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# THE WAR OF IDEAS

THAT *Dædalus,* journal of the American Academy of Arts and Sciences, should have asked Theodore Roszak to contribute to its Summer 1974 issue, devoted to science and its changing relationships to the public, is of considerable interest. Long a determined critic of "scientism," if not of science, Mr. Roszak has nonetheless won the respect of certain members of the scientific community, one reason being that he sounds a note which some scientists are themselves responsive to. The guest editor for this issue of *Dædalus* is Gerald Holton, who teaches physics at Harvard, and in his own contribution he names Roszak as one of the "more measured and thoughtful" critics who deserve attention.

Prof. Holton, however, does not focus on Roszak in this article. Instead, he seeks agreement on a conception of scientific knowledge somewhere between the embattled extremes of those whom he calls the "New Dionysians" and the "New Apollonians." The Dionysians include, along with Roszak, such writers and thinkers as Charles Reich, R. D. Laing, Norman O. Brown, and Kurt Vonnegut—a somewhat motley team, be it said. The Apollonians are ultra-rationalist followers of Karl Popper, of whom Imre Lakatos is the quoted champion. One might say that, for Prof. Holton, the Dionysians tend to be all heart—reliers on "intuition"—while the Apollonians are tough-minded positivists who regard intuition as a troublesome intruder in the wholly rational or logical enterprise of scientific discovery. The latter attempt to tame and harness even the free-wheeling intuitions of Albert Einstein.

We shall not, here, give attention to Prof. Holton's well-argued reproaches to the Apollonians, since this seems mainly—or at least at present—an intra-science argument; nor expend much space on his criticism of Charles Reich's *The Greening of America,* since Reich's book is all too easy a target. While brilliant in its analysis of the status quo, *Greening* is indeed vulnerable to the charge that it advocates undiscriminated emotional response to the experience of life. Holton seems justified in calling Reich an anti-rationalist in this respect, although the epithet cannot be applied to the critical portions of the book. It might have been more fruitful for Holton to have examined the contentions of a more disciplined thinker.

But what, in any event, would be a balanced view of the idea of knowledge, according to Prof. Holton?

Notable, at the outset, is the fact that he does not set up the familiar polarity—the subjective response to experience contrasted with the scientist's objective account of the "real" world. The scientific account is identified simply as a "consensus." As independent thinker as well as physicist, Prof. Holton avoids the conceit that science knows and describes the real world, proposing rather the requirement of some form of outside, consensus criticism of the deliveries of feeling and intuition. We need, he says in effect, a rational *check* on all such inspirations and intimations. Prof. Holton finds his ideal advocate in Einstein, who often spoke of the indispensable role of intuition in scientific discovery, yet also said that one ought to "form for himself, in whatever manner is suitable for him, a simplified and lucid image of the world," as supplying, so to speak, the stable reference-points one needs but "cannot find within the narrow confines of swirling, personal experience." Those reference-points are made available by "the physical world picture"—a picture unbiased by "the individuality of separate intellects."

Dr. Einstein admitted that the precision sought in science would be obtained *"at the cost of completeness."* However, there is also the idea that this loss may later be overcome or corrected, since science, as it matures, should eventually "turn out to apply to natural phenomena as they offer themselves to us, in all their complexity and completeness." Having by quotation given the Einsteinian expectation of this symmetrical view of natural reality, Prof. Holton concludes by stressing once again the importance of intuition. Einstein said that while it ought to be possible to achieve by pure deduction the theory of natural processes, including those of life, this is "far beyond the capacity of human thinking." To the basic principles, there is no "logical bridge"—or, as he put it in one sentence: "To these elementary laws there leads no logical path, but only intuition supported by being sympathetically in touch with experience."

It seems fair to conclude that Prof. Holton has shaped in quotations from Einstein what he feels to be a statement of the proper assumptions of scientific epistemology, since he ends this section of his article by saying:

> Obviously, I have chosen Einstein because of the clarity, honesty, and independence of his methodological remarks. The process he describes is one most scientists will recognize as applicable to really fundamental work (although the use of the word "intuition" is bound to embarrass some of them). Moreover, almost by definition, the methods an Einstein used cannot reasonably be denied the label "rational," no matter how different they are from the models for rationality set us as straw men by the new Dionysians or icons by the new Apollonians.

As a statement for common assent among physicists, this seems likely to be above reproach. Yet if "the physical world picture" so arrived at, by even vastly intuitive scientists, is meant to be what is available for checking or giving rational order to the content of our private feelings, "our swirling personal experience," then it is not adequate at all. There are only *physical* realities in this picture—no human realities. Various levels of reference-points are needed for comparison with the deliveries of our inner, psychic life, if we are to evaluate their leadings and test their intellectual and moral validity. For this crucial task the symmetries and operations of the physical world afford only vague analogies. The simplifications of Galileo and Descartes may have made possible certain splendors of mathematical analysis, leading to a neo-Pythagorean sort of physics, both impressive in its web of elegant abstractions and serviceable in its directives for harnessing the energies of nature—yet it remains a portrait of nature that *leaves out man.*

Now since physics leaves out man—having in it not the slightest implication of a need for man in the universe, nor of any of his qualities—and since all the other sciences more or less accepted the example of physics as a model—it becomes a simple matter of history—easy to confirm—that the sciences which propose to deal with man have in effect left him out, too. No intellectual process legitimized by the rules of rationality, the laws of logic, could put man back into the scientific world-picture obtained from physics; if he is nonetheless there, this is only because he has been forced into it by compulsive moral necessity. But he doesn't *fit.*

Social science—which is a science of man—is at least a hundred years old, and it is still trying to make man fit into what social scientists do. In the same issue of *Dædalus,* Marc J. Roberts, an economist at Harvard, writes:

> As a first step, social scientists must recognize that all science is not physics. Physics has obtained equations that apply to all electrons because all electrons are, in the relevant sense, alike. All voters or consumers are not alike. When phenomena are heterogeneous, generality can only be gained at the price of content. One is forced to say less and less about each case in order to include all possible cases. Such abstract, non-phenomena-oriented theorizing in the social sciences most emphatically cannot be justified by analogy to basic research in natural science since the latter, unlike the former, is concerned with explicating real empirical events.

Since we are going to quote some more from Mr. Roberts, it seems important to notice that

practically everything he says is in behalf of emancipating his discipline from the assumptions which have been borrowed from the science of physics. On the question of values Roberts follows Polanyi:

> I fail to see how science itself can be justified except on the basis of some prior norms. The goals of explaining, predicting, and controlling nature are, after all, only goals. The systematic, objective approach by which science both defines its activities and measures its progress is not the only conceivable approach to epistemological problems. A Zen mystic, for example, would accept neither its definition of the question nor its specifications as to what constitutes a good answer.
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> The relationship between facts and values is thus asymmetric. Logically speaking, values come first, for facts alone cannot serve to establish or justify values. The naturalistic fallacy is a fallacy. . . .
>
> Values then are involved in the choice to pursue any given question in a scientific manner. This statement has often been accepted, perhaps without full awareness of its implications. Of course, one cannot consistently choose to believe anything. Choices are restricted by the "facts" as determined in accordance with one's basic epistemological and conceptual assumptions. That these most fundamental assumptions cannot themselves be derived from experience should not be worrisome to practical men. The lack of an objective or transcendental justification simply reflects the normatively empty character of the universe. All values and actions can ultimately be justified only in terms of those unprovable ends to which individuals choose to commit themselves.

Mr. Roberts is of inestimable service. First, he clearly qualifies as rational. Everything he says makes lucid sense. He also writes simply about basic matters. The last paragraph above has great pertinence to our general contention.

Prof. Holton maintains that we *need* an impersonal, verifiable consensus of what the world is and how it works' in order to check up on our subjective impressions, on our flights of imagination—in order to live the life of reason.

Fine; but if we are required to be rational, then *values come first.* We know this. Mr. Roberts knows it. Plato knew it. Buddha knew it. *Everybody* ought to know it. But the physical world—or our scientific picture of the physical world—is, as Mr. Roberts says, "normatively empty." How, then, can it guide us in the matter of values? It may tell us whether or not the world is flat, but must remain silent on how to live a good life on any sort of world. We have only, as Mr. Roberts says, "those unprovable ends to which individuals choose to commit themselves" as a clue to how to live our lives—not just practically or efficiently, but *well.* Operation bootstrap.

It may be immediately given that for man values come first, but this is not true of the universe of science. This universe doesn't have any values; it has for us only utility, depending upon our unprovable ends. Such a universe, then, is no help at all, humanly speaking.

Well, why *should* a universe—any universe—be value-seeking or have in it value-seeking intelligence? It seems evident that if you are going to be properly scientific you must say that it shouldn't. Bertrand Russell didn't quite say this, but he implied it; and Dr. Skinner now affirms it.

Many years ago William McDougall wrote an excellent book—*Modern Materialism and Emergent Evolution*—to show the weaknesses of the doctrine of Emergent Evolution—of the claim that value-seeking can somehow be generated as a quality of human beings in a universe that is "value-free." He showed that value-seeking is not some extrinsic quality—something strangely added as a function of material complexity—but a defining characteristic of human beings, there from the first, since man is man. His book, of course, had no effect, or very little. The physicists' picture of the physical world as the "real" world had been made so persuasive that McDougall's argument fell on deaf ears. Looking back, we can say that, after all, he also believed in ESP, didn't he? What rational ground is there in physics for a thought-continuum?

Well, as Marc Roberts notes, "The systematic, objective approach . . . is not the only conceivable approach to epistemological problems." This is Theodore Roszak's contention. Some physicists might agree, but he also maintains that an approach starting with the assumption that values are the stuff of primary reality is far more important than the systematic, objective approach, and this is why Roszak makes the scientifically-minded uneasy. Many people, including thoughtful scientists, will agree that intuition, feeling, and values are important in human life. But they are not able to cope with the idea that values "come first.' The implication of having them come first is that cosmologists must begin with mind, with feeling and idea, instead of with matter and its motions.

Could anything be more bewildering to persons trained to be scientists? Instead of a treatise on angular momentum, they would have to write dithyrambs on Eros. Instead of a study of nebulae, they would need to investigate the dynamics of Nous. Perhaps, some day, scientists will learn to do both, but at first, Prof. Holton says' it is necessary to "simplify." So you do things one at a time and, of course, you do first things first. Completion comes later. Who knows enough, now, to paint the big picture of a universe in which values come first? We are still puzzling over how the cosmos got started in simple. physical terms.

Roszak, it may be complained, sometimes sounds like an antiquarian. But whose fault is that? People haven't thought about the dynamics of *Nous* for a long, long time. Odes to Eros, hymns to Kama-Deva, are almost as old as the hills. So naturally he sounds like an antiquarian. He, like Marc Roberts, is trying to loosen the clamps of physicalist assumptions about "reality." He looks in various directions—at the Gnostics, for example, and their "spiritual" rationalism; and at the Neoplatonists and the Hermetic philosophers, who were in their way rigorous thinkers. He also points out that the popularity of modern science, which began with the Enlightenment and continues in some quarters to this day, is rooted in the hunger for what Prof. Holton half-way implies science should do for us (but can't). In the seventeenth and eighteenth centuries the pioneers of science were hardly aware of the demoralizing implications of their methodological assumptions. They believed they were emancipating human beings from the irrationality of dogmatic religion. The people sensed this implication and, trustingly, responded. Science, they believed, would throw light on the *meaning* of the world; already it was restoring to human beings their feelings of sturdy competence, of being equal to life in the world and to one another. Science had a great deal to do with the moral awakening that began what we call "modern times." The *spirit* of science means the quest for impartial certainty. Even today, this love of truth, this seeking of value, as though it were inscribed in the very grain of life, sometimes finds expression by an accomplished scientific mind, and the people respond. They respond because such utterances make them think that they are on the way to finding meaning in the great world outside.

Writing in this vein Roszak says:

> . . . have scientists never noticed how the lay public hangs upon these professions of wonder and ultimate belief, seemingly drawn to them with even more fascination than to great discoveries? If people want more from science than fact and theory, it is because there lingers on in all of us the need for gnosis. We want to know the meaning of our existence, and we want that meaning to ennoble our lives in a way that makes an enduring difference in the universe. We want that meaning not out of childish weakness of mind, but because we sense in the depths of us that it is *there*, a truth that belongs to us and completes our condition. And we know that others have found it, and that it has seized them with an intoxication we envy.
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> It is precisely at this point—where we turn to our scientists for a clue to our destiny—that they have indeed a Promthean role to perform, as has every artist, sage, seer. If people license the scientist s unrestricted pursuit of knowledge as a good in its own

> right, it is because they hope to find gnosis in the scientists knowledge. To the extent that scientists refuse that role, to the extent that their conception of what science is prevents them from seeking to join knowledge to wisdom, they are confessing that science is not gnosis, but something far less. And to that extent they forfeit—deservedly—the trust and allegiance of their society.
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> Dr. Faustus, Dr. Frankenstein, Dr. Moreau, Dr. Jekyll, Dr. Cyclops, Dr. Caligari, Dr. Strangelove. The scientist who does not face up to the warning in this persistent folklore of mad doctors is himself the worst enemy of science. In these images of our popular culture resides a legitimate public fear of the scientist's stripped-down, depersonalized conception of knowledge—a fear that our scientists, well-intentioned and decent men and women all, will go on being titans who create monsters.
>
> What is a monster? The child of knowledge without gnosis, of power without spiritual intelligence.

How is science to blend itself with spiritual intelligence?

Perhaps we should stop talking about "science" as though this term represented a unique ability of special people, something irreplaceable. Science, after all, is a disciplined and self-regulated form of human behavior and inquiry. There may be strong elements of the excellence we attribute uniquely to science in persons who never think of themselves in this way and never use scientific language. We may be able to deinstitutionalize and free these qualities by not talking about science and scientists, at least for a while.

Galileo, it will be remembered, didn't think much of the books read by the learned doctors of the church. He wouldn't study them. He preferred the book of Nature, and ancient works on mathematics. He started afresh, in other words. The theologians of his time went right on doing what they had been doing and didn't learn much from Galileo. They didn't willingly go to school to him. The Copernican theory remained listed in the *Index Expurgatorius* until 1835. Galileo and his successors had to fight for attention, for a fair hearing, almost the whole way.

Well, progress of a sort may be made by such struggle, but it is costly in time and in other considerations. Polemics and counter polemics do not make a well-marked path to truth. Special pleading creates bias, bias becomes prejudice, and the party spirit eventually gets in the way. Bruno was a Pythagorean, and was accorded a rather uncompromising refutation—by fire. Galileo was arrested and threatened. No wonder scientists put on the armor of materialism. No wonder the *philosophes* stomped on revealed religion—it was hardly worth saving, they felt.

But the people—all the people who were pawns on this great battlefield, first of ideas, then of movements, then of blood and iron—were the victims. The people took instruction from battlecries, not from men longing to know and to tell the truth. There has never been much pure truth in battlecries, and practically none today. The people always pay the costs of cultural lag, and they pay it most by adopting the distorted, partisan beliefs which are spread by wars of ideas.

# *REVIEW*
## ABOUT METAPHORS

HAVING a choice between a science-fiction story by Ursula Le Guin and an article by her on science fiction, we picked the article (in the *Christian Science Monitor* for July 8) for review, mostly for the reason that what she says has such rich implications. Ursula Le Guin is best known for her *Wizard of Earthsea*—a fantasy no home should be without. (A paperback edition is available.) Discussing why some writers write science fiction, she says:

> Like most writers, we want to tell about this world, our world, now. But there is not much in our past that serves to describe the incredible complexities of our present. We cannot use the old metaphors. They no longer fit. So we reach forward, blindly, into the fog of Time-to-Come for our metaphors of the human condition. What our groping hands may seize, we often don't know. An intelligent slime-mold of exquisite civility? Fine. A spaceship exceeding the speed of light and thereby traveling backward through time? Lovely. . . .
>
> In writing stories about these things, we are not predicting them. They are devices to get a fresh view of our own times, our problems, ourselves. Critics call the technique "distancing."

Here Miss Le Guin is answering a familiar question: "How do you (science fiction writers) predict the future?" "We don't," she says, going on to explain why science fiction is so often *about* the future, despite the writer's inability to predict. Yet there is also the possibility that a writer may be lucky (or perceptive) enough to anticipate the future in uncomfortably accurate terms. Miss Le Guin thinks that technological prediction may come true:

> A writer familiar with any field of science or technology can often guess what the next breakthrough or invention will be; if he can't guess, the scientists will tell him, they know. A writer sensitive to the profound trends of his society can extrapolate them, and if his sensitivity is great his vision may be appallingly accurate.

Actually, accurate prediction need not be appalling, although Orwell's *Nineteen Eighty-Four* certainly was. Take for example the element of prediction in L. L. Whyte's *The Next Development in Man* (1944). Already his conception of future man as increasingly intuitive—striving toward wholeness, seeking to unite his feeling with his rational nature has been partially realized in intellectual, emotional, and even communal terms. (While Mr. Whyte's idea of the future was not embodied in science fiction, it might have been.) Meanwhile his posthumous *The Universe of Experience* (Harper Torchbook) makes not at all gloomy predictions about the 1970s.

What good is science fiction, beyond its function as entertainment? Miss Le Guin believes that reading it frees our thinking habits. It helps us to stop expecting tomorrow to be the same as today. Its tools are literary:

> Irony, fantasy, and nonsense are extremely important techniques for the mind attempting to see its way ahead. The reason why one should mistrust Rand Corporation predictions and computer-produced prophecies is that they do not employ irony, fantasy, and nonsense.

Some day we may understand more clearly why the figure of speech communicates so much better than the literal statement. In prose or poetry, vitality springs from metaphor. The metaphor sacrifices precision for provocation. The metaphor makes the mind leap, take chances.

What is a metaphor? Our ancient *Britannica* says:

> A figure of speech which consists in the transference to one object of an attribute or a name which strictly and literally is not applicable to it, but only figuratively and by analogy. It is thus in essence an emphatic comparison, which if expressed formally is a "simile"; thus it is a metaphor to speak of a ship ploughing her way through the waves, but a simile when it takes the form of "the ship, like a plough, moves," etc.

We might say, following Miss Le Guin, that the metaphor gives us "distance." When a writer carries us into some imagined future, we find some things the same and some things different; the science fiction author gives us new light on what is the same, because it stands out when other things are different. Then we see things about ourselves that we have never noticed before.

For light on the metaphor we might compare it to an octave in music. A note seven tones above the one we strike will be the same, but different. Being higher, it will have more vibrations per second. Yet

it is the same in the sense that, as you go up the scale, you are reaching toward *home*. So, by this reasoning, you could say that the metaphor is always inviting you to look for some more interesting or more capacious home. It is the language of adventuring toward a richer security.

This subject has various implications. The "new novelist," Alain Robbe-Grillet, some years ago announced his war on metaphor. The metaphor generates metaphysical assumptions, and he despises metaphysics since he believes that its promises can't be kept. He thinks metaphysics beguiles us into believing that "everything will be all right," when it won't unless we bestir ourselves in some practical way. He thinks "tragedy" is a fraud on the human emotions: it is self-deception, he says, to smile through our tears. His argument is conveyed by a couple of paragraphs:

> Metaphor, in fact, is never an innocent figure of speech. To say that time is "capricious" or a mountain "majestic," to speak of the "heart" of the forest, or a "pitiless" sun, of a village "crouching" in the hollow of a valley is, to some extent, to furnish information about the things themselves: forms, dimensions, situations, etc. But the choice of an analogical vocabulary, however simple, always goes beyond giving an account of purely physical data; and what is added cannot be attributed to purely literary concerns only. The height of the mountain takes on, regardless of the writer's intention, a moral value; the heat of the sun becomes the result of an implied volition. In almost all contemporary literature these anthropomorphic analogies are reiterated too insistently, too coherently, not to be regarded as clues to a whole metaphysical system.
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> One must conclude that the writers who use such terminology are more or less consciously setting up a constant rapport between the universe and the human being who inhabits it. Thus the feelings of man are made to appear to originate one by one from his contacts with the world, and to find in the world their natural correspondences, if not their fulfillment.
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> Metaphor, which is supposed to express only comparison without concealed meaning, always in fact introduces a subterranean communication, a movement of sympathy—or of antipathy—which is its true *raison d'être*.

This play of sympathy Robbe-Grillet regards as some sort of betrayal. If a man will refuse communion with the world, he may experience lack of meaning—but if the "meaning" isn't really there, then by refusing communion he makes himself immune to tragedy. In short, this writer advocates a dull, post-scientific stoicism—the most colorless and hope-free existentialism of them all.

Robbe-Grillet wants things to be only things and men to be only men, separate and apart, with no mysterious connection between them. This is a deadly pluralism, leading, it seems to us, to a passive, lifeless prose. In *The Age of Complexity* Herbert Kohl provides a comparison:

> Contrast, for example, Sartre's account of entering a room: "I took a moment to compose myself and entered. A guardian was sleeping near the window. A pale light, falling from the windows, made flecks on the paintings. Nothing alive in this great rectangular room, except a cat who was frightened at my approach and fled. But I felt the looks of a hundred and fifty pairs of eyes upon me" with this description of Robbe-Grillet's *In the Labyrinth:* "Now a door opens into a square room furnished with a day bed, a rectangle table, and a marble-topped chest. A fireplace with cold ashes in an open grate but without andirons on the hearth occupies the center of one wall. To the right of this fireplace is another door ajar, opening into a dark room or closet."

No metaphysical entanglements for Robbe-Grillet. Calling a thing a thing will preserve us from "enslavement and fear." There can be no failed transcendence, no lost salvation for one who learns to destroy his expectations by a careful choice of inanimate, pedestrian words. This is taste which savors a literature as empty of meaning as the universe of Jacques Monod. Russell, at least, described his gloomy cosmology with sparkling imagery which declared its own covert resistance to everything he said. But Robbe-Grillet's prose just lies there, inert; and that's the way he wants it, he says.

The world is probably safe from his message. The metaphors declaring sympathetic bonds between things and men make far more interesting reading.

# *COMMENTARY*
## CHAMPION OF MIND

WILLIAM MCDOUGALL'S *Modern Materialism and Emergent Evolution* (Methuen, 1929) shows the devastating effects of Descartes' reduction of mind to ineffectual impotence. McDougall fought this demoralizing influence all his life, during a period when the assumptions of materialism were seldom questioned. *Modern Materialism,* as he explains, was a sequel to *Body and Mind,* written much earlier to defend mind as a reality both purposive in character and causal in action.

In *Modern Materialism* he quotes Claude Bernard's claim that while life may be admitted to be a "metaphysical force," its behavior is not physical, making it "useless to science." Bernard insisted that "mechanical, physical, and chemical forces are the sole effective agents of the living organism, and that the physiologist has to take account of their action alone."

McDougall calls this a vicious sort of dualism, pointing out that if mind does indeed act upon and cause effects in nature, "science cannot leave it to metaphysics and content itself with seeking only mechanistic explanations." Musing on the question of why a universe in which choices exist and freedom is possible "should give birth to a philosophy which denies their existence," he offered this reply:

> Man's survival has depended primarily upon his efficiency in understanding and directing physical events. He has, therefore, been chiefly interested in them; and this predominant interest has shaped the form of his language, the cast of his thinking, the structure of his mind. It has led him to develop the physical sciences in advance of and out of all proportion to the sciences of Mind. Hence he feels confident and masterly in reasoning of pure mechanism, he falters and fumbles when he attempts to reason about himself. He finds a ready escape from his perplexity by setting up the fiction that he also is but a machine, and erects the fiction into a methodological principle of science. Yet, though the first effect of man's increasing control over nature has been to convince him that he has no control, it would be strange if, with further increase of that control, he should not reverse that first hasty conclusion. . . .
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> In the sphere of practice, as is now increasingly recognized, our civilization is in danger of becoming self-destructive, just by reason of our lack of understanding of human nature and our consequent inability to shape and control our own development. The dogma that *Man is a Machine* is at once the perfect symbol of that lack of understanding and the greatest obstacle to the overcoming of that inability.

In saying these things so long ago, McDougall was a lonely, courageous, and prophetic thinker. He now has many allies and successors.

# CHILDREN
## . . . and Ourselves
### A TALE OF NO GREAT IMPORTANCE

ONCE upon a time, in a California canyon which opens out on the Pacific Ocean, there was a one-room schoolhouse. An early settler in the canyon gave the land, and the local school district, named for the canyon, built the school. This was in about 1900. Before that, the children had had lessons in a dilapidated "residence" in another part of the canyon, which had been converted into a school. Life in this region was something like life on the Western frontier in the early days of American history. Deer roamed the Santa Monica Mountains, coyotes howled nightly, especially when the moon was bright, and cougars or mountain lions were sometimes seen on trails winding through the hills. The canyon was not a fashionable part of the coastal area, having for years been isolated from tourist and other traffic by the stubborn owner of a vast estate to the south who, for more than a generation, had opposed development of some twenty or thirty miles of territory bordered by the sea, and had prevented road construction along the beach. The people of the canyon lived on the land, doing a little farming, running horses, working as mechanics or fishermen, and sometimes for county agencies such as the fire department or the road maintenance division, or for utility companies like Edison and General Telephone that were slowly penetrating the area. There was no public water supply; each home had its own well, pump, and irrigation system.

There were plenty of children in the sparsely settled canyon—fifteen or twenty, that is—but the one-room schoolhouse was big enough to hold them, and the teacher found by the local school district managed to maintain a level of scholastic achievement considerably above the average of neighboring communities. So, for about sixty years the Decker Canyon School District's single school served the children of Decker Canyon well. But by 1958 the population of the coastal area to the south had increased enormously. Old Mrs. Rindge, who fought the state and enterprising realtors for so long, had years before been forced to submit to the imperatives of "growth." After 1922 a network of highways—one of them Pacific Coast Highway—began to connect all Malibu with nearby cities. The "movie colony" descended on the region, the stars and lesser lights looking for sites for bizarrely designed homes near the sea. Gas stations, restaurants, and other service businesses began to dot the area, and with these various enterprises came more people and more children. In time, the people of Decker Canyon were no more than a small minority, so that when, in 1958, the residents of the Decker Canyon School District—which extended far beyond the limits of Decker Canyon—voted to consolidate with the Santa Monica School District, the mothers and fathers who lived in the Canyon had to bend with the majority decision. No more one-room schoolhouse. The younger children began to be bused to an elementary school a few miles away, while the older ones went to high school in Santa Monica.

That's the end of the first part of our story. The big little schoolhouse survived for a while, an empty, graying, stucco structure alongside a black-topped playground where the youngsters still tossed a basket ball at the practice ring, and where people parked their cars and pick-ups when they came visiting in the evening. Mothers talked about the good old days when their children were getting a better education than the big schools farther away were now providing, and when they didn't have to spend two or three hours riding around in buses every day.

There was one other memorial to past schooldays in Decker Canyon—a merry-go-round in the school yard, which remained after the razing of the schoolhouse building. The merry-go-round was—is—a sturdy affair constructed of steel and capable of riding sixteen or eighteen children, depending upon their size. It has a diameter of about twelve feet, with eight bench seats arranged like radii around the center, and two push-pull stations to rotate the large platter on the same principle as a railroad hand-car. It squeaks but it works. The present generation of children in Decker Canyon swarm all over it, and mothers or grandmothers are sometimes seen pushing the thing around while a lone tot sits grandly on a bench for a private ride.

The gears are still in sound condition and the balance is good.

Well, one day—a Saturday morning—a pick-up pulling a flatbed trailer wheeled into the playground yard, and four men jumped out. They went right to the merry-go-round and started loosening the bolts securing it to a foundation in the slab. A couple of ten-year-olds and a four-year-old saw what was going on and yelled their objections. No tactful inquiry or anything like that—they just jeered and hollered. There isn't a record of what they said, which may be just as well. Then one of the ten-year-olds tore up the hill to her dad. "They're taking away our merry-go-round!" she said. "Who is?" he asked. *"Those guys with the truck,"* she said. The father, newly arrived in the area, went down to see.

It was true. The men were taking off the nuts with big wrenches and soon the merry-go-round would be portable, in a manner of speaking. Actually, the flatbed trailer they had brought was too small to carry anything twelve feet in diameter, so one of them had to go about fourteen miles to rent a larger U-drive vehicle. This gave everybody time. Well, the father asked the men what was going on. One who was apparently the "leader" explained that the Santa Monica School District, for which he happened to work, had announced that it wanted to dispose of the merry-go-round, and had agreed on a price of fifty dollars. The decision to sell it was spurred by the fact that some trouble had developed out of similar "obsolete" equipment left on deserted schoolyards elsewhere in the county. Little people would get hurt playing on them. Some accidents had occurred and damage suits had been entered, with the result that the School District decided to liquidate all such hazards. The man who bought the merry-go-round and enlisted some friends to help him carry it away had all the proper documents—letters and a bill-of-sale. So the merry-go-round was now *his*—by legal passage of title. The Decker Canyon School District had bought the landlocked whirly-bird in 1919, but by consolidation the property of the Decker District became the property of the Santa Monica District, and the SMSD had sold it to the man with the flatbed trailer.

Well, the man was growing a little uncertain. He had told the ten-year-old girl that he wanted $250 for the merry-go-round: raise the money, he said, and he wouldn't take it away. Word spread around the neighborhood. Six-year-olds dashed home to get their piggy banks. Parents, infected by sentiment and practical regard for a mechanical baby-sitter—better by far than a TV—began to commit themselves to twenty, forty, sixty dollar contributions. And the juvenile audience on the playground, now ten or twelve children, stopped jeering. "We began looking as sad as possible," a girl said, a couple of days later.

The instant fund-raising made an impression on the man. "If I had known," he said, "what this thing meant to all these kids I'd never have tried to take it away." He explained that he owned a couple of small apartment houses or courts in Santa Monica, and that there was a yard near this property where he could install the merry-go-round for the children who lived there to play on. But children in Decker Canyon are just as important as children in Santa Monica, he said.

"If you'll just get together enough money to pay me my fifty dollars back, cover the price of the equipment rental, and some wages for these fellows who came to help me—they've lost more than half a day—I'll be glad to leave the thing."

And that's the way it worked out. The neighbors contributed. The men from Santa Monica generously unloaded the merry-go-round in the large yard of a canyon resident, who volunteered to bolt it to a new foundation there, so that children could play on it safely. Now it was off school district land, which would satisfy the Santa Monica school board.

Maybe, even, before the drama of that Saturday morning has completely faded from the memory of Decker Canyon parents, the squeaking merry-go-round will be propitiated with some axle-grease and its benches and other parts get a fresh coat of paint.

# *FRONTIERS*

## Cyclops and Bruno

AN article by Marvin Miles (*Los Angeles Times*, Aug. 25) on "Project Cyclops," a joint undertaking of Stanford University and a research branch of NASA, reveals the revival in scientific terms of questions which, as issues in philosophy and religion, played a decisive part in both the Renaissance and the Reformation. By releasing men's minds from old beliefs, they gave encouragement to the then awakening spirit of scientific inquiry.

What is Project Cyclops? It is, the *Times* writer says, "a preliminary look at a system for detecting extraterrestrial intelligent life and the reasons for searching the stars." Assuming the possibility of intelligent beings inhabiting planets in outer space, and believing that electromagnetic waves are "the only likely interstellar communications means," the Stanford/NASA group has proposed the construction of a closely ordered phalanx of radio-telescope antennas, covering an area larger than a football field, to catch signals from other worlds.

The Cyclops team has apparently tried to compute the probability of intelligent life elsewhere in the cosmos. Their studies indicate that the antenna area might need to be expanded as much as ten times, to increase the chance of receiving such radiations. The life-term of civilizations on planets in other solar systems is a factor involved:

> If they exist for only 10,000 years, the nearest culture would be about 850 light-years away and the search time would probably be on the order of 25 years on the basis of an estimated 10,000 cultures within Cyclops' 1,000-light-year range.
>
> On the other hand, if distant cultures survive for 100 million years, there would be about 100 million civilizations in the galaxy, the nearest probably would be within 36 light-years, and the search time would be only 1.2 days.

Since the cost of construction of the equipment to carry out this proposal would run several billion dollars, the cosmic receiving station may not be erected for a while. However, the questions it would seek to answer, as given in the *Times*, are of considerable interest:

> Are we alone, unique not only in the solar system but in the universe? How prevalent is life in the universe? Is the biochemistry of life unique or are there alternatives? Is evolution divergent or convergent?
>
> Is interworld communication common or exceptional? Does a galactic community of cultures exist? What is the longevity of such cultures? Is there interspace travel or merely intercommunication?
>
> Does life serve a role in the evolution of the universe or does it exist completely at its mercy? Do cultures survive the death of their primary stars? What is our destiny?

These questions plainly arise in the context of present-day scientific thinking, with perhaps a dash of science-fiction for spice.

Discussion of such ideas in Renaissance days generated a different mood. While, for Copernicus, though he had formulated the heliocentric system, the universe was still finite, for Nicholas of Cusa and Giordano Bruno it was limitless on philosophical grounds. Both had read Lucretius' *On the Nature of Things*, in which the Roman poet said, "The whole universe then is bounded in no direction of its ways," but they, not being materialists, based their similar conclusion on the boundlessness of Deity. Nicholas declared that the universe can have neither center nor circumference, for these would constrain it within a limit—something philosophically impossible. Nicholas also held that the entirety of the universe is animated by a single soul, giving life and being to all. Having the same outlook, Bruno seized upon the expanded astronomical conception of Copernicus, turning it into a cosmological revolution. As Dorothea Singer says in *Giordano Bruno* (Schuman, 1950):

> To Bruno and Bruno alone the suggestion of Copernicus entered into the pattern of a completely new cosmological order. In this sense Bruno not only anticipated Galileo and Kepler, but he passed beyond them into an entirely new world which had shed all the dross of tradition. It was a great vision which, from the very nature of the case, could be shared in full neither by his own nor the succeeding generation.
>
> The whole of Bruno's philosophy is based on his view of an infinite universe with an infinity of worlds.

> . . . Thus the Lucretian universe of innumerable minimal parts or atoms in perpetual concourse and discourse became for Bruno the symbol of the spiritual universe of an infinity of monads, infinitely numerous elements of the universe, each pursuing the development congruent to its inner nature. And to Bruno the universe like all its parts had the quality of life.

Of necessity, then, the endlessly numerous worlds spread out in space were inhabited, and some of these inhabitants, Bruno said, must be superior to the terrestrial race. (*De Immenso* I, 9.)

In some respects Bruno made the same arguments as those of the Project Cyclops team. The *Times* report says: "No planets circling distant stars have ever been observed with earth telescopes, the study explains, because of the brightness difference between star and planet and the close separation of images that would make observation almost impossible." Answering a similar objection (in *On the Infinite Universe and Worlds*), Bruno said that planets of other systems are invisible to us because they are so much smaller than their suns.

To those who wondered why there was no communication between such worlds and ours, Bruno gave a Taoistic reason:

> To the next argument we reply that there is no need of this courteous exchange of intercourse between the various worlds, any more than that all men should be one man or all animals one animal. And this apart from what we learn from experience, that it is best for the living creatures of this world that nature hath distributed their diverse kinds throughout the seas and mountains. And if by human artifice there hath befallen traffic among them, good is not thereby so much added to them as removed, since communication tendeth rather to redouble vices than to augment virtues.

Yet Bruno did not bar the possibility of inward learning about distant spheres, since "every soul and spirit hath a certain continuity with the spirit of the universe." The Platonists and Pythagoreans, he said in *De Magia*, held that the soul is of a substance "diffused throughout immensity," so that the individual soul may "apprehend most distant species, in an instant and without motion, nor cloth the eye or aught therefrom suddenly advance to the stars, nor aught suddenly from the stars to the eye." But certain unspecified impediments would have to be removed for the soul to have "present to it the most remote species which are not joined to it by motion." Finally, "since the soul of the individual is continuous with the soul of the universe, it is not impossible that it may be carried to bodies which do not interpenetrate with it," and for other reasons "the innumerable spirits and souls diffused through space interfere not at all with one another, nor doth the diffusion of one impede the diffusion of the infinity of others."

Bruno, as we know, was punished by fiery death for daring to think in this way. Among the various threats he constituted to orthodox belief, there was the central one described by A. O. Lovejoy in *The Great Chain of Being:*

> The theory of the plurality of inhabited worlds tended to raise difficulties, not merely about the minor details of the history included in the Christian belief, but about its central dogmas. The entire moving drama of the Incarnation and Redemption had seemed manifestly to presuppose a single inhabited world. If that presupposition were to be given up, how were these dogmas to be construed, if, indeed, they could be retained at all? Were we, as Thomas Paine afterwards asked, "to suppose that every world in boundless creation had an Eve, an apple, and a serpent, and a Redeemer?" Had the Second Person of the Trinity been incarnate in innumerable planets in turn, or was ours the only portion of the universe in which moral agents had any need of redemption?

As we see, the mood of wondering about life on other planets has changed enormously. Now we ask if "those people out there" are likely to invade and enslave us, or perhaps use us for "pets"? It seems an open question whether our thinking about intelligent beings elsewhere in the universe is on a higher plane than in the sixteenth century. We certainly don't now know more on this subject than the people of those days. Perhaps less.