VOLUME XXII, NO. 45
NOVEMBER 5, 1969

SIEGE PERILOUS

THE astronauts are widely regarded as fair game in social criticism. Men who symbolize the human element in the supreme achievement of science and modern technology are bound to be held up and carefully inspected for signs that they typify what has gone wrong with our civilization. By some, of course, the astronauts are taken to represent the unique excellences and opportunities of great times to come. These contrasting readings of their symbolic meaning are inevitable, since, as Sigfried Giedion observed, "Some think that we stand at the beginning of a great tradition," while others, "seeing the disaster around them, think that we are at the utmost end of an age." So the astronauts are cast either as heroes or as but the nervous tissue of enormously complex machines.

Writing "In Search of a Hero" (in *Chrysalis*), Harry Behn has this musing aside:

> Today, young men are being trained at great expense to be hurled into emptiness and, I suppose, should be considered heroes. They are certainly brave and good and clever. But their adventure just doesn't seem to me to have much to do with the race of man on this earth. I don't understand the motivations of the governments and scientists who are using them. It is too Roman for me, like some emperor's lust to conquer and humiliate other nations all for a parade called a Triumph. Could it be that we have to have a circus to give ourselves an illusion of importance?

Victor Ferkiss, in *Technological Man*, having had opportunity to see an astronaut close up and hear him speak, verifies that these men are "brave and good and clever":

> What was he like, this new man, this hero of technological civilization? His speech—presented in the first person—could have been written by a sophisticated computer. He read it perfectly, with the enthusiasm and sincerity of a perfectly happy and well-brought-up child, the kind one seems to encounter these days only in films from mainland China. . . . A military man by formal profession, he seemed neither soldier nor sailor nor airman nor even warrior. He was obviously a supertechnician whose character combined keen intelligence, perfect poise and calculated courage. . . .

The list of superb moral qualities is long, giving way to gentle ironies only after Mr. Ferkiss has noted that the astronaut possessed "bravery of a different kind from that of the men who fought across Iwo Jima, who could have been his elder brothers," since it was "compounded of knowledge and self-control, of perfect acceptance of reality. . . ." This writer reports the suggestion of a false note only when the astronaut spoke of "wonder felt or beauty observed", then he adds:

> This personable young man—who in appearance and manner could just as well have been a rising junior executive in any large American corporation—seemed so obviously at peace with himself and his world, so perfectly adjusted to the machines and the organization around him, knowing them and their capacities as well as he knew himself, finding in that knowledge peace and freedom. By every test of any number of political and psychological ideologies he should have been an almost perfectly alienated man, for had he not given his body, his mind and soul over completely to the vast physical and human machine of which he and his fellows were the cutting edge? Yet it would be hard to visualize anyone who less fitted the popular modern stereotype of the alienated man, or who seemed more assured and serene.

One might note here the importance of Mr. Ferkiss' art; he is both perceptive and conscientious; he writes from a definite point of view, yet his account prevents heavy partisan interpretation. While the astronaut is *not* a hero in any familiar and accepted sense, he is somehow an exponential expression of qualities found in millions of other young men, and the exploit which catapulted him to fame is something to be grasped with all possible understanding.

We lack the language to describe with fidelity the incredibly complex and sustained intellectual effort that went into reaching the moon in a rocket-powered space capsule. It is difficult to suggest by suitable analogy the participatory feelings of the hundreds of thousands of people whose abilities were involved. Let us say simply that an extraordinary potentiality of human beings to act in exacting concert has proved itself at a plateau far above merely emotional collaborations. This tells us something about ourselves. Restraining comment about exquisitely elaborated practical means to almost purely "symbolic" ends, let us grant at least technical fulfillment of one of the great demands of the age—the need of men to learn to work with full commitment at divided yet very precisely related responsibilities in behalf of a goal which no one man could possibly reach by himself. Has there ever been a demonstration of hierarchical organization and function *objectively* comparable to what the astronauts represent? *Of course* the astronauts are not alienated! The intensity of their involvement in space flight would prevent anything like that. Commitment and involvement are the cure for alienation, as the psychology books have said for years. What then is wrong with all those "political and psychological ideologies" according to which the astronauts should be "almost perfectly alienated," men?

It seems necessary to stipulate that the scientists and the engineers have made their point. Or they have made *some* point. And they may even have proved the existence of some radical sort of free will, since sailing around out there in space ships can without much contradiction be declared an unmotivated act, and freedom, according to one school of philosophers, is demonstrated only by unmotivated acts. They went to the moon because it's *there.*

What was really demonstrated is the enormous potentiality for doing what "we" set out to do by means of a scientific-technological *team.* The astronauts are the protoplasmic vernier attachment for controlling the flow of all this technical intelligence, directing it through a vast techni-organism created out of materials found on earth and energized by natural forces. They are also symbols of the objective wonders that can be performed by conscious reliance on the law of interdependence.

What remains to be demonstrated? We must now see whether there is any significant difference between the scientific-technological team and the Arabian Nights *djinn* who takes his ends from whoever knows the secret of controlling him.

It seems plain, in other words, that one sort of hierarchical scheme is effective for obtaining control over the forces of nature, but that another is required for deciding upon their use. We must not ignore this distinction. We cannot permit the *gee whiz* and *wow* aspect of technological wonders to obscure the prior importance of ends. Contrary to the claims of a historic religious institution, miracles are not a foundation for the faith that saves. Despite rumors originating in Washington, D.C., the explorations of space are not bringing us closer to the garment hem of God. Even if the scientific institution not only promises miracles, but is now able to produce them, the problem of ends is no closer to solution than it was thousands of years ago. The contribution of science to clarification of this mystery is still the same as it was in the *via negativa* of ancient mystical religion—"not this, not that," as the Upanishads put it. The scientific contribution is important and necessary, but it obtains its proper virtue only from being recognized as gravely limited.

The issue is moral and ethical, and unapproachable, therefore, except in the terms of individual human consciousness. If a single man cannot be conceived of as understanding it, it cannot be understood. What we are after is the sort of man who exhibits consciousness of the interdependence that must be recognized and understood for the selection of goals in human undertakings, scientific or otherwise. Only such

men can qualify for the team. Have we had any such men? They are rare, but examples of them can be found. In science, at any rate, before the team there was the man, the individual discoverer or thinker. Two of these may illustrate—one who lived at the dawn of the scientific renaissance, the other at its post-Newtonian noon—Leonardo da Vinci and Diderot. Leonardo invented models for machines, Diderot for men. Both controlled their scientific model-making out of regard for the use to which their inventions might be put. Leonardo suppressed some of his machines for warmaking—a submarine, for example. That he did not suppress them all is not the point. He retained the principle of control. His responsibility for ends was not handed over to specialists in ends. That is the rule for hierarchical function in the selection of human ends—*there are no specialists;* all must accept responsibility. It is this principle of individual control that now needs to be held up to view, with as much drama, as much celebration, as much sanctity and awe as the achievement of the astronauts has been meant to enjoy. For this is what has been lost in the development of the scientific-technological team: "Without virtue and love of the Good which measures men, the sciences are nothing or worse than nothing."

"I don't understand," said Mr. Behn in his reflections about the astronauts, "the motivations of the governments and scientists who are using them." This is enough to disqualify them as heroes. Nobody *uses* a hero. He is a hero precisely because he will not be used. He may of course seem to be used. A man may lose himself in a cause by recognizing in it his highest being, or he may take refuge in it to avoid the perilous decisions understanding brings. One is the counterfeit of the other; one is a hero, the other is not, but often we cannot tell, objectively, about the true qualities of such men until long afterward. Might an astronaut become a Claude Eatherly, given a change of duty and assignment? Would his training have sensitized or inured him to such possibilities? We hardly know. Involved is the question of the nature of man, and whether through science we can make of a man what we will; or if, no matter what we do, he will have something to say about it, *eventually,* himself. Is there, that is, a latent hero in him?

This brings us to Diderot, who evolved a brave new theory of man. Diderot set out to be, indeed *was,* the "new man" of the Enlightenment. He hated the deceptions of institutional religion. "Yes, I am atheist," he declared, "but look into my heart and examine my conduct and you must admit that an atheist can be a good man." He planned in his books to reveal the "shining beauties of the natural man." He wrote as an interpreter of science, resolved to show "that philosophy makes more good men than sufficient or efficacious grace." It should be possible, he maintained, to have a religion based "upon the primitive and evident notions which are found written upon the hearts of all men." A noble and simple aspiration, yet Diderot could not fulfill it. When he finally finished the *Encyclopedie,* was made financially independent by the generosity of Catherine II, and at last had *time* to realize his dream, he ceased to publish. As Carl Becker says in "The Dilemma of Diderot" (in *Everyman his own Historian,* Gofts, 1935):

> And so the question remains, why did Diderot, who published many books when he was too busy, as he tells us, to do good work, publish none when he acquired- the leisure to write, and did in fact write, some of the most profound and original works of the eighteenth century?

We know what was in those books; they were after all published a century later because Diderot did not destroy the manuscripts, but gave them to a friend. Yet he had no intention of allowing them to be printed. Why? Because he saw that the model of the "natural man" he was able to construct out of eighteenth-century science would destroy the faith in man that he felt to be necessary, and, as Becker says, "he had none of Rousseau's talent for ignoring difficulties." Speaking of one of these suppressed books, *Neveu de Rameau,* Becker says: "Rameau is simply

Diderot's materialism personified, a creature whose will is precisely nothing but 'the last impulse of desire and aversion,' a kind of Frankenstein's monster such as one might construct from Diderot's *Physiologie*, an example of the natural man, stripped of all 'artificial' accretions, functioning in society as it existed, in Paris, about the year 1772."

Diderot *wanted* to complete a book that would prove that "one can do nothing better for one's happiness than to be a good man," but the crudities of Enlightenment "psychology" stopped him cold. He wrote to Mlle. Volland:

> "I have not dared to take up the pen to write the first line. I say to myself: if I do not come out of the attempt victorious, I become the apologist of wickedness; I will have betrayed the cause of virtue, I will have encouraged men in the way of vice. No, I do not feel myself equal to this sublime work; I have uselessly consecrated my whole life to it."

He did write, of course, but he did not publish. The upright Grimm, according to Madame d'Epinay, said that Diderot "is the most perfect moral man he knows"; such a man would not pretend that he had found in science the path to true morality, even though this was the constant longing of his heart. Perhaps he sensed, as Becker suggests, that—

> The identification of man and nature, and the conception of both as the necessary product of uniform natural law, had done nothing more after all than to put blind force in the place of God, and by eliminating purpose from the world leave men face to face with the *reductio ad absurdum* that "whatever is is right."

Among champions of "science," however, Diderot was almost a minority of one. All the world labors, today, under political constructions based upon Enlightenment psychology and its Utilitarian applications, which do not really work. Yet despite the fact that the scientific version of "whatever is" changes from epoch to epoch—if not from day to day—the predication of solutions for human problems on the current reading of science goes on with comparative disdain of the painful consequences. What else can we do, and why should there be any restraint when "whatever is is right"? Tomorrow we shall be only a little righter, that's all. As Victor Ferkiss says, repeating, not the theory, but the consensus version of it:

> "Technology is altering life to its existential roots before our very eyes." How? Simply by giving man almost infinite power to change his world and change himself. In the words of Emmanuel Mesthene, director of the Harvard Program in Science and Technology, "We have now, or know how to acquire, the technical capability to do very nearly anything we want. Can we transplant human hearts, control personality, order the weather that suits us, travel to Mars or Venus? Of course we can, if not now in five or ten years, then certainly in 25 or in 50 or 100." The space race and atomic energy are not the most telling evidence for man's new existential position. More fundamental yet is what is going on in medicine and biology. "We cannot do God's work," is a typical comment of the emerging new man, "but we can come very close."

To which Mr. Ferkiss replies:

> Yet can this really be true? Men such as Hubert Humphrey and Richard Nixon still aspire to become President of the United States. The Flat Earth Society still holds meetings. The Dodgers continue to play, albeit in Los Angeles. Politicians are bribed by the Mafia, and school-teachers complain about their pay. Television advertises candy and children quarrel over it. Books are banned in England as well as Boston. Muezzins still cry from their mosques, and the bush returns in triumph to the streets of Congolese towns. The stock market flourishes, as do fortune-tellers and fundamentalist preachers. Dialectical materialism is still stuffed into the heads of Russian students, and Americans still vote against big government. The world we know is still as real as it ever was.

But messier, one ought to add.

The scientific-technological *team*, in short, is a *djinn*. Its principle of limit, its compass for direction, is outside itself. The *nature* of the scientific enterprise is so defined. As Ortega has said:

> The internal conduct of science is not a *vital* concern, that of culture is. Science is indifferent to the exigencies of our life, and follows its own

> necessities. Accordingly science grows constantly more diversified and specialized without limit, and is never completed. But culture is subservient to our life here and now, and is required to be, at every instant, a complete, unified, coherent system—the plan of life, the path leading through the forest of existence.

What has happened to us is fairly obvious. The specializations of science have gotten away from us, often making us servants of *their* necessities. There are two reasons for this subservience. First, science gives immeasurable power, which makes it seem god-like; second, its "knowledge" has been widely mistaken for *human* knowledge—knowledge of what is good for man. There is only one thing to do: cleave to what individual knowledge we have, however slight, of the vital concerns of human life. This is what Leonardo did, what Diderot did, what Otto Hahn did, what Robert Oppenheimer tried to do, and what a large number of unknown young men are doing as well as they can by refusing to be used by the war machine. This is not to suggest that there is nothing to be learned from science about man's nature or about the service of his vital concerns. We may learn a great deal, but only as it is assimilated and can be acted upon by individuals. For scientific knowledge becomes human knowledge by being filtered through the moral individuality. This is the law, the rule of interdependence for every man on every team. There is a vast difference between making individual decisions anxiously or uncertainly, and collaborating in freedom very imperfectly—as the best we can do—and not even attempting to act like moral agents at all.

REVIEW
A HISTORIAN'S DIAGNOSIS

IN *Science* for March 10, 1967, Lynn White, Jr., a historian, published "The Historical Roots of Our Ecological Crisis," a paper which charged that attitudes originating in and fostered by the Christian religion have been responsible for the mutilation and disorder of the natural world following in the wake of modern technology. The paper excited a tempest of widely diverse comment. As Dr. White says in the preface of *Machina Ex Deo* (MIT Press, 1969, $5 95):

> As I watched the sparks fly, I realized that both the enthusiasm and the rage which the study evoked were caused by the fact that it was written in the context of a larger pattern of thinking which has not occurred to most people. Ansel Adams, whose photographic lens has enabled him to probe deep into the relation of man to nature, wrote to me, "You have summed up a number of basic and opposing forces of which 'conservation' (as we know it) is merely a 'surface effect'."

Machina Ex Deo presents eleven essays (including the one printed in *Science*) which outline that larger pattern of thinking. The book is mellow, urbane, and richly educative. We shall use our space here to show how Dr. White patiently peels away various layers of the cultural egotism of Western man. Initially, some attention to his "controversial" paper is called for. Since "what people do about their ecology depends upon what they think about them. selves in relation to things around them," the question that needs answer is: "What did Christianity tell people about their relations with the environment?"

First, by claiming the uniqueness of Jesus—there was one Saviour, and only one—Christianity put an end to old cyclical conceptions of history. The haze of mythic repetitions of what had happened previously was replaced by the definite Old Testament account of the Beginning:

> By gradual stages a loving and all-powerful God had created light and darkness, the heavenly bodies, the earth and all its plants, animals, birds, and fishes. Finally, God had created Adam and, as an afterthought, Eve to keep man from being lonely. Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: no item in the physical creation had any purpose save to serve man's purposes. . . . Christianity, in absolute contrast to ancient paganism and Asia's religions (except, perhaps, Zoroastrianism), not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends.

After a lovely passage on the old pagan belief in elemental spirits of nature—"every tree, every spring, every stream, every hill had its own *genius loci*, its guardian spirit"—Dr. White says: "By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects. . . . The spirits *in* natural objects, which formerly had protected nature from man, evaporated. Man's effective monopoly on spirit in this world was confirmed, and the old inhibitions to the exploitation of nature crumbled."

The straight-line conception of history, elaborated by Augustine, followed from the Hebrew account of Creation and the uniqueness of Christ. Opposing the idea of universal repetitions, Augustine exclaimed: "God forbid that we should believe this. For Christ died once for our sins, and, rising again, dies no more." So, as the Church gained power and temporal authority, "the doctrines of undulation and recurrent cycles vanished from the Mediterranean world." Dr. White assesses the consequences:

> No more radical revolution has ever taken place in the world outlook of a large area. In the early fifth century St. Augustine elaborated on Judeo-Christian foundations the first developmental philosophy embracing all human history. During the Middle Ages and the Renaissance, step by step, this Augustinian providential interpretation was very gradually secularized into the modern idea of progress, which until recently dominated Western historical thinking.

Showing that up to the middle of the seventeenth century the pioneers of science thought of themselves and their discoveries in

religious terms, Dr. White makes it clear that "modern Western science was cast in a matrix of Christian theology." The basic attitudes concerning man's relations with the world were changed but little by the scientific revolution—theologically sanctioned self-interest is at their core. Dr. White says:

> Our science and technology have grown out of Christian attitudes toward man's relation to nature which are almost universally held not only by Christians and neo-Christians but also by those who fondly regard themselves as post-Christians. Despite Copernicus, all the cosmos rotates around our little globe. Despite Darwin, we are *not*, in our hearts, part of the natural process. We are superior to nature, contemptuous of it, willing to use it for our slightest whim. A governor of California, like myself a churchman but less troubled than I, spoke for the Christian tradition when he said (as is alleged) "When you've seen one redwood tree, you've seen them all." To a Christian a tree can be no more than a physical fact. The whole concept of the sacred grove is alien to Christianity and to the ethos of the West. For nearly two millennia Christian missionaries have been chopping down sacred groves, which are idolatrous because they assume spirit in nature.

Dr. White sees no real help for our ecological crisis save in a new religion or in extensive revisions of our old one. He recognizes the spirit of reverence for all life in the infusion of Eastern thought now affecting our culture, but inclines, himself, to a basic Franciscan reform of Christianity. St. Francis saw intrinsic value in all creatures.

The other chapters of *Machina Ex Deo* do not have the same impact as this one, but they are consistent with it and serve the same general purpose of wearing away at Western provincialism. The author shows how the growing influence of worldwide communications and various cultural cross-fertilizations incidental to recent wars is fatal to many Western conceits. Owing to Christianity's exclusive claim to religious truth and to the secular achievements of science, we have been confident that no one in the world but ourselves has understood *either* spiritual truth or "really living." "To us, Man has really meant European-American Man: the rest were 'natives'." Today, a thousand and one cosmopolitanizing influences—some profound, some mundanely trivial—are reducing this delusion. Even the shelves of supermarkets bear gastronomic witness to the resources and talents of non-Western peoples; a nation sated with hamburgers quickly appreciates tasty exotic foods imported from far-off lands! Meanwhile, if the behavior of the young is any index to the future, there will soon be no "foreign" ideas at all, and the expression, "Western thinker," will have meaning only in historical studies. Psychoanalysis has already done much to undermine the over-simplifications of Western "rationalism," and the work of recent psychologists has been broadened and even inspired by deepening acquaintance with the universal symbolic meanings found in all parts of the world. We are going to think differently—are already thinking differently—as a result.

Dr. White also finds in our own European past the genesis of mind-stretching influences. Copernicus opened up free speculation about other worlds, perhaps inhabited by beings like ourselves, and Bruno was burned at the stake for affirming this idea as a philosophic verity. Why did he have to die for such an expansive conception? Because it intimated that the salvation-bringing drama of the Crucifixion might be only one episode in a vast, cosmic serial! Would not other worlds need other Saviours? Or was Christ perhaps a commuter with many stops to make? Christian dogma had no accommodations for such disturbing notions. Christ's singularity in space was challenged by Bruno's philosophic daring, so Bruno had to die. But in the end he won. The philosophizing of the traditional religion is irresistible and, as Dr. White says, "Christ is become Krishna of the myriad Incarnations," an avatar of *world* religion.

Another value of this book is its instruction in the meaning of technology. One thinks automatically of button-pushing conveniences and

other symbols of magical control, but technology in its origins is discovered in humble devices like stirrups and plows, pennons and gears. No civilization has been without a technology, and it is surprising how many of the most important inventions came from Oriental or Arabic sources. The key principle of the diesel engine, for example, came from the fire piston of ancient Malaya. The crank and the rotary fan first appeared in China during the Han dynasty. So, reading about the ingenious inventors and discoverers of a distant past, we are bound to wonder why these clever people did so little with what they knew. Some kind of "drive" was lacking in them, to be sure; this is something we need to understand more about, since the "chosen people" explanation of *our* uniqueness is becoming embarrassingly ambiguous.

Technology, then, is rooted in powers of mind that can be found in ancient as well as modern civilizations, and if its extraordinary development during the past hundred years is something of a historical mystery, there have been other bursts of creative energy which may prove to have been more balanced in both origin and effect. As for the practical problem of accomplishing changes in attitude among those directly responsible for the applications of scientific technology—the engineers—Dr. White regards present efforts in this direction as insignificant:

> They schedule a course here and a lecture there; the young men read a bit of Plato or of George Orwell, and look at the drawings of Matisse. None of this is bad, but it lacks impact. This is partly because it has so little relation to the motivations of most engineering students, who have not yet achieved a professional grasp of the complexity of the problems they will face. But it is chiefly because the present changing condition of humanism is not understood.

Naturally enough, the author thinks that modern humanism could gain some educational muscle from historical studies of science and technology. The point of this recommendation is made clear:

> One mark of a mature profession is consciousness of its own history. A second and equally important sign, however, is conscious dedication to an explicit ideal goal, a consciousness which pervades the teaching of those who intend to go into the profession. . . . By this criterion, engineering is still an immature profession. One suspects that the millennial delay of engineers in arriving at such self-awareness is rooted in the fact that, from the beginning, the immediate job in hand was so often either slaughter or profit; the context did not favor thinking about ultimate problems. . . .

This final comment by Dr. White recalls his hope of a Franciscan appreciation of the world of nature and all living things—bringing conviction that the physical universe, to which engineers address their skills and powers, has intrinsic meaning and "is to be treasured and controlled as the necessary ground of psychic life."

COMMENTARY
THE NEW MAGIC

IT is often pointed out that the immeasurable powers of the modern corporation were not anticipated by the makers of the Constitution of the United States. The Charter affords no basic theory of control for what corporations can do. Widely demoralizing effects have resulted from the proliferation of corporate activity, not because the managers of corporations are "bad" people, but because they are pursuing initially acceptable objectives of self-interest according to a rationale that sets no limits for operations that mold or confine the lives of entire populations. Whether the new-born "corporate conscience" will be equal to comprehending the dimensions of this problem remains to be seen. Typical difficulties are suggested by the Englishman, quoted by Tawney, who exclaimed: "Things have come to a pretty pass if religion is going to interfere with one's private life!"

There are plenty of people, however, to argue this case, while only a handful of humanists are giving attention to areas left without control by the tough-minded "objectivist" view of nature and the habitual exclusion from "the rational" of all forms of experience which do not submit to familiar scientific methods of investigation. A vast domain of human life is governed by mere impulse and subject to the play of "magical" habits of thinking. After all, if man is an "object," entirely shaped by outside forces, what use has he for rules of thinking? The need is simply to condition him correctly. The old myths of subjectivity are but tools for effective conditioning—for manipulating people who imagine themselves to be moral agents and free. Image politics is evidence sufficient to show that this is the prevailing view.

Well, there is good magic and bad magic. We might as well use the word because the practice is all around. Good magic is learning the laws of nature and teaching them to others without pretense. Bad magic hides its petty secrets behind a mask of power and promises a free ride on the miraculous know-how of experts. The *gee whiz* and *wow* features of technology are the public relations resources of a magic that started out with good intentions but is rapidly becoming something else. What can we do about this? The only way to eliminate the longing for free rides—the origin of our most dangerous vulnerabilities—is to work long hours and almost exclusively for the development of competence and self-reliance in individuals, until they *know* that free rides don't exist in nature, and that believing in them costs, and costs, and *costs*.

CHILDREN
. . . and Ourselves
THE MASTER-TEACHER'S VISION

THE beginning of a long-forgotten novel of colonial days in America describes a settler on Long Island who is plowing a field. As he jerks along, he glances at a small, leather-bound volume on Government by John Locke. The book is resting on a handle of the plow. Like other men of his time and place, the farmer is thinking of the application of Locke's principles to the society that is developing in the New World, and how, that evening, after supper, he will explain Locke's ideas to his children. He will tell them about Locke's conception of a free society, or a society of free men. He will *teach* them. Their schooling, for him, is no burden, no "responsibility." It is a central meaning of his life.

One thinks of the awkwardness or embarrassment that would confront, not all, but most, modern fathers if faced by a similar task. But the times are different! True, yet after all the differences between that time and this are taken into account, the essential difference may be overlooked: the farmer on Long Island taught his children out of a *vision* of what he and they might accomplish together, and there is no such over-arching conception of social meaning abroad in the land today.

How many of the problems of the present are owing to this lack? How many of the difficulties we experience in relation to the "generation gap" and in education would be mopped up quite efficiently through the dawning of a common vision?

It is quite true, of course, that the vision of the American colonists, or something resembling it in inspiration, cannot be summoned to our aid simply because we see the accuracy of this diagnosis. The American participation in the enthusiasm of the Enlightenment was the result of several vast historical forces, such as the discovery of America and the stir of hope which attended the flow of peoples from the Old World. There was also the burst of genius which articulated the promise of the eighteenth-century revolution, and in America this combined with the availability of an almost untouched land free from oppressive tradition. Thus were born the resourcefulness and self-reliance developed by men eager to live under frontier conditions. These were some of the "givers" for the formulation of the American Dream. Obviously, those people had help! While, as a *tour de force,* one could argue that similar provocatives exist today, *recognizing* them requires the sustained use of the imagination. We need the vision, but we don't have the help.

The wilderness that needs taming, today, is a man-made wilderness. Its thickets are the massed and thorny vegetation of indifference and complacency; its deserts are arid by displacement of vital human qualities that have no market value; and its ever more frequent storms are as much the product of a superficial and partisan meteorology as anything else. This, alas, is the psycho-social context for getting done what ought to be done in education.

These are reflections generated by reading a very good book, *The Classroom Disaster* (Teachers College Press, Columbia University, New York, $6.95). The author, Leslie A. Hart, contends that conventional "classes" impose a rigid pattern on children which is alien to natural learning processes and becomes, in general, a stultifying indignity to their lives. About half the book is devoted to supporting this charge with evidence and quotation. The other half presents proposals of what ought to be done, many of them based on what, a little here and a little there, *is* being done. Several chapters are taken up by a visit to an imaginary ideal school where the reader is introduced, step by step, to the kind of administrator, the kind of teachers, and the teaching methods which the author believes could now be installed in the schools, given the will and

concern of the people. As he says in his last chapter:

> The key to implementation, in the final analysis, seems to rest on public comprehension of how bad our present schools are. Mere unhappiness for individual family reasons will not suffice. We must realize the full horror of the mess we are in: that our schools are prisons, that they systematically torture our children, that much of the money we give them is used to hold back and discourage children who would otherwise learn that the school's educational output is ridiculous in relation to the vast sums, time, and effort put in; that they widen the gap between have and have-not and foster racism and prejudice; that the whole vast operation is in a state of anarchy, unmeasured and out of control, that we can no longer staff it pay for it, or suffer it to drag down our national strength and sunder our democracy.
>
> We are in urgent need of new structures. The institution of the classroom blocks them: the classroom, an invention that served us well only briefly, must go.
>
> Then, if we have not slipped over the brink, we can take a splendid leap forward. Public education can become as shining as it is now tawdry.

It is here that we see the necessity for vision—in order to grasp in some *feeling* way "how bad our present schools are." Practically all the books which describe the defects of the schools are also filled with evidence of the indifference of a great many people. Yet educators, as such, are hardly in a position to demand "vision." The last time this happened—in the campaign led by George S. Counts for Progressive Education—the country declared the whole idea out of order. The fact is that little or nothing is known, even by educators, about the generation of vision, and to speak of it at length, instead of *showing* it, is to waste one's energy in futile exhortation.

More practical, perhaps, for the educator, is to do what Mr. Hart does. He translates something of what we mean here by vision into the special case, the attitude of mind, of the "master teacher." This vision consists in understanding how human beings grow and learn; the author lets its persuasive influence animate his book. After all, something deeper and more far-reaching than the vision of even the Founding Fathers is needed at this juncture of history. It will doubtless come, if it ever does, in consequence of a more profound insight into the nature of man, and master-teachers will surely have a part in this.

Mr. Hart's book is peculiarly rich in its account of how children actually do learn. It is, as he shows, an unpredictable and *random* process, although a continuous one. Having fixed classes for children, with fixed content for each grade, amounts to frontal attack on the natural learning process, replacing it with artificial, procrustean requirements, making dictator-moralists out of teachers and victims out of children. In Mr. Hart's ideal school, children are not moved from grade to grade on a conveyor-belt schedule determined by administrative necessities:

> We use exactly the reverse plan. We make *completion* the fixed factor, and time the variable. This is so plainly sensible that I am embarrassed to state it. In each phase, we predetermine what *must* be learned, including basic concepts. How long it takes we don't really care, so long as the delay is not caused by some negligence or failure of the school. We don't tolerate any "65%, pass," merely because the term has ended. We insist on mastery of all fundamentals and "foundation" learning—in effect, every child has to score 100%. The effect of this policy shows up more and more, year after year. We don't have non-readers; or students who are "lost" in math; or who can't write a clear, correct paragraph at age twelve. Nor do we have children the school has labelled "failures" or "left-backs," convinced by a brutal system that they are stupid and inept, and who therefore continue to fail as expected of them.

In this ideal school, the educational project divides into teaching *skills, concepts,* and *content.* Reading, for example, is a skill. Content or "information is only miscellany unless it is tied to concepts." Concepts are the generalizing and explanatory meanings that people use in life. They are man's teachable connections with "vision." To say that everything in education has to be related to concepts is to say it must relate to meaning—and vision is the blood supply for the heart of

meaning in a man's life. When the colonial farmer mused on how he would teach Locke to his children, he was *moved* to do it because Locke's concepts illuminated how a vision would work out in practice. All education, to have meaning, must relate to some such *moving* force. Naturally enough, children respond to what *interests* them, so the teacher's task is to relate their interests to concepts. He does this by using concepts appropriate to the natural interests of the young. Interests grow and change best when they are encouraged, not suppressed. You don't "give" the child his interests, you bet on them and guide them when they appear. This is known as faith in man. It is a faith which recognizes that each child's pace is different, the keys to his interests different. Education which proceeds in full recognition of these several realities of the learning process is not only possible but entirely successful. Mr. Hart has plenty of evidence for this.

FRONTIERS

Can Virtue be Taught?

EVERY virtue has two meanings, one of them difficult and the other easy to understand. The easy meanings can be codified, the difficult ones cannot. The easy meanings are unambiguous and can therefore be made the foundation of politics and law. The difficult meanings are unambiguous only in abstraction and a life patterned after them can be admired but it cannot be imitated. There are no transformation formulae that will convert difficult meanings into easy ones. The hope of converting them, of making their truth a sure thing, is what betrayed the Grand Inquisitor. On the day when enough intelligent men stop trying to translate the difficult meanings of virtues into unambiguous rules for the masses, and settle down to devoting themselves, instead, to the Socratic enterprise—to exploration of how the difficult meanings may be gradually and individually understood: in short, to the teaching of virtue—the seeds of tomorrow's "good society" will begin to send down roots.

Take the paradigmatic virtue of all social entities—justice. We can't really define justice, but we can find a corresponding virtue in individuals without too much reduction. In men, justice is impartiality. We can't define impartiality either, but we sense its presence in just men. The social problem is the scarcity of just men. Plato attacked this problem in the *Republic*, with what success still remaining an open question. The same problem, as we conceive or encounter it in experience, may be summed up by the fact that Western man knows how to recognize and to tear down unjust systems of society, but does not know how to establish just ones. Sooner or later, the ones we establish go bad. In the eighteenth century the explanation was that they go bad because of the spurious claims of rulers to authority and their misuse of that authority. Broadly speaking, the Enlightenment philosophy of the eighteenth century proposed two remedies. One was to declare the inaccessibility of final certainty, which meant that all authority must be limited and all officials must be watched. Only pragmatic, practical certainties can be allowed and implemented by law, and a constitution obtains its dignity, its relation to "truth," by refusing to lay claim to knowing it.

The other remedy lay in the practice of science. A system which has admission of ignorance for its ruling principle is bound to produce restlessness in a species that longs invincibly for truth, so that science became the promise of what politics had been forced by bitter experience to deny, and the dynamic, therefore, of every utopian dream.

Well, what is justice in the practice of science? In politics it is social impartiality—equal rights for all. In science, which is either beyond morality or amoral, the virtue of impartiality becomes "objectivity." Originally, the reductive tendency of science was a means to unhampered intellectual freedom. A scientist could say to a churchman, after giving a properly objective definition of what he was looking at, "This is all *ours*, nothing subjective, nothing ambiguous about it! So leave me alone." That the scientific enterprise would eventually destroy the theological cosmos was not sufficiently recognized until the momentum of science was so great that nobody could stop its progress. But by the middle of the nineteenth century, the triumph of the scientific polemic became completely obvious with the birth of a scientific politics. This was a way of saying that *science* had succeeded in eliminating the ambiguity in the difficult meanings of the virtues. It meant that science now gave unequivocal instruction in what to do for the good of all men. Instead of being based on common ignorance, politics could be based on public truth. For the scientific socialists, the subjective regions became fiefs in the empire of objective fact. Vast libraries were filled with books and papers purporting to demonstrate the rule of the objective fact. That in the West the political implications of objective scientific certainty were not developed,

or were expressed with restraint, does not alter the reality of the basic attitude. A great many people believe that government by scientific think-tanks is only a matter of time.

So, we live in a world that has been thoroughly indoctrinated concerning the reliable-knowledge content—even the truth-content—of objective determinations. There are strong feelings of consensus-security from believing that what we think is based upon objective facts. We expect all important decision-making of the public-good sort—where to put the dam, how to reform the post office, what to do about delinquency—to be guided by scientific studies which assemble all the relevant facts.

At the same time, however, and from a variety of hardly understood causes, there is a growing revolt against the whole idea of "objectivity." Slowly, in science itself, another conception of knowledge is coming into being. This reform it deserves the name of reform—has high philosophical and educational motives behind it. There is for example the claim of Michael Polanyi that the conscience of the individual scientist plays a crucial role in the selection and conception of "relevant" facts. It follows that an invisible web of moral intentions provides the moral continuum for the practice of science. Denying or ignoring this web leads to both social and scientific collapse, Polanyi says. (See *Science, Faith and Society* and *Personal Knowledge,* University of Chicago Press.) Other aspects of this reform are covered by Willis Harman's recent paper, "The New Copernican Revolution" (*Stanford Today,* Winter, 1969), in which he speaks of the "objective" scientific world-view as limited and partial—one metaphor, so to speak, among others. The writings of Abraham Maslow fill out this new conception of science—an approach which translates "objectivity" back into its original meaning of impartiality and restores the *difficult* aspect of scientific virtue. It rejects the reductionism of both the Fausts and the Grand Inquisitors.

Another wing of the revolt is grounded in intense moral feeling. Making its influence felt in a massive attack on cultural and intellectual habits which reflect scientific conditioning, this revolt often substitutes emotional for intellectual reductionism. A critic of journalism, for example, remarked recently: "Objectivity is the rationalization for moral disengagement, the classic cop-out from choice making." What does this mean? It *could* mean: Don't worry about perspective-permitting distance from what is going on; just be *right,* and get on with the struggle. A writer in the *Saturday Review* (Oct. 11), reporting the spread of this attitude, notes "the passionate conviction of many college editors today who see the role of the student press as being no longer to report the university community, but to radicalize it."

Well, these are the determined bill-collectors of the price of over-simplifying scientific objectivity, you could say. Religion made virtue easy—see our Salvation Manual for what to do—and the result was a scientific revolution which abolished religion. But science developed its own doctrine of easy virtue—truth is objectivity; that is all ye need to know, all you *can* know. Of course, the *real* scientists never said that, but neither did the great teachers of religion codify the virtues for easy, unambiguous practice. Yet pointing this out gains no eager audiences. We have an *emergency,* people say. The difficult meanings of virtue can have attention later on. . . .