

Editorial

The papers in this issue of *Zygon* suggest that the fear that so many have today, that man is alone and a stranger in the cosmos with only his fragile self to count on for his fate, may not be warranted—even if some have declared the traditional God to be dead. Religion and theology may not be out of business, if theology takes seriously the imperative set forth by Hefner in his “The Relocation of the God-Question” that theology utilize the sciences to throw light on such questions as the trustworthiness of the processes of evolution, as man’s survival, as the nature and demands of the world processes, and whether man is fundamentally at home or out of phase with them.

Bronowski’s “New Concepts in the Evolution of Complexity: Stratified Stability and Unbounded Plans” opens a new window on the relation of life to the cosmos. Since the establishment of the second law of thermodynamics about a century ago, scientists first, and then philosophers, theologians, and poets, became disturbed about its implications for what was usually interpreted as an inevitable kiss of death for all life in the ultimate heat death of the cosmos. Bronowski has something new and bright to say about the relation of life to the second law. His new brightness is not from wishful, nonscientific, or soft thinking, but, on the contrary, from an even harder formulation of the scientific picture. Instead of explaining life’s marvelous qualities by some new principles lying outside and beyond the scientific pictures of the world, he finds life explained more fully in terms of the laws of physics. Life, including human life, and its long evolution to ever higher levels of organization and complexity, is shown to be a natural outcome of physical circumstances and principles, including operations in accord with a proper understanding of the second law of thermodynamics. Man can be seen more clearly than ever before to be at home in the world, and the creature of the ultimate powers that be, even, yes especially, as described by physics.

Bronowski’s thesis necessarily disagrees with notions that physics and chemistry are not able to explain life, and he argues forcefully against some of his distinguished scientific colleagues who have concluded such impotence for physics. After seeing his paper I wrote him a memorandum to say I thought he was right in his argument, but also to suggest

that he had in part misunderstood Polanyi's notions about man as a machine. Bronowski thereupon insisted that my memorandum be published along with his paper, and it is inserted here between Bronowski and the paper by Scott dealing with Polanyi's notions.

Scott's paper on "A Bridge from Science to Religion Based on Polanyi's Theory of Knowledge" was shown to me by Polanyi before he departed from Chicago this spring, with the suggestion that this would be a significant contribution for *Zygon*, fairly representing his own views. I agreed, and Scott kindly consented to let us have it. In the free world of ideas, especially in the sciences, we have the privilege of disagreeing on certain formulations of a man while deeply cherishing other contributions. Of course, we should show some evidences for our acceptances and rejections; but sometimes we have to wait for history (natural selection of culture types) to rule on what formulations are most useful or valid. Meanwhile, the pages of *Zygon* offer some arguments from both sides about such problems as "reductionism" of life and spirit to physics and chemistry, and suggest that the resolution of the confusion may come from semantic clarification.

Scott's review of the virtues of Polanyi's important concept on "tacit knowledge" suggests to me that this is akin to the story of knowing that is currently unfolding from attempts to analyze what the brain is doing. For instance, this kind of overlap seems implicit in the relation of Scott's "the processes of . . . perception occur in automatic ways over which we have no control . . ." to the "biologically programmed essential forms" found in the following paper by Clynes. I suspect that an exploration of how the brain operates to produce "personal knowledge" will resolve many of our philosophical, epistemological problems.

Beyond Scott's good interpretation of Polanyi's notions of how we know, he does something that I don't think Polanyi has yet so clearly done—he extends Polanyi's kind of knowing and scientific knowledge in general to an attempt to make the term "God" meaningful. I find this to be most significant, and his suggestions very helpful, a good contribution toward a scientifically meaningful concept of God, particularly some Christian images of God. However, I find myself unsatisfied in some places, for example, when he says "mechanistic explanations have no need for the concept of God." While many prefer to let the term "God" denote something less than the totality of reality or nature, if I don't find God in the significant mechanistic explanations of how my brain or anything else works, I feel the term "God" cannot mean very much to me.

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I find it more comfortable and more valid to think of God in terms of Bronowski's model of the cosmos in which physics is our best guide even as our contemplation moves up the steps from one level of stratified complexity to another, from atoms to Adam and to us. To be sure, Bronowski's paper does not refer to Adam, and he obviously sees his universe as unrelated to some of the traditional Christian conceptions of God. Nevertheless, I feel that Bronowski is giving a very realistic description of theologian Hefner's "nature and demands of the world processes," which Hefner suggests is perhaps now where we find the most relevant meaning for what people are really asking when they are asking the "God-question," especially people who have come to accept the validity of scientific explanations.

Clynes's "On Being in Order" is for me a brilliant, scientifically rooted poem about the nature of man, a poem which suggests how we can reconceive things so as to avoid the logical paradoxes of subjective versus objective and mind versus matter. He is at once speaking in the images of the toughest, deterministic, data-processing-machinery concepts of brain or human personality, and at the same time he is an artist portraying the sources of his own art from some frontier scientific explorations in which he participates as a scientist. As I suggested earlier, Clynes's approaches to the problems of knowing through knowing the working of the brain is complementary to those of Polanyi as reported by Scott.

While a reader who possesses an understanding of the special fields in depth will of course find a richer experience in the reading of these papers, no one has depth in all these fields; and I believe that good common sense will let readers in general get some vision of exciting and rewarding visions of some frontier scientific doctrines of the nature of man and of the reality from which he comes. I believe these papers hold unusual riches for those concerned to develop a philosophy or theology in the light of the sciences. They will be helpful for seeing that man is at home in and has meaning in the physicists' cosmos and that he is a conscious, loving, artistic creature even when he understands himself as programmed by DNA and conceived of in images used by computer theorists.

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