is able to live in harmony with his most perfect understanding of himself, with "his highest hope," will he grow in stature. "Mankind" is yet unable to do so, but the individual can do it if he so desires. To accomplish this he needs no priests, churches, incense or ceremonial. The experience of intellectual truth and of the beauty created by nature and man—these are religion and prayer. Out of his sensual world comes the chance of contemplation, out of his sensuality is born the power of love, from his pride and ambition springs humility.

Is this atheism? If the half-adults who have neither the innocence of children nor the wisdom of grown-ups, wish to call it atheism, let them! Allow them to cling to their chink of light at the end of their cave—we prefer the wide horizon of intellectual freedom.

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