Articles

A RELIGION FOR AN AGE OF SCIENCE

by P. Roger Gillette

Abstract. The period 800–200 B.C.E. has been called an axial period or age because it was a period of major technological and cultural change that led to the development of new worldviews, which in turn called for and led to the emergence of the current major world religious traditions. The world is now in the midst of another period of major global scientific, technological, and cultural change that is leading to the development of a new global worldview. In this worldview, the cosmos is taken to be more like an activity than a thing—more like an emergent complex of interrelated and interactive doing in space-time than a created complex of beings in space and time—and its complexity and space-time scale are understood to be enormously greater than heretofore supposed.

These changes in worldview call for changes in theology, religion, and ethics. Most workers in the field of science and religion are heeding this call by attempting to reconcile traditional religious concepts with the new scientific concepts. Others, however, have become convinced that the new worldview differs so radically from the previous ones as to mark a new axial age, which calls for a new, post-traditional theology, religion, and ethics, with a *theos*[1] that is more like an activator of doing than a ground of being, and with meaning and purpose achieved more by a quality of doing than a quantity or quality of being.

Keywords: age of science; axial age; axial period; cosmic theology; global ecosystem; post-traditional theology; process theology; *theos*.

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A New Axial Age?

Students of the history of philosophy and religion have noted that all of the current major world philosophic and religious traditions emerged in roughly 800–200 B.C.E., a period of creative and radical cultural change that is being called an axial age or period. Among available discussions of this age are those of Karen Armstrong (1993, 27) and Lloyd Geering ([1994] 2000, 30). As they indicate, it was a period in which new prosperity and concentration of wealth led to the rise of both merchant and intellectual classes. This in turn led to the development of new ideas, including the concept of individual conscience and the realization that people's behavior could affect the fate of future generations. Various distinctive ideologies emerged to address these problems and concerns—Daoism and Confucianism in China, Hinduism and Buddhism in India, different versions of monotheism in Iran and Israel, and philosophical rationalism in the Greek region. These new philosophical and religious developments overwhelmed (but did not completely displace) older polytheistic mythologies.

A cultural change of perhaps greater magnitude is now under way. This currently ongoing change is marked by increasingly explosive scientific and technological development, human population increase, and globalization of human physical, economic, and cultural interpenetration and interaction. These revolutionary developments have produced a markedly different worldview from those of the 800–200 B.C.E. period.

These developments have provided a multitude of opportunities for life enrichment but have also led to a multitude of problems. Excessive and misdirected utilization of modern technologies has led to serious degradation of the physical environment in the form of clearly evident land, water, and air pollution and not-so-evident climatic changes. It also has led to large-scale destruction of ecosystems and a major increase in the rate of extinction and the amount of suffering experienced by nonhuman animal and plant species. And, though technology has led to possibilities for marked increases in human longevity and alleviation of human suffering, and thus to a rapid increase in the earth's human population, this has been at the cost of poor distribution of such benefits and to what can best be described as gross pollution of human bodies and minds. The enormous increase in the capabilities of weapons and other war-making and mass-destruction equipment has only added to the threats to the well-being of our planet's human and nonhuman (animal and plant) populations and the global ecosystem.

A culture deals with such problems by some combination of persuasion and force—that is, by the spread and adoption of appropriate philosophical and religious beliefs and practices and by the enactment and enforcement of governmental laws and regulations. Thus, improvements are needed and being sought both in our philosophical and religious beliefs and practices and in our governmental structures, laws, and regulations to solve or

at least mitigate our current global problems (taking an instrumentalist, utilitarian view of political, philosophical, and religious systems as well as science; see Hefner 1998, 541; Barbour 2000, 125).

The current situation is thus not unlike that in the 800–200 B.C.E. axial age in which current world philosophical and religious traditions arose. And indeed, numerous proposals for either marked modification of current world religious and ethical systems or the development of essentially new ones have been put forward, notably (though far from entirely) under the aegis of the Institute on Religion in an Age of Science and in the journal *Zygon*.

Most of these proposals are offered by persons who are trying to preserve key principles of an existing religious tradition that they accept as their own and to show how that tradition can be reconciled with the findings of modern science. Philip Hefner has called this a traditionalist approach (1998, 542). However, some people (e.g., Geering 1999) have concluded that the worldview provided by twentieth-century science differs so markedly from any of those that gave rise to current religious traditions as to doom attempts at reconciliation. They have therefore assumed that the current age of science is indeed a new axial age, in which an alternate approach is appropriate. In this approach, which Hefner calls the post-traditionalist approach (1998, 542), one attempts to imitate the basic process by which anthropologists believe the major world traditions were initiated—that is, to start with the modern admittedly tentative science-based worldview and to develop a religious belief that is consistent with it, recognizing that the resulting belief will also be tentative.

The remainder of this paper describes the result of such an attempt—a proposal for a truly modern religion, based on a theology suggested by the modern worldview, and thus a religion for a new axial age, the age of modern science. In the proposed theological concept, a *theos*[1] is postulated and modeled as an activity or process comprising three functional elements—a creatively designing element, a purposefully guiding element, and a constructively actualizing element. Religious practices corresponding to this theology comprise (1) rituals to recognize and express appreciation of the beauty and goodness of the cosmos and thus of the *theos* and (2) ethical directives that govern individual and social interaction with the cosmos as part of the cosmos but also as its created co-designers/guides/actualizers (Hefner 1993, 27).

The next section describes and discusses significant findings of modern science and the resulting scientific, philosophical, and technological world and worldview. Subsequent sections describe first theological and then ethical principles that can be inferred from and are compatible with this worldview and thus are applicable to this world. A final section discusses possible practices of the resulting religion for a new axial age, the age of science.

In these discussions the words *science*, *technology*, *religion*, and *ethics* are usually used in accordance with definitions implied by Ian Barbour's use of them in the titles of his books *Religion in an Age of Science* (1990) and *Ethics in an Age of Technology* (1993) (see also Brown 1993). The boundaries between these fields of knowledge are necessarily fuzzy, but in grossly simplified terms, *science* provides a description of how the cosmos is and operates, *technology* provides ways to modify how it is or operates, *religion* provides a description of its meaning and purpose, and *ethics* provides rules for the application of the technology to achieve the purpose.

The Modern Scientific Worldview

Although the beginnings of what can be called the age of science occurred several centuries ago, the twentieth century, with revolutions in every scientific field, gave us what scientists call modern science as distinguished from classical science. The development of special and general relativity and quantum mechanics, quantum electrodynamics, and quantum chromodynamics gave us modern physics. The development of Big-Bang, inflation, galaxy formation, stellar-evolution, and black-hole theories gave us modern astronomy. The development of plate tectonics gave us modern geology. The discovery of DNA structure and other developments gave us modern molecular, cell, and evolutionary biology. The development of new brain scanning techniques has facilitated studies in neurophysiology and neuropsychology that are giving us modern evolutionary and developmental psychology and thus the evolution of mind, in both its emotional and its rational aspects—the evolution of love and logic. And new computer simulation and analytical techniques promise to give us correspondingly modern econometrics, sociology, and political science (see Hawking 1988; Chaisson [1981] 1989; Swimme and Berry [1992] 1994; de Duve 1995; Dennett 1996; Holmes 1996; Ashbrook 1997; Barlow 1997; Deacon 1997; Goodenough 1998; Rue 2000.)

These modern scientific developments have given us powerful medical, agricultural, manufacturing, transportation, and communication technologies that have had revolutionary effects on our physical, economic, and social worlds. Humans now have possibilities for much longer and healthier lives and greatly increased ranges of productive and recreational activities. There has been a major increase in the global human population and a globalization of physical, economic, and cultural dispersion and interaction, with resulting cultural intermixing, pluralization, and possibilities for mutual interaction and cultural enrichment.

The new technologies have also been a major enabling factor in the development of the modern sciences themselves, beginning with the development of new equipment for observation and measurement. In particular, modern computer technology has provided enormous expansions in computational and data processing capabilities and thus has enabled the

processing of enormous amounts of observational data. This technology has enabled the development of powerful simulation techniques that can supplement the more traditional observational techniques in fields of scientific research where the collection of observational data is hindered by physical, economic, and ethical constraints.

Modern science has also led to major changes in our basic overall view of the nature and operation of the cosmos and of ourselves as part of it. The cosmos is now viewed not as a static or cyclically changing complex but as an emerging and evolving one, of which we are an evolving part. More fundamentally, it is probably to be viewed as like a complex of activities or processes as much as a complex of things—like a complex of doings as much as a complex of beings. However, it may be more accurate to say that, as an electron or a photon is in essence neither a particle nor a wave but something beyond our everyday human experience and our evolving capabilities for comprehension and description (and as matter and energy are two aspects or forms of something beyond), so the cosmos is to be viewed as neither doing nor being but as something beyond doing and being, as we understand and define them. Furthermore, as pointed out by Thomas Kuhn (1970) and others, consideration of the history of science shows that science has also emerged and evolved—as an evolving story of an evolving being and doing we call the cosmos—so this modern worldview, wonderfully accurate as it seems to be, is to be viewed as tentative and still evolving.

Modern science has also changed our view of our position in the cosmos. In one sense, we are physically not at the center of the cosmos—there is no such center. However, in another sense we are. Our physical size is somewhere near the same number of orders of magnitude larger than the size of a photon or electron as it is smaller than the size of the cosmos as a whole (Morrison et al. [1982] 1994). But so are many of the other species of life on Earth. And we are clearly related by DNA to all other species (not "different in kind" from them, as many philosophers and theologians have claimed). We are dependent for our continuing existence on many if not most other species. We are thus part of a sort of superorganism we can call the biosphere, which has emerged and evolved or developed over the past few billion years. And, as we have developed and employed our sciences and technologies, we have become increasingly able to exercise some degree of conscious control over the biosphere. The emergence and evolution of this ability is somewhat analogous to the emergence and evolution of animal brains and their ability to consciously control animal bodies. Thus the human species is in a sense the "brains" of the biosphere, our global ecosystem, and, so far as we now know, of the cosmos. In other words, in the human and perhaps some closely related species, the cosmos has become conscious of itself (Swimme and Berry [1992] 1994, 39–45).

These new concepts of the nature of the cosmos and of our nature as part of the cosmos border closely and have significant effects on philosophy and theology and should be expected to lead to a new philosophy and theology for our age of science, our new axial age.

A Thoroughly Modern Theology

As scientists try to consider all available evidence, so should theologians. The evidence available to theologians includes that provided by the various major world religions and associated religious texts. Many theologians are seriously trying to do this. Many more are admitting that they should try but are still tending to stay with and emphasize the particular tradition with which they are most familiar and comfortable. These include Ian Barbour (1997, 160; 2000, 177–78), Gordon Kaufman (2001, 347), Hans Kung ([1987] 1988, 250), and Arthur Peacocke (2000, 131). Perhaps the most common reason for staying with one tradition is the belief that it is based on the most direct, clear, and believable divine revelation, difficult and questionable as such judgments may appear to an outside observer—especially to one versed in new developments in evolutionary neuropsychology and sociology, to whom the basic concept of and evidence for revelation as a process would seem to require critical review.

Theologians also usually recognize that as the sciences have evolved and changed, so have religion and theology. There have been axial ages or periods in which revolutionary developments have occurred, but traditions have not been static between such periods. The history of religions has exhibited a sort of punctuated equilibrium behavior not unlike that exhibited by the evolution of living species (as suggested by Stephen Jay Gould in de Duve 1995, 296). Such developments have tended to be associated with scientific developments, so closely that it can perhaps be said that science and theology have been engaged in a kind of dialogue, though usually not fully consciously and deliberately.

Then how can theology be expected to react to the new worldview provided by modern science? Paul Tillich has suggested that the *theos* with whom/which theologians are concerned should be considered to be not a being (even The Being) but rather "The Ground of Being" (Kaufman 2001, 336). But if the cosmos is as much an activity as a thing, as much doing as being, as much actuality as reality, so the *theos* should be considered to be the activator of doing as much as the ground of being. To go further, the *theos* should perhaps be considered as much actuality as reality, as much doing as being, as much active process as static principle—but as beyond both actuality and reality, both process and principle as we understand them. For the purposes of this paper, it is appropriate to emphasize the aspect not heretofore usually emphasized. Therefore, it will be asserted that the *theos* as process is the activator of the cosmos as process, which

includes life as process and us humans as processes. This is process all the way down!

Hindu theology suggests that, though inherently beyond such description, the *theos* can usefully be described in terms of attributes. The foregoing discussion suggests that the attributes may be conceived to be functions performed by the *theos*, including (probably) a creating and empowering function, (possibly) a guiding and enlightening (and even inspiriting and inspiring) function, and (perhaps) a realizing and actualizing function. These are not the creating, sustaining, and destroying functions sometimes attributed to the Hindu Brahma, Vishnu, and Shiva, respectively. Nor are they the functions usually attributed to the Christian Father, Spirit, and Son, though some similarity may be noted. Correspondence may be closer to some meanings of the Greek terms *nomos*, *nous*, and *logos* (see Kittel 1967). In Stephen Hawking's language (1988, 174), *nomos* may provide the equations while *nous* provides the fire in them.

But note that this concept of *theos* does not involve what we usually think of as personality or personhood, which are biologically emergent qualities (nor is this *theos* love or logic). The concept is not anthropomorphic or even quite biomorphic. Nevertheless, as an activity or process, the *theos* operates with and within space-time and may even emerge and evolve with and within expanding space-time in interaction with the emerging and evolving cosmos. But the concept does not involve omniscience or omnipotence as usually defined. Nor is it truly pantheistic or panentheistic; the *theos* and cosmos are not one, and neither is contained by the other. Nevertheless, the theology may be called a kind of process theology.

Guidance as one of the functions conceived to be performed by the *theos* implies the existence of some goal or purpose as the basis for such guidance and thus some meaning for the cosmos. The achievement of ever increasing complexity is one possible cosmic goal. This increasing complexity may in turn have the achievement of life as an objective. And life of increasing complexity may have the achievement of conscious, self-aware, and eventually fully cosmos-aware life as its objective (Swimme and Berry [1992] 1994, 39–40, 44–45; de Duve 1995, 301). But the achievement of such increasing complexity of life forms has involved (and may have required) the emergence and survival for appreciable periods of a multitude of species of living cells, multicelled organisms, and multiorganism societies. As Edward Wilson (1998, 255), Loyal Rue (2000, 105), and others have suggested, continuation of life for some significant period must be the first objective for each living individual, conscious or preconscious, without which it can do nothing else. However, the achievement of the larger purpose of the organism, society, or cosmos of which the individual is a part generally requires that the individual relinquish its life at some time, if only to make room for other individuals that may have greater capability for achieving the overall objective. Thus, both individual and

group survival and well-being are necessary and legitimate goals, as are both species and ecosystem survival and well-being, but the less inclusive and shorter-lived categories exist only as parts of the more inclusive ones, and the survival and well-being of the more inclusive ones must take precedence.

It may be noted in this connection that in the modern scientific worldview the existence of separate souls that can survive the death of bodies seems rather unlikely. However, the maximum human life span now seems to be about one hundred twenty years, at the end of which a person may have little interest in further prolonging his or her life. This may be especially true for those who think of their lives primarily in terms of participation in the activity of larger groups, up to and including the global ecosystem, rather than in terms of individual and self-centered activity.

But is the achievement of a cosmos that is alive and conscious of itself the ultimate objective, the ultimate value? Perhaps this is still just a means to an end. What could the end be?

I suggest that the end is in the means, the purpose is in the process, and that the process, so far as we can tell, is life. Observation of all forms of life that may be conscious suggests that the ultimate goal and value may well be best described in our limited human terms as global if not cosmic joy in the process of living—or, as the French put it, *joie de vivre.*

But these terms are limited. The description here presented is intended to be, and cannot be more than, a reasonably comprehensible and useful model or picture (and what could perhaps be called a "cosmomorphic" picture) of what is inherently beyond human comprehension and description.

A Modern Global Ethics

If cosmic *joie de vivre* can be taken to be the ultimate goal of the cosmos, it seems logical to suppose that a consequentialist, utilitarian system of ethics should be based on the general principle that the best choice among alternative courses of action that are available in any given situation will be the one that best supports achievement of this cosmic objective. The nature of the objective suggests that the system should include aesthetic as well as ethical, emotional as well as rational, considerations to achieve beauty as well as goodness, building on the truth provided by science.

This principle encompasses the human-to-human portions of the ethical systems promulgated by major religious traditions: most of the Buddha's Noble Eightfold Path, six of the Judaic Ten Commandments, the second of Jesus' two great commandments, the fourth of Islam's Five Pillars of Wisdom, and so on. However, it goes beyond the ethics of "the descendants of Abraham" in that it enjoins us not only to consider the effects of our actions on other humans but also their effects on all other living species.

This means that we should extend Kant's categorical imperative to cover all species: We should treat all living species, domesticated and wild, not

merely as means to our ends but as ends in themselves—deserving of preservation for the species and good lives and painless deaths for the members. It means that neither the human species nor any other species should be allowed to grow to such numbers that major extinctions of other species result. It means that insofar as our technologies allow us to affect the welfare of the biosphere as a whole, as well as that of individual species, we should accept responsibility for the achievement of such welfare. It means that even for animal species that we develop and grow for food we should provide good lives and painless deaths. We are all part of one global ecosystem, one superorganism, one global family.

This also means that we should preserve a good physical environment for the biosphere. We should not unduly pave over or pollute the landscape or the seascape or pollute or unduly warm the atmosphere and thus make them unsuitable as habitats for the living species.

These new concepts of broadened responsibilities clearly indicate that our concepts of human rights, especially human rights to property and its treatment, require major modification. This ethics is clearly much more far-reaching and all-encompassing than currently accepted philosophical and religious ethical systems. It is a post-traditional ethics, an ethics for a new axial age.

A Religion for a New Axial Age

The origin of the word *religion* (see Brown 1993) suggests that one's religion should tie back or connect one to a community, to the cosmos, and to the source of the cosmos. So, insofar as all of these are processes, connection to them must also be a process. This process involves praising and pledging support—first expressing appreciation for the beauty and goodness of the human community, the biosphere, and the cosmos, and for the *theos* as the source of all of this beauty and goodness, and then pledging efforts to enhance and not diminish the global beauty and goodness, the global *joie de vivre.*

Practicing such a religion may involve participation in regular religious services. These services could include prose, poetry, and music recognizing "worthship," expressing praise, and pledging active support of aesthetic and ethical objectives. They could also include educational and instructional statements regarding religious principles, aesthetic and ethical principles, and more specific approaches and measures to be pursued in achieving aesthetic and ethical objectives. In short, the services could be quite similar to the religious services of most Christian churches—though they would not involve praise and prayer addressed to a listening and responding personal God or the usual sacramental rituals and scripture-reading; nor would they limit attention to the human portion of the cosmos, but rather they would involve attention to the global ecosystem and the whole cosmos.

Application of these principles to services and practices designed to be similar to those of the Judaic and Islamic communities leaves perhaps less to imitate. The practices of Hindu, Buddhist, Daoist, and Confucianist communities do tend to include meditation in their rituals in ways that could be applicable to the proposed religious faith, but much else present in the services and practices of most believers would seem to be excluded.

Thus, what has been described is a religious faith and practice that is markedly different from that of any of the current world religious traditions. It has been conceived as a new and fresh approach in the development of a religion for an age of science—and technology. This age is culturally a new axial age that can be expected to require and inspire the development of a religion that is new and different. What has been described herein is suggested as a possible candidate for the task of serving as a new faith, the beginning of a new tradition, a religion for the new axial age.

NOTE

1. The term *theos* is used in this paper to emphasize the connection with *theology* and to help discourage association with the characteristics usually associated with the term *God*.

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