

ORDER AND PURPOSE

THE numerous meetings held in recent years in quest of synthesis between science and religion have on the whole been notably without fruit. The explanation probably lies in the institutional character of the confrontations. One band of proprietors meets with another, and the two groups talk things over in a restrained and scholarly way. Actual issues are seldom joined. The sole exception that we recall occurred at the gathering of scientists, religious spokesmen, and philosophers in September, 1940, at the Jewish Theological Seminary in New York. Some five hundred "representative" leaders took part, among them Albert Einstein, who, although he did not come, sent a paper to be read. After three days of conferring, the sponsors said that the main achievement had been "democratic toleration" of one another by scientists and religionists. On the other hand, the theologians maintained that "the scientific demand for experimental proof had no application in the religious field," while the scientists "declared the product of unverifiable theological speculations could not be termed knowledge."

A large conference of luminaries of the scientific and theological worlds was hardly needed to reach these conclusions. Einstein's paper, however, did not rest with generalities. He expressed the view that "the main source of the present-day conflicts between the spheres of religion and science lies in [the] concept of a personal God." He continued:

To be sure, the doctrine of a personal God interfering with natural events could never be refuted in the real sense by science, for this doctrine can always take refuge in those domains in which scientific knowledge has not yet been able to set foot. But I am persuaded that such behavior on the part of the representatives of religion would not only be unworthy but also fatal.

For a doctrine which is able to maintain itself, not in clear light, but only in the dark, will of necessity lose its effect on mankind with incalculable harm to human progress.

In their struggle for the ethical good, teachers of religion must have the stature to give up the doctrine of a personal God—that is, give up that source of fear and hope which in the past placed such vast power in the hands of priests. In their labors they will have to avail themselves of those forces which are capable of cultivating the Good, the True and the Beautiful in Humanity itself. That is, to be sure, a more difficult but incomparably more worthy task.

The further the spiritual evolution of mankind advances the more certain it seems to me that the path to genuine religiosity does not lie through the fear of life and the fear of death and blind faith, but through striving after rational knowledge. In this sense, I believe that the priest must become a teacher if he wishes to do justice to his lofty educational mission.

While it became apparent that many of the attending scientists more or less shared Einstein's view, the theological addresses, according to a *New York Times* report (Sept. 10, 1940), associated religion with the traditional Bible God, and Dr. Louis Finkelstein, of the Jewish Theological Seminary, found it surprising that "Prof. Einstein should give such an absolute judgment in a field that was philosophical and theological in character." Dr. Einstein, he implied, had no special training in such matters and "should realize that he must speak with as much reserve in these fields as he habitually does in his own field of natural science."

Einstein no doubt did practice "reserve" in his own field until he reached some conclusion, but then he had no hesitation in speaking his mind. Asked by a colleague how he came to find out what he did about the universe, Einstein replied, "I refused to accept an axiom."

And the question of the nature of Deity is certainly not a matter that can be claimed as a private preserve by any group of scholars or priests, or any institution. It is the right and need of every person to ask himself such questions; and, if he thinks he has something worth saying, to express his views to others. When it comes to basic questions and the inquiry into truth, there can be no special proprietorships. The principle of freedom of ideas applies to individuals, not to interest groups.

Simone Weil addressed herself to this question in *The Need for Roots*:

Freedom of opinion and freedom of association are usually classed together. It is a mistake. Save in the case of natural groupings, association is not a need, but an expedient employed in the practical affairs of life. . . . Generally speaking, all problems to do with freedom of expression are clarified if it is posited that this freedom is a need of the intelligence and that intelligence resides solely in the human being, individually considered. There is no such thing as a collective exercise of the intelligence. It follows that no group can legitimately claim freedom of expression, because no group has the slightest need for it.

In fact, the opposite applies. Protection of freedom of thought requires that no group should be permitted by law to express an opinion. For when a group starts having opinions, it inevitably tends to impose them on members. Sooner or later, these individuals find themselves debarred, with a greater or lesser degree of severity, and on a number of problems of greater or lesser importance, from expressing opinions opposed to those of the group, unless they care to leave it. But a break with any group always involves suffering—at any rate of a sentimental kind. And just as danger, exposure to suffering are healthy and necessary elements in the sphere of action, so they are unhealthy influences in the exercise of the intelligence.

Simone Weil goes on to say that for the abuses of group opinion an "immediate, practical solution would be the abolition of political parties." The objection to this is that parties are organs of concerted action, which is necessary in politics, but the point, here, is that the pursuit of truth is another sort of activity. The use of the

mind does not require organization. The *discovery* of truth is a labor accomplished by individuals, which needs no institutions or parties. Books and libraries may be useful tools, but these do not coerce, control, or predetermine opinion. And it happens that the historic discoverers of religious truth were usually men who broke away from the influence of existing institutions and proprietorships of "truth."

A recent investigator of the possible compatibilities of science and religion, Charles H. Townes, an astrophysicist at the University of California in Berkeley, and winner of the 1964 Nobel Prize for physics, considers "The Convergence of Science and Religion" in the *California Monthly* (U.C. alumni magazine) for February, 1970. His intention seems to be to show that the scientific approach to nature and the phenomena of life increasingly resembles what he regards as the "religious" approach, although most of his discussion is devoted to changes in basic scientific attitudes, to which are added a few, brief statements concerning religious attitudes and purposes.

Prof. Townes begins by correcting popular misconceptions of science. "It is," he says, "perhaps science whose real nature is the less obvious, because of its blinding superficial successes." The vast confidence expressed by Laplace a hundred and fifty years ago is now gone. Deep problems of uncertainty affect the scientific idea of knowledge. After a review of the consequences of quantum mechanics and relativity, he exclaims:

How wrong, oh how wrong, were many ideas which physicists felt were so obvious and well-substantiated at the turn of the century!

Scientists have now become a good deal more cautious and modest about extending scientific ideas into realms where they have not yet been thoroughly tested. Of course, an important part of the game of science is in fact the development of general laws that can be extended into new realms. These laws are often remarkably successful in telling us new things or in predicting things which we have not yet directly

observed. And yet we must always be aware that such extensions may be wrong, and wrong in very fundamental ways. In spite of all the changes in our views, it is reassuring to note that the laws of nineteenth-century science were not so far wrong in the realm in which they were initially applied—that of ordinary velocities and of objects larger than the point of a pin. In this realm they were essentially right, and we still teach the laws of Newton and of Maxwell, because in their own sphere they are important and useful.

We know today that the most sophisticated present scientific theories, including modern quantum mechanics, are still incomplete. We use them because in certain areas they are so amazingly right. Yet they lead us at times into inconsistencies which we do not understand, and where we must recognize that we have missed some crucial idea. We simply admit and accept the paradoxes and hope that sometime in the future they will be resolved by a more complete understanding. In fact, by recognizing these paradoxes clearly and studying them, we can perhaps best understand the limitations in our thinking and correct them.

Prof. Townes is now ready to make his point:

With this background on the real state of scientific understanding, we come now to the similarity and near identity of science and religion. The goal of science is to discover order in the universe, and to understand through it the things we sense around us, and even man himself. This order we express as scientific principles or laws, striving to state them in the simplest and yet most inclusive ways. The goal of religion may be stated, I believe, as an understanding of the purpose and meaning of our universe and how we fit into it. Most religions see a unifying and inclusive origin of meaning, and this supreme purposeful force we call God.

Understanding the *order* in the universe and understanding the *purpose* in the universe are not identical, but they are also not very far apart. It is interesting that the Japanese word for physics is *butsuri*, which translated means simply *the reasons for things*. Thus we readily and inevitably link closely together the nature and the purpose of our universe.

Prof. Townes turns to what he regards as clear evidence of the essential similarity of science and religion. "Faith," he says, is claimed as a distinguishing characteristic of religion. Yet faith

is also basic in science—faith that ours is an orderly universe, understandable by man. While the mode of religious discovery—that of an inner inspiration—is said to set religion apart from science, Prof. Townes gives illustrations of scientific advances which began with a moment of intuition, sometimes even a kind of "vision," as was the case with Kekule's discovery of the benzene ring.

When it comes to the fact that all scientific discoveries must pass the test of experimental verification, the demonstration of similarity grows difficult, but Prof. Townes points to the limitations of scientific "proof" by speaking of the recent contributions of Godel, his conclusion being that no scientific proof can have absolute validity. He then asks:

Can religious beliefs also be viewed as working hypotheses tested and validated by experience? To some this may seem a secular and even an abhorrent view. In any case, it discards absolutism in religion. But I see no reason why acceptance of religion on this basis should be objectionable. The validity of religious ideas must be and has been tested and judged through the ages by societies and by individual experience. Is there any great need for them to be more absolute than the law of gravity? The latter is a working hypothesis whose basis and permanency we do not know. But on our belief in it, as well as on many other complex scientific hypotheses, we risk our lives daily.

Both science and religion, then, reach only tentative conclusions, and in this they have a deep similarity. And both involve bewildering paradoxes. Having already listed some of the chief paradoxes in physical science, this writer now turns to religious paradoxes. One he finds in "the suffering around us and its apparent inconsistency with a God of love." Another is in the contradiction between love and justice: "A completely loving approach and the simultaneous meting out of exact justice hardly seem consistent."

This concludes Prof. Townes' argument, and in one of his final paragraphs he says:

Finally, if science and religion are so broadly similar, and not arbitrarily limited in their domains, they should at some time clearly converge. I believe this confluence is inevitable. For they both represent man's efforts to understand his universe and must ultimately be dealing with the same substance. As we understand more in each realm, the two must grow together.

This is a useful article, but more helpful for a general understanding of the present-day conception of scientific knowledge than for gaining a grasp of the issues in religion. The latter are touched upon only superficially by Prof. Townes. It may be unjust to say that he seems to regard religion as some kind of institutional establishment, yet in reviewing religious problems he leaves unmentioned questions of great importance which the religious bodies of the day also neglect. For example, he speaks with great respect of Gautama the Buddha, citing him as an exemplar of religious discovery, yet fails to point out that there is no "God" in Gautama's religious philosophy. He might have added, also, that the psychological disciplines intimated by Buddha's teaching may actually represent the sort of verification and "proof" that is possible in the subjective area.

Science, on the other hand, as Prof. Townes says, addresses itself to the "objective and unique reality shared by everyone." In some measure, therefore, scientific discovery can be described as public truth. This means that a kind of external or institutional progress may be expected of science, although always within the limits set by underlying assumptions. So, when Prof. Townes says that science and religion "must ultimately be dealing with the same substance," he must mean a very ultimate and wonderful substance indeed, one which encompasses both matter and mind—both subjective and objective aspects of Reality. This is certainly convergence, but its admission or recognition will surely be limited to metaphysicians and mystics.

Can it be said that the religions of present-day denominations actually represent serious inquiry

into "the purpose and meaning of our universe and how we fit into it"? For one thing, was there ever a period so impoverished in thought as ours about the meaning of death? For comparison we have the last words of the dying King Cyrus of Persia to his children, as reported by Xenophon and quoted by Cicero in *De Senectute*:

"Do not believe, my dear children, that when I shall have quitted you I shall be nowhere and no more. While I was with you you did not see my soul; you only comprehended by my actions that this body was animated by one. I have never been able to persuade myself that souls that live while in mortal bodies when they leave them die. I cannot believe that they lose all intelligence in quitting bodies that are essentially destitute of intelligence. When death disunites the human frame, we clearly see what becomes of its material parts; they apparently return to the several elements out of which they were composed; but the soul continues to remain invisible, both while present in the body and when it leaves it.

"You know, my children, that nothing more resembles death than sleep; and the sleep of souls chiefly proclaims their divinity, for many of them foresee the future and show what they will become when they shall be freed from the prison of the body."

Religion must offer more than a code of moral behavior; among its obligations is an account, in terms of transcendent meaning, of both man and the cosmos, and this will involve considerably more than detailed information, however exact, about the order of natural processes. It should also provide some working hypothesis for understanding the polarities of good and evil in experience. Most of all, it must give at least clues to the answers to those basic questions which haunt every human being: Who am I? What is my relation to society and to other selves? How does my life relate to the life of the world?

Science has never really attempted to deal with these questions, while religion as we know it seems to have given up on them long ago. One might think that the best way to seek a synthesis between science and religion would be in terms of

their contributions to a body of thought which relates to such inquiries.

On the questions of faith and proof in religion, we have three quotations which might be called expressions of "faith," yet they seem to be something more, as well. Could they, one wonders, be called "axiomatic," or do they need supporting proof? First, then, from Emerson:

All goes to show that the soul of man is not an organ, but animates and exercises all the organs; is not a function, like the power of memory, of calculation, of comparison but uses these as hands and feet; is not a faculty, but a light; is not the intellect or the will, but the master of the intellect and the will; is the background of our being, in which they lie—an immensity not possessed and that cannot be possessed.

Next, from Charles Kingsley:

"I am I." I know it. Take away my "organization," cast my body to the crows or the devil, logically or physically strip me of all which makes me palpable to you, and to the universe, still I have the unconquerable knowledge that "I am I," and must and shall be so forever. How I got this idea I know not but it is the most precious of all convictions, as it is the first.

Finally, from Charles Wagner:

One can no more rid himself of the notion of moral obligation than of that of time or space; and as surely as we must resign ourselves to walking before we know how to define this space through which we move and this time that measures our movements, so surely must we submit to moral obligation before having put our finger on its deep-hidden roots Moral law dominates man, whether he respects or defies it See how it is in everyday life; each one is ready to cast his stone at him who neglects a plain duty, even if he allege that he has not yet arrived at philosophic certitude. Everybody will say to him, and with excellent reason: "Sir, we are men before everything. First play your part, do your duty as citizen, father, son; after that you shall return to the course of your meditations."

REVIEW

THE PARADOX OF VALUES

LIKE all ultimate matters, the problem of Values is enwrapped in paradox. Just as the self, or the idea of the self, appears under many guises, so also do the objects, qualities, states and relationships which men value or most desire. Given the human longing for certainty, one can easily see the beguiling attraction of any form of orthodoxy which claims to embody final answers in unambiguous language, and why "thinking" about these matters tends to be regarded as a kind of ill, which may be condemned as "metaphysical" inquiry from one point of view, or "heresy" from another.

Yet orthodoxies, as we know, always break down. Their relative truth no longer applies or they are exposed by their own arrogance and inflexibility. It follows that the historical patterns of opinion on great philosophical questions follow a course of extreme oscillations. Students of revolution have pointed out that what seem brief intervals of extraordinary intellectual and moral freedom—in thought, at least—begin before and extend until perhaps a few years after the climax of revolt and change, since this is a time when the old assumptions have lost their power and the new ideas have not yet hardened and lost their seminal quality.

Could there be an even progress instead of these discouraging repetitions of confinement by and release from idea-systems? Not, one may think, without a general release from the fear of ambiguity. This is a way of arguing that the area of a man's uncertainty and feeling of paradox maps the region of his growth. How could a whole *society* be persuaded to embrace this view?

The obstacles seen in paradoxes begin right here. Despite the fact that many of the ills of present-day society can be traced to the eager pursuit of "certainties" which have turned out to be filled with errors and miscalculations, the idea of living without confidently proclaimed certainties is itself extremely unsettling. We *want* our leaders to go about their tasks exhibiting sturdy confidence in their knowledge, as well as an air of total righteousness.

Naturally, they try to behave in this way. Otherwise, it is said, the people would become fearful and might do desperate and unpredictable things. So there is a sense in which present-day attitudes require a falsification of the human situation by persons who have the role of power and public responsibility.

But even this is paradoxical, since it is easy to think of situations in which it would be a man's duty to hide his qualms and show to others only the balance and courage he can scarcely maintain. In an emergency the prevention of hysteria may be the first necessity in the saving of lives. To say what embodies the value of "truth" in these instances becomes quite difficult, unless one speaks mostly in the subjective language of motive and need, and discounts appearances by referring to the wisdom that must be applied.

Another objection to accepting uncertainty and paradox would be that it is often hard to tell whether a man's uncertainty is due to laziness or to genuine philosophic maturity. A careless or indifferent thinker may *claim* his ignorance is noble because Socrates said he was ignorant, too. But this objection may spring mainly from the bad habit of supposing that we have either the obligation or the right to check up on other people. It is only a short step from checking up on them to deciding that we have to change them. A society in which a great many people try to "change" other people is not an environment in which people easily learn to change themselves, since the weight of binding social observance is mostly in the other direction—toward molding others or being molded by them.

This is the sort of society which forms the background for a useful discussion of values—*Values and Humanity* (St. Martin's Press, 1971, cloth \$5.95, paper \$2.95), by Elizabeth Monroe Drews and Leslie Lipson. The book begins with a survey of the various "images" of man which underlie the diverse thinking about values in the West. One image is the wolfish, selfish, aggressive man of Machiavelli and Hobbes. Another is the blank sheet of Locke or the plastic impressionable material of Pavlov and Watson. The third is of a being with dual potentialities, good and evil, higher and lower. The next portrays a being of natural

goodness, who needs the support of a good society to elicit his true qualities. Finally, there is the idea of man as self-transcendent, a being who remakes himself, or who is able to. This is Emerson's man who is "never finished," and Maslow's self-actualizer.

In a later chapter, the authors construct a scheme of seven stages of individual development, based on various researches, which, briefly indicated, go from (1) the presocial, (2) the impulse-ridden, (3) the opportunistic, (4) the conformist, (5) the conscientious, (6) the autonomous, to the highest, (7) the integrated, being-motivated, Universal Man.

This sort of classification is of value since it is both factual and visionary. That is, however "realistic" the negative judgments of human nature may be, the fact is that transcendently wise and good men have existed throughout all history. They are not just "possibilities," but a part of the record of actual human achievement. And there is, if recent research can be accepted, a gradual development of human beings as individuals from one stage to the next.

When the authors turn to the subject of the good society, it at once becomes evident that the social structures of the present take little account of the human reality of these differences among men, nor is much attention given to the question of development in these terms. That development is plainly toward inner discipline, self-reliance, autonomy, more and more inclusive feelings of identity, original thought, and altruistic motivation in behalf of the good of all. The growth of present-day nation-states and social formations has not been in this direction, nor is there, indeed, in the prevailing mode of scientific thinking about society, any recognition that the ascending value-scale shown by this scheme of human development has any pertinence for the scientific study of society. As Drews and Lipson say:

In the present century, . . . the current vogue among . . . social scientists . . . is to avoid evaluation—to be objective in their work and value-free. They have chosen to do this on these professed grounds: that they wish their study of human society to be as scientific as possible, that to be scientific is to base one's findings on data which are objective and external to the viewer, and that values are a

subjective judgment which, if introduced into conclusions, will render them unscientific. . . .

Their aim has been to develop a study of mankind and of human society by a method similar to that used by physical scientists. To accomplish this, the social scientists work within a framework of prescribed rules, consisting of "thou shalt" and "thou shalt not." On the permissible side, as empiricists, they observe and record the behavior of people or animals and conduct experiments under controlled conditions whenever possible. . . . What is not permitted is the introduction of any subjective element into their work. True social scientists do not express value judgments. Moreover, they claim that the values which they personally hold do not enter into their findings, and they further assert that the way the results are used is not their concern.

From this analysis the authors go to economics, political science, and psychology, showing how these disciplines are pervaded by the same conceptions, and they conclude: "The product of modern social science is exactly what could be expected from its initial assumptions." Further:

By neglecting to criticize either the effects of the methods they used or the kind of culture which their research buttressed, many value-free scientists worked against the higher values of human beings and the natural world. The human need for self-expression and self-transformation—to reach for something higher and better—was stifled. The needs of the spirit in ethics, aesthetics, religion and critical inquiry were disavowed. The need for intimate association in small, egalitarian groups was displaced by the size and arrogance of huge organizations, both private and public.

Fortunately, other tendencies are now under way, among general thinkers as well as scientists. This book is written from the viewpoint of the vanguard movement in modern thought, as represented by Maslow and Polanyi, Chomsky, Roszak, Goodman, and a number of others. It is pervaded by quotations from Emerson and looks to Thoreau "as mentor for the new age, as creator of a better way to live." The problem and paradox of values calls for individual resolution, and as men begin to realize that there is no other way, the beginnings of a new age may become manifest. This is a book which points in the right direction.

COMMENTARY

AFTER TWENTY-FOUR YEARS

THIS issue of MANAS begins the volume which, when complete, will mark twenty-five years of publishing. During this nearly a quarter of a century there have been many changes in the world, the most noticeable being quite plainly for the worse. We take the view that these discouraging events were mainly precipitations from conditions which preceded them; their uglier aspects have merely come to the surface, while the good things, which were doubtless also in the making, are not so easily recognized or have not yet emerged. That is, the germinal ideas which may help, one day, to support intelligent idealism in the future, do not make headlines or attract much attention. Their time of widespread influence will come later. We think, for example, of the several men who have occupied much space in our pages during recent years, but who were hardly known in 1948 when MANAS began publication. Among these men are A. H. Maslow, Michael Polanyi, and E. F. Schumacher, who are likely, we think, to play a part in giving form and direction to future thinking similar to that played by Galileo and Descartes and Bacon in shaping the epoch now coming to a close.

Our "heroes" remain the same as they were in 1948: they are still Socrates and Tom Paine, although the addition of Gandhi would make a trinity. Our format is unchanged, and the expression of what we are about, or trying to do, as given in the boldface box on this page, needs no revision.

The material health of the paper is somewhat improved, due to the many readers who are also supporters. These friends help to find new subscribers and contribute money to take care of our deficit—a condition which, unfortunately, is likely to continue for a long time, since printing and postal costs keep going up, reducing the advantages gained by increases in circulation. Of great assistance was the recognition in 1966 by

the Treasury Department that the Manas Publishing Company is a non-profit corporation entitled to say that gifts to help maintain MANAS in existence are tax-deductible. However, we do not put on "campaigns" or send out money-raising appeals in behalf of this need, but simply make our situation known from time to time. The response from readers who are able to help has been and continues to be impressive. We now express our particular appreciation of the widely varying amounts which readers sometimes add to their checks or money orders when renewing subscriptions.

There are other pleasing signs. A considerable number of university and public libraries now subscribe to MANAS, doubtless at the urgent request of teachers and readers. We also get reports that MANAS is used in courses of various sorts, around the country. Publishers have grown quite cooperative in sending us good books for review, and a large number of readers consistently mail in material that they think deserves attention, or recommend books and articles that they would like to see reviewed.

We have no special or dramatic plans for the future. We intend to keep on with what we are now doing, hoping, as the years go by, to learn how to be simpler and clearer in what we say, and to be better able to identify those common denominators in issues and problems which make simplicity possible.

One thing we have not mentioned in past editorials of this sort is the fact that nearly all readers, when they have occasion to write to MANAS, write to us as trusted friends. This makes us feel that regarding the MANAS readers as forming a "community" of a sort is not in the least pretentious. The idea is supported by the substance of fact.

CHILDREN

. . . and Ourselves

A BOOK BY HERBERT READ

WHETHER the neglect of art and art education is at the root of the troubles of the modern world, or whether the indifference to these things has arisen from deeper causes is a question which ought to be noted, but may be left unpursued during an appreciation of the ideas of Herbert Read. For Read says so many good things, regardless of the right answer to this question, that there is hardly a need to contest his belief that the development of the æsthetic side of life provides a natural basis for moral balance and awareness. Needless to say, the æsthetic is for him a very rich conception. In *The Grass Roots of Art* (Meridian paperback), Read affirms his fundamental views again and again. The chapter on aesthetic education condemns the separation of the intellectual from the moral virtues, the first, in modern times, becoming the concern of the State, while the Church gained a monopoly over instruction in morals. Read recalls the Platonic position "that all the intellectual virtue man is capable of is not only useless, but indeed dangerous, unless it is grafted on to a stock of moral goodness," then adds: "By ignoring the essential priority of moral virtue, our systems of education are merely putting dangerous instruments into the hands of people whose instinctual life may be, not merely unformed, but even evilly disposed."

Read's sort of criticism is now heard quite often, but this chapter was composed for a lecture given in 1946, when such ideas were quite rare. And the following passage begins with a still unanswered challenge:

We have never dared to trace the connections between the disordered state of our civilization and our traditional system of education. If our schools were producing naturally and normally personalities which we could describe as balanced, integrated or harmonious, we should not be able to tolerate a condition of universal disunity and mutual distrust. We should therefore re-examine our whole tradition

of education since the Renaissance and dare to ask ourselves whether it has been generally productive of individual serenity and social harmony. We might then have to confess that in our exclusive preoccupation with knowledge and science, we had omitted to educate those human faculties which are connected with the emotional and integrative aspects of life—that we had carefully nurtured inhuman monsters, with certain organs of intelligence gigantically enlarged, others completely atrophied. . .

I hope I have now made it clear that what I have called the development of a balanced aesthetic awareness is not an end in itself. Our aim is the same as Plato's—the moral and intellectual wholeness or health of mankind—and art is for me, as it was for Plato, a means to this end. But that has not been the general purpose of education since the Renaissance. I think one might go so far as to say that since the rise of scholasticism in the Middle Ages, education has taken many forms, but essentially, during all these centuries, its aim has been to increase the powers of the intellect, to discipline the emotions and to build up a knowledge and understanding of the natural world. That aim has been pursued with such consistency and singleness of mind that, according to some anatomists, the very structure of the human brain has been altered and physiological tensions have been set up which are definitely perceptible as processes alien to the organism as a whole.

What, then, is to be done? Our present moral education, such as it is, is entirely by "precept." It does not occur to us that any other instruction is possible. But if precepts make reference to some existing social system as the norm, we may, as Read remarks, "merely propagate one another's vices, along with a few convenient virtues." Then he says:

For this reason we must look outside human society for the pattern of moral virtue, and the only pattern outside ourselves is our environment, in so far as that is enduring. Look into the structure of the physical universe: there, said Plato and Aristotle, you will find the pattern of moral virtue. Repeat that pattern in your lives, impress it on your souls, do this habitually and especially in childhood, and then goodness will become second nature to you.

Plato did not put forward this theory as a likely hypothesis: he attempted to give it a logical demonstration. It was already evident to the Greeks

that certain laws are exhibited in the structure of the physical universe: laws of harmony and proportion, of balance and rhythm. Modern physics has, of course, enormously reinforced the early perceptions of Greek science in this respect. The same laws, Plato was quick to perceive, are also exhibited in the most perfect and efficient forms of human activity: in music, in dancing, in gymnastics, in the rhythms of poetry and the harmonics of painting or sculpture. The inference was then simple enough—so simple that for twenty-four centuries it has seemed too bold and revolutionary. Make the rhythmic arts the basis of your methods of education, said Plato. Then, quite naturally, quite inevitably, you instil into children that sense of form or grace which is the foundation of moral goodness. That is the theory, simple and inflexible, which Plato taught in the *Laws* no less eloquently than in the *Republic*. It is simple, it is clear: the only mystery is why the world has for so long neglected it.

In another place Read grows eloquent in his advocacy:

For centuries—throughout the history of the modern world—man has attempted to build new societies on the basis of some religious or political ideal, but always these societies have reverted to patterns of tyranny, of injustice, of crime and suffering. Never once has humanity thought of acting on the assumption that the true basis for moral beauty is plastic beauty.

Such is the secret of the power of all great works of art—the cathartic power of tragedy, the enlivening power of music, the joy and affirmation that is the colour and form of painting, or the volume and inert power of sculpture. Art is an affirmation, not of reality, but of man's ability to create something beyond reality.

Why should "art" have this power? Conceivably, what W. Norman Brown once said of ancient Indian sculpture helps to suggest an answer to this question: "Sculpture was not meant to be a reminder of a human being or of an apotheosis of man, but of something abstract, spiritual in its reality beyond apprehension by the senses, an ocular reference to universal knowledge that might somehow become comprehensible to humanity." In other words, the basis for moral beauty is not in plastic beauty, but in what the

plastic beauty endeavors to represent or make reference to.

Early in this book, Read says:

The point of view which I put forward, as against the whole grammatical and logical tradition of education, is the Platonic doctrine which finds in the practice of art those regulative principles in virtue of which the integration of the personality can be achieved. Art is a *natural* discipline. Its rules are the proportions and rhythms inherent in our universe; and the instinctive observation of those rules, which come about in the creative industry of the arts, brings the individual without effort into sympathetic harmony with his environment. That is what we mean by the integration of the personality—the acquiring of those elements of grace and skill which make the individual apt in self-expression, honest in communication and sympathetic in the reciprocal relationships upon which society is based. Art, we might say, can make us completely human.

Read immediately adds that art education is not confined to the schools, nor can education be identified with any special institution.

A particularly engrossing section of this book is concerned with the idea of "taste." Taste, Read maintains, grows out of practical skills. He speaks of the invariable good taste of peasant art, which is art of the people, and not of specialists. Taking the exquisite taste of the Balinese as an example, he quotes from Miguel Covarrubias:

Everybody in Bali seems to be an artist, coolies and princes, priests and peasants, men and women alike, can dance, play musical instruments, paint, or carve in wood or stone. . . . the Balinese did not permit the centralization of the artistic knowledge in a special intellectual class. . . . a commoner may be as finished an artist as the educated nobleman, although he may be an agriculturalist, a tradesman, or even a coolie.

The last chapter proposes, as an antidote to the poisons and artificialities of modern industrial society, the deliberate creation of a "Duplex Civilization," which turns out to be Read's idea of a "counter culture," suggested in 1946. He means by this an arrangement under which everyone will give a portion of his time to manual craftsmanship.

He rejects as impractical the idea of turning certain industries over to handcraft methods:

But there is another possibility, and this is to make the division horizontal, affecting every industry and every individual, but only up to a certain point. In other words, let every individual serve an apprenticeship in handcrafts. I have already made my plea for the aesthetic basis of education, what I am now advocating is an extension of that method beyond the school age, into the period of apprenticeship, into the hours of adult leisure. . . . if we could accustom their hands and eyes, indeed, all their instruments of sensation, to a creative communion with sound and colours, textures and consistencies, a communion with nature in all its substantial variety, then we need not fear the fate of those children in a wholly mechanized world. . . .

Only a people serving an apprenticeship to nature can be trusted with machines. Only such a people will so contrive and control those machines that their products are an enhancement of biological needs, and not a denial of them. Only such a people will be secure from the debilitating effects of mass production and mass unemployment (miscalled "leisure"). Only such a people, with sensations still vivid and intelligence ever active, can hope to form a stable and integrated society in the industrial world of the future.

There is surely enough truth in what Read says to make it doubly important today.

FRONTIERS

Power from Sun and Wind

IN less than a century—if we can believe the experts—the United States will have a secure supply of "only three of the 20 mineral commodities necessary for industrial development." And of those three, which are molybdenum, iron and coal, the future supply of coal is in question. But the exhaustion of even such key raw materials is made to seem comparatively unimportant by the almost immediate crisis in energy supply. According to Wilson Clark, who writes in the November, 1971, issue of *Smithsonian*:

Demand in the United States for *all* sources of energy is rising at a steady five per cent per year—it is doubling every decade. Continuation of this trend is clearly impossible, given the current means of obtaining energy. In a few decades there will be no oil for conversion into electricity or for transportation, nor will there be any natural gas, the cleanest burning fossil fuel. (And when fossil fuels are gone, so too will be their other uses, such as conversion into plastics and other synthetic materials.) The one other alternative, power from the fissioning of the radioactive isotopes of uranium, is fraught with problems—not only the possibility of the contamination of the earth by radioactivity, but also the depletion of finite uranium deposits.

This is the energy crisis, a crisis which . . . requires recognition that our energy resources are dwindling, the bitter realization that at some not-too-distant hour the party will be over. Yet America has no "energy policy," and there have been few attempts to develop one. One of the reasons for this may be despair. Another is faith that some untried or unknown future technology will save us in the nick of time.

The task, as Gordon Harrison says in *Earthkeeping*, is "to manage producing systems of all kinds so that they do not pollute." This, as Wilson Clark shows in his *Smithsonian* article, is a task that is getting studied neglect from all but inventive individuals. Nationally, we are not even giving serious attention to the possibility of finding ways to greatly reduce both pollution and energy consumption. For example, so far as we

know, only one man, Ivan Illich, has proposed the general use of low-horse-power vehicles which would be economical and travel at low speeds. Bicycles are gaining popularity, and this is all to the good, but many people cannot use them. Illich's suggestion of transport for the network of trails connecting the 40,000 villages of Peru sounds intensely practical—three-wheeled gasoline "donkeys" with six-horse-power engines having a speed of fifteen miles per hour and capable of carrying 850 pounds. No roads are necessary for these vehicles, just well-kept six-foot-wide trails! An intelligent adaptation of this idea for America would save enormous amounts of money and greatly reduce pollution.

Meanwhile, there are at least some constructive developments. Wilson Clark's article is about sunpower, how many people are already using it to heat their homes, and a report in detail on the extraordinary proposal of two astronomers, Aden Meinel, of the University of Arizona, and his wife, Marjorie, for the large-scale conversion of solar radiation into electricity. This is, Clark says, the "most innovative and exhaustively researched idea" that has been suggested:

The Meinels propose the construction of 1,000 land-based solar power stations each capable of producing 1,000 megawatts (*i.e.*, one million kilowatts).

This so-called National Solar Power Facility would be located in the largely uninhabited desert region of the lower Colorado River basin, between the Mexican border and Las Vegas, Nevada. It could, the Meinels says, supply most of the United States' electrical needs in 2076, as well as those of northern Mexico.

Since the power plants would use conventional steam turbine technology, they would have to be cooled. The Meinels propose to do this by pumping salt water from the Gulf of California through aqueducts built in Mexico's Sonora province. The cooling process would heat the water enough to desalinate it. The steam would be collected and condensed, producing 50 billion gallons of fresh water a day. That is enough fresh water to supply 120 million people in what is now a chronically water-hungry region.

The expected efficiency of the Meinels' program is higher than any other land-based solar power plant, due to the design of the solar collectors, which would be tubular heat absorbers mounted inside a glass envelope. The glass would be coated with an optical layer to transmit sunlight and trap infrared radiation, reflecting it back into the absorber. Heat would be conveyed to a thermal storage facility to maintain 1,000 degrees F. in a huge tank of molten salt, which would supply the energy to drive steam turbines to produce electricity. The entire installation would occupy 13,000 square miles of desert.

Many other details are given in Mr. Clark's article. The Meinel group has a small research grant from a branch of the National Science Foundation. William Cherry, a NASA executive enthusiastic about the use of solar resources, has said:

Since solar energy can't be used as a weapon, there's no need for international secrecy. Super-facilities aren't necessary to begin developing this power source. In fact, the American public can participate in this on a do-it-yourself basis. Not many people can build nuclear reactors as a hobby. Solar power can be developed at home.

The *Smithsonian* article gives various leads in this direction.

Another enormously encouraging development—one actually on the way—is the revival of sailing ships for commercial use. James McCawley, a writer in *Rudder* for November, 1971, tells the story of Wilhelm Prölss, who in 1935 began dreaming about such possibilities. An engineer and designer for Shell Oil, located in Hamburg, he would look out over the city's huge harbor on the North Sea, sometimes seeing an old sailing ship being towed to destruction. Twenty-one years later, in 1956, he had completed the model of a six-masted, square-rigged sailing ship that needed only a small auxiliary engine. He showed it to the Institute for Naval Architecture at the University of Hamburg. His diagrams and research won the interest of the director. Ten years later the Institute declared in a report that Prölss' Dyna-

Ship would return a 30 per cent greater profit on investment than power-operated freighters return because of its larger hold (no enormous diesel engines) and lower operating and construction costs. Sailing speeds are predicted at 12 to 16 knots from simulated runs across the Atlantic. German shipping interests remained skeptical, so did the English, but help finally came from some environmentalists who are also hardheaded businessmen. A successful Bavarian lawyer has commissioned the first of the Dyna-Ships. The cost will be \$5,000,000, the launching date 1973, and masts are now in construction. The Hamburg engineers and their backers are convinced that these computer-controlled sailing ships will successfully compete with diesel-powered vessels for 90 per cent of the bulk shipping market, on a twentieth of the fuel consumed by a modern freighter.