

# Zygon @ 49

with Ian G. Barbour, "Zygon's Dual Mission."

## ZYGMON'S DUAL MISSION

by Ian G. Barbour

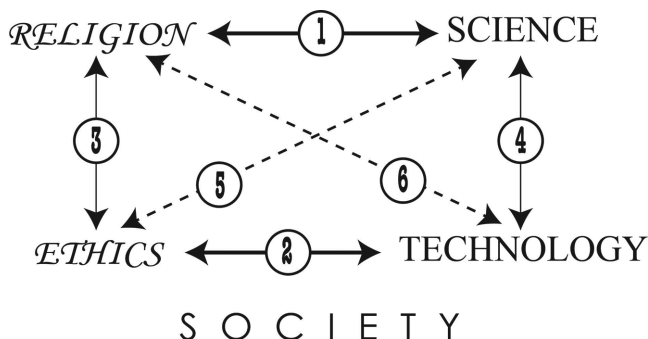
*Abstract.* The first mission of *Zygon* has been the exploration of the relation between *Religion* and *Science*. The second, I suggest, has been consideration of the relation between *Ethics* and *Technology*. Some articles have given attention to the relation of *Religion* to *Ethics*, or that of *Science* to *Technology*. The interaction of *Ethics* and *Science*, and that of *Religion* and *Technology*, are also significant. I give examples of articles or symposia in each of these categories and close with great hope for *Zygon's* future.

*Keywords:* ethics; religion; science; technology; *Zygon: Journal of Religion and Science*

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*Zygon: Journal of Religion and Science* is to be congratulated as it nears 50 years of significant contributions to the dialogue between the two disciplines in its subtitle. I was on the first editorial advisory board and wrote articles for its inaugural issue in 1966 and 13 subsequent issues. The journal has included a rich variety of articles over the years; I am proposing a typology that would include most of them. I will suggest that in addition to dealing with *Religion* and *Science*, the journal has frequently examined the intersections of *Ethics* and *Technology* (as shown by horizontal arrows in Figure 1). In addition to commenting on this dual mission, I will look at four other interactions among these disciplines: *Religion/Ethics* and *Science/Technology* (vertical arrows); also *Religion/Technology* as well as *Ethics/Science* relationships (diagonal arrows). These interactions should always be placed in the broader context indicated by the word *Society*. We are not talking about abstract concepts but about real people with roles in institutions: universities, corporate laboratories, political parties, legislatures, churches, and so forth. I will close with some comments on the journal's future in a religiously pluralistic, scientifically exciting, ethically challenging, and technologically exploding world.

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**Figure 1.** The dialogue between the academic disciplines most relevant to the mission of *Zygon* are shown by horizontal arrows (1 and 2). Vertical interactions (3 and 4) and diagonal ones (5 and 6) have also been explored. The wider context of SOCIETY has often been discussed.

#### RELIGION AND SCIENCE (RELATION #1)

*Religion* is a broad term encompassing many phenomena such as myths, rituals, leadership roles, and institutions, in addition to religious beliefs. By contrast, *theology* refers only to religious beliefs. The Center for Theology and the Natural Sciences (CTNS) in Berkeley, California, founded and directed by Robert Russell, appropriately uses the word *theology*, as does its quarterly journal, *Theology and Science*. CTNS is an affiliate of the Graduate Theological Union, a consortium of eight Protestant and Roman Catholic Seminaries (plus affiliated Jewish, Islamic, and Buddhist centers). CTNS has given particular attention to “Scientific Perspectives on Divine Action” in a series of influential volumes based on conferences cosponsored by CTNS and the Vatican Observatory (see Wildman 2004). *Theology and Science*, launched in 2003, has continued the discussion of divine action, but has included many other topics, including reflections on human nature in the light of biology, anthropology, neuroscience, and other sciences. It has also included Jewish, Islamic, and occasional Buddhist, Hindu, or naturalistic authors.

Many issues arising from science are considered at the Center for Theological Inquiry at Princeton Seminary which stands in the Presbyterian tradition. The American Scientific Affiliation (ASA) publishes *Perspectives in Science and Christian Faith*, whose contributors are mainly Christian conservatives or evangelicals. A similar constituency contributes to *Science and Christian Belief* in England. The European Society for the Study of Science and Theology (ESSSAT) sponsors conferences leading to publication, usually in book form, though occasionally in *Zygon*. *Zygon* presents a wider range of alternative worldviews than any of these other journals.

*Religious Naturalism* has been strongly represented in *Zygon's* history. Its defenders are varied but have in common a respect for evolutionary science, a rejection of supernaturalism, and an interest in diverse human responses to nature: interpretive, spiritual, aesthetic and moral, as well as scientific. A central theme is that we are part of the interconnected, ongoing, web of life which we should revere and celebrate if we are to avoid harming it. An eloquent voice has been that of the biologist Ursula Goodenough, author of *The Sacred Depths of Nature* (Goodenough 1998). Three of the four editors of *Zygon* (Ralph Burhoe, Karl Peters, and Willem Drees) have defended Religious Naturalism, albeit with differing emphases (see Stone, 2008).

Each author in *Zygon* is asked to give several keywords characterizing his or her article. On the Web site a viewer can type in a word of interest, call up a list of all the articles whose authors have identified it as a keyword, click on an entry, and immediately view an abstract of the article and the other keywords used by the author to characterize it. An author has to decide which keywords would be most helpful to readers, and I in turn have to guess for which words to search, so the numbers below provide only a rough estimate of the relative importance of various topics in the journal's history.

Here are the number of articles or editorials between 1966 and 2013 when I chose the following keywords concerning religion that I thought someone might use in discussing "Religion and Science" (with similar terms grouped together): Religion 300, Christianity 80, Islam 53, Buddhism 34, Judaism 33, Hinduism 10, Indigenous Religions 5; Ritual 170, Myth 110; Religious Experience 200, Mysticism 36; Theology 300, Natural Theology 240, Religious Beliefs 110, Argument from Design 110; Theism 80, Panentheism 26, Pantheism 12, Religious Naturalism 100, and Atheism 30. The low count for "Christianity" (80) compared to "Religious Naturalism" (100) presumably reflects the tendency of many authors to assume Christianity when they use the word "Religion," whereas Religious Naturalists usually identify themselves as such. Many of these articles emphasize the diversity *within* a religious tradition, which should warn us against oversimplified generalizations.

*Science* is, of course, a very broad term. *Zygon* contributors have included many outstanding biologists, geneticists, molecular biologists, geologists, astronomers, physicists, a few chemists, and more recently neuroscientists. Philosophers of science interested in each of these fields have written for *Zygon*. Biological evolution has been the most prominent scientific field, often coupled with sociocultural evolution as biocultural evolution. Nonhuman organisms have been of great interest, whether early hominid discoveries, primate studies, or theories of the origin of life on our planet. Some version of "the evolutionary epic" is a recurrent theme, running the gamut from scientific studies to broad visions of humanity's place in

cosmic history. The social sciences—cultural anthropology, sociology, and psychology—have been well represented in the journal. The Information Revolution, Artificial Intelligence, and Cognitive Science have also been featured. Attention is frequently given to methodological or historical questions in all these fields.

Of particular interest in recent years were two attempts to “explain” religion. The first, proposed by Michael Persinger (1987), claimed that the neural patterns and the reported experiences induced by a magnetic field helmet over the temporal lobe of the brains of ordinary people are similar to those of epileptics and religious meditators. The second, proposed by Pascal Boyer (2001), argued that a “hyperactive agency detector” arose as a cognitive module in the brains of hominids; for example, mistaking a stick for a snake has survival value compared to mistaking a snake for a stick. The module was then used to imagine supernatural agents. Many *Zygon* articles discussed these and similar reductionistic claims.

A *Zygon* search shows the number of articles with the following keywords: Physics 200, Quantum Theory 76, Relativity 23, Entanglement 5; Cosmology 85, Big Bang 35, Astronomy 25; Evolution 270, Biology 195, Origin of Life 140, Genetics 52, Molecular Biology 35, DNA 33; Emergence 330, Complexity 85, Chaos Theory 36; Evolution of Religion 258, Cognitive Science of Religion 120; Primates 13; Artificial Intelligence 40; Anthropology 120, Psychology 165, and Sociology 32. Emergence at 330 is a surprisingly popular topic, followed by Evolution (270).

#### ETHICS AND TECHNOLOGY (RELATION #2)

Several types of ethics have been defended by philosophers and theologians and examples of most of them can be found in *Zygon*.

*Utilitarian Ethics.* Here, decisions are judged entirely by their consequences, not by intentions, motives, rights, or duties. One such criterion is “the greatest good to the greatest number,” maximizing the total good. Economists use cost/benefit analysis, asking what people would pay for a benefit or pay to avoid a cost. But the benefits may accrue to some people while other people pay the costs; think of a coal-burning plant. So a principle of distributive justice should be introduced. Consequences for future generations are heavily discounted (at the rate that market investments would earn). Only humans are included and harm to animals or other forms of life is ignored. Indirect costs (called externalities), such as resource depletion or global warming, are not considered. Consequences are discussed by many *Zygon* writers who weigh costs against benefits, occasionally using more formal cost/benefit analysis.

*Rights and Duties.* Rights were once based on divine decree, as in “the divine right of kings.” The Roman Catholic tradition has for many centuries defended the idea of a “natural law” built into the created order.

After the Enlightenment, “natural rights” were assumed, as in the U.S. Bill of Rights. Several *Zygon* authors have invoked the UN Declaration of Human Rights as a basis for proposing policies concerning global crises in energy, water, or food. But a right is only an idealistic hope unless one specifies who has a duty to respond to violations of that right (concerned individuals, voluntary groups, corporations, or states?). Individual rights are sometimes viewed as absolute. The “right to life” of a fetus is said to be “inalienable” and must be protected regardless of the cost to the mother or society. While talk of rights may be helpful in international contexts (such as the United Nations, or the U.S. efforts to get China to improve its record on human rights), it needs to be supplemented by other types of ethics in debating local or national decisions.

*Virtue Ethics.* Philosopher Alasdair MacIntyre’s *After Virtue* (MacIntyre 1981) has been influential in considering ethics within a family, church, synagogue, or community. Character education occurs within particular religious or secular traditions. Effective choice of the good requires habits and practice as well as rational reflection. The theologian H. Richard Niebuhr has proposed an ethic of response and responsibility (Niebuhr 1963); he suggests that if we are grateful for creation and redemption, we will respond by reaching out to others. Ethics of virtue or response are rare among *Zygon* contributors but may be important for authors addressing particular religious communities.

*Value Ethics.* A value is a broad goal sought in individual and social life. Values can be defended on either religious or secular grounds and then applied as shared criteria in policy choices. Elsewhere, I have discussed Individual Values (food and health, meaningful work, personal fulfillment); Social Values (social justice, participatory freedom, economic development); and Environmental Values (resource sustainability, environmental protection, respect for all forms of life; Barbour 1993, chaps. 2 and 3). Note that here freedom is understood positively as participation in the decisions that affect one’s life, rather than negatively as the absence of governmental regulations. I believe that Value Ethics are particularly helpful in the appraisal of technology, but this need not exclude the other types of ethics above.

The *Zygon* search shows the following number of entries for keywords: Ethics 180; Utility 8; Happiness 13; Rights 340; Human Rights 320; Natural Rights 255; Duties 12; Virtues 9; Values 200; Health 85; Freedom 90; Justice 40; Sustainability 5; Development 190; and Economic Development 45. Note that “Rights” (340) are the most frequent approach to ethics, followed by “Values” (200).

Technologies have changed greatly over *Zygon*’s history. In 1966, the Information Revolution had barely begun. DNA had been discovered but biotechnology was a dream rather than a reality. Medical technologies have made enormous advances over these years, creating huge financial

burdens on health delivery systems. The Green Revolution in agriculture had started, using selectively bred natural strains, but few people were thinking of genetically modified crops. Agribusiness and corporate farms were beginning to expand. The basic energy options have changed little, but economic and political forces (more than scientific discoveries) have encouraged some and held back others.

The Office of Technology Assessment was established by Congress in 1972 to provide advice on legislation. It was supervised by a committee of six Democrats and six Republicans. It produced many valuable studies of new technological options, typically using cost/benefit and risk/benefit analyses and the judgment of outside experts. Unhappily, it was abolished in 1995 when cooperation between the political parties became more difficult. The National Academy of Sciences has continued to produce comprehensive studies of particular technologies, drawing on its own members and experts from government agencies, industry, and academia.

The number of *Zygon* articles with the following keywords were: Technology 180, Technology Assessment 24; Energy 80, Nuclear Power 18, Energy Conservation 10, Solar Power 4, Coal 3, Global Warming 3, Fuel Economy 2; Medical Technology 60, CAT Scan 15; Water 25; Genetic Engineering 24, Cloning 13, Genetic Modification 11; Food 22, Agriculture 12; Computers 11; and Pollution Control 5. Interest in energy-related technologies seems to have been relatively evenly distributed over the time period, while interest in Genetic Modification is mostly recent.

### RELIGION AND ETHICS (RELATION #3)

So far, we have examined two dyads on the pages of *Zygon*, defined by the two horizontal arrows in Fig. 1: Religion/Science and Ethics/Technology. But Religion cannot be separated from Ethics, and Science cannot be separated from Technology, so we have two vertical arrows in the diagram. In the first case, *religious* traditions hold up distinctive *ethical* ideals, such as "love thy neighbor as thyself," though they have seldom lived up to them. Most religions have had both prophetic voices challenging the status quo and priestly classes dedicated to preserving it. Christianity has had its saints and prophets, but also its autocrats and persecutors. It has been influential in social progress (hospitals, schools, the civil rights movement) and it has also engendered violence (crusades, clashes in Northern Ireland, Ku Klux Klan lynchings). It has often been impressive in acting to relieve suffering (soup kitchens, aid to victims of starvation) but it has less frequently been concerned about justice rather than charity, or about changing the conditions that produce hunger and starvation. Similar departures from their own ideals are evident in other religious traditions.

In today's marketplace of religious institutions, some people have moved from the tradition in which they grew up to a different tradition because they were attracted to its ethical stance (liberal or conservative) or its practices (such as meditation) as much as to its theology or religious beliefs. Religious Naturalists and both theistic and nontheistic Unitarians have been vocal in defending gender equality, environmental awareness, and social justice. Historical and sociological studies of such groups can help us understand them. The previous keyword counts for "Religion" and "Ethics" show some common entries. It would be nice to have a program to find the intersection of those two sets, but it would be tedious to attempt to compare them individually. The social context (indicated by the word *Society* at the bottom of Fig. 1) is especially relevant here.

#### SCIENCE AND TECHNOLOGY (RELATION #4)

Many people think of technology as applied science. Physical theories led to the laser which led to all those CDs and DVDs. But many technologies grew from solutions to practical problems that in turn contributed to the formulation of new theories. Skillful lens grinders in Holland made the lenses for the telescope with which Galileo discovered the moons of Jupiter, providing support for his theory that the earth goes around the sun rather than vice versa. Solid-state physicists studied superconduction at very low temperatures, whereby powerful magnets could be built for the proton collider under the Swiss-French border, leading to the confirmation of the existence of the Higgs boson predicted on theoretical grounds 40 years earlier. Similar two-way interactions between genetic science and genetic engineering are evident in biotechnology today.

One school of thought in the Sociology of Knowledge insists that there is no such thing as objectivity in either science or technology because both are so strongly influenced by their social contexts and intellectual assumptions. It is true that the selection of scientific problems to be studied is determined largely by the interests that fund it (in government, industry, and even university settings). Feminists have pointed to gender biases in studies of human health and primate behavior. But most scientists hold that the testing of theories against experimental evidence eventually provides a built-in corrective to such biases.

Technology, on the other hand, is more clearly influenced if not determined by the interests of its sponsors. Pharmaceutical companies pour billions into new medications for relatively minor ailments in affluent countries, but little into the treatment of debilitating diseases common in the Third World. The coal and oil industries have extensive lobbies and TV ads not only opposing pollution regulations but casting doubt on the overwhelming evidence that global warming is caused by human activities.

There are many studies showing how the social context of a technology has been crucial to its history.

Studies of the relation of Science to Technology show up in the *Zygon* search under such keywords as: History of Science 200; History of Technology 120; Philosophy of Science 240, Philosophy of Technology 120, and Sociology of Knowledge 45. Articles confined solely to the relation of Science to Technology may not be appropriate for *Zygon*, but they can illuminate the social contexts that are so important in discussing religious and ethical issues.

#### ETHICS AND SCIENCE (RELATION #5)

It has been said that an “ought” cannot be derived from an “is.” To try to do so has been called “the naturalistic fallacy.” Prescriptive conclusions cannot be derived from descriptive premises. Science can tell us what is possible but not what is desirable. *Social Darwinists* since Herbert Spencer have justified ruthless competition in capitalism as an example of “the survival of the fittest.” This ignores the fact that evolutionary survival has often depended as much on cooperation and symbiosis as on competitive strength. Social Darwinism was also discredited when it was used to justify eugenics in Nazi Germany, where mentally retarded, physically handicapped, and Jewish citizens in the millions were killed.

Work in Sociobiology and Evolutionary Psychology has evoked extensive debates about the evolution of *altruism*. A soldier ant cannot reproduce and will sacrifice itself to defend its queen. A bird’s life is at risk when it pretends to be wounded to distract a predator from offspring in the nest. In each case, more of its genes will reach future generations. Siblings and close relatives are favored over unrelated individuals (kin selection). If one individual helps another, it may be because it expects to be paid back (reciprocity). Richard Dawkins has popularized the phrase “selfish gene,” though the adjective describes an outcome rather than a motive. But research demonstrates that unrelated primates are capable of sharing food and show empathy in helping each other.

A broader question is the relation of *nature* and *nurture* in human development. The distinction between nature and nurture breaks down when we realize that organisms are not only selected by their environment but are active in selecting or creating their environmental niches. To what extent are we determined by our genes or by our neurons? Can free will be defended? Despite the roots of human abilities in earlier life forms, the presence of abstract symbolic language gives us a unique ability to creatively imagine future alternatives and their consequences.

Occasional articles have examined ethical issues arising in a scientist’s *practice*. Plagiarism and failure to give credit to other scientists are rare, not because scientists are virtuous but because experiments must be



reproducible by others (though this is hindered by secrecy in corporate-sponsored research). Engineers and doctors are more likely to discuss “professional ethics” than physicists or biologists. Occasional *Zygon* articles have discussed doctor-patient relationships, ethics committees in hospitals and universities, informed consent by research subjects, the suffering of research animals, invasion of privacy in gathering human data, and “conflict of interest” when the study of a new drug is funded by the company that makes it.

Concern about Environmental Ethics has grown enormously over *Zygon*’s history. New journals have been founded which specialize in environmental philosophy, theology, and ethics, but articles on such questions show up occasionally in *Zygon*. How can one defend the importance of preserving wilderness areas and endangered species, beyond their value to humans? How should one balance the benefits of pollution reduction against the costs, including the loss of jobs?

The number of articles under each of my chosen keywords here was: Environmental Ethics 84; Medical Ethics 67; Evolutionary Ethics 120; Social Darwinism 35; Altruism 75; Selfish Gene 28; Morality, 100; Love 90; Cooperation 39; Empathy 28; Nature and Nurture 16; Genetic Determinism 22; Original Sin 85, and Free Will 320 (listed most frequently).

#### RELIGION AND TECHNOLOGY (RELATION #6)

The final diagonal arrow in my diagram connects religion and technology. An article by Rustum Roy is entitled “Religion/Technology, not Religion/Science, as the Defining Dichotomy” (Roy 2002). Some articles are studies of the impact of specific technologies on individuals and congregations, such as the growth of television ministries and the use of TV screens in megachurches. Other articles have explored the influence of computers and social media on personal and political life. But *Zygon* has published several symposia on wider issues. One was a symposium in 2002 on “Human Meaning in a Technological Age.” Another was “Techno-Secularity and Techno-sapiens,” in which 22 authors were asked to respond to an article by John Caiazza (2005). A 2006 symposium was on Bronislaw Szerszynski’s *Nature, Technology and the Sacred*, which argues that technology brought not the disenchantment of the sacred but its transformation (Szerszynski 2005). Former *Zygon* editor Philip Hefner has written about our role as “created co-creators” (Hefner 1993), but others have said that we are “playing God” when we try to alter nature excessively. Some of the articles take a pessimistic view, stressing the harmful possibilities of technology, but more are very hopeful for its future.

Some keywords for such issues might be: Religion and Technology 190, Technological Age 80, Technology and the Church 75; Information Age 350, Social Media 90; Robots and Human Nature 270;

Technosecularity 16; Cocreator 21, Playing God 13; Extended Life 31, Genetic Engineering 26, and Transhumanism 5. Information Age tops the list at 350, and many of the articles cited there explore religious implications.

Most of the articles and symposia in *Zygon* fall in one or more of the six categories set forth above. But there may be some that are so creative and original that they defy classification. A few stay within just one field, but offer valuable information or are part of a symposium in which other participants raise interdisciplinary questions. We have to trust the judgment of editors and referees in what must sometimes be difficult decisions about the suitability of manuscripts submitted.

#### EXAMPLES FROM TWO SYMPOSIA

Let me give examples of what I take to be the two central missions of *Zygon*. The first, exemplifying the Religion/Science track, is a symposium on the social nature of selfhood, published in 2011, that came from a week-long IRAS conference organized by psychologist John Teske. Among its eight articles is one by Phillip Cary on “Philosophical and Religious Origins of the Private Inner Self” (Cary 2011). Anindita Baslev looks at Hindu concepts of selfhood (Baslev 2011), and psychiatrist Amy Banks writes “Developing the Capacity to Connect” (Banks 2011). Lawyer Steven Winter presents “Reimagining Democratic Theory for Social Individuals” (Winter 2011). Teske himself describes the embodied and embedded self, exploring ways in which selfhood is constituted by bodily and social interactions (Teske 2011). This conference was oriented toward reflection and analysis rather than action, and it did not try to formulate any manifesto or declaration.

Another IRAS conference in 2013, at which my 90th birthday was celebrated, exemplifies the Ethics-Technology track. Organized by theologian Patricia Bennett and anthropologist Sol Katz, it included experts with experience from around the world speaking on the many facets of hunger, malnutrition, food, and agriculture. Katz himself described his research on blue corn in a Hopi Indian culture, pointing out the interactions between its agricultural history, its nutritional value, the rituals of food preparation, and its role in their creation myths. Another speaker had experience with efforts to improve inner-city diets and to encourage urban vegetable plots. Government policies for agriculture and for overseas aid as well as church programs for emergency and long-term relief were analyzed and often criticized. Obesity was seen as a problem in both low-income families in the United States and in developing countries because in both cases people consume excessive sugars and carbohydrates which are cheap, but of low nutritional value. The conference was action-oriented, with discussions of what we could do in our families, communities, and political opportunities when we went home. The last day was devoted to preparing a Manifesto

to reach a wider public. Some papers emerging from this symposium may be published in a future issue of *Zygon*. A similar IRAS conference devoted to Energy was the basis for an earlier *Zygon* symposium that ended with a Call to Action (Rasmussen, Laurendeau, and Solomon, 2011).

#### LOOKING BACK

*Zygon* is a Greek word for anything that joins two bodies together (from the same root as *zygote* in biology). In the journal's subtitle, the link is between Religion and Science. Among the four types of relation between Religion and Science that I described in the first volume of my Gifford Lectures (Barbour 1990, Chap. 1), *Zygon* is primarily concerned with *Dialogue* and *Integration*. Occasional articles have replied to *Conflict* (fundamentalism at one extreme, materialism at the other). Occasional authors have defended *Independence* (unrelated languages or nonoverlapping domains), which avoids conflict but does not allow the creative interchange to which *Zygon* is dedicated.

In the second volume of my Gifford lectures, I described three attitudes toward technology (Barbour 1993, Chap. 1). The first sees technology as *liberator*, raising living standards, increasing our power over nature, making global communication possible. It is optimistic in looking to the future in a postindustrial society. The second is pessimistic, seeing technology primarily as *threat*. Technology is viewed as an uncontrollable force, imperialistic and addictive, alienating us from nature and from each other. The third views technology as *an instrument of power*; consequences depend on the social context. The interests of institutions such as corporations and government agencies have dominated technological development, but the redirection of technology is possible by political and economic action within such institutions or by local community initiatives. Most articles on technology in *Zygon* seem to agree with me in endorsing this third position.

#### LOOKING FORWARD

I believe *Zygon* has a very promising future. It has become a widely respected journal. It has a relatively small group of individual subscribers and is financed mainly by library subscriptions, which are increasingly online licenses rather than the purchase of printed copies. The publishing agreement with Wiley-Blackwell seems to be working well. Wim Drees is doing an amazing job editing the journal on the Internet from the Netherlands, with occasional trips to confer with the managing staff in Chicago. The size of the journal has been increasing, averaging 254 pages per issue in 2012.

There are other conferences that can provide possible papers for symposia in the future, in addition to IRAS. The John Templeton Foundation has made modest grants to individuals on the themes it selects each year,

but it is increasingly giving substantial grants to universities where a project on a clearly defined topic is administered by a Principal Investigator and colleagues, who then solicit applications from individuals. Editors of the journal will undoubtedly continue to plan articles and symposia on interesting topics and significant new books. Symposia at the annual meetings of the American Association for the Advancement of Science will be an occasional source for articles. Sessions of the American Academy of Religion (AAR) will continue to be helpful. The American Academy of Religion long-standing AAR section on "Religion and Science" has changed its name to "Religion, Science, and Technology." I am not suggesting that *Zygon* change its subtitle, which is long enough as it is, but only that its dual mission be recognized in thinking about its future.

There will be exciting breakthroughs in scientific fields such as neuroscience. In 2011, Christoph Koch started a 10-year program to decode the cortical connections of mice, financed by a \$300 million grant from Microsoft founder Paul Allen. President Obama has announced support of a 10-year effort to "map the brain." The bioengineering of human replacement organs such as heart valves is just beginning. We will see robotics move from laboratories and industrial plants into homes, hopefully in helpful rather than dehumanizing ways. In energy, a significant improvement in the storage capacity of batteries would boost the adoption of electric cars, though not without a cost in pollutants where the electricity is generated. Perhaps algae can be used to capture the sun's energy efficiently. New forms of conservation will remain the most effective options and some will require significant life-style changes.

Changes in Religion seem to be slower and less predictable, but they do occur. Think of new religious movements and theological proposals in the last 50 years. Many Christian theologians today are more outspoken in asserting that death did not enter history because of one man's sin; it is a requirement for the evolution of all forms of life. Others hold that God cannot know the future if chance mutations and human freedom are real. Changes in religious practice can lead to changes in beliefs. Religious Naturalism has a long history and it will continue to develop further in an evolutionary framework.

Ethical convictions change slowly, but they do change. Children today grow up with an environmental awareness children in previous generations never had. Interracial marriages, rare 50 years ago, are now widely accepted, though many forms of racial prejudice remain. The acceptance of gay and lesbian couples has been increasing as people have come to know them. New technologies, such as cyber warfare, or drones used against suspected terrorists, need new ethical analyses; one can no longer use "just war" theories that were formulated for wars between states.

I believe the greatest challenge to *Zygon* is the inclusion of greater *religious diversity*. Contributions on Judaism will continue to be frequent. Buddhism

should be well represented (partly because of the interest of the Dalai Lama and neuroscientists in meditative practices). Contributions from Islamic authors on indeterminism and quantum physics and on creation and cosmology will certainly continue. Muslim interest in Biomedical Ethics has been growing, as seen in a recent symposium (Ghaly 2013). The roles of the Qur'an, Sunna, and the legal schools vary considerably among authors; further debate about the nature of scriptural authority is needed. Evolution is not widely accepted in most Islamic countries (particularly Pakistan and Iran), partly because Darwin is associated with the British imperialism of the nineteenth century and materialism and atheism today.

Hinduism has a rich and diverse history and outstanding scholars in both science and religion; better communication among them and with *Zygon* should be fruitful. In the past, international conferences have allowed face-to-face interaction and personal friendships. Scientists who respect each other as collaborators tend to be less dogmatic than theologians or philosophers who often see themselves as competing with each other. But escalating air fares may dictate a greater reliance on teleconferencing and E-mail symposia.

In sum, we can be very grateful for the journal's past contributions and hopeful for its future in a religiously pluralistic, scientifically exciting, ethically challenging, and technologically exploding world.

## NOTE

This article grew out of a presentation by Ian Barbour in a session to celebrate his upcoming 90th birthday, held at the conference of the Institute on Religion in an Age of Science (IRAS), on "Scientific, Spiritual, and Moral Challenges in Solving the World Food Crisis," Silver Bay, NY, July 27-August 3, 2013. On that occasion, a virtual issue with Ian Barbour's previous contributions to *Zygon: Journal of Religion and Science* was presented to him. This virtual issue is accessible at the journal's home page at Wiley Online Library. Ian Barbour died on December 24, 2013, while this article was in proof.

## REFERENCES

- Banks, Amy. 2011. "Developing the Capacity to Connect." *Zygon: Journal of Religion and Science* 46: 168–82.
- Barbour, Ian G. 1990. *Religion in an Age of Science: Gifford Lectures, 1989–1991, Vol. 1*. San Francisco: Harper & Row. Revised and expanded as *Religion and Science: Historical and Contemporary Issues*. San Francisco: Harper San Francisco, 1997.
- \_\_\_\_\_. 1993. *Ethics in an Age of Technology: Gifford Lectures, 1989–1991, Vol. 2*. San Francisco: Harper San Francisco.
- Baslev, Anindita N. 2011. "The Enigma of I-Consciousness." *Zygon: Journal of Religion and Science* 46: 135–49.
- Boyer, Pascal. 2001. *Religion Explained: The Evolutionary Origins of Religious Thought*. New York, NY: Basic Books.
- Caiazza, John C. 2005. "Athens, Jerusalem, and the Arrival of Techno-Secularism." *Zygon: Journal of Religion and Science* 40: 9–21.
- Cary, Phillip. 2011. "Philosophical and Religious Origins of the Private Inner Self." *Zygon: Journal of Religion and Science* 46: 121–34.

- Ghaly, Mohammed. 2013. "Islamic Bioethics in the Twenty-First Century." *Zygon: Journal of Religion and Science* 48: 592–99.
- Goodenough, Ursula. 1998. *The Sacred Depths of Nature*. Oxford, UK: Oxford University Press.
- Hefner, Philip. 1993. *The Human Factor: Evolution, Culture, and Religion*. Minneapolis, MN: Augsburg Fortress Press.
- MacIntyre, Alasdair. 1981. *After Virtue: A Study of Moral Philosophy*. Notre Dame, IN: University of Notre Dame Press.
- Niebuhr, H. Richard. 1963. *The Responsible Self*. New York, NY: Harper & Row.
- Persinger, Michael. 1987. *Neuropsychological Bases of God Beliefs*. New York, NY: Praeger.
- Rasmussen, Larry L., Normand M. Laurendeau, and Dan Solomon. 2011. "Introduction to the Energy Transition: Religious and Cultural Perspectives." *Zygon: Journal of Religion and Science* 46: 872–89.
- Roy, Rustum. 2002. "Religion/Technology, Not Religion/Science, as the Defining Dichotomy." *Zygon: Journal of Religion and Science* 37: 667–76.
- Stone, Jerome. 2008. *Religious Naturalism Today: The Rebirth of a Forgotten Alternative*. Albany: State University of New York Press.
- Szerszynski, Bronislaw. 2005. *Nature, Technology and the Sacred*. Oxford, UK: Blackwell.
- Teske, John A. 2011. "Externalism, Relational Selves, and Redemptive Relationships." *Zygon: Journal of Religion and Science* 46: 183–203.
- Wildman, Wesley. 2004. "The Divine Action Project, 1988–2003." *Theology and Science* 2: 31–75.
- Winter, Steven L. 2011. "Reimagining Democratic Theory for Social Individuals." *Zygon: Journal of Religion and Science* 46: 224–45.