

FUTURE DIRECTIONS FOR THE ZYGMON CENTER

by Ian G. Barbour

Abstract. A brief comparison of the Zygon Center for Religion and Science and the Center for Theology and the Natural Sciences is given. The work and emphases of the two Centers overlap but also differ in significant ways. Without neglecting the physical sciences or the Christian tradition, ZCRS would do well to continue to give high priority to the biological sciences and the dialogue with the major world religions.

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The first issue of *Zygon* appeared in 1966, the same year that my book *Issues in Science and Religion* was published. Over the years I have been greatly indebted to the journal, first under Ralph Burhoe's leadership and more recently under Philip Hefner's. I enjoyed a sabbatical leave at the Chicago Center and have had opportunities over the years to speak here at a variety of conferences and workshops. Under its new name, the Zygon Center, and with Antje Jackelén's leadership, I know it will have a significant future.

My hope is that the Center will build on what have been its distinctive contributions in the past. I highlight these by comparing it with the Center for Theology and the Natural Sciences (CTNS) in Berkeley, with which I have been deeply involved since its founding in 1980. CTNS has explored the implications of both the physical and biological sciences but has emphasized physics and cosmology, in part because of the scientific background of its founder and director, Robert Russell. CTNS has contributed

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significantly to the teaching of science and religion in colleges and universities through its course program, aided by grants from the John Templeton Foundation. The main focus of CTNS has been on the relation of science to the Christian tradition, though in recent years it has given considerable attention to other traditions, especially through the program called Science and the Spiritual Quest. The CTNS journal *Theology and Science*, launched in 2003, will continue this emphasis on Christianity without ignoring other traditions.

The Zygon Center has by no means neglected the physical sciences, but it has been particularly interested in biology. Evolution was a central concern of Burhoe and of Hefner after him. Partly because of this biological interest, ZCRS has a long and significant record of reflection on human nature, including issues raised by sociobiology, evolutionary psychology, behavioral genetics, and, more recently, neuroscience. ZCRS and the journal *Zygon* have frequently featured speakers and authors from the Christian tradition but also have included many voices critical of theism, including defenders of religious naturalism, such as Burhoe himself, Ursula Goodenough, and Willem Drees. Earlier than CTNS, the Zygon Center encouraged dialogue with a variety of religious traditions—by participating, for example, in the Parliament of World Religions in Chicago and then in South Africa. The Centers in Berkeley and Chicago have probably given equal attention to epistemological questions, including the views of feminist authors. They both have been deeply engaged in ethical issues such as those in environmental policies and genetic engineering, though for neither of them is applied ethics the central concern.

Other panelists will speak about the dialogue with non-Christian traditions, so let me suggest four reasons for stressing the continuing importance of biology despite the fact that my own training was in physics.

1. The impressive power and scope of Newtonian physics led many scientists in the eighteenth century to expect it to explain all events. But quantum physics in the twentieth century called determinism and reductionism into question. It is understandable that the spectacular success of molecular biology and genetics today leads many scientists to hold that these fields will in principle be able to answer all questions about living organisms, including human beings. It is now in biology more than in physics that people are tempted to extend a powerful set of scientific concepts into a total explanatory scheme with unexamined philosophical assumptions.

2. In physics, attention must be directed to wholes as well as parts. An orbital electron in an atom is a state of the whole atomic system, not a particle with an individual identity. In recent experiments on nonlocality and quantum entanglement, two particles originating in a single event must be described by a single wave-function even when they are traveling

to detectors many kilometers apart. In both quantum physics and relativity, measurements describe relationships between the observer and what is observed and are not statements about objects in themselves. But holism in biology is even more striking. Organisms consist of a hierarchy of levels that emerged in evolutionary history. The behavior of such organized systems cannot be described by concepts or explained by laws applicable to their component parts. Higher-level activities set boundary conditions for lower-level laws without violating them. Arthur Peacocke has been a strong defender of top-down causation from higher to lower levels, or from wholes to parts, in addition to bottom-up causation from parts to wholes.

3. Some physicists maintain that the consciousness of the observer plays a crucial role in the collapse of the quantum wave-function when a measurement is made. I have argued that such measurements require not consciousness but the communication of information from a quantum system to a larger experimental system. But consciousness clearly is a major issue in the biological world. Cognitive scientists have made considerable progress in understanding consciousness defined as access to information and consciousness defined as a program for self-monitoring. But consciousness as subjectivity remains problematic. Work on information processing and artificial intelligence in computers leaves out consciousness, emotions, embodiment, and social interactions, which are features of human selfhood. The challenge is to understand a person as a many-leveled psychosomatic unity rather than a dualism of body and soul or a complex assembly of molecules.

4. For the general public the cosmologists' discovery of the immense span of the universe in time and space does threaten human significance, but cosmic significance is preserved by a sense of awe before the unimaginable events of the Big Bang and the beauty and intelligibility of the universe. Biology, however, seems a more serious threat to human dignity. Creationist opposition to evolution is partly based on scriptural literalism and commitment to a traditional view of preordained design, but it is also an attempt to defend human uniqueness and moral values. The claim that our behavior is in large measure determined by our genes seems to undermine human freedom and responsibility. Many current debates such as those over cloning and stem cell research raise fundamental questions about human selfhood and are relevant to personal and social choices we have to make today.

To sum up, it is my hope that in the future ZCRS will continue to give high priority to the biological sciences and the dialogue with the major world religions without neglecting the other topics to which it has made such significant contributions. I congratulate Antje and wish her all success in her new role.