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Editorial

GOING PUBLIC

Nearly ten years ago, in an address to the American Psychological Association, I argued that religion-and-science is more than a specialized field of thinking; it is part of a larger human search for meaning. I wrote, "When I speak of the search for meaning, I am referring to the effort by men and women to reinstate some sort of congruence between their overarching images of reality, embodying the bases for values and moral behavior, and contemporary knowledge, preeminently scientific knowledge" (Hefner 1996, 309). Furthermore, those of us who are active in this field are accountable to the larger human exploration of meaning.

Many of the articles we publish touch on this larger accountability; it is a clear thread of concern in the issue we here present to you. Holmes Rolston, III (theology, philosophy) speaks of this larger accountability in his focus on the question, How do we rise from the *facts* of natural history, earth's biodiversity, to what *ought to be,* human caring for a valuable creation? Steven Reiss (psychology) roots religion-and-science in the basic drives of the human psyche. Under the rubric of reductionism, Frank Budenholzer (chemistry, theology) and Donald Wacome (philosophy) struggle with how we can appreciate the fact that we are material creatures and still affirm our human distinctiveness.

The symposium "Questions that Shape Our Future," papers from which constitute the second major section of this issue (and which are dealt with in separate introductory articles), touched on a challenging array of basic human questions: What is required for the survival of our species (Mihaly Csikszentmihalyi)? Where will we find moral guidance (Willem Drees)? How can we come to know God (Arthur Peacocke)? How can religion and science explore the "twilight zone" of knowledges that lie outside their conventional disciplines (Vítor Westhelle)? And there are more such questions in the pieces by Ian Barbour, Grace Wolf-Chase, V. V. Raman, Antje Jackelén, and Philip Hefner.

Papers from a Symposium on HIV and the Science-and-Religion Dialogue form the third portion of this issue. They focus directly on the human engagement with disease—hence its theme, "Toward a Theology of Disease." In his preface, James Moore introduces the participants in

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this symposium: Barbara Strassberg, Mary Hunt, Gayle Woloschak, Philip Hefner, and Joseph Edelheit.

It is not always easy for intellectuals, persons who focus on ideas and live for ideas—particularly those who work within academic disciplines, organized in academic institutions—to give priority to what I call the "larger human quest." It is even more difficult to acknowledge that we are *accountable* to that quest. Perhaps this accountability is the purchase of the currently fashionable term *public intellectual.* On one hand, thinkers who are devoted to religion-and-science are intrinsically public intellectuals. On the other hand, the very term *public* seems to imply that one must step outside the daily involvement with ideas in order to enter the public realm. University presidents and department chairs have been known to challenge those who "go public," as if they are shortchanging their institutional communities. More to the point, however, is our recognition that, even when it is carried out within the confines of disciplinary and institutional specializations, religion-and-science is a public discourse with a public accountability.

Two critical issues emerge from this view of religion-and-science. The place of action is a troublesome one. Theory's relation to practice is the issue. Can we reflect on the value of nature without engaging in caring action for the earth? Can we reflect on the survival of our species without acting in behalf of survival? Is reflection on disease empty words apart from healing action? Our finest universities frequently argue that their greatest contribution to society is to focus exclusively on knowledge and ideas, with no regard for behavioral consequences; too quick a move to practice actually distorts the long-term significance and social value of the ideas. This argument can be stated in very persuasive terms. Of course, its cogency rests in the point that the larger accountability can often be served best by refraining from immediate attention to the practical consequences of our thinking. This argument is, obviously, vigorously contested by many theorists and also often by those who fund them. Others argue that the so-called professional schools are the most suitable location for socially accountable knowledge—law, medicine, social work, religious ministry, and the like.

It is no surprise that we are still uncertain as to whether religion-and-science should be located in universities or professional schools, or in both. The very fact that we wrestle with such issues may be the clearest demonstration that our thinking in religion-and-science is a public enterprise.

The second critical issue is the long-term significance of religion-and-science. Does our work in this field have any real, lasting significance apart from its public character? The problems we work with—reconciling sacred texts with Big Bang cosmology, developing concepts of emergence and top-down causality, or elaborating ideas of design in nature—are so intriguing that they can become ends in themselves. Precisely so, and as a

result we can forget that developing our concepts is only the first task; there remains the equally pressing responsibility to deal with the question "What difference do our intriguing ideas make?" This question dare not be subordinated and left out of consideration. The founders of this journal placed this question at the top of their agenda (see the "statement of perspective" in the back matter of this issue): this journal is dedicated to the thesis that religion-and-science can speak of "meaning that provides valid and effective guidance for enhancing human life." Such a mission for the journal or for religion-and-science in general invites the public into laboratory and study. With that invitation comes vigorous discussion and debate, even conflict—because when they are public, the ideas *matter*. That they matter is an indication they are significant.

We conclude this issue with a tribute to Malcolm Sutherland, who died in November 2003. He is one of the journal's founders, without whose vision and hard work *Zygon* would not exist. He served as co-chair of our Joint Publication Board for all of our thirty-eight years of publication. Malcolm was a quintessential public thinker, whose spirit energizes us to this day.

—Philip Hefner

Reference

Hefner, Philip. 1996. "Science-and-Religion and the Search for Meaning." *Zygon: Journal of Religion and Science* 31 (June): 307–21.

Thinkpiece

CARING FOR NATURE: FROM FACT TO VALUE, FROM RESPECT TO REVERENCE

by Holmes Rolston, III

Abstract. Despite the classical prohibition of moving from fact to value, encounter with the biodiversity and plenitude of being in evolutionary natural history moves us to respect life, even to reverence it. Darwinian accounts are value-laden and necessary for understanding life at the same time that Darwinian theory fails to provide sufficient cause for the historically developing diversity and increasing complexity on Earth. Earth is a providing ground; matter and energy on Earth support life, but distinctive to life is information coded in the genetic molecules that superintends this matter-energy. Life is generated and regenerated in struggle, persists in its perishing. Such life is also a gift; nature is grace. Biologists and theologians join in celebrating and conserving the genesis on Earth, awed in their encounter with this creativity that characterizes our home planet.

Keywords: environmental conservation; evolutionary natural history; fact/value distinction; genetic information; nature as grace; order versus contingency; respect for nature; reverence for nature.

There is often thought to be a great divide between *fact* and *value*, two words paired in my title, the famous gap marked by the "naturalistic fallacy." The second pair of words, *respect* and *reverence*, may be thought to be closely entwined. Generally I will here entwine the first two more than many readers may be comfortable with and distinguish the second two more than readers might expect. Respect is but a preamble to reverence. Three of these words—value, respect, and reverence—are likely to elicit

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the first word of my title, *caring*. Along the way I will look at some bridge words: *awe*, *wonder*, and the *sublime*.

How do we rise from the *facts* of natural history, Earth's biodiversity, to what *ought to be*, human caring for a valuable creation? Notice, first, that the signs posted that forbid trespassing this boundary are themselves cultural artifacts, deriving from certain theories about ethics, the moral neutrality of nature, or value as human-interest satisfaction. Experienced naturalists often are inclined to ignore signs about where one can and cannot legitimately go. I cannot promise to provide you with a formal logic across the fact/value gap, but I can give you a good story—exciting natural history. There is something awesome about an Earth that begins with zero and runs up toward 5 to 10 million species in several billion years, setbacks notwithstanding. Something about the long evolutionary toil gives us cause to hope that this drama will continue. That history seems valuable; it commands respect, even reverence.

Now we confront another alleged fallacy, the "genetic fallacy." One cannot move value judgments back and forth from present to past. One does not dismiss the greatness of Abraham Lincoln as president by discovering that he was born in the back woods. One does not dismiss a scientific theory by discovering that it originated in idiosyncratic circumstances. One cannot undermine presently encountered value—so this argument goes—by discovering that it had uncertain origins. Can we not remain puzzled about origins while we greatly respect what we now find on Earth?

One does not have to go so "deep down" to know the "native range" worth. A husband can respect his wife while not knowing what kind of proteins she is made of, much less that she is made of quarks or that her ancestors evolved over millennia of natural selection. Possibly we can know that value is present without knowing its origins. Still, in historical events, processes such as speciation do not separate easily from products such as species. Upon finding a goose that lays golden eggs, it would be odd to admire the eggs and ask no questions about the goose.

Biodiversity and Plenitude of Being

Something is increasingly learned across evolutionary history: how to make more kinds and more-complex kinds. This seems to be an undeniable truth about natural history, although we next wonder how far neo-Darwinism, the prevailing paradigm, is competent to provide an adequate explanation for how this happens. We do not think that there is any progress as the planets spin around the sun or gases swirl around Jupiter. There is none on Earth with the passing of cold and warm fronts; they just come and go. Likewise with the rock cycles, orogenic uplift, erosion, and uplift again.

But there is no natural selection there either—nothing is competing, nothing is surviving, nothing has adapted fit. Biology seems different.

Climatological and geomorphological agitations continue in the Pleistocene period more or less as they did in the Precambrian, but the life story is not the same all over again. Where once there were no species, now there are five to ten million. It seems evident that, on average and environmental conditions permitting, the numbers of life forms start low and end high. Diversity increases.

So does complexity. With genetic evolution, organisms gain the capacity to acquire new information over historical time and to store and transmit this information. All of them start simple, and some end up complex; there are trends over longer-range time scales, and something is at work in addition to the mere tracking of drifting environments. The life process is drifting through an information search and locking onto discoveries. It is cybernetic or hereditary, as geomorphic processes are not. There is no cumulation of information in the hydrologic, climatological, orogenic cycles, but there is in the birth, life, death, genetic cycles. Biology is historical in ways impossible in physics or geophysics.

Ernst Mayr, though he realizes that *higher* is a troublesome word in biology, still asks:

> And yet, who can deny that overall there is an advance from the procaryotes that dominated the living world more than three billion years ago to the eucaryotes with their well organized nucleus and chromosomes as well as cytoplasmic organelles; from the single-celled eucaryotes to metaphytes and metazoans with a strict division of labor among their highly specialized organ systems; within the metazoans from ectotherms that are at the mercy of climate to the warm-blooded endotherms, and within the endotherms from types with a small brain and low social organization to those with a very large central nervous system, highly developed parental care, and the capacity to transmit information from generation to generation? (Mayr 1988, 251–52)

David Raup and John Sepkoski (1982) graph a rise, again with climbs and drops, especially at times of catastrophic extinctions, from zero to perhaps 750 families (Fig. 1). During the relatively flat part of the marine curve, one should notice, life moves onto the land and greatly diversifies there, from the Silurian Period onward (not shown in this graph). That requires also considerable evolution of complexity, since the terrestrial environment is more demanding. Plants develop steadily on the land masses, graphed by Karl Niklas (Fig. 2). For animals, it is in the vertebrates, most of all, that advancement is difficult to deny (Fig. 3) (Niklas 1986; 1997).

Norman D. Newell (1963) graphed the numbers of all families—terrestrial and marine, vertebrate and invertebrate—increasing through evolutionary time (Fig. 4). Nothing seems more evident over the long ranges than that complexity has increased. In the Precambrian there were microbes; in the Cambrian trilobites were the highest life form; the Pleistocene produced persons. Francisco J. Ayala concludes, "Progress has occurred in nontrivial senses in the living world because of the creative character of the process of natural selection" (1974, 353).

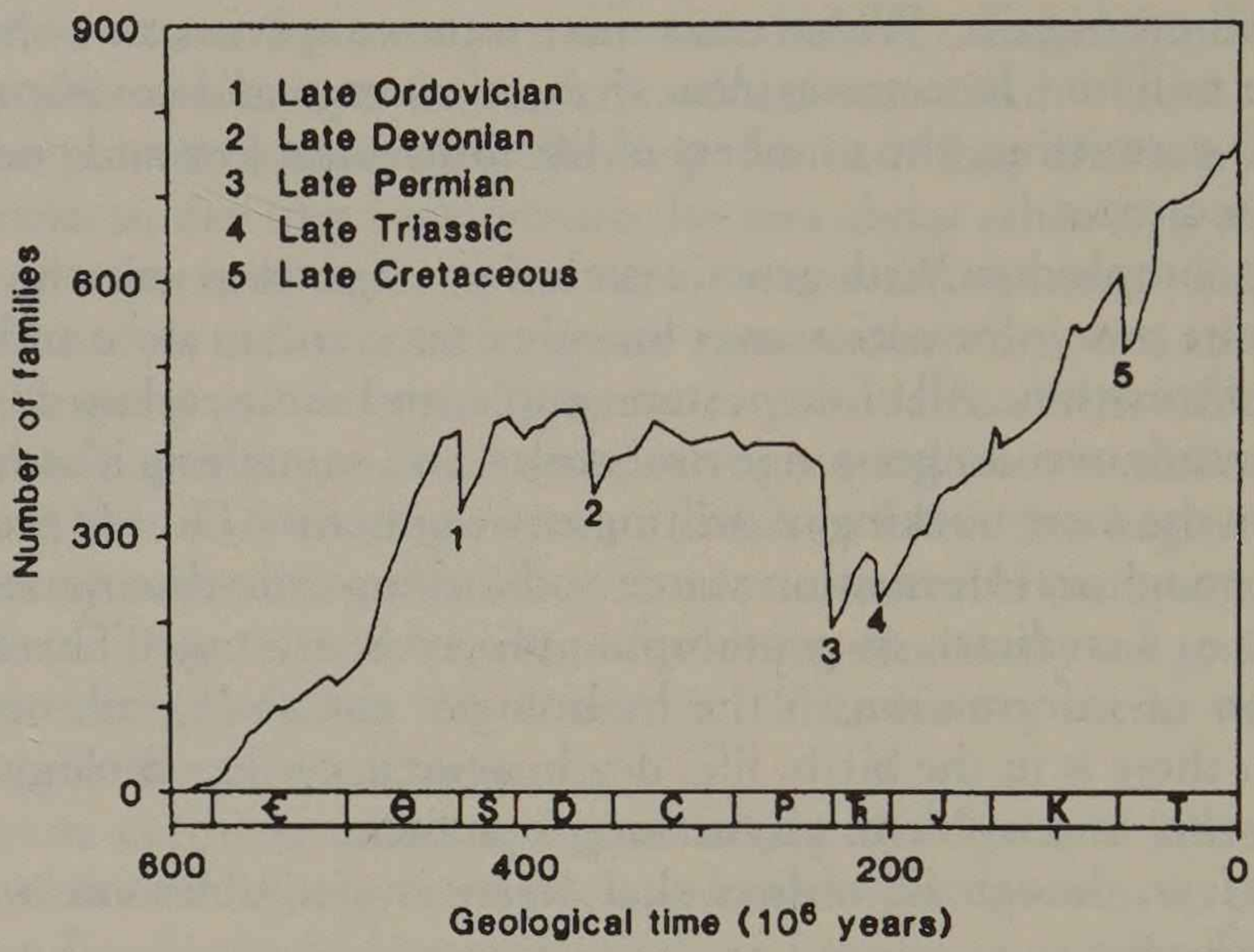


Fig. 1. Standing diversity through time for families of marine vertebrates and invertebrates, with catastrophic extinctions numbered (Raup and Sepkoski 1982, 1502). Reprinted with permission from *Science* 215:1501–03. Copyright ©1982 AAAS.

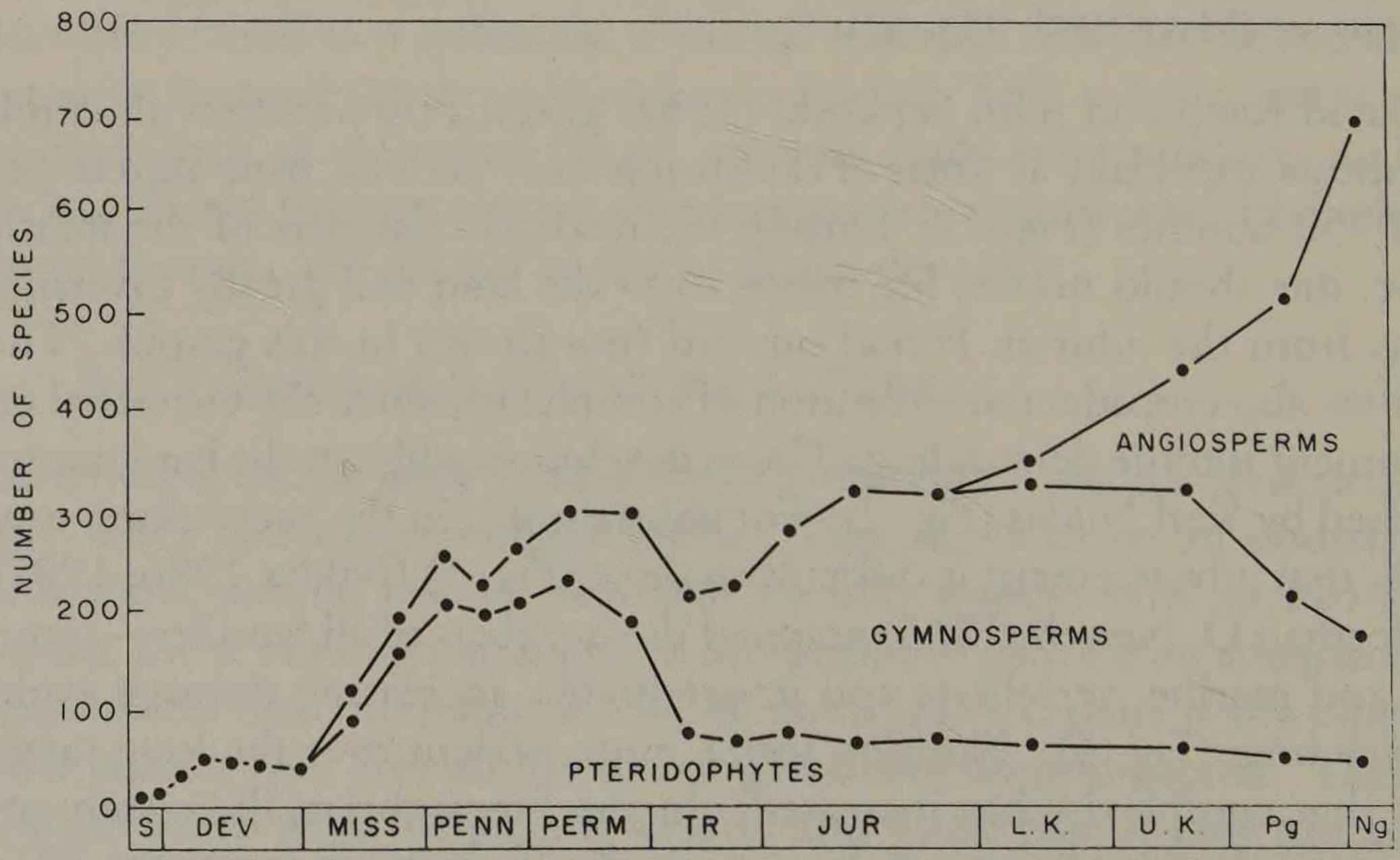


Fig. 2. Species diversity changes in vascular plants (Niklas 1986, 385). Copyright ©1986 Springer-Verlag. Reprinted with permission.

Against this background, we acknowledge the current fashion among social constructionists and postmodernists to think that any such increase of complexity or diversity is just British aristocrats reading their metaphysics back into nature. A scholar's chosen opinions reflect his or her social and cultural climate as much as they do what is objectively there in the fossil record. One takes one's mood from whatever spirits are at large on the contemporary academic landscape, insist the social constructionists (without conceding that they too are among such spirits).

On this point philosophers of science and even the paleontologists themselves may nowadays join the social constructionists. Michael Ruse insists, "Evolution is going nowhere—and rather slowly at that" (1986, 203). Although most paleontologists over the last century have seen progress in evolutionary history, this is pseudoscience, an overlaying of European ideologies onto the fossil record (Ruse 1996, 526).

Stephen Jay Gould, the most visibly outspoken paleontologist of the last century, insists that belief that there is "inherent, stately progress as a hallmark of life's history" is foolish prejudice. "The history of life . . . is not going anywhere intrinsically" (Gould 1980a, 31–32). "We are the

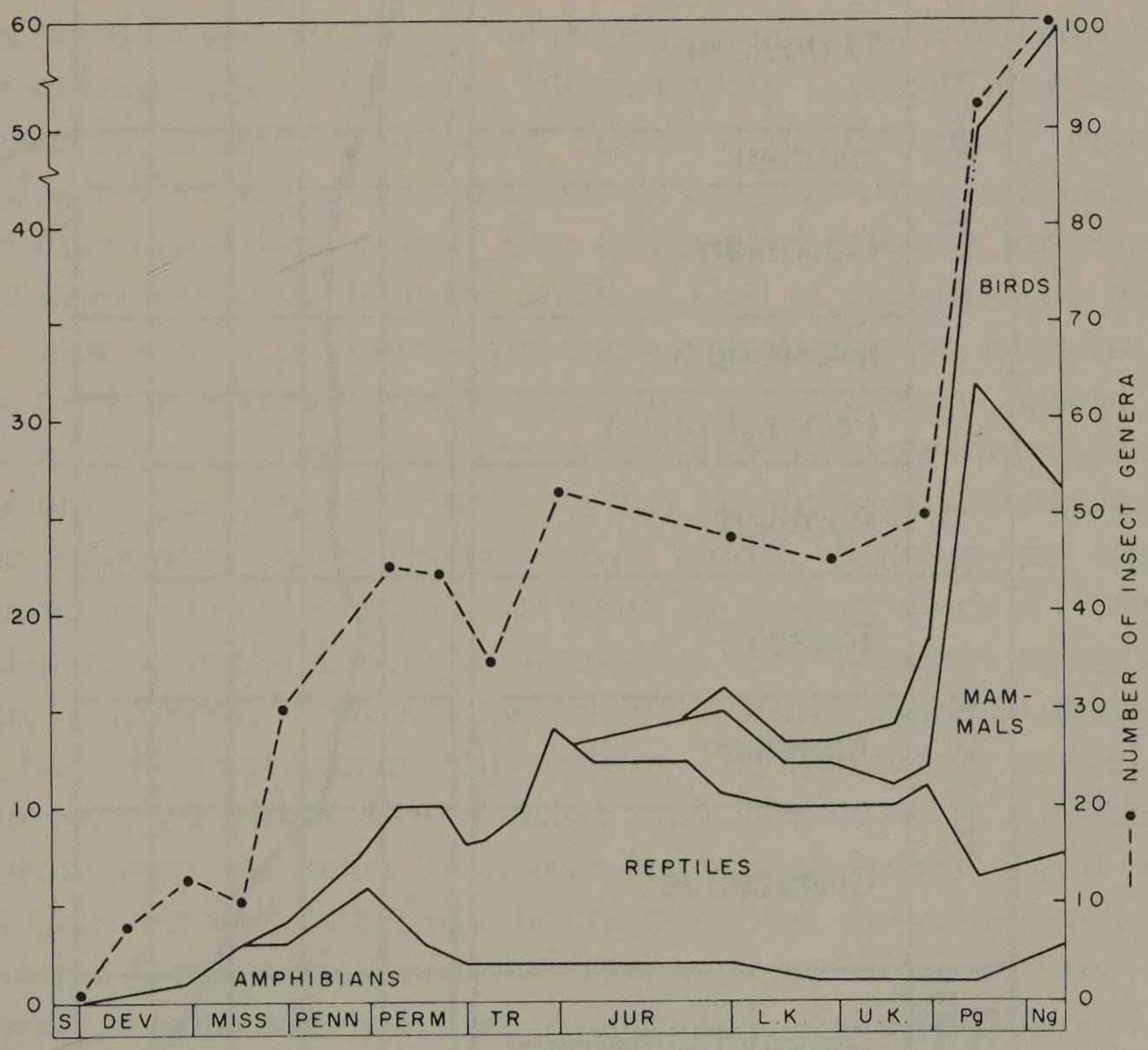


Fig. 3. Changes in the composition of vertebrate orders and numbers of insect genera (Niklas 1986, 390). Copyright ©1986 Springer-Verlag. Reprinted with permission.

accidental result of an unplanned process . . . the fragile result of an enormous concatenation of improbabilities, not the predictable product of any definite process" (Gould 1983, 101–2). Biology has no covering law, or trend, enabling one to say that microbes, or mammals, or human beings could statistically be expected. Evolutionary theory offers no explanation of the crucial journey; indeed, it claims that there is none, that the results are random. All that is selected for is the capacity to survive, unrelated to any increase of worth or value.

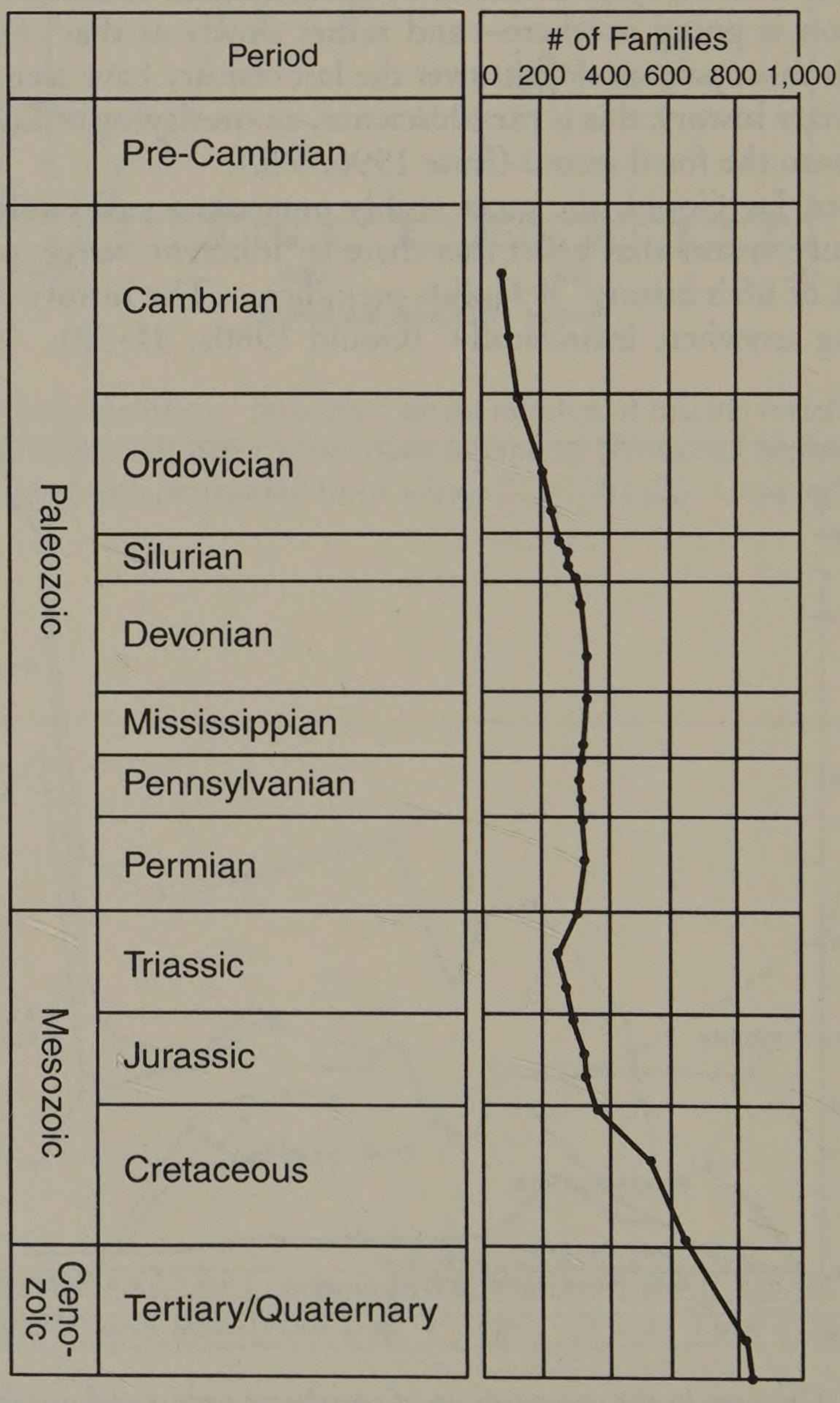


Fig. 4. Number of major families of fossil animals increasing through time. (Newell 1963, 80). Reprinted with permission.

Perhaps the philosophical interpretation of these graphs is not science; nevertheless we have a metaphysical problem on our hands as a result of the science. John Maynard Smith says, "There is nothing in neo-Darwinism which enables us to predict a long-term increase in complexity." But he goes on to suspect that this is not because there is no such long-term increase but because Darwinism is inadequate to explain it. We need "to put an arrow on evolutionary time" but get no help from evolutionary theory. "It is in some sense true that evolution has led from the simple to the complex: procaryotes precede eucaryotes, single-celled precede many-celled organisms, taxes and kineses precede complex instinctive or learned acts. I do not think that biology has at present anything very profound to say about this" (Maynard Smith 1972, 89, 98).

We survey evolutionary history to find, to use an old category, plenitude of being. The modern term is biodiversity. If you want a still older, more earthy term, Earth has brought forth "swarms of living creatures" (Genesis 1:20 RSV). The long evolutionary creativity seems pretty much the fact of the matter, see it with what social constructions we may.

Darwinian Nature and Sufficient Cause

Perhaps one does not need to go "all the way down," but it will enrich our valuing and our ethics if we can go "all the way up"—that is, if we can gain some systemic, comprehensive view. "Down under the quarks" may be a bad analogy. One might need to know the origin or context of some values to authenticate these values. One might need to know, for example, whether one's wife is made in the image of God to treat her with full respect. Value will be piecemeal without a system, a grand narrative. At least we need, in Maynard Smith's metaphor, a phylogenetic "arrow."

Without systemic tendencies, the biological richness we find on Earth is an anomaly, a cascading value stacking that cannot be predicted, derived, or given account of out of the theoretical model. If the species one encounters are results of being buffeted about by random winds of change, if their adaptation to the drifting environments is by variations arising from a genetic "crapshoot," then one may by good fortune luck into spasmodic wealth, but one is not systemically wealthy. The biodiversity we find ourselves surrounded with is, Gould insists, only "chance riches" (1980b).

A person who has riches by chance (a winning lottery ticket) is less wealthy than one with riches who has earned them, or one who inherited them from a family with decades of hard work and achievements. Certainly, you can value what you have through luck. But if you just luck into all your goods, you have no cause to expect more value and no explanation for what you have. A person who finds on Earth only accidental riches is less wealthy than one who inhabits a system bent on enriching the diversity of life. Lucky people may still be inclined to respect their wealth, but

they will unable to respect any system that produced such wealth. Without any phylogenetic arrow, they are as likely to drift out of their wealth as to be aimed for more. They might respect life, but they are unlikely to reverence it, because they do not have any account of its origins or matrix in the scheme of things.

Did not Maynard Smith complain that increase of complexity, an arrow on evolutionary time, seemed a fact about which contemporary theoretical biology had little to say? Biology does have some things to say about life. One cannot construct life (as we know it, at least) without carbon, hydrogen, and oxygen atoms and without a source of energy such as the Sun. One cannot construct complex forms without beginning with simpler ones. In such biological theory we have necessary cause but find no sufficient cause.

Maynard Smith and Eörs Szathmáry analyze "the major transitions in evolution" with the resulting complexity, asking "how and why this complexity has increased in the course of evolution. . . . Our thesis is that the increase has depended on a small number of major transitions in the way in which genetic information is transmitted between generations." Critical innovations have included the origin of the genetic code itself, the origin of eukaryotes from procaryotes, meiotic sex, multicellular life, animal societies, and language, especially human language. But they find "no reason to regard the unique transitions as the inevitable result of some general law"; to the contrary, these events might not have happened at all (Maynard Smith and Szathmáry 1995, 3).

Meanwhile, biology is value-laden. Biologists talk about values all the time. "An ability to ascribe value to events in the world, a product of evolutionary selective processes, is evident across phylogeny. Value in this sense refers to an organism's facility to sense whether events in its environment are more or less desirable" (Dolan 2002, 1191). Adaptive value, survival value, is the basic matrix of the governing Darwinian theory. An organism is the locus of values defended; life is otherwise unthinkable. But this is value individualized, or, to put it more provocatively, piecemeal value. Darwinian value comes in particulars, packed into individuals who survive and flourish, adapt and die, and regenerate themselves. We do find golden eggs, but we are not sure whether there is a systemic goose. If there is, it looks as though the goose lays eggs chaotically; and when they hatch, things at once become ugly, "red in tooth and claw."

Francis Crick complains that biology is not "elegant." As organisms evolve through that interplay of chance and necessity called evolution, they become encrusted with mechanisms and tricks that might have no overarching logic. An organism has an accidental history in a way that an atom or a galaxy does not (Crick 1988, 6, 137–42). Despite finding pandas and orchids among his chance riches, Gould claims that the panda's thumb is makeshift and that orchids are "jury-rigged" (1980c, 20–21). François

Jacob characterizes evolutionary history as millennia of "tinkering" (1977).

But, if we return to basic Darwinian theory, biologists do have niches into which each of these organisms must be placed as an "adapted fit." That invites thinking about the interdependence and community in which organisms participate. If so, we need to move from "*x* has a value of its own" to "*x* is valuable in the system." If *x* serves a role as an adapted fit, we might often find that *x* expresses some value not otherwise present in the system, enriches it by being there.

Of course, it might be that *x* has a value of its own but that the pursuit of that value is bad for the system, or bad for people. That *x* has a good of its own does not entail that the good of *x* should be promoted. Disease germs have a good of their own, but we do not wish to promote that good. The first is a fact, the second is a normative judgment.

With a more systemic set of facts, however, diseases are parasitic on a larger wealth of biodiversity. Parasitism is a subroutine in a larger value-capture system. The whole idea of parasitism is conceptually parasitic on values elsewhere present and flourishing enough to be parasitized. The parasite that loses skills borrows those skills because these remain in the host. The disvalue, parasitism, is privative on some value, autonomous life; and all life is interdependent.

Seldom does the system as a whole degenerate. Sometimes it may, as when climates turn colder or drier, but even then new skills appear. On planetary scales there is that overall increase of diversity and complexity we earlier considered. If one values life at all, one must value it generically, collectively, as with the term *biodiversity*. Every individual organism, presumably, is a distributive increment in a collective good. The burden of proof will be on those who single out germs—or skunks, weasels, or poison oak—as bad kinds. For the most part, these swarms of creatures are very good—as is affirmed early in the book of Genesis.

Whether biologists can find such selective principles or not, it seems that something is at work making the system fertile, prolific, and developmental, combining both innovations and novelties with stabilities and regularities so as to order the story and perpetuate a swelling wave. This portrays in some respects a loose teleology, a soft concept of creation, yet one that permits genuine, though not ultimate, integrity and autonomy in the self-developing creatures. What comes to pass wells up from below, congealing out of the quantum states. After that welling up is underway the higher levels can also come to superintend the lower, responding to potentials presented there, as when an organism with its genetic program executes its lifestyle, commands and puts to use resources in its metabolism. The life adventure overall seems more an interaction phenomenon, where a pro-life principle is overseeing the affairs of matter.

Theories are like suits of clothes; they do have to more or less fit the data, but a great deal depends on how you want to dress things up. Maybe

you want to dress up randomly and chaotically. Maybe you want to dress up red with tooth and claw. Maybe you want to dress nature up with "selfish genes" (Dawkins 1989), defending local values in a system where conflict and combat is all that one can see. But there is another way to dress nature up, as seen in those conservation biologists ready to rejoice in the richness of biodiversity.

When we celebrate biodiversity and wonder whether there is a systemic tendency to produce it, biology and theology become natural allies. The classical theology of design perhaps needs reforming, but the biology of randomness and bloody struggle may need reforming just as much. The paradigms need to change; and to that end, I argue that the better biological categories are those of values achieved, actualized, shared, and conserved in a natural history of dramatic creativity. Such a reinterpreted biology will be much more congenial to theology. The facts may give us, so to speak, sufficient cause to wonder about reverence for creation. Where there is creativity, we will have to wonder whether there may lurk a Creator.

Earth as Providing Ground

Every animal, every plant has to seek resources, but life persists because it is provided for in the system. Earth is a kind of providing ground. I am choosing my words deliberately, if also provocatively. *Ground* has an earthy tone, along with a cosmic possibility. Life needs an earthy "grounding," and when we find how prolific Earth is, we need some metaphysical "ground" of such a nature.

Provide has echoes of "providence" and classical theological convictions that God provides for an abundant life and that those provisions include a Promised Land, a garden Earth. Yes, Earth has "provisions"—or, as scientists prefer, resources. But what are we to make of the deeper sources by which there come to be these resources? What are we to make of these provisions for life on Earth, found as facts by science, judged valuable, respected in environmental ethics, even reverenced by ecological theologians? There is biodiversity, plenitude of being, because Earth is a "resource-full" place. How does this come to be? If we can answer that, we may want to go on to ask, *Why* does this come to be?

Physics has discovered the so-called fine-tuned universe. Astrophysics and nuclear physics, combining quantum mechanics and relativity theory, have made dramatic discoveries at both astronomical and submicroscopic levels. Recent theory interrelates the two levels; astronomical phenomena, such as the formation of galaxies, stars, and planets, depend critically on microphysical phenomena. Events at the mid-range scales, where the known complexity on Earth mostly lies (in ecosystems or human brains), depend on the interacting microscopic and astronomical ranges.

These results have been summarized as the *anthropic principle*, which argues that the universe has been configured from the start in the funda-

mental characteristics of its construction for the subsequent construction of stars, planets, life, and mind. (For summaries of a large literature, see Barr 2001; Leslie 1989). There are naturalistic ways of interpreting these discoveries, which, rather curiously, typically multiply universes generously enough so that our prolific universe can be a rare piece of good luck—one among myriad stillborn universes. By this account, not only are the achievements of evolutionary history on Earth, starting some five billion years ago, mostly a matter of luck; even more, some ten billion years before that, getting the kind of universe started up that would later become a providing ground is fantastically lucky.

If one is a metaphysician unhappy with multiplying other speculative and otherwise unknown universes sufficiently that we can have this one by luck, then one needs to look more closely at the remarkable features of this one that make it possible for there eventually to be life. But now the luck problem returns in events within our home universe. It is difficult to tell whether these astronomical and microphysical relationships are necessary or contingent, or both. So far as these relations are necessary, we seem to have some pro-life principle there before the startup; so far as they are contingent, we seem to need some pro-life principle appearing as life gets underway. There is already at the astronomical levels this readiness for life, in the sense of constructing the sorts of atoms that—as we later discover, but so far only on Earth—can be organized this way.

Contingent or necessary, on Earth we have the dramatic result that life and mind are absolutely dependent on some deep structure that makes this universe right for life. None of this prevents an inquiry, beyond the natural, into why there is this natural and improbable or inevitable prolific universe. We live in what K. G. Denbigh (1975) calls "an inventive universe." But that there exists a universe with such a fundamental makeup nowhere seems necessary or self-explanatory, either in its fundamental astronomical makeup or in the specifics of events on Earth.

A striking property is that the universe is prone to form pacts of energetic matter: stars, assembled in galaxies—and these stars have served as furnaces in which all of the higher elements have been forged, with a cooking time of many millions of years. The products have included carbon, oxygen, nitrogen, iron, silicon, and other elements in proportions that later have proved fortuitous for evolving dirt and, out of the dirt, life. But life needs a place to happen, and such places are not so easy to find.

Located at a felicitous distance from the sun, Earth has liquid water, atmosphere, a suitable mix of elements, compounds, minerals, and an ample supply of energy. Radioactivity deep within the planet produces enough heat to keep its crust constantly mobile in counteraction with erosional forces, and the interplay of such forces generates and regenerates landscapes and seas—mountains, canyons, rivers, plains, islands, volcanoes, estuaries, continental shelves.

On Earth, life appears. The know-how for life is coded into genetic sets, which are not present in rocks, clouds, or stars. An organism is a spontaneous cybernetic system, self-maintaining with a control center, sustaining and reproducing itself on the basis of information about how to make a way through the world. Organisms employ physical and chemical causes, but, distinctive to life, there is *information* superintending the causes. This information is a modern equivalent of what Aristotle called formal and final causes; it gives the organism a *telos*, an end, though not always a felt or conscious end. A major discovery of biologists in the last half century has been massive amounts of information coded in DNA, a sort of linguistic molecule.

Physics is often taken to be the ultimate science. It also is the simplest of the sciences, in the sense that it leaves out all of the later and higher-level complexities to focus on the search for what is "down under," for the elemental particles and processes out of which everything came. But we do not hit any rock bottom at the start; we just quit in physics, because there is no more fundamental science to which to turn. And sometimes we fail to realize how a fundamental element in the story is not present in physics at all.

In nature, there were once two metaphysical fundamentals: matter and energy. The physicists reduced these two to one: matter-energy. The biologists shortly afterward discovered that there were still two metaphysical fundamentals: matter-energy and information. Norbert Wiener insists, "Information is information, not matter or energy" (1948, 155). George C. Williams is explicit: "Evolutionary biologists have failed to realize that they work with two more or less incommensurable domains: that of information and that of matter. . . . The gene is a package of information" (quoted in Brockman 1995, 43).

Maynard Smith writes, "Heredity is about the transmission, not of matter or energy, but of information" (1995, 28). The most spectacular thing about planet Earth, says Richard Dawkins, is this "information explosion," even more remarkable than a supernova among the stars (1995, 145). Klaus Dose adds that, after more than thirty years of experimentation on the origins of life, we have only "a better perception of the immensity of the problem rather than its solution. . . . We do not actually know where the genetic information of all living cells originates" (1988, 348).

When sodium and chlorine are brought together under suitable circumstances, anywhere in the universe, the result is salt, sodium chloride. No information input is needed. When nitrogen, carbon, and hydrogen are brought together under suitable circumstances anywhere in the universe, with energy input, the spontaneous result may be amino acids, but it is not hemoglobin molecules or lemurs—not spontaneously. The know-how, so to speak, to make salt is already in the sodium and chlorine, but the know-how to make hemoglobin molecules and lemurs is not secretly

coded in the carbon, hydrogen, and nitrogen. The essential characteristic of a biological molecule, contrasted with a merely physicochemical molecule, is that it contains vital information. All such information once upon a time did not exist, but came into place. This is the locus of creativity.

In the ongoing story, especially after biology arrives with its genetic capacities to store information, transitioning across those levels noted by Maynard Smith, we keep getting more out of less. The ultimate phenomenon to be explained is not really energy physics but information history, especially the natural history on Earth. The creativity in nature is poorly authorized by the best causal accounts; there is little or no imperative for the commanding drama. We get lots of explanations, yet the sense of mystery does not go away.

Theologians, when they turn from conversing with physicists to dialogue with biologists, will want to notice that, although the physical universe is *necessary* for life, perhaps even fine-tuned for life, this physical universe is not yet known to be *sufficient* for life. Indeed, so far as we yet know, life has occurred only in the tiniest fragment of it. The universe as a whole is quite lifeless. Even if there is extraterrestrial life, life will still be among the rarest things in the universe. Earth stands somewhere midscale in the spectrum of levels from quarks to galaxies, and at this midscale take place the most complex events known anywhere in the universe. We seem to reside on some providing ground, and Earth seems to be an intense expression of how dramatic these provisions can be. Earth is indeed a promising planet. But if we claim that science is explaining how, much less why, this is so, we are only holding out a promissory note. Such a promissory note must compete with religious explanations of Earth's creativity.

We can, we ought to, respect such creativity. If we see nature only instrumentally, we are inclined to manipulate it, our providing ground, our provisions. If we see these evolutionary and cybernetic processes and the resulting products, Earth's biodiversity, more deeply as having intrinsic value, we are inclined to respect it, and we may pass over unawares to reverence for life. If we come to systematically venerate the productive processes, the Ground that provides for life, we have passed into the domain of the religious.

Cruciform Creation

Next, we move from provision to struggle. Darwinian natural history reveals an ambiguity in life. Life is provided for in the system and is simultaneously a ceaseless struggle; new life is generated by blasting the old. Darwinians may accentuate the competition, "nature red in tooth and claw." Darwin as well portrays connectedness: common ancestry, survival of the best adapted, life support in ecosystems. Darwin portrays life persisting in

the midst of its perpetual perishing, life generated and regenerated in spectacular biodiversity and complexity, with exuberance displayed over three and a half billion years, an abundance of life. Such a view of life echoes ancient religious motifs: Life is a table prepared in the midst of enemies, green pastures in the valley of the shadow of death (Psalm 23).

Darwin himself contains much of this ambivalence:

> Thus, from the war of nature, from famine and death, the most exalted object of which we are capable of conceiving, namely, the production of the higher animals, directly follows. There is a grandeur in this view of life, with its several powers, having been originally breathed into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved. (Darwin [1859] 1968, 459–60)

Darwin also exclaims that the process is "clumsy, wasteful, blundering, low, and horribly cruel" (quoted in de Beer 1962, 43).

There is such ambivalence already present in the Bible. Often the Bible extols the beauties of creation: "O Lord, how manifold are thy works! In wisdom hast thou made them all; the earth is full of thy creatures" (Psalm 104:24 RSV). Nature is a wonderland—perhaps not a paradise, but a realm to be encountered in awe. Alongside these passages we also find laments over creation. Nature, sighs the Preacher, is "vanity of vanities" (Ecclesiastes 1:2 RSV). "The whole creation," asserts Paul, "has been groaning in travail together until now. . . . The creation was subjected to futility" (Romans 8:22, 20 RSV).

In chemistry, physics, astronomy, geomorphology, and meteorology, nothing suffers; in botany, life is stressed; but only in zoology does pain emerge. Genes do not suffer; organisms with genes need not suffer; but those with neurons do. One is not much troubled by seeds that fail to sprout, but it is difficult to avoid pity for nestling birds fallen to the ground. In every season, most of the sentient young starve or are eaten or abandoned. Life is indisputably prolific; it is just as indisputably pathetic (Greek *pathos*), almost as if its logic were pathos. The fertility is close-coupled with the struggle.

Suffering is a troubling fact, but the first fact to notice is that suffering is the shadow side of sentience, felt experience, consciousness, pleasure, intention, all the excitement of subjectivity waking up inexplicably from mere objectivity. Rocks do not suffer, but the stuff of rocks has organized itself into animals who do experience pains and pleasures. We may wonder why we suffer, but it also is quite a wonder that we are able to suffer. Something stirs in the cold, mathematical beauty of physics, in the heated energies supplied by matter, and there is first an assembling of living objects and later of suffering subjects. Energy turns into pain. The world begins with mere causes; it rises to generate concern and care.

With such concern, turning (as we now do) to wonder whether to respect such a nature, perhaps this is ugliness emergent? Or are we perhaps encountering a valuable good, sentient life, with its inevitable dark side? Pain is objectively present in nature, and what is its connection with genesis? Struggle is the dark side of creativity—logically and empirically the shadow side of pleasure. One cannot enjoy a world in which one cannot suffer any more than one can succeed in a world in which one cannot fail. The logic is not so much formal or universal as it is dialectical and narrative. In natural history, the pathway to psychosomatic consciousness—the only kind of experience we know—is through flesh that can feel its way through that world. An organism can have needs; inert physical nature cannot. If the environment can be a good to it, that brings also the possibility of deprivation as a harm. To be alive is to have problems. Things can go wrong precisely because they can also go right.

Sentience brings the capacity to move about deliberately in the world, and also to get hurt by it. There might have evolved sense organs without any capacity to be pained by them. But sentience has not evolved to permit mere observation of the world but rather to awaken some concern for protection of the kinesthetic core of an experiential life that can suffer. A neural animal can love something in its world and is free to seek it. This capacity is greatly advanced over anything known in immobile, insentient plants. The appearance of sentience is the appearance of caring when the organism is united with or torn from its loves. The story is not merely of goings on but of going concerns, that is, of values that matter. The evolution of caring—and, inseparable from this, of suffering—is the evolution of the capacity to respect life—first one's own life, and in due course the lives of others.

The system historically uses pain for creative advance. Such is the biology of life. We can subsume struggle under the notion of a comprehensive situated fitness. We begin to get a new picture painted over the old, although some of the old picture still shows through. Theologically speaking, this position is not inconsistent with a theistic belief about God's providence; in fact, it is in many respects remarkably like it. There is grace sufficient to cope with thorns in the flesh (2 Corinthians 12:7–9).

The community of life is continually regenerated, as well as creatively advanced, and this requires value capture as nutrients, energy, and skills are shuttled around the trophic pyramids. From a systemic point of view, this is the conversion of a resource from one life stream to another—the anastomosing of life threads that characterizes an ecosystem. The "waste" (as it first appears) is really the systematic interconversion of life materials; nature recycles. Death *in vivo* is death ultimately; death *in communitatis* is death penultimately but life regenerated over the millennia of species lines and dynamic biotic communities, millennia continuing almost forever.

Genera and species sometimes die (that is, go extinct without issue), but often they are transformed into something else, new genera and species; they are rejuvenated. On average, there have been more arrivals than extinctions, an increase in both diversity and complexity over evolutionary history. The loss of species in natural systems has meant more birth than death. Perhaps there, too, it is tragic, but it is not unredeemed tragedy. The birthing metaphor is at the root of the etymology of *nature*; here creativity comes only with "labor" and "travail," which was Paul's metaphor for regeneration and newness of life.

The world is not a paradise of hedonistic ease but a theater where life is learned and earned by labor. In this struggle there is something demanding appropriate respect, something inviting reverence, something divine about the power to suffer through. The cruciform creation is, in the end, deiform, godly, *because* of this element of struggle, not in spite of it. Among available theories, there is no coherent alternative model by which, in a painless world, there might have come to pass anything like these dramas of nature and history that have happened, events that in their central thrusts we greatly value.

An environment that was entirely hostile would slay us; neither life nor culture could ever appear there. A nature that was entirely irenic would stagnate us; human life could never have appeared there, either. All human culture, in which our classical humanity consists, originated in the face of oppositional nature. Nature insists that humans work, and this laboring and even suffering is its fundamental power for genesis. Creativity is through conflict and resolution. We suffer, and, lest we suffer more, we organize ourselves creatively. In that sense, humans owe all culture to the hostility of nature, provided we keep in tension with this the support of nature that is truer still, the one the warp, the other the woof, in the weaving of what we have become.

The distinctive characteristics of the human spirit make tragedy and redemption possible. Birth is superseded by rebirth and the question of generation by the question of regeneration. Any adequate interpretation of this story of spirits fallen into tragedy and redeemed from this fall is going to be irreducibly religious. This is the essential theme of Christianity and Judaism, for example, that suffering love is divine. We doubt whether biology is competent to evaluate whether this is true or false, although it is competent to document the struggle for survival, the sequence of life, death, and life renewed. Zoology, perhaps joined with psychology, can raise the problem of suffering, but its redemption is a religious issue.

Before there was culture and human redemption, the way of natural history was already a *via dolorosa*. Since the beginning, myriad creatures have been giving up their lives as a ransom for many. In that sense, Jesus is not the exception to the natural order but a chief exemplification of it. The secret of life is seen now to lie not so much in heredity molecules, or

in natural selection and the survival of the fittest, or in life's informational, cybernetic learning. The secret of life is that it is a passion play. This is the labor of divinity, and it is misperceived if seen only as selfish genes or red tooth and claw. The view here is not panglossian; it is a tragic view of life, but one in which tragedy is the shadow of prolific creativity. That is the case, and the biological sciences with their evolutionary history can be brought to support this view, although neither tragedy nor creativity is part of their ordinary vocabulary.

We celebrate the richness of biodiversity on Earth. We respect life and come, at the depths, to reverence this struggle for life. The Prologue to the Gospel of John opens with the divine *logos*, through which all things were made, coming where it already was. This divine informing of nature is, we could say, a cybernetic metaphor. The Prologue continues: "The light shines in the darkness, and the darkness has not overcome it" (John 1:5 RSV). I would find it difficult better to describe, in poetic metaphor, the course of evolutionary natural history.

Nature as Grace

Nature is struggle. Nature is grace. I recall, in the Appalachian woods, stumbling upon a whorled pogonia flowering in spring in a secluded glade and exclaiming, "Amazing grace!" Life persisting in the midst of its perpetual perishing is a kind of gift. Scientists may prefer the word *given* to *gift*, and they will definitely prefer *law* to *grace*. The secular will say only that life is a given, and also perhaps that one ought to respect such a given. But the religious will think that *gift* is more insightful than just a *given*. And then we may need a Giver with the gift, or, if that is too monotheistic, at least some metaphysical explanation that seems adequate to what is given.

There is creativity by which more comes out of less. Though the system provides for it, no logic demands it. Scientific theory doubtfully predicts it. Actually, neither scientific logic nor theory handles historical explanations very competently, especially where there are emergent novelties; science prefers lawlike explanations in which there are no surprises. Given initial conditions, one predicts, logically unfolding one's theory, and the prediction comes true. Nevertheless, biology is full of unpredictable surprises. The account of natural history will not be by way of implication, whether deductive or inductive. There is no covering law (such as natural selection), plus initial conditions (such as trilobites), from which one can deduce primates, any more than one can assume microbes as a premise and deduce trilobites in conclusion. There are no humans invisibly present (as an acorn secretly contains an oak) in the primitive eucaryotes, to unfold in a lawlike or programmatic way. All we can do is tell the epic story—eucaryotes, trilobites, dinosaurs, primates, persons who are scientists, ethicists, and conservation biologists—and the drama may prove enough to justify it.

True, there are scientists who see earthen natural history as inevitable, as a systemic given. Christian de Duve writes, "Life was bound to arise under the prevailing conditions, and it will arise similarly wherever and whenever the same conditions obtain. There is hardly any room for 'lucky accidents' in the gradual, multistep process whereby life originated. . . . I view this universe [as] . . . made in such a way as to generate life and mind, bound to give birth to thinking beings" (1995, xv, xviii).

"This universe breeds life inevitably," concludes George Wald (1974, 9). Life appears, claims Melvin Calvin, "not by accident but because of the peculiar chemistries of the various bases and amino acids. . . . There is a kind of selectivity intrinsic in the structures." The evolution of life is "a logical consequence" of natural chemistries (1975, 176, 169. Manfred Eigen concludes "that the evolution of life . . . must be considered an *inevitable* process despite its indeterminate course" (1971, 519).

Simon Conway Morris is recently the most vigorous, and, among paleontologists, the most anomalous in his seemingly certain conviction that human life has appeared only on Earth but did so here as a law of the universe: We are "inevitable humans in a lonely universe." "Life . . . is full of inherences," precursors of later unfolding tendencies. "Life shows a kind of homing instinct." He builds his case on evolutionary convergences. "All the principal properties that characterize humans are convergent" (Conway Morris 2003, 8, 20, 96).

> Given time, evolution will inevitably lead not only to the emergence of such properties as intelligence, but also to other complexities, such as, say, agriculture and culture. . . . We may be unique, but paradoxically those properties that define our uniqueness can still be inherent in the evolutionary process. In other words, if we humans had not evolved then something more-or-less identical would have emerged sooner or later. (2003, 196)

Such accounts suggest that the history is predestined, but this outcome is seen only retrospectively. Even if some scientist had been able to observe the elementary particles forming after the first three minutes, nothing much in them would have suggested anything specific about the coding for life that would take place, fifteen billion years later, on Earth. Only much later do scientists arrive on the scene and posit the anthropic principle that finds the materials right for life.

After Earth's formation, as the lifeless planet is being irradiated by solar energy (as are other planets), quantum physics depicts an open system and nested sets of possibilities; but all of the atoms and molecules take nonliving tracks. Only later do some atoms and molecules begin to take living tracks, called forth as interaction phenomena when cybernetic organisms appear. If there is some "inside order" (inherency) to matter that makes it pro-life, it is in the whole system, not just in the particles. But this is not evident in systemic astronomy, since by far the vastest parts of the universe are lifeless (the "lonely universe"). Life is an earthbound probability. Nor,

on Earth, are the meteorological or geomorphological systems all that suggestive of inevitable life. Biology seems to open up entirely unprecedented levels of achievement and power.

There is not much in the physics and chemistry of atoms and molecules, prior to their biological assembling, that suggests that they have any tendencies to order themselves up to life. Even after things have developed as far as the building blocks of life, there is nothing in a thin hot soup of disconnected amino acids to predict that they will connect themselves, or be selected along upward, negentropic though metastable courses into proteins, or that they will arrange for DNA molecules in which to code the diverse forms of life, or that these molecules will discover how to code dinosaurs, primates, and persons. We are unsure how the gift is given or even whether, either in the universe or on Earth, all this natural history *is* some kind of given. Scientists do not know whether Earth's biodiversity is chance riches or a systemic inevitability. Meanwhile, we discover a wonderland—and discover in ourselves a metaphysical wonder whether this could be grace.

In claiming that nature is grace I must deal not only with scientists but often also with theologians who are unable to find grace in nature, indeed unable even to find value there, until they have been so authorized by divine revelation. Here is Keith Ward, a theologian: "I do think that nature has to have intrinsic value because God has created it. If there were not a God, if I did not believe in God, I would not think that nature had any intrinsic value. . . . I would have an instrumentalist view, actually" (2002, 14). The claim seems to be that, until one has insight from elsewhere, one will not know what to make of nature. After one gets converted, one can love nature for what it is in itself, but any who think they are warranted in loving nature before they are converted are just confused. All the unconverted can do is use nature instrumentally. That does not seem to approach even respect, much less reverence. But Paul Taylor, a philosopher, has a celebrated argument for biocentrism: *Respect for Nature* (1986). In it there is no suggestion of reverence.

So, how far can we get toward the conviction that nature is grace, left to our own wits? Maybe we can get halfway there with another experience: the sense of the sublime. *Sublime* is today thought to be an archaic word. But that word has a way of reappearing when we really get *archaic* in the deep sense—that is, back to the archetypes—which happens more often in the wilderness than in town. The experience of the sublime literally "takes us to the limits" and is closer to mystery and the religious than to mere respect. Nature is the first mystery to be encountered; society comes later, much later, after one learns evolutionary history. In the primeval forest, or on the desert or tundra, humans get transported by forces awful and overpowering, by the signature of time and eternity.

"The trees of the Lord are watered abundantly; the cedars of Lebanon which he planted" (Psalm 104:16 RSV). With forests, America is even more of a promised land than is Palestine. John Muir exclaimed, "The forests of America, however slighted by man, must have been a great delight to God; for they were the best he ever planted" (1901, 331). Such forests are a church as surely as they are a commodity. Trees pierce the sky like cathedral spires. Light filters down as through stained glass. The forest canopy is lofty; much of it is over our heads. In common with churches, forests invite us to transcend the human world and experience a comprehensive, embracing realm. "The groves were God's first temples" (Bryant [1825] 1903, 79).

So, far from being unaware that nature is grace until after one has been to church, for many it is the other way around. Forests serve as a more provocative and perennial sign of the mysterious and the awesome than many of the traditional, often outworn, symbols devised by the churches. Muir commented, "The clearest way into the Universe is through a forest wilderness" (quoted in Wolfe 1938, 313). Christians would regard that as an overstatement; for them the clearest way into the Universe is though Jesus Christ.

But Christians may also remember that Jesus saw the presence of God clearly in the natural world in which he resided. The birds of the air, he said, neither sow nor reap yet are fed by the heavenly Father, who notices the sparrows that fall. Not even Solomon is arrayed with the glory of the lilies, though the grass of the field, today alive, perishes tomorrow. There is in every seed and root a promise. Sowers sow, the seed grows secretly, and sowers return to reap their harvests. God sends rain on the just and unjust. Divinely given, earthen nature is the original act of grace.

Being among the archetypes, a forest is about as near to ultimacy as we can come in the natural world—a vast scene of sprouting, budding, flowering, fruiting, passing away, passing life on. We get goose pimples with mountaintop experiences, hearing the wind in the pines, with solitude in a sequoia grove, watching the falling autumn leaves. We feel life's transient beauty sustained over chaos. A forest wilderness is a sacred space. There Christians recognize God's creation (perhaps cued to look for it when they were back in church at the altar). Others may find an Ultimate Reality, or a Nature sacred in itself. A forest wilderness elicits cosmic questions differently from town, and it seems to do this whether we have been reading our Bibles or not. Christians ought to have a particular interest in preserving wildlands as sanctuaries for religious experiences, both for Christians and for others inspired there.

If the word *sublime* is too archaic for modernists who visit the woods, perhaps we can get halfway to the sacred with the word *wonder*. If we wonder at nature, do we not thereby consider nature a wonderland? A wildland is a wonderland, standing on its own. "Praise the Lord from the

earth, you sea monsters and all deeps, fire and hail, snow and frost, stormy wind fulfilling his command! Mountains and all hills, fruit trees and all cedars! Beasts and all cattle, creeping things and flying birds!" (Psalm 148: 7–10 RSV) "Thou crownest the year with thy bounty; the tracks of thy chariot drip with fatness. The pastures of the wilderness drip, the hills gird themselves with joy, the meadows clothe themselves with flocks, the valleys deck themselves with grain, they shout and sing for joy" (Psalm 65:11–13). "Who has cleft a channel for the torrents of rain, and a way for the thunderbolt, to bring rain on a land where no man is, on the desert in which there is no man; to satisfy the waste and desolate land, and to make the ground put forth grass?" (Job 38:25–27).

Gould finds Earth the scene of "wonderful life," even if this is just "chance riches" (Gould 1989; 1980b). Indeed, in the last words he wrote, he was moved to use the word *holy*:

> Something almost unspeakably holy—I don't know how else to say this—underlies our discovery and confirmation of the actual details that made our worlds and also, in realms of contingency, assured the minutiae of its construction in the manner we know, and not in any one of a trillion other ways, nearly all of which would not have included the evolution of a scribe to record the beauty, the fascination, and the mystery. (Gould 2002, 1342)

E. O. Wilson, a secular humanist, ever insistent that he can find no divinity in, with, or under nature, still exclaims, with emphasis: "The flower in the crannied wall—it *is* a miracle" (Wilson 1992, 345). "The biospheric membrane that covers the Earth, and you and me, . . . is the miracle we have been given" (Wilson 2002, 21). Daniel Dennett, as resolute a naturalist as one can find, still ends his survey of natural history: "This world is sacred." Apparently not even Darwin's "universal acid" can dissolve that claim, dissolve God though this acid can (Dennett 1995, 520–21).

Maybe these code words, *miracle*, *sacred*, and *holy*, are just rhetoric; maybe they are provocative. But I suspect that even these three secularists are tugged by a deeper undertow than they realize in their encounters with these archaic orders. The secular—this present empirical epoch, this phenomenal world, studied by science—does not eliminate the sacred after all; to the contrary, the secular evolves into the sacred. Surveying paleontological history, Loren Eiseley exclaims, "Nature itself is one vast miracle transcending the reality of night and nothingness" (1960, 171).

Viewing Earthrise from the moon, astronaut Edgar Mitchell was entranced: "Suddenly from behind the rim of the moon, in long, slow-motion moments of immense majesty, there emerges a sparkling blue and white jewel, a light, delicate sky-blue sphere laced with slowly swirling veils of white, rising gradually like a small pearl in a thick sea of black mystery. It takes more than a moment to fully realize this is Earth . . . home." Mitchell continued, "My view of our planet was a glimpse of divinity" (quoted in Kelley 1988, at photographs 42–45). Astronaut

Michael Collins recalled being Earthstruck: "Earth is to be treasured and nurtured, something precious that *must* endure" (Collins 1980, 6).

These are astronauts, not biologists, but what they see is the home planet, the living planet in all its startling possibilities, of which evolutionary history is the most indisputable evidence. The vision of the land of promise originated in Israel. What we have discovered is that this is a global vision. The land of promise is the planet of promise.

Genesis and Creativity

The creative action once reserved to God's special creation of fixed species must now be reallocated to include a vast self-creativity within the creatures, lured upslope over this long evolutionary process. What theologians once termed an established order of creation is, rather, a natural order that dynamically creates, an order for creating. The older and newer accounts concur that living creatures now exist where once they did not. But the manner of their coming into being has to be reassessed. God is not, crafts-man-like, molding the material. But God "from below" microscopically creates the energetic, pro-life materials that bubble up trials. "From above," systematically and environmentally, God, perhaps via selectivity intrinsic in the processes, perhaps by divine "inspiration" (=informing), coaxes forth living organisms and, via natural selection, selects the best adapted.

Biologists find biological creativity indisputable, whether or not there is a Creator. Biologists have no wish to talk theologians out of genesis. Whatever one may make of God, biological creativity is indisputable. There is creation, whether or not there is a Creator, just as there is law, whether or not there is a Lawgiver. Sometimes biologists decline to speak of creation, because they fear a Creator lurking in the concept of creation. Well, at least there is genesis, whether or not there is a Genitor. Ultimately, there is a kind of creativity in nature demanding that we either spell *nature* with a capital *N* or pass beyond nature to nature's God. Biologists today are not inclined, nor should they be as biologists, to look for explanations in supernature, but biologists nevertheless find a nature that is super! Superb! Science teaches us to eliminate from nature any suggestions of teleology, but it is not so easy for science to talk us out of genesis. What has managed to happen on Earth is startling by any criteria. Biologists may doubt whether there is a Creator, but no biologist can doubt genesis.

Many resist the idea that value has to be introduced from outside nature. Biologists and physicists wish to have causes emanating from their own domains, and they have often persuaded theologians too that, surprising as these phenomena are, they are nevertheless natural. So, Gordon Kaufman speaks of the "serendipitous creativity" that seeps through the universe, but he nevertheless wishes to remain a theological naturalist (Kaufman 1993, chaps. 19, 20). Use the word *God* as a "symbol" for these

remarkable processes, if you wish (perhaps rather like Wilson with his "miraculous flower," Gould with his "holy" evolutionary history, or Dennett with his "sacred world"), but do not try to detect God the Father transcendent to this serendipity. Rather, celebrate nature as the source of this serendipitous process—like gravity, except negentropic. This bioforce pulls things upward to higher and higher forms.

Kaufman then finds himself "in face of mystery" (1993) and marvels at the serendipity on Earth. But serendipity is not an explanatory concept. It just baptizes the natural phenomena with a fairy tale word.[1] It puts the spectacular creative events down to extraordinarily good luck. If we are to have a real explanation, we need to detect something "extra" lurking within the serendipitous process. We can say, if we like, that with the appearance of life, or photosynthesis, or warm-blooded animals, or endoskeletons, or fat cells, or immunoglobin molecules, or psychological inwardness, there is just serendipity, more serendipity, cascading serendipity. But that is not an explanation; it is a confession that we do not have any adequate explanation. Nothing we know in science, certainly not in biology and just as doubtfully in physics, authorizes any scientific theory of nature that is "up to" these events that are the surprising facts of natural history. If you wish a nature with that power, you must be religious about it.

Neither physical nor biological discoveries of pathways of development do much to make nature self-explanatory. We find causes necessary but not sufficient. The rejoinder to Where is the Presence? is Where is the explanatory adequacy of a self-contained physics or a self-contained biology? Evidence that nature is not self-explanatory can be seen at all its creative loci. Three especially dramatic places: (1) In physics, once upon a time there was the origin of matter-energy. (2) In biology, once upon a time there was the origin of life, first during the era of chemical evolution, with the elaboration of life over many subsequent millennia. (3) In neurobiology, once upon a time there was the origin of subjective life, of felt experience. Each time, there is created something novel. Perhaps at the origin of life and the origin of mind we can give some story of the assembly of parts, how possibly this novel event came to take place historically. But these are never why-necessarily explanations; we are always getting conclusions that exceed what is precontained in the premises.

The secular autonomy that once seemed to banish any Presence turns out to veil a kind of haunting incompleteness. True, there are always some causes behind effects, but these nevertheless have surprising, serendipitous effects that the causes never seem to completely specify. The stream steadily rises above its source. The effects over time, whether probable or improbable, initiate events the likes of which have nowhere been seen before.

In this deeper sense, says Ernst Mayr, though hostile enough to traditional monotheism, "virtually all biologists are religious, in the deeper sense of the word, even though it may be a religion without revelation. . . . The

unknown and maybe unknowable instills in us a sense of humility and awe" (1982, 81). "I would say," writes Loren Eiseley at the end of *The Immense Journey*, "that if 'dead' matter has reared up this curious landscape of fiddling crickets, song sparrows, and wondering men, it must be plain even to the most devoted materialist that the matter of which he speaks contains amazing, if not dreadful powers, and may not impossibly be . . . 'but one mask of many worn by the Great Face behind'" (Eiseley 1957, 210). The molecular self-assembling of organisms over evolutionary history is a sort of self-actualizing, but it is also a response to the brooding winds of the Spirit moving over the face of these earthen waters.

Once J. B. S. Haldane found himself in conversation with some theologians and was asked what he had concluded from his long studies in biology about the character of God. He replied that God had an inordinate fondness for beetles. God must have loved beetles, he made so many of them. But species counts are only one indication of diversity, and perhaps the fuller response is that God must have loved life, God animated such a prolific Earth. Haldane went on to say that the marks of biological nature were its "beauty," "tragedy," and "inexhaustible queerness" (Haldane 1932, 167–69). This beauty approaches the sublime; the tragedy is perpetually redeemed with the renewal of life, and the inexhaustible queerness recomposes as the numinous.

Biology produces many doubts; here are two more. I doubt whether one can be a biologist without a respect for life, and the line between respect for life and reverence for life is one that I doubt that we can always recognize and one that is more important than we think. If anything at all on Earth is sacred, it must be this enthralling creativity that characterizes our home planet. If anywhere, here is the brooding Spirit of God.

Note

This article is a version of an address given at the American Academy of Religion in Atlanta, Georgia, November 2003.

1. The word *serendipity* was coined by Horace Walpole after the characters in the Persian fairy tale *The Three Princes of Serendip* who were always making fortunate and unexpected discoveries by accident.

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Articles

THE SIXTEEN STRIVINGS FOR GOD

by Steven Reiss

Abstract. A psychological theory of religious experiences, *sensitivity theory*, is proposed. Whereas other theories maintain that religious motivation is about a few overarching desires, sensitivity theory provides a multifaceted analysis consistent with the diversity, richness, and individuality of religious experiences. Sixteen basic desires show the psychological foundations of meaningful experience. Each basic desire is embraced by every person, but to different extents. How we prioritize the basic desires expresses our individuality and influences our attraction to various religious images and activities. Each basic desire is associated with a basic goal and a unique joy, such as love, self-worth, relaxation, or strength. We do not seek to experience joys infinitely; we regulate joys, in accordance with our core values, to sixteen balance points (sensitivities) that vary based on individuality. Religions help persons of faith regulate the sixteen basic joys by providing some images that strengthen joyful experiences and others that weaken them. We can strengthen our experience of self-worth, for example, by contemplating God in the image of savior; we can weaken our experience of self-worth by contemplating original sin. The theory of sixteen basic desires is testable scientifically and suggests such philosophical concepts as value-based happiness.

Keywords: Gordon Allport; Aristotle and psychology; god-images; intrinsic value; meaning of life; means and ends; Reiss Profile; religion and motivation; religion and personality; sensitivity theory of motivation; sixteen basic desires.

Human beings embrace religion for a number of reasons, according to previously published theories. Religion can, for example, help individuals

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cope with fear and anxiety, especially the fear of death. This idea is expressed by the saying "There are no atheists in foxholes" (Argyle and Beit-Hallahmi 1975, 197) and explains why clergy are readily available in hospices and hospitals and near battlefields. Some religious teachings, moreover, are aimed at helping the faithful manage anxiety and experience inner peace.

Ritual observance has been suggested to be a significant source of religious motivation. Rituals are common in religious ceremonies; they help people cope with life's major events, such as birth of a child, child rearing, marriage, and death of a loved one. Sigmund Freud (1907) emphasized the significance of religious rituals, calling religion an "obsessive neurosis."

John C. Flugel discussed the significance of religion in helping persons cope with guilt. Religions teach adherents to atone for their sins through sacrifice to gods. "Men [hold] the primitive notion that their God . . . is appeased by human suffering" (Flugel [1945] 1961, 187–88). We inflict punishment and suffering on ourselves and hope that our gods will forgive us, much as our parents forgave us after we had been punished as children. Being forgiven reduces our experience of guilt and increases our fundamental sense of acceptance and salvation.

Freud thought that religion plays an important role in regulating sexual impulses. For example, religions ban incest, and Freud regarded such taboos as essential for the survival of our species. God images, according to Freud, are disguised father figures that help people manage their unconscious sexual desires.

Intellectual curiosity may motivate interest in religion (Allport 1961). We all wonder about life's larger questions—who we are and why we exist. Religions address our curiosity by providing explanations for the origin of the universe, the origin and purpose of human beings, and the nature of good and evil.

Religion can help people satisfy their need to find meaning in suffering and, thus, cope with poverty, illness, disappointment, and frustration. Karl Marx expressed this idea when he called religion the "opium of the people" (1964, 43–44). As Kenneth Davis put it, "The greater [one's] disappointment in this life, the greater his faith in the next. The existence of goals beyond this world serves to compensate people for frustrations they inevitably experience in striving to reach socially acquired and socially valuable ends" (1948, 532).

Recently, a number of psychologists have suggested that spirituality is a unique motive. Ralph Piedmont (1999) presents some evidence for this idea, proposing a trait he calls spiritual transcendence. Piedmont has validated the concept of spirituality in factorial studies and studies of peer ratings of religious behavior. He has shown that spiritual transcendence has some independence from five-factor personality theory. At least part of the appeal of religion may be to satisfy our need for spiritual experiences.

Scholars have ascribed these and other psychological motives for religious behavior. Anxiety reduction, fear of death, guilt reduction, enjoyment of rituals, and spirituality represent the most frequently cited.

Theory of Basic Motivation

My *sensitivity theory* (Reiss 2000a) holds that sixteen basic desires motivate much of our behavior, including religious behavior. In this essay I consider the main tenets of this theory and then apply the sixteen basic desires to understanding religious experiences.[1]

Conceptual Foundations.

Sensitivity theory represents an original combination of Aristotle's analysis of motivation ([330 B.C.E.] 1976) and Gordon Allport's concept of individuality (1961).[2]

Desires are Reasons. These are motives, defined as reasons for engaging in behavior.

Ends are Intrinsically Desired. Sensitivity theorists divide motives into means and ends (see Aristotle ([330 B.C.E.] 1976). Means are behaviors we engage in because they produce something else, whereas ends are desired for no reason other than that is what we want. When a professional athlete plays football for a living, the game is a means of obtaining a salary. When a professional athlete plays football to exercise, the game is its own end. An analysis of a person's behavior may identify a series of means followed by one or more ends that complete the behavior chain. For example, a person may attend medical school to become a researcher (a means), seek the cause of cancer because it has killed a parent (a means), and show loyalty to a deceased parent out of honor (an end).

Automatic Nature of Ends. End motives occur automatically and cannot be deliberately chosen. As Aristotle observed, "Deliberation is about means, not ends" ([330 B.C.E.] 1976, Book III, iii, 79). We cannot choose whether or not we feel hunger, for example, but we can choose a diet to satiate our hunger. The idea of choosing an end is a self-contradiction: the ends are the criteria by which we make fundamental choices, and the means are the options that are chosen. As a matter of logic, any option we choose is a means to the criteria of choice and, thus, not an end.

Ends are Associated with Varying Degrees of Self-Awareness. Self-awareness of our end desire—both what we want and how strongly we want it—varies considerably depending on individuality, experiences, and possibly the effects of culture on attitudes toward the desire in question. When we increase self-awareness we are better able to use our intellect to select appropriate and effective means.

Basic Desires Exclude Certain Biological Needs. Basic desires (also called human strivings) are end motives, excluding those biological needs that have no relevance for psychology. For example, the need for constant body temperature is not considered a basic desire. As shown in Table 1, sensitivity theory recognizes sixteen basic desires.

Genetic Origin of Basic Desires. Theoretically, the sixteen basic desires are regarded as genetically distinct sources of motivation. Culture and learning, however, play significant roles in the strength of a person's desires.[3]

Basic Desires Imply End (Basic) Goals. Each of the sixteen basic desires is aimed at different ends, called basic goals because of their connections to basic desires. A person who is motivated by curiosity, for example, has a basic goal of acquiring knowledge, whereas a person who is motivated by idealism aims to improve society. Other basic goals are sound character, approval, and so on (see Table 1).

Basic Goal Experiences Produce Joys. The experience of a basic goal produces a joy (an intrinsically valued psychological state), a different joy depending on which basic (end) goal is experienced. For example, the joy of wonderment is experienced when we obtain knowledge, and the joy of beauty is associated with the experience of sex. I argue that the sixteen joys cannot be reduced to a few global categories such as pleasure versus pain or intrinsic versus extrinsic motivation (Reiss forthcoming a). Aristotle observed, "As activities differ in kind, so do their pleasures" ([330 B.C.E.] 1976, Book X, v, 322). The pleasure associated with the joy of wonderment, for example, is qualitatively different from the pleasure associated with the joy of loyalty.

Basic Goals Imply Core Values. The concepts of values and goals are closely connected. We value what we want and want what we value. Values connected to basic desires are called core or fundamental values; examples include family values, intellectual values, and humanitarian values. According to sensitivity theory, each basic goal implies its own core values.[4]

Core Values Drive Personality Development. Values, not pleasure and pain, are the primary motivators of human behavior and personality development, according to sensitivity theory. We sacrifice for our children because we value them, not because we want to avoid the guilt associated with parental neglect. Soldiers throw themselves on exploding grenades and save their comrades because they value their honor even more than they value their life. People survived Nazi concentration camps because they found ways to express meaningful core values (Frankl 1984), not because they found ways to make their experience pleasurable.

TABLE 1

Religious Images and Sixteen Basic Desires

Basic Desire	Basic Goal (Core Value)	Basic Joy	Religious images for ↑ joy/ express core value	Religious images for ↓ joy/ negate core value
Acceptance	approval (inclusion)	positive self-regard	Savior, baptism, confession	original sin
Curiosity	knowledge, cognition (truth)	wonderment	omniscient, God as Reason	incomprehensible, ineffable God
Eating	food, sustenance	satiation	totem animals, Eucharist, feasts	fasts, dietary laws
Family	raise children (family values)	love	God in image of son/daughter	mythical gods of abandonment
Honor	sound character (morals)	loyalty	God in image of father; Ten Commandments	devil's temptations
Idealism	fairness (human condition)	compassion	social gospel, missionary work	God's tolerance of illness and natural disaster
Independence	autonomy (self-reliance)	freedom	God is self-sufficient	unity, Nirvana, attentive deities
Order	organization (precision, cleanliness)	stability	God's immortality; church rituals	impurity of body, soul; unclean food
Physical Exercise	muscle movement (strength)	vitality	God's infinite strength	Sabbath
Power	influence (leader-ship, glory)	self-efficacy	Almighty, Creator, Brahman	submission
Romance	sex (sensuality)	lust, beauty	holy matrimony	celibate, ascetic, Puritanical
Saving	collection (frugality)	ownership	religious relics, mementos	mythical gods of waste
Social Contact	friendship (groups)	belonging, fun	festivals	retreat, solitude, vows of silence
Status	prestige, stature (social class)	self-importance	Divine creation of humankind	human beings nothing compared with divinity
Tranquility	personal safety (prudence)	inner peace, relaxation	freedom from anxiety and guilt (the Way)	fear of God
Vengeance	retaliation (self-defense)	vindication	wrath of God; war gods	conflict avoidance ("turn cheek")

Basic Goals Experienced as Meaningful. Because the meaning of a behavior is its purpose or aim, and because basic desires aim for basic goals, basic desires and goals are experienced as psychologically meaningful. The sixteen basic desires are the key psychological foundations for meaningful experience, according to sensitivity theory. In contrast, unmotivated behavior such as reflexes and biological events are without purpose and are therefore considered to occur without conveying a psychological sense of meaningfulness.

Organizing Role of Basic Desires. Under sensitivity theory, basic desires organize perceptions, values, cognitions, emotions, and behavior into coherent acts. Generally, we attend to stimuli relevant to our needs and desires and ignore irrelevant stimuli. We filter what we see through our desires and values. We want what we value, we value what we want, and we experience joyful emotions when we get what we want. Our values affect our attitudes, beliefs, and thoughts. A person with above-average motivation for status, for example, may pay a great deal of attention to prestigious versus less prestigious clothing labels, cars, residential neighborhoods, and so on; put on airs associated with high social class; wear expensive jewelry; dismiss lower-class persons as unworthy of attention; believe that one should not have to achieve in order to gain attention from others; believe that persons should associate with, and marry, within their social class; believe that those of high social class are more important than those of lower social class; be highly concerned with personal reputation; be careful to wear the "right" clothes; and be uncomfortable in the presence of lower-class persons or when visiting their homes or neighborhoods. In contrast, a person with below-average motivation for status tends not to notice the differences between clothing labels, cars, residential neighborhoods, and so on; may not value wealth or other marks of social class; may believe that social class is a trifle when selecting a marriage partner; may identify with working or lower-class persons; may feel uncomfortable when at a high-society gathering; and may dress sloppily, showing little interest in what others think about his or her appearance.

Summary. Sensitivity theory puts forth sixteen basic desires that include both biological needs such as eating and psychological needs such as acceptance and status. Each basic desire motivates people to embrace basic goals and express the core values associated with basic goals. Table 1 shows some of the connections between specific basic desires, basic goals, and core values. Basic desires occur automatically, with varying degrees of self-awareness, and are assumed to have a genetic origin. They may be altered by significant life events, but generally we do not know how to deliberately change them. Our basic desires and core values motivate personality development by organizing perceptions, values, cognitions, emotions, and behavior into coherent acts and behavioral propensities. Under

sensitivity theory, the sixteen basic desires provide the key psychological foundations of meaningful experiences, because they determine what we care about and who we are.

EVIDENCE FOR SIXTEEN BASIC DESIRES. Deep down, what do people desire? What are the basic motives that drive our behavior and give psychological meaning to our lives? To find out, Susan Havercamp and I developed a questionnaire, called the Reiss Profile (Reiss and Havercamp 1998), which was completed by more than ten thousand research participants. The results of this work showed that sixteen specific desires guide much of human behavior.[5]

The research was conducted in three phases. In Phase 1, we showed the "factorial validity" of the Reiss Profile questionnaire and the sixteen basic desires. Factorial validity implies that if a person endorsed an item on one of the sixteen Reiss Profile scales, such as the scale for status, the individual (a) tended to endorse all other items on the same scale (such as all of the status items) and (b) did not necessarily endorse any item on a different scale (such as the items on the scale for curiosity or eating).

Phase 2 consisted of studies that assessed the psychometric properties of the questionnaire. These studies showed that people self-report their basic motives similarly at different points in time. They also showed that the results of the questionnaire were only minimally influenced by the social desirability bias factor (the tendency to respond in ways that make one look good).

In Phase 3 we validated the sixteen basic motives by showing that how people self-reported their motives on the Reiss Profile predicted significantly how they had behaved in their lives (such as choice of college major, interest in military or clergy), how they scored on psychological tests, meaningful aspects of romantic relationships and friendships, mental health diagnoses, and certain genetic developmental syndromes.

INDIVIDUALITY. Sensitivities are about individuality in basic motivation and core values. The concept is similar in meaning to that of an Aristotelian *mean*. As Aristotle put it, "I call a mean in relation to us that which is neither excessive nor deficient, *and this is not one and the same for all* ([330 B.C.E.] 1976, Book II, vi, 100; emphasis added).

Sensitivity is the term given to how strongly a person is usually motivated by a particular basic desire. Those who are strongly motivated by power, so-called dominant personalities, may be said to have a high (strong) sensitivity for power, whereas those who are weakly motivated by power, so-called submissive personalities, may be said to have a low (weak) sensitivity for power. Inquisitive persons may be said to have a high sensitivity for curiosity, whereas noninquisitive people may be said to have a low sensitivity for curiosity.

One way to think about sensitivities (individual differences in basic motivation) is to consider each of the sixteen basic desires as a continuum of end motivation anchored by opposite basic goals. In Figure 1, for example, the basic desire of curiosity is shown as a continuum between the basic goal of spending no time in effortful thought versus always being engaged in effortful thought. All other possibilities lie between these extremes. Sue is happiest when she spends approximately 15 percent of her time in effortful thought, whereas Mary is happiest when she spends about 70 percent of her time thinking. If the average person desires to spend about 20 percent time in effortful thought, Sue has normative curiosity, and Mary has high (strong) curiosity.

Sensitivity theory holds that we go through life motivated to regulate each of the sixteen basic desires to individually determined balance points, called sensitivities. In the example shown in Figure 1, Sue is bored when her intellect is challenged significantly less than 15 percent of the time; the boredom motivates Sue to seek out intellectual challenges. When Sue is intellectually challenged more than 15 percent of the time, she experiences intellectual fatigue, which motivates her to behave mindlessly for a while. Mary experiences boredom when her intellect is challenged significantly less than 70 percent of her waking hours, and she experiences intellectual fatigue when her intellect is challenged significantly more than 70 percent of the time. Practically speaking, Sue will rarely experience boredom and often behave mindlessly, but occasionally she will want to think things through. Mary will easily experience boredom and be thoughtful about nearly everything, but on some occasions she will be motivated to behave mindlessly. Sue will likely embrace anti-intellectual values, whereas Mary will likely embrace intellectual values.

Figure 2 shows the hypothetical sensitivity points for Steve and Bob on the basic desire for independence. Bob places a higher value on self-reliance than does Steve. Sensitivity theory holds that whenever Bob and Steve experience more independence (self-reliance) than they desire, they experience an overwhelming sense of freedom and seek psychological support to moderate their experience. Whenever Bob and Steve experience less independence than they desire, they feel trapped and are motivated to behave in a self-reliant fashion. Because Bob and Steve are motivated to experience different degrees of independence, the same experiences can have opposite effects on their behavior. Suppose that Bob and Steve are

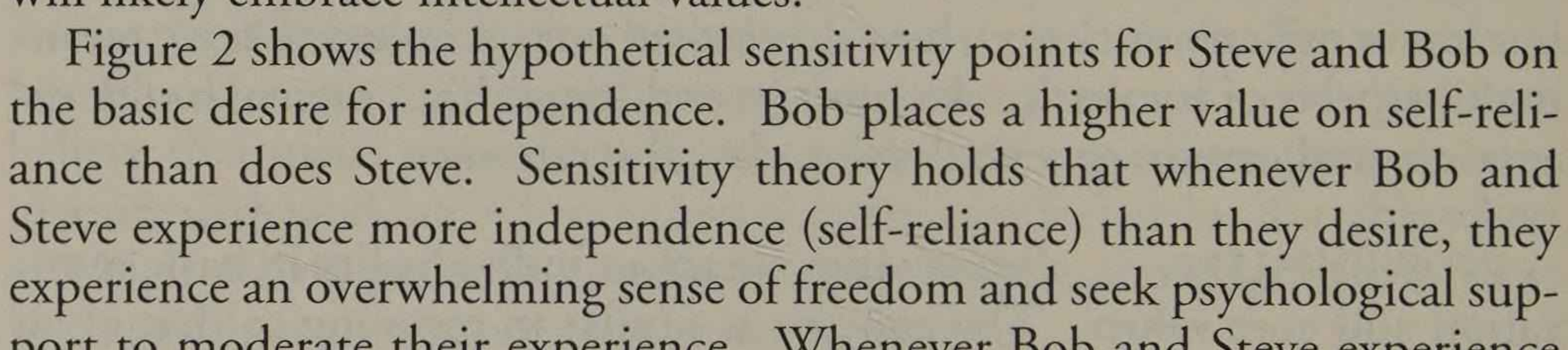


Fig. 1. The basic desire of curiosity (need for cognition) as a continuum.

businessmen competing against each other for a major new business contract each must have to stay in business. Bob should feel comfortable being on his own when competing for the contract, but Steve should prefer to confide in a partner or pray for divine assistance to experience psychological support and reduce the frightening feelings of being on his own.

Desire Profile. Each of the sixteen basic desires motivates everybody, but to different extents. A Reiss Desire Profile is an individual's rank ordering of the sixteen basic desires, a display of an individual's sixteen sensitivities. Some military people may have a desire profile in which the basic motives of power, honor, and physical strength are highly valued, whereas some business executives may have a desire profile in which power and status are highly valued.

Generally, the motives most relevant to defining our personalities are those that are strong or weak relative to norms. People who are motivated by leadership, for example, show high (strong) power motivation relative to the norm and may show dominant, ambitious, authoritarian, or controlling personality traits. Those who are motivated to be followers show low (weak) power motivation relative to the norm and may show submissive, nondirective, and unambitious personalities.

VICARIOUS AND COGNITIVE EXPERIENCES. We have the potential to express our core values and experience the sixteen basic joys through vicarious experiences, such as viewing shows, and through imagination and reflection. When we watch or imagine our favorite team scoring a goal, for example, we experience the joy of efficacy (which falls under the basic desire for power) similar to what is experienced by the player who scored the goal. The vicarious experience of power is so apparent at sporting events that some fans thrust clenched fists into the air upon viewing the achievement. Although sensitivity theory allows for the possibility that the power experienced by the player is of higher quality than that experienced by the fan—it may be more enduring and more readily re-experienced by recalling the achievement—sensitivity theory holds that both player and fan experience the same joy of efficacy.

The hypothesis that the sixteen basic desires motivate vicarious experiences should not be confused with catharsis. Like sensitivity theory, catharsis theory predicts, and the results of research studies confirm, that

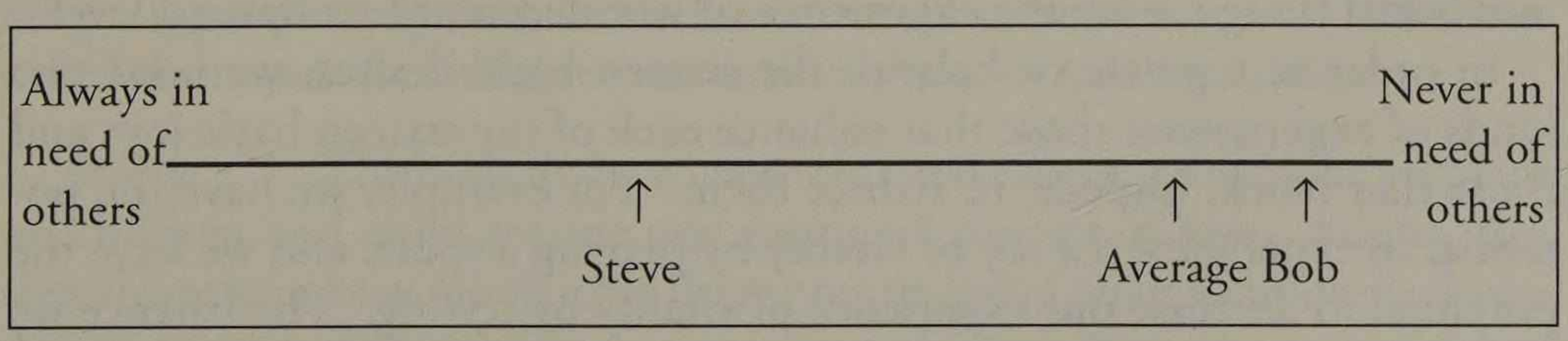


Fig. 2. The basic desire for independence as a continuum.

people are attracted to shows with content relevant to their basic motives and core values. Aggressive children are attracted to aggressive television programs (Huesmann and Eron 1989; Freedman 1984), sex-oriented people to programs with sexual themes (Greenberg and Woods 1999), religious people to religious programs, and curious people to television news (Perse 1992). Unlike sensitivity theory, however, catharsis theory predicts that basic motives can be satiated vicariously—that, for example, viewing aggression temporarily satiates the need to release aggressive energy. The available evidence does not consistently support this viewpoint; in fact, children who view aggressive models may imitate aggressive behavior rather than show satiation for aggressive motivation (Bandura and Walters 1965). If viewing aggressive models serves as an outlet for the viewer's aggressive energy, as predicted by catharsis, why are viewers no less aggressive after viewing violence than before?

Sensitivity theory does not predict that viewing aggression usually leads to reductions in aggressive behavior. Sensitivity theorists do not view aggression motivation as a pool of energy that can be released vicariously through viewing experiences; under sensitivity theory, the basic motive of vengeance expresses enduring personality needs to experience vindication frequently and at high magnitudes. Vindication is a joy, not a pool of negative energy awaiting release, for highly aggressive people.

To summarize, sensitivity theory holds that we have the potential to experience the sixteen joys through imagination, fantasy, and contemplative experiences that have content relevant to the sixteen basic desires. An aggressive person, for example, may experience the joy of vindication by watching a violent movie.

Theory of Religion

We regulate, in accordance with our core values and sensitivities, how often and how intensely we experience each of the sixteen basic joys. Some people seek to experience a particular joy frequently and intensely; others seek to experience the same particular joy moderately; still others seek to experience this joy only infrequently and at low intensity. Intellectuals seek to experience wonderment frequently, the average person only sometimes, and nonintellectuals infrequently—and they also may behave mindlessly at times as a tactic for minimizing cognition. In each case, the individual is regulating the experience of wonderment to a desired level.

In order to regulate or balance the sixteen basic desires, we need two kinds of experiences: those that enhance each of the sixteen basic joys and those that block, impede, or reduce them. For example, we have the potential to experience the joy of vitality by playing a sport, and we have the potential to decrease our experience of vitality by resting. The balance we seek between physical exercise and rest depends on individuality—on our sensitivity to and our valuation of physical exercise.

We have the potential to express our core values and regulate the sixteen basic joys through both secular and religious means. Religious people aim to satisfy their needs through spirituality and nonreligious people through secular activities. Religious experiences are well suited to help us regulate these joys and express the associated core values.

Many god-images are "pure" expressions of core values. Throughout history, people have imaged gods of power, status, knowledge, order, vindication, acceptance, and so on, as outlined in Table 1. Human beings strive for power, status, knowledge, order, vindication, acceptance, and so on. Many religious images express the specific core values and produce the same joys as those associated with the sixteen basic desires.

The following comments are intended to show the relevance of religious experiences for the management of the basic desires. Although religious experiences address all sixteen, Judeo-Christian values are more relevant to the management of some basic desires than others. Because of space considerations, the discussion here is limited to those basic desires most relevant to Judeo-Christian values. Table 1, however, shows that sensitivity theory is potentially relevant for understanding spirituality, not only Judeo-Christian religions.

Acceptance. The desire for approval expresses the value of inclusion and produces the joy of positive self-regard. This desire forms a continuum between always seeking approval and never seeking approval. Psychological studies show that people regulate this desire. In laboratory experiments, for example, people given the opportunity to self-reward themselves for their performances usually choose moderate amounts of reward consistent with their self-esteem; people rarely give themselves maximum reward or no reward (Bandura 1977).

We have the potential to experience acceptance by imagining gods in the form of savior or redeemer. The Christian belief that Jesus died to atone for the sins of humanity increases feelings of acceptance and self-worth in the minds of the faithful. Roman Catholic priests forgive people who confess their sins, increasing their sense of acceptance and self-worth. Baptism is a religious ritual that atones for original sin, producing a sense of fundamental acceptance from God.

When we experience a level of acceptance greater than we desire, we feel uncomfortable and are motivated to reduce acceptance. At these times religious people may find themselves attracted to preachers who talk about original sin and the sinfulness or unworthiness of human nature.

Family. The basic desire to raise children expresses the value we place on children and child rearing and produces the joy of love. Adults vary significantly in how much time they want to spend raising children. Some do not want to have children, some have children but are not around to raise them, and some organize their lives around their children's needs.

We have the potential to vicariously experience parental love by worshipping God in the image of sons or daughters. Various ancient societies, including prehistoric people who left behind artifacts such as figurines and drawings, worshipped child gods (Armstrong 1993). Jesus Christ represents God in the image of a son. Although some mythical gods were antifamily (Cronus ate his children as they were born), mainstream institutional religions express family values. Persons who want to reduce time spent with family or express antifamily values probably will not be able to accomplish this goal through religious means.

Honor. The desire to behave morally expresses the values of duty and responsibility and produces the joy of loyalty. Honor motivates psychological connections between ourselves and our parents and ancestors. This desire forms a continuum between absolute goodness (God) and absolute evil (the devil). Dutiful people obey traditional moral codes of conduct, whereas expedient people are quick to take personal advantage of any opportunities that may arise. Some adult children may feel guilt when they are disloyal to their parents or heritage.

We have the potential both to increase and to decrease our experience of honor through religious means. We can honor our parents by embracing God's commandments, or we can dishonor them by behaving immorally. We can choose to behave morally in most areas of life but expediently or unethically in others so that our overall experience is consistent with our individually determined balance (sensitivity) point for honor.

We can increase our experience of loyalty by worshipping gods in the image of father. We also can embrace the religious affiliation of our parents (Kendler, Gardner, and Prescott 1997). Loyalty can be experienced each time an adult child thinks about his/her observance of family religious traditions or his/her efforts to marry or raise children within the religion of the parents. We can decrease our experience of loyalty to religious parents by behaving immorally.

Independence. The desire for self-reliance expresses the value of taking care of oneself and produces the joy of freedom. People normally aim for a balance point (interdependence) between absolute independence (never in need of others) and absolute dependence (always in need of others). In its extreme variant, absolute dependence implies a diminution of the sense of *I* to the point of unification with love objects. In love, we see some type of wish for loss of the sense of *I* and desire for union with the loved object.

We have the potential to increase or decrease our experience of independence by embracing various religious images and beliefs. We can increase our sense of independence by embracing god in the form of Reason. Using this imagery, many intellectuals believe that we have the potential to discover scientific principles (the rationality of the natural universe) and then apply those principles to increase our control over our destiny. We

also can increase our sense of independence by contemplating Descartes's philosophical concept of divine substance.

We can decrease our experience of being on our own by imagining attentive and supportive deities who care about us and listen to our prayers. When we imagine caring deities we tend to experience psychological support, which moderates the experience of independence. An especially discomforting aspect of dying, for example, is that human beings die alone (Malraux 1961). Persons who face death have the potential to moderate the feeling of being on their own through faith in gods who care.

Order. The basic desire for organization expresses the values of precision, neatness, cleanliness, and perfection and produces the joy of stability. Order can be viewed as a continuum between the extremes of constant flux or chaos and unchanging form. Organized persons pay attention to detail, follow rules religiously, and enjoy rituals and planning. Spontaneous persons enjoy ambiguity and spontaneity, interpret rules flexibly, and dislike detailed plans and organization. Some spontaneous persons introduce ambiguity into arguments because they enjoy ambiguity more than they enjoy persuading others of their opinion. Others will mess up a neat and clean room just enough to feel comfortable.

We have the potential to increase our experience of order by embracing various religious images and beliefs. Immortality, a characteristic of many gods, conveys a sense of infinite stability and permanence. No matter what might happen in life, religious people believe that the Divine will be unchanged. Although the physical universe is in constant flux, divinity is stable and permanent. Stability also can be experienced through the practice of religious rituals and traditions. Nations may come and go, but certain religious rites and rituals have remained little changed since antiquity. Religions have put forth many rituals that express the value of cleanliness, which falls under the desire for order. Cleanliness is a form of perfection and organization.

Since antiquity people have worshipped gods who create order. The first gods of ancient Babylonia were organized structures that emerged from a primordial soup of divine substance (Armstrong 1993). These gods did not create the world and did not intervene in people's lives. They expressed the human beings' yearnings for permanence and stability. When Babylonians worshipped these gods, they experienced a sense of stability by contemplating the order in the universe. Further, the first sentences of the Bible describe an orderly creation.

Religious values favor order and cleanliness over flexibility and sloppiness. Religions have provided few images that decrease our experience of order. Religious services and ceremonies rarely encourage spontaneity.

Power. The desire for influence expresses the values of leadership and achievement and produces the joy of efficacy. Individuals differ in

how much power they like to experience. Dominant personalities usually enjoy being in charge, giving advice, making decisions, and controlling things and may seek high levels of achievement (influential works). Submissive or nonambitious personalities usually prefer to be followers and to let others make decisions.

We have the potential to express our core values regarding power by embracing various religious images and practices. The image of god as Almighty Creator expresses infinite influence and conveys efficacy: Creation is arguably the greatest achievement human beings can imagine. We can decrease our experience of self-efficacy by imagining god in this form, as lord over all. When we reflect on this god's power over us, we feel powerless relative to divinity. A highly successful person, who may tend to look at his or her accomplishments and feel extremely competent, may experience humility through religious submission. Psychologically, humility moderates the experience of efficacy.

Status. The basic desire for prestige expresses the value of stature and produces the joy of self-significance. Individuals vary in how strongly they are motivated by status and in the level of status with which they feel most comfortable. People who are highly motivated by status are often concerned with their reputation and stature. They tend to seek wealth or popularity or social standing as means of gaining an impressive reputation. People who are weakly motivated by status care little about what others think of them and pay little attention to marks of social class, such as wealth and popularity.

We have the potential to regulate our experience of status by embracing various religious images and beliefs. The religious idea that gods created humanity and that they are aware of what happens to us implies that we are so important that we command attention from divine sources. The concept of a soul also suggests a special status for human beings. We can decrease our sense of self-significance by imagining gods who are too busy to pay attention to us.

Vengeance. The basic desire to retaliate expresses the value of self-defense and produces the joy of vindication. This desire can be considered as a continuum between the extremes of "seeks to experience conflict 100 percent of time" and "seeks to experience conflict 0 percent of the time." Vengeful people tend to be highly vigilant to signs of offense, may strike back quickly, and may value self-defense and aggressiveness. Conflict-avoidant people tend to look the other way when offended, strike back very slowly, if at all, and may value peacemaking.

We have the potential to use religious imagery and practices both to increase and to decrease our experience of vindication. Since the dawn of history, people have prayed to war gods for divine assistance on the battlefield. God has been invoked on both sides of the war in Iraq, for example.

Prayers for divine intervention may arouse images of battlefield victory, which lead to feelings of vindication. Hindus have the potential to experience vengeance by imagining and identifying with the destructive goddess Kali and the god Shiva, who is experienced in the image of destroyer. It is said that more temples have been built for Shiva than to God in the form of creator and preserver combined (Smith 1991). Christians can reduce the experience of vengeance by focusing on teachings of kindness and "turning the other cheek." Thus, we can regulate our experience of vengeance by imagining different aspects of divinity.

Tranquility. This basic desire for personal safety produces the joy of relaxation and expresses the value of prudence. Individuals differ in how much risk they like to take. People with high tranquility tend to be cautious, risk-avoidant, fearful, and anxious, and they have a propensity to experience panic attacks (McNally 2002). People with low tranquility tend to be risk takers, fearless, and nonanxious.

Through faith we have the potential to overcome fear and anxiety and experience tranquility. According to Reinhold Niebuhr (1949), we become anxious when we realize how precarious our lives are. We develop fundamental fears concerning death and human insignificance. Niebuhr thought that faith offers the best opportunity to overcome such anxieties and experience tranquility. There is less of a tendency to panic over the possibility of death if you believe your soul is headed for Heaven.

Buddhism and Taoism offer religious paths for gaining tranquility and coping with anxiety, pain, and suffering. In Taoism, the Way is a state of complete contentment, tranquility, and harmony with nature (Smith 1991).

Compound Motives. Much like all chemical compounds reduce to combinations from the chart of elements, sensitivity theory holds that many complex human motives are combinations of two or more of the sixteen basic desires. Some religious images, concepts, and experiences, therefore, may be related to the regulation of more than one of the basic desires. The religious concept of sin, for example, is multifaceted. Sin reduces our sense of honor and our experience of loyalty to parents, because it is a violation of our moral heritage; sin also reduces our sense of acceptance, because it represents an estrangement from God; and sin reduces our experience of order, because it is a violation of rules, giving impressions of impurity. The concept of sin, thus, is relevant to the regulation of at least three of the basic desires—honor, acceptance, and order.

Scientific Study of the Human Spirit

Sensitivity theory is best viewed as a theory of behavior. Only years of research can establish the validity of these ideas, and I urge behavioral scientists, philosophers, and theologians to conduct future work in the

sensitivity theory of religion. I conducted an early empirical test of this theory by evaluating which basic desires play large roles in motivating religiosity—defined as how religious a person says he or she is. I asked 558 mostly Christian adults to complete the Reiss Profile questionnaire and then describe themselves as very religious, somewhat religious, or not religious. The results showed that how religious people said they were was strongly associated with the extent to which they said they were motivated by honor (see Reiss 2000b). I interpreted this result to mean that many people embrace religion to honor and show loyalty to parents and ancestors. The results also showed that religious people place below-average value on independence (self-reliance). The more religious a person said he or she was, the less the individual sought to be self-reliant. This result is consistent with the religious literature that emphasizes the significance of being absolutely reliant on God. Although religious people desired to be in need of God or others, they showed average desire for personal power or influence. Indeed, some religious people saw opening their hearts to God as a means of gaining power.

Self-reported religiosity also was associated with above-average motivation to raise a family, avoid conflict (low vengeance motivation), and experience order. These findings are consistent with Christian teachings on the importance of family and the concept of "turning the other cheek." Since self-reported religiosity was associated with order motivation, the psychological satisfactions of rituals may play a significant role in attracting people to religion.

Havercamp has studied preliminarily the basic desires that drive young adults to join the clergy. She administered the Reiss Profile to 49 students (26 men and 23 women) enrolled in one of three Midwestern Protestant seminaries and showed profiles of low independence, high idealism, and low status (Havercamp 1998). The significance of low scores for the basic desire of independence already has been discussed; it implies a desire for psychological support (as in submission to God). High scores for idealism suggested that the seminary students sought to improve society. The seminarians also scored more than a half standard deviation below the general population norm for status, suggesting that they should feel comfortable taking vows of poverty.

Although these initial studies have provided empirical support for sensitivity theory, they need to be replicated and extended with participants from more diverse religious backgrounds. Future research could determine which desire profiles are associated with various god-images and specific religious practices. I suspect that the world's major religions address the same basic desires but in different ways. Administering the Reiss Profile to large groups of people practicing different religions and comparing the results based on religious affiliation might produce interesting results.

Sensitivity theory expresses a number of ideas that would benefit from further analysis by philosophers and theologians. One idea is that basic desires are great equalizers (see Reiss 2000a). I believe that the child who overcomes a physical handicap to dribble a basketball experiences the same sense of accomplishment Michael Jordan experienced when he won his fifth National Basketball Association championship. The adult with mental retardation who prays to God experiences the same psychological support experienced by anyone who prays to God. Under the theory of sixteen basic desires, all people—rich and poor, smart and dull, handsome and plain, healthy and sick—have approximately equal potential to embrace their basic desires and experience life as psychologically meaningful.

I distinguish two kinds of happiness that I call "value-based happiness" and "feel-good happiness" (Reiss 2000a). Value-based happiness refers to a sense that life is meaningful, and feel-good happiness refers to the experience of sensual pleasures. Value-based happiness occurs as a by-product of experiencing basic goals (satisfying our strivings), whereas feel-good happiness occurs when certain senses are excited. Arguably, the study of value-based happiness, which is what the sixteen basic desires are all about, could be seen as a scientific study of the human spirit.

Notes

1. Sensitivity theory addresses the psychology of religious experiences and has no implications for the validity or invalidity of religious beliefs.
2. See Daniel L. Robinson's account (1989) of Aristotle's psychology, especially the discussions of self, for an overview of this subject matter. Sensitivity theory is an original theory that reflects the influence of Aristotle's work.
3. Under sensitivity theory, genetically influenced behavior is not necessarily unchangeable. Sometimes significant life events alter our fundamental desires and change who we are, but usually these are unplanned. Generally, psychologists do not know how to deliberately change their patients' basic desires and core values. For the most part, therapy is about changing means, not ends. Usually its goals are to teach patients effective means for satisfying their basic needs (such as teaching social skills to a person having interpersonal problems) or reducing conflict with regard to the means an individual has chosen to satisfy different ends.
4. For more than twenty centuries the scholarly study of human motivation was classified under the heading of "ethical philosophy" because we value what we want and want what we value. Aristotle's *Nicomachean Ethics* ([330 B.C.E.] 1976) includes lengthy discussions of motivation and temperament.
5. Details of this research are reported elsewhere. See Reiss 2000a; Reiss and Havercamp 1996; 1998; Reiss, Wiltz, and Sherman 2001; Wiltz and Reiss 2003; Dykens and Rosner 1999; Engel, Olson, and Patrick 2002; Lecavlier and Tasse 2002; Reiss forthcoming a, b; Reiss and Havercamp forthcoming; Havercamp and Reiss 2003.

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REDUCTIONISM'S DEMISE: COLD COMFORT

by Donald H. Wacome

Abstract. Nonreductive physicalism, as opposed to reductionism, enjoys wide popularity by virtue of being regarded as comporting with the traditional image of human beings as free and ontologically unique without the difficulties of mind-body dualism. A consideration of reasons, both good and bad, for which reductionism is rejected suggests instead that the move to nonreductive physicalism does nothing to mitigate the implications of a physicalist account of human nature.

Keywords: freedom; mind-body dualism; nonreductive physicalism; physicalism; reductionism.

The dualistic idea that humans are, in whole or in part, immaterial beings is now widely regarded as outré. To confess it in certain intellectual circles is to reveal a possibly hopeless naivete. Dualism continues to have able and ingenious defenders, but they are fighting a rear-guard action. Physicalism, the view that we are entirely physical beings, has become something close to an academic orthodoxy. The more we learn about the workings of the human brain, the harder it is to insist that the mind is nonphysical. In some quarters, however, physicalism is rarely endorsed without the qualification that, while it is true and good, reductionism is false and bad. In the past it was taken for granted that physicalism and reductionism are more or less synonymous. However, it is now clear that they are distinct: reductionism implies physicalism, but physicalism does not imply reductionism. What makes physicalism palatable to many today is the realization that there can be a *nonreductive physicalism* (Davidson 1980; Post 1987, 159–208). This possibility has been eagerly endorsed. Physicalism is in; reductionism is out. Endorsing reductionism is, for many, as retrograde as endorsing dualism itself.

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This adverse judgment on reductionism by avowed physicalists is perhaps especially pronounced among persons of faith, for whom a central concern is protecting the traditional human self-conception from the inroads of a scientism intent on denying the uniqueness of human beings. In the course of advocating a physicalist account of the human being, Arthur Peacocke asserts, "Christian believers, affirming as they do the reality, dignity, and value of the human mind, are opposed to reductionism" (1985, 149). More recently, the essays comprising *Whatever Happened to the Soul? Scientific and Theological Portraits of Human Nature* (Brown, Murphy, and Malony 1998) work from the supposition that a physicalist view of human nature that rejects the dualism of body and mind (or soul) comports well with the standpoint of faith so long as it is a nonreductive physicalism. Ian Barbour contends that "without reverting to dualism we can today reject reductionistic materialism and acknowledge human beings as responsible persons" (2002, 129).

What is so bad about reductionism? Does it threaten our reality, dignity, value, or freedom in any way that physicalism as such does not? My aim in this essay is to put forward considerations that undermine the conviction that nonreductive physicalism mitigates the difficulties that the triumph of physicalism poses for our traditional view of ourselves as free and ontologically unique. Physicalism challenges the traditional view of human beings in its nonreductive forms no less than in its reductive forms.

In what follows, I begin with a brief characterization of classical intertheoretic reduction, the strongest version of anything properly called reduction. Then I consider a variety of objections to it and suggest that any merit they have is as objections not to reductive physicalism as such but to physicalism in general. I go on to consider the actual reasons that classical reductionism came to be widely regarded as a failed project and suggest that they offer no clear comfort to those who see it as a threat to the human self-image. Next, I cast doubt on the view that, while reductionism precludes the possibility of free agency, nonreductive physicalism leaves room for it. Finally, I note that the rise of views closely akin to classical intertheoretic reduction threatens to render nonreductive physicalism anachronistic.

Classical Reductionism

The term *reductionism* is used in a variety of ways, but I focus on a core concept. As articulated in the mid-twentieth century heyday of logical empiricism, reductionism was understood as a logical relation between the statements of theoretical languages (Nagel 1979; Hempel 1966, 101–10).[1] A standard example is the reduction of chemistry to physics: the reductionist claimed that the theoretical language of chemistry can be translated into the theoretical language of physics. For instance, the chemist's term

molecule can be translated into physical terms, such as *atom* and *electron,* that refer only to things with which physics is concerned. This translatability is a one-way relation; we cannot in general translate the terms of physics into those of chemistry. The language used by chemists can be replaced with the language used by physicists with no diminution of our power to refer to things, but physicists talk about things for which there is no chemical vocabulary. Some physical things are "invisible" to the language of chemistry; there is no way explicitly to refer to them. A crucial fact here is that reduction is a relation of one set of *types* to another set of types; classical reduction is *type reduction.* If one science is reducible to another, there is a smooth mapping of the types—the concepts, categories, and kinds—of the reduced science onto the concepts, categories, and kinds of the reducing science.

Reducibility was conceived as a logical relation between linguistic items—theoretical vocabularies and the statements framed in them—but type reducibility was taken as having ontological implications. If the languages of chemistry and of physics are completely interchangeable, no more things can be referred to by means of chemists' language than are already referred to by means of physicists' language. If we specify the relation of a particular oxygen atom and two particular hydrogen atoms, particularly the way they share electrons, then we have ipso facto specified a water molecule. We cannot think that there is anything more to a water molecule—this chemical thing—than its physical parts standing in the physical relation in which they stand. After all, a water molecule *is* two hydrogen atoms and an oxygen atom suitably related to one another. So, in a derivative sense, we may speak of the reducibility of one type of thing to another type of thing, of molecules to atoms.

Common Objections to Reductionism

Those who embrace nonreductive physicalism think that it is good and important that reductionism be false. A consideration of widespread objections to reductionism suggests that rejoicing in the possibility of a nonreductive physicalism is ill grounded. Either these objections rely on misunderstandings about what reductionism implies or they apply to *any* sort of physicalism, whether reductive or nonreductive.

Reductionist has a pejorative use in many sectors of contemporary intellectual discourse as equivalent to *simplistic.* Here, a reductionist approach is construed as ignoring things that should not be ignored; it literally reduces the number of things or aspects of things to which we think we need to pay attention. A sociological theory that pays heed to economic facts to the exclusion of other features of a society—its religious and cultural aspects, for instance—might be characterized as reductionistic in this sense. It is true that to think simplistically is a mistake; the question is whether

any particular reductionist theory is in fact too simple, actually leaving out of consideration something that should not be left out. A type-reductionist theory involves a reduction in the number of referring terms and by implication the number of fundamentally different kinds of entity that need to be taken into account. The reduction of chemistry to physics involves the possibility of replacing all of the uniquely chemical vocabulary with that of physics. In this way to reduce is to simplify.

Why should anyone regard the reductionist claim about the in-principle replaceability of one vocabulary with another as simplistic, as ignoring something that should not be ignored? If someone claims that our psychological language can be reduced to a language that talks only about the brain and its doings, what is she ignoring? It's not as though she is saying that in trying to understand the mind we can ignore mental things; presumably she means that we must pay attention to mental things but that they can all be referred to with a strictly physicalist vocabulary. Of course, this implies that those mental things are physical things. Those who believe that the mind is not a physical entity have a right to complain that the reductionist omits something that ought not to be left out—the immaterial mind. However, all physicalist theories of the mind, whether or not they are reductionist, reject the existence of a nonphysical mind and contend that it is the brain, a physical thing, that reasons, chooses, emotes, is self-conscious, and so on. Reductionist theories are not unique in leaving the nonphysical mind out of consideration. This is the essential theoretical simplification that physicalism endorses. Nonreductive physicalism is no less guilty of it than reductionist physicalism is.

A related objection is that reductionist theories of mind deny the reality of the mind. Peacocke appears to be getting at this when he describes reductionism as incompatible with the *reality* of human beings. The contention is that to say that the mind is reducible to something physical is to say that, after all, the mind does not really exist. The reductionist is implicitly characterized as saying that we used to think there were such things as minds, but now we know there aren't any; there are only brains.

The reductionist has a ready response to this objection: at face value it is absurd. Suppose I say that the theoretical language in which Xs are referred to can be reduced to the theoretical language in which only Ys are referred to. The ontological implication of this is that Xs are *identical* to Ys, perhaps to exceedingly complex arrangements of them; any given X is this Y and that Y and that other Y and so on, suitably organized. What cannot reasonably be intended in the reductionist claim is that Xs do not exist *and* that they do not exist because they are identical to Ys, which do exist. That things of a certain sort are the very same things as things that do exist is not a good reason to believe that things of the first sort do not exist. Being the same thing as an existent thing is not the way to achieve nonexistence. That mental things are identical to neuroscientific things is

not a good reason to think that mental things do not exist. What seems to be forgotten here is that reductionism is a theory about the language with which we refer to things and not about the things to which that language refers. To say that the language with which we speak of Xs is in principle replaceable with the language we use to refer to Ys is to make a claim about the referential adequacy of the latter language, not a claim about the non-existence of the things to which the reduced language refers.

This objection appears to embody a confusion of classical type-reductionism with a theory that is opposed to it, indeed a response to the failure of this sort of reductionism: *eliminativism*. The eliminativist, not the reductionist, contends that the entities referred to by way of the irreducible language should be eliminated from our catalogue of things that really exist.[2]

However, this response is probably too hasty. There are contexts in which the claim that our talk of Xs reduces to talk of Ys is reasonably taken as tantamount to the claim that there are no Xs. Suppose someone believes that Xs *essentially* have such and such a property, some property that Ys essentially lack: he believes that if Xs exist at all, they have this property. He reasonably receives the assertion that nothing has this property as implying that there are no Xs. An analogous case might be that of the traditional theist who regards accounts of language about God as reducible to talk about human ideals and aspirations as tantamount to atheism: she'll say that if, as this reductionist theory claims, there is no supernatural personal being, there is no God. To the one who thinks that the human mind is essentially immaterial, theories on which the mental reduces to the physical are theories in which minds do not exist. On this score the dualist is entitled to object to the reductionist theory, but the objection is properly to physicalism in general, not specifically to its reductive versions. Physicalism, whether reductionist or nonreductionist, denies the existence of the immaterial mind.

Another objection is that the reductionist is saying that Xs—the reduced things—are *nothing but* things of the sort to which the reducing language refers, and this, derisively dismissed as "nothing buttery," is regarded as preposterous (see Peacocke 1993, 40). However, is there a plausible reading of the reductionist claim that Xs are nothing but Ys, which is patently false from a physicalist point of view? It seems unlikely.

Suppose I say of Polly the cat that she is nothing but a cat. I do not mean to say that the predicate *cat* is the only one that legitimately can be applied to her; there are surely any number of other things true of her, even though she is nothing but a cat. Polly is also an organism, a pet, an object that blocks my view of my computer screen, something I often refer to as an example, a thing my friend Jay mistakenly believes possesses a soul, a home for fleas, and so on. I mean that she belongs to a category that excludes her belonging to some other category, whereas someone else

might mistakenly say that, or behave as if, she belongs to that category too. I tell Polly, a creature singularly rich in self-esteem, that she is nothing but a cat, thereby reminding her that she is not a human being. Those who advance reductionist theories of mind are up to something similar, asserting that a human mind is nothing but a material thing, a more or less functioning brain, a collection of suitably interacting elementary particles, not—lest you imagine otherwise—an immaterial substance. Those with dualist inclinations will not appreciate this attempt to put human minds in their ontological place, but there is nothing essentially reductionist in this; all physicalists, reductive or not, regard minds as material.

A related objection is that reductionism implies that the reduced things are *nothing but the sum of their parts*, and that this is false because things are indeed more than the sum of their parts. Three questions arise here: What does it mean to say that a thing is or is not more than the sum of its parts? Does reductionism imply that things are no more than the sum of their parts? and Are the things in question in fact more than the sum of their parts? Consider an ordinary, reasonably complex physical object—an automobile. What would it mean to say that it is more than the sum of its parts? Imagine someone's believing that when all of the parts are put together properly, the result is still not a car, or perhaps not a functioning car; that the car will not work unless another, entirely different sort of part is added—say, a car spirit, an immaterial (or at least very special physical) entity. No one believes this about cars, but for a long time it was almost universally believed about living things. To deny this vitalist view we might say that a biological organism is nothing more than the sum of its parts. To say that is to say something obviously true; there are no vital forces or entelechies; biological life is the result of just putting the physical components together in the right way. This is analogous to what the physicalist says about human beings. When material things of the right kind are assembled in the right way, the result is a human person, mind and all. No further nonphysical thing—no immaterial mind or soul—must be added to do the real work of thinking, sensing, and emoting. Dualists will find this view objectionable, but it is essential to physicalism, whether reductive or nonreductive.

However, the assertion that a thing is no more than the sum of its parts might say something false. Take the car apart, and we wind up with a pile of parts but no car. Some of us who have experimented with the disassembly of complex physical objects have learned the hard way that just collecting all the parts together in one spot is a long way from having the object. If we read *sum* as simply the set of a thing's parts, with no regard to how they are put together, how they relate to one another and interact, it is obvious that most things are more than the sum of their parts. A car is not a set of car parts, even though it has the elements of a set of car parts as its parts. In this sense it would be incorrect to describe a human mind as no

more than the sum of its material parts; a bucket of neurons and glial cells is not a human mind. For the reductionist, things are no more than the sum of their parts, but not in this sense.

Yet another objection is that a reductive account of something *explains it away*. Here too it is difficult to see what could be intended that is at once a reasonable interpretation of the reductionist claim and obviously false, at least from a physicalist point of view. When I hear that something is being explained away, I think of this sort of case: Fred believes that some UFOs are extraterrestrial spacecraft. He experiences a sighting. The Air Force explains it as an atmospheric phenomenon. The UFO has been explained away; the proffered explanation is not what he hoped for or expected.

Whether something has been explained away or simply explained is relative to the sort of explanation wanted or expected in the first place. A vitalist might say of contemporary biology that it has explained away life; he was hoping for a sort of explanation different from what biochemistry and microbiology might supply. Only those committed to an explanation of mental phenomena that posits an immaterial entity are entitled to feel that a reductionist account explains away the mental. Here again the objection is misdirected. It is physicalism in general, not reductionist physicalism per se, that explains away the mental in this sense.

An underlying theme runs through the five preceding objections to reductionism: something has been left out that ought to have been included. It is hard to see what that might be, other than the nonphysical mind, in which dualists believe but which all physicalists reject. I suspect that these commonly voiced objections to reductionism are in reality merely expressions of vestigial discontent with physicalism and have little relevance to the issue of reduction.

A somewhat different type of objection contends that reductionism is committed to untenable views about how the mental can be explained. The core objection here arises in a variety of forms. One version contrasts nonreductive physicalism with the reductionist idea that such higher-level, mental facts can be explained in terms of lower-level, neurobiological facts. Another version contrasts nonreductive physicalism with the reductionist idea that what is true of a complex whole can be exhaustively explained in terms of its parts. Once again, it appears that while these claims are clearly false under some interpretations, the reductionist is committed to them only under other interpretations on which they are plausible from any physicalist perspective, whether or not it is reductionist. Objections of this type seem to miss the significance for issues of explanation of the fact that the mental supervenes upon the physical even if it is not reducible to it.

Physicalism in any form implies that the mental asymmetrically *supervenes* upon the physical. This means that whereas two persons can differ physically without differing mentally, they cannot differ mentally without

there being some physical difference. Whether or not the mental reduces to the physical, the mental facts are fixed by the physical facts; a physical duplicate of this world is necessarily a mental duplicate of it, too.[3] This implies that if we had adequate knowledge of the physical state of the world, including the nature of the supervenience relations that exist between the mental and the physical, we could explain anyone's being in any mental state by pointing out that the world's being in such-and-such a physical state implies that the person is in that supervenient mental state. For the sake of simplicity, suppose that Marvin's mental states supervene locally upon the neurophysiological states of his brain, and ask for an explanation of Marvin's happiness.[4] There is a kind of explanation of his being happy in that his brain is in such-and-such a neurophysiological state, and this implies that he is happy, because happiness supervenes upon that sort of brain state. Similarly, a kind of explanation lies in the fact that earlier Marvin's brain was in a particular neurophysiological state, and this, in conjunction with the relevant laws of nature, implies that he was caused to be in such-and-such a neurophysiological state upon which his being happy supervenes.

What is significant here is that these explanations are possible irrespective of the reducibility of Marvin's mental states to his brain states; they depend only upon the supervenience to which every physicalist is committed. The nonreductive physicalist has no basis for objecting to the mental facts about Marvin—the facts about the whole made up of the trillions of atoms and billions of neurons—being exhaustively explained in this sense. Of course, for finite human minds, such explanations are almost useless. From the reductionist perspective, we make sense of the world scientifically when we detect the higher-level patterns that map onto its lower-level causal regularities. Reductionism's promises about the reducibility of one science to another always related to what is possible *in principle*; no one seriously maintained that we might in practice dispense with the concepts, generalizations, and, if there are any, laws of the higher-level sciences on the grounds of their reducibility to physics.

The claim that reduction implies that the mind can be exhaustively explained in terms of the physical could be interpreted in another way, but when it is taken this way the reductionist does not accept it. It could be construed to mean that the higher-level, mental terms and concepts have no legitimate use in explaining the mind or human behavior, as if reductionism implied that we should reject such explanations of Marvin's happiness as "Marvin wanted to go to the party with Mary, and she accepted his invitation" and replace them with explanations that speak only of Marvin's lower-level, neurophysiological states. The reductionist theory implies that the mental vocabulary is in principle replaceable with the neuroscience vocabulary; this may sound as though the reductionist rejects the former in favor of the latter, but such a view misconstrues the intent of the reduc-

tionist program. To ascertain that the things we refer to when we speak of mental states are the same things that figure in our best scientific theories is not, for reductionism, a reason to discard such concepts. On the contrary, it is a discovery that legitimates their use. From the physicalist point of view, successful reduction serves to root the mind in reality. It is the failure of reduction that casts doubt upon the scientific validity of our mental concepts and, for some, upon the reality of the mind.

Consider two famous examples from the history of science. In the early eighteenth century Georg Stahl posited phlogiston to explain combustion, but this theory ultimately failed to account for the empirical facts and was rejected. Chemistry holds that phlogiston simply does not exist. Statements that refer to it are simply false; they are not translatable into the chemical vocabulary that refers to the various kinds of molecules and their interactions. Phlogiston plays no role in scientific explanation. In contrast, consider a successful reduction, that of heat to the mean kinetic velocity of constituent particles. Statements such as "The water in the beaker has a temperature of 100 degrees" can, in principle, be replaced with complex statements about the molecules in the beaker and their aggregate motion. Heat, unlike phlogiston, has a place in the world portrayed by modern science and a role in scientific explanation precisely because it is reducible to the lower-level language of physics and chemistry. Chemistry textbooks, undeterred by heat's reducibility, are replete with assertions about heat and its effects. In general, the reducibility of a pretheoretical concept to some scientifically acceptable theoretical vocabulary underwrites its explanatory validity.[5] The successful reduction of mind to brain would show why it is entirely reasonable to go on explaining human behavior by appealing to beliefs, desires, emotions, and all of the other familiar mental entities. As Paul and Patricia Churchland put it, a successful reduction "vindicates" the reduced theory (1998, 73).

Reductionism's Demise: Cold Comfort

It might seem perverse to dwell on the failings of these popular objections to classical intertheoretic reductionism in light of the fact that it is widely regarded as a refuted theory. However, as will become clear, those who look to its demise as making physicalism safe for the traditional human self-image make mistakes that parallel those embodied in the objections just cited. The move from reductionist to nonreductionist physicalism offers no comfort to those concerned with reductionism's impact on our self-image.

Even as classical reductionism was being perspicaciously formulated, its end was in sight. For a generation it has been clear that as a general thesis about relations among the sciences classical reductionism is untenable. There might be some intertheoretical reductions; possibly chemistry does

reduce to physics, but in general it appears not to work.[6] There is, for instance, a good case to be made for biology's not reducing to chemistry. The kind *gene*, a crucial biological type, arguably cannot be defined in chemical terms. All the genes we know of happen to be segments of DNA molecules, yet *gene* is a *functional* concept. A gene is anything, no matter what it happens to be made of, that acts like a gene—that is, that plays a certain information-theoretic role in cellular reproduction. There are any number of ways to make something that plays that role; genes could be made of Tinkertoys® or Play-Doh® or trained cats. The kind *gene* is multiply realizable: there are many different ways to be a gene, so many that there is no hope of spelling them out in the language of physics.

Reductionism, in its failure, separates from physicalism and reveals the possibility of a nonreductive physicalism. Consider the question of whether such folk-psychological concepts as *belief* and *choice* and *desire* embodied in our everyday language about the mind reduce to neuroscience, and, thus, whether the mind is ultimately reducible to the things of which physics speaks. It may have seemed that, while a successful reduction implies physicalism, the irreducibility of mind to physical reality would imply dualism; but the relation is not symmetrical. Successful reduction counts decisively in favor of physicalism, but reductive failure does not give us a good reason to think that the irreducible things are immaterial. To discover irreducibility is to discover nothing particularly significant about the ontology of the mind.

To appreciate why, consider an ordinary material object, say, a pizza, and consider the kind-term *pizza* that we use to refer to pizzas. Two things seem indisputable. One, we cannot reduce pizza talk to physics talk; pizzas cannot be defined in the vocabulary of physics. In that parsimonious language we cannot list the individually necessary and jointly sufficient conditions that something must satisfy to be a pizza. Here again the issue is multiple realizability: there are too many ways to be a pizza. If there is a pizza essence, it cannot be expressed by means of the conceptual resources of physics. Pizzas are among the world's irreducible realities.

Yet, pizzas indisputably are physical things. Pizza irreducibility inspires no one to embrace pizza dualism; there is nothing more to a particular pizza than the physical stuff of which it is made configured in the way it is configured. The fact that we cannot define what it is to be a pizza by speaking only of quarks and electrons does not imply that any given pizza is anything more than a large number of quarks and electrons suitably arranged. We are all nonreductive physicalists when it comes to pizzas and to most of the objects of everyday life. To say that the mind is irreducible to physics, or to some higher-level science such as neurophysiology, is to say something about it that is true about most, maybe all, macroscopic material things. The irreducibility of the mental to the physical seems about as ontologically interesting as the irreducibility of pizzas to the physical

and is not likely to point to solutions to the problems our being material poses for traditional conceptions of what it means to be human. Nonreductive physicalism offers no obvious route to human uniqueness.

Nonreductive Physicalism And Freedom

Perhaps nonreductive physicalism's strongest attraction lies in the hope that it makes possible an account of free agency consistent with our being material beings. Typically we explain the choices that human beings make by appealing to their reasons for those choices, that is, to their beliefs and desires. We explain, for instance, Karen's choosing to go to the zoo by pointing out that she wanted to see an aardvark and believed that the best place to see one was at the zoo. The crucial question is whether our reasons *cause* our choices and, if they do, whether this is compatible with those choices' being free. From the incompatibilist perspective we can be free only if our reasons do not cause our choices.

On plausible assumptions, the type irreducibility of the mental to the physical implies that there are no causal laws that refer to mental states as such (Davidson 1980; Fodor 1981). The laws of nature are about the causal relations between physical types, not the irreducible types of our psychological vocabulary. No causal law dictates that if Karen wants to see an aardvark and believes that the best place to see one is at the zoo she will choose to go to the zoo. This might inspire someone to think that in escaping classical, intertheoretic reduction we have made the world safe for incompatibilist free choice. However, this move runs afoul of the fact that, even if reduction fails and there are no type identities, there still might be *token* identities. Even if mental kinds (types) are not identical to physical kinds (types), it might still be the case that any particular mental thing is numerically identical to—the very same individual thing as—some particular physical thing.

There is no classical reduction of talk about pizzas to talk about the quarks and electrons that they are made of; the kind *pizza* is not identical to any physical kind. Nonetheless, it is highly plausible that any given pizza is *token* identical to a particular arrangement of quarks and electrons existing at a particular place and time. Likewise, we can reject the type identity of the mental and the physical and still say that any given mental event is token identical to some physical event. So long as the mental is in this sense identical to the physical, the mind remains decisively implicated in the cause-and-effect matrix of the natural world. Dispensing with classical reduction and type identity does nothing to change that. Once again there seems to be nothing special about human minds. There are no laws of nature about such irreducible items as pizzas or pencils, yet these are surely governed by such laws. The term *pencil* appears in no law of nature, but this does not exempt my pencil from falling to the floor when I drop it

as prescribed by the law of gravity. So long as the mental is token identical to the physical, the mind appears to be completely embedded in the causal structure of nature just as everything else in the physical world is.[7]

We should note in passing that there is good reason to worry that if mental events are not at least token identical to the physical events that cause bodily movements, the mind lacks causal efficacy: it would be an illusion that our conscious choices cause our behavior. Indeed, some think that this epiphenomenalist consequence is avoidable only if some sort of type reduction and type identity obtains (Kim 1998). The cost of ensuring that choices are not identical to physical events, and thus not the effects of other physical events, might be their being causally impotent.[8] The conclusion that our choices have no physical effects goes far beyond securing the view that they have no physical causes.

Nancey Murphy, a prominent advocate of nonreductive physicalism, seeks to safeguard freedom by denying the identity of the mental and the physical without denying physicalism itself. She asks, "If human behavior is entirely reducible to chemistry, and chemistry to physics, then is it not the case that the laws of physics ultimately determine everything we do and that human free will is an illusion?" (Murphy 1997, 13) She attempts to demonstrate the nonidentity of the mental and the physical by pointing out that mental states not only possess the property of being multiply realizable but are also "multiply constituted"—that is, the same type of brain state can be the supervenience base for different types of mental state, depending upon the circumstances in which the mental state is realized. This suffices to show that mental types are not identical to neurophysiological types and, thus, that no classical reduction succeeds (Murphy and Ellis 1996, 32–37; Murphy 1998, 128–43).

However, multiple constitutibility is consistent with the token identity of particular mental events with particular brain events. Consider the example Murphy offers, in which two experimental subjects receive a small electric shock to the back. Subject A has been led to expect to have ice applied to his back (Murphy 1998, 137). Because of this "mental set," he experiences the shock as a sensation of cold. Subject B has been led to expect something hot to be applied to his back; his mental set leads him to experience the shock as the sensation of being burned. We are to assume that the application of the shock to the back produces the same kind of neurophysiological event in both subjects. Thus we have:

- A's sensation, *w*: a particular event, a token of the mental type *C*, "sensation of cold"
- A's brain event, *x*: a particular event, a token of *N*, a neurophysiological type
- B's sensation, *y*: a particular event, a token of the mental type *H*, "sensation of heat"

- B's brain event, *z*: a particular event, a token of *N*, a neurophysiological type

This shows that *N* is not identical to *C* and that *N* is not identical to *H*. It does not show that *w* is not numerically identical to *x* or that *y* is not numerically identical to *z*; token identity of mental event and brain event might obtain in the absence of any identity of mental types and neurophysiological types. Two identical brain events, *x* in A and *z* in B, could be sensations of two different types.[9]

This is important for the issue of freedom, because whatever causally determines a particular brain event also determines any mental event numerically identical to it. The mental events we call choices might well be type irreducible to some type of brain event, but if any given choice is token identical to a particular brain event, whatever causes that brain event is its cause. The nonidentity of the mental and the physical for which Murphy contends appears to be of no help in the attempt to secure incompatibilist freedom. It leaves the human mind fully embedded in the cause-and-effect physical world.

The token identity of mental and physical particulars is widely accepted among physicalists. However, not everyone accepts it. It might be that, although mental events supervene upon the brain, it is no easier to identify mental particulars with neurophysiological particulars than it is to identify mental types with neurophysiological types (Haugeland 1998). Suppose that Mike is thinking about bananas and is doing so because of what is going on in his brain; his banana thought supervenes upon his brain. He cannot stop thinking about bananas and start thinking about beer without there being appropriate changes in his brain, and his brain's being in this state is sufficient for his thinking about bananas. This supervenience relation may hold even though his banana thought cannot be identified with any particular brain event, even if his banana thought turns out to depend upon brain activity so widely distributed that there is no plausible candidate for the neurophysiological event or state that is this mental event. This possibility acquires some credibility from a connectionist, or parallel distributed processing, model of the mind. On this account the mind, consisting of a network of many interconnected processors (neurons), represents bananas not because it contains an explicit banana symbol but by virtue of the overall pattern of weighted connections. Little less than the current state of the whole neural network can be identified with a specific representational state (Bechtel and Abrahamsen 1991, 1–20,147–75).

However, abandoning the token identity of the mental and the physical appears to offer no more to those intent on procuring freedom for material persons than does giving up on type identities. Even if there are no useful identifications of supervenient mental particulars with anything less than the state of the whole brain, this will not alter the fact that the brain and all

its states are fully subject to natural law. Supervenience shorn of both type identities and token identities offers nothing to support the conclusion that mental events somehow escape the net of physical causation and, thus, nothing to encourage the view that nonreductive physicalism can give us the kind of freedom incompatibilism demands. Physicalism needs help from neither the type identity nor the token identity of the mental and the physical to pose problems for our traditional conception of ourselves as free agents. Those problems arise from physicalism itself.

Reductionism Redux?

Reductionism is perhaps not so bad after all; at least it is no worse than nonreductive physicalism, except for the rather large impediment of being generally regarded as false. Even this view might be passing. There are accounts of the relation between the mind and the brain that are reductionist in spirit yet apparently immune to the difficulties that encumbered classical reductionism.

We should first recognize that multiple realizability implies the nonidentity of mental and physical types only on the assumption that the types specified in the reducing language must be relatively simple—not wildly complex, messily gerrymandered disjunctions that would be of no use in scientific explanation. If this requirement were to be relaxed, a physicalist might have no reason to deny the reducibility of the mental to the physical; any mental property or entity or event would be identical to some physical property or entity or event. The classical notion of intertheoretic reduction originated in the philosophy of science, so it is not surprising that this requirement has generally been seen as decisive in its failure. However, philosophers whose concerns are more generally metaphysical might see no reason to regard reductionism as a failed project (see, for example, Lewis 1994, 412–15).[10]

Also, it is not clear that the collapse of classical reductionism spells doom for the type reducibility of the mental to the physical as such. Multiple realizability might defeat the view that, for example, the very general mental type *pain* is identical to a particular type of human brain state; other kinds of organism might experience pain even though their brains are constructed on quite different principles than ours. However, type reductions might be possible if restricted to a single species. Possibly the mental type *human pain* is, after all, identical to some type of human brain state (Bechtel and Mundale 1999; Kim 1998, 93–97).

Further, we should keep in mind that *functionalism*, the main successor to the mind-brain identity theory and to the type reductionism involved in it, is a theory that, while principally motivated by the multiple physical realizably of mental types, does not typically reject type reducibility as such. Instead, it replaces the project of reducing mental types to neurophysi-

ological types with the project of reducing mental types to functional types specifiable as causal roles. Functionalism is the theory of mind that underlies the computational approaches to the mind that, despite their difficulties, dominate cognitive science. Suppose that mental types reduce to computational types and that computational types, being realizable in any number of quite different physical systems, cannot be reduced to neurophysiology: this hardly gives aid in the quest for human ontological uniqueness or comfort to those who seek to extricate the human mind from the causal structure of the physical world. At face value, it leaves us as deeply embedded in this world governed by causal law as the machine running the irreducible, multiply realizable word-processing software that I am using to write this.

Finally, it is important to recall that the conception of reduction that has for a generation seemed generally implausible treated theories as essentially linguistic in form and reducibility as a logical relation between sets of propositions. Failures of reduction were failures of translatability. Contemporary "new wave" accounts of intertheoretic reduction dispense with the linguistic element and construe reduction as a structural isomorphism between mathematical models (Hooker 1981; Bickle 1998). Arguably, these are not subject to the difficulties that overwhelmed linguiform reductionism. Should mental to physical reduction in this sense appear to be on the way to success, confident espousals of nonreductive physicalism would sound increasingly hollow.

Conclusion

The disrepute into which reductionist versions of physicalism have fallen can obscure the fact that physicalism itself is far from cost free, so far as our traditional self-understanding goes (Bielfeldt 2001). As far as our conception of what we are is concerned, there may be much that is bad about reductionism, but what's bad about it is just what's bad about physicalism. There may well be no plausible account of human nature that is genuinely physicalist but avoids the conclusion that we are as embedded in the physical world as all other material things are. Whatever value, dignity, and freedom we possess are the value, freedom, and dignity possible for physical things, irrespective of the success or failure of any reductionist project. Nonreductive physicalism is not a secure place to stand. We must either go back to defending dualism or get on with the task of ascertaining how much of our traditional self-image survives the discovery that we are material beings.

NOTES

A version of this essay was presented at the Upper Midwest Regional Meeting of the American Academy of Religion in St. Paul, Minnesota, in April 2002.

1. What I characterize here as classical, intertheoretic reduction is roughly a conjunction of what Barbour (2002, 20) characterizes as *ontological* and *epistemological* reduction. The uses of *reductionism* and its cognates vary widely, especially in the literature on religion and science. One can find oneself appreciating the quip that the term's principal use is to denote whatever aspects of materialism a particular materialist dislikes.

2. A parallel question worth asking, but one that I will not go into here, is whether the demise of eliminativism would do anything to preserve the traditional human self-image once physicalism is accepted.

3. Different versions of supervenience depend on precisely what kind of necessity is involved here (Kim 1993).

4. The more realistic supposition might be that his mental states supervene upon this brain in its environment and with its particular history.

5. It is a further question when something's irreducibility disqualifies it from having an explanatory role.

6. Even the paradigmatic cases of allegedly successful reduction face significant difficulties on close inspection (see, for example, Sklar 1992, 106–17; Stewart and Cohen 1997, 33–61).

7. Some nonreductive physicalists believe that the fact that the mental supervenes upon but does not reduce to the physical world opens the possibility of a downward causation in which mental events act upon the physical world without themselves being determined by physical events. This is regarded as refuting the view, labeled *causal reductionism*, that all of the higher-level characteristics of a complex whole are determined by the lower-level events on which they supervene (Murphy 1998, 129). Although it is highly plausible that in some sense there is such a thing as downward causation—the state of my brain a few moments from now will in part be an effect of my thinking the thoughts I am thinking right now—it is difficult to imagine how this could be of use in securing incompatibilist free choice. On physicalist assumptions mental events are events in the physical world and thus have physical causes; they are neither uncaused nor caused by events occurring in something nonphysical. For the case that there is little metaphysical mileage to be derived from the idea of downward causation see Bielfeldt 1999.

8. Oddly, some defenders of nonreductive physicalism assert that it is the *identity* of the mental and the physical that would render the mental epiphenomenal (Polkinghorne 1996, 18; Murphy 1998, 132).

9. The case is analogous to that of a computer in which two exactly similar events in the hardware might play quite different computational roles, depending on what software the machine is running.

10. While successful reduction can have significant ontological implications, suggesting that there are fewer fundamental kinds of thing than appearances might lead us to expect, more broadly it is important to keep in mind that the facts about reducibility and irreducibility are primarily facts not about the world but about the thought and language with which we refer to the world. Once we make the move to physicalism, the ontological status of the mind is essentially decided; further facts about the reducibility or irreducibility of the language with which we refer to it cannot change that.

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EMERGENCE, PROBABILITY, AND REDUCTIONISM

by Frank E. Budenholzer

Abstract. Philosopher-theologian Bernard J. F. Lonergan defines *emergence* as the process in which "otherwise coincidental manifolds of lower conjugate acts invite the higher integration effected by higher conjugate forms" (*Insight*, [1957] 1992, 477). The meaning and implications of Lonergan's concept of emergence are considered in the context of the problem of reductionism in the natural sciences. Examples are taken primarily from physics, chemistry, and biology.

Keywords: emergence; Bernard Lonergan; reductionism; schemes of recurrence.

The so-called problem of reductionism has received considerable attention in religion-science circles in recent years. Here, the main concern is the nature of the human person and the difficult question of the meaning of the soul (Russell, Murphy, Meyering, and Arbib 1999; Brown, Murphy, and Malony 1998; Clayton 2002). On a more philosophical level, however, the question is no less urgent when considering the objects studied in physics, chemistry, biology, and sensitive psychology. Is reductionism primarily a methodology that has allowed science to progress to its current state (methodological reductionism), or does this methodology suggest that the material universe is determined in full by its smallest components, ontological or causal reductionism (Agazzi 1991)? My opinion regarding ontological reductionism is clearly in the negative. Making use of the thought of theologian-philosopher Bernard Lonergan,[1] I suggest that the various levels of reality studied by the physicist, the chemist, the biologist, and the psychologist are equally real and not simply reducible to the lower

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levels. In an earlier essay in *Zygon* (Budenholzer 2003) I argued that we can deal with the seeming impasse of reductionism only if we radically rethink our concept of material reality. The material is not somehow little chunks of imaginable matter, *res extensa*, but ultimately verified intelligibility that is at the same time limited in such aspects as place, time, and number by what Lonergan calls the "empirical residue" ([1957] 1992, 50–56). Each of the various levels of reality consists of an intelligible integration of what on the lower level would simply be random occurrences. Details of this argument are presented in my earlier article (Budenholzer 2003). An anonymous referee of that paper had noted that one of the things lacking was a consideration of Lonergan's concept of emergence. This essay addresses that omission.

The Nature of Metaphysical Speculation

Before discussing emergence as such, a preliminary question must be explored. Presumably, when we ask to understand Lonergan's concept of emergence, we are asking for some kind of philosophical explanation. But what is the function of such an explanation? What is it supposed to do that science cannot? First, in asking about emergence we are not hoping to somehow avoid the tough scientific questions. If you want to understand the relationship between subatomic physics and atomic physics, or between atomic physics and chemistry, or between chemistry and the biology of simple life forms, you have to do the science—quantum chromodynamics, quantum chemistry, biochemistry, and molecular biology. There is no shortcut. But if this is the case, what does philosophy have to tell us?

Here Lonergan parts company with many other scholastic philosophers. In a way reminiscent of Descartes and Kant but with a very different outcome, Lonergan argues that by understanding the nature of human knowing itself we can heuristically learn something about the nature of the known (Meynell 1998, 266 ff.). It is not my purpose to examine in detail here the so-called turn to the subject, the basis of Lonergan's epistemology and metaphysics. Although it may seem to some rather naive to presume that an examination of our knowing process can tell us something about the object of that process, to deny it would undermine all of our knowledge, scientific and humanistic. Many areas of presumed knowledge may be in error, but in each case when we believe that we are mistaken, we use the most reasonable approach we can think of to try to rectify the mistake. The knowing process is all we have. So the question would be, in the very nature of the scientific knowing process, are there any clues as to the nature of the known? Specifically, are there any clues to a tiered reality in which we may speak meaningfully of emergence?

Lonergan argues that all knowing, at least in the universe in which we live, involves a triple cord: experience, understanding, and judgment. We

experience data such as size, shape, weight, and color. From this experience we seek to gain understanding of the way things operate in either an explanatory mode (things in relation to each other) or a descriptive mode (things in relation to us). In the explanatory mode, we are ultimately seeking to understand basic laws—of physics, chemistry, biology, and so on. We also attempt to understand *things*—unity, identity, wholes such as atoms, molecules, living organisms, or human persons, which we experience and ultimately understand in their oneness. Finally, we may attempt to understand the complex arrangements of things in both space and time—what Lonergan refers to as "schemes of recurrence." Such schemes include everything from our solar system to social and economic systems to the complex artifacts of human ingenuity. However, not all understandings, whether scientific laws, the nature of things that make up our universe, or complex schemes of recurrence, are correct. Ultimately our knowing requires verification.

As explained in my earlier essay (Budenholzer 2003), to describe the properties of things and events Lonergan employs the technical term *conjugates*. "Experiential conjugates are correlatives whose meaning is expressed, at least in the last analysis, by appealing to the content of some human experience" (Lonergan [1957] 1992, 102). Colors and tastes, as well as the categories of descriptive science such as anatomy or geology, are examples of descriptive conjugates. "Pure (or explanatory) conjugates, on the other hand, are correlatives defined implicitly by empirically established correlations, functions, laws, theories, systems" ([1957] 1992, 103). Explanatory conjugates, because they involve things in relation to one other, are implicitly defined by the equations and explanatory networks of the sciences.

Lonergan defines a *thing* as "an intelligible, concrete unity differentiated by experiential and explanatory conjugates" ([1957] 1992, 280). Things exist on various levels and are the unities that are explained—subatomic particles, atoms, molecules, cellular organisms, sensitive organisms, human persons that can transcend themselves in knowing and loving. Science knows each level through the descriptive and explanatory conjugates correlative to the thing under study. The criterion of reality of both conjugates and things is simply their verified intelligibility.

Each level of reality has its own set of explanatory conjugates, which are the particular subject of the science of that level—physics, chemistry, biology, sensitive psychology, and so forth. No set of conjugates or level of things is more real than any other. The real is verified intelligibility at whatever level one is operating. Saying that each level is equally real is not denying the clearly verified conclusion of levels of reality. At each level the random conjugates of the lower level are unified in a higher integration. Chemistry systematizes what would be merely coincidental events on the atomic level, allowing the emergence of an autonomous science of chemistry. Biology is an autonomous science that integrates what would be merely

coincidental events on the level of chemistry. The integration of coincidental manifolds at a new level does not take away the autonomy of the lower levels. The reality of the biological organism includes the conjugates of chemistry and physics. Therefore, the most exciting areas of science will be the cross-disciplinary areas—molecular biology and chemical physics, for example. Here science attempts to understand how those lower-level conjugates are systematized at the new level.

This, then, was the primary conclusion of my earlier essay. The real is verified intelligibility. We know things on various levels—subatomic, atomic, molecular, cellular, organismic, and so on. Each level has its own set of descriptive and explanatory conjugates. As verified intelligibility, each level is equally real; no level has ontological priority. At the same time, it also is recognized that successively higher levels systematize what on lower levels would be merely random occurrences. To appropriate what Lonergan suggests is no small step. I suggest that only when we move beyond the criterion of imaginability can we really understand the richness of what science has to teach us.

What does philosophy have to tell us about moving from one level to the next? Can we from an examination of our knowing process gain some understanding of the emergence of new levels of reality? As already noted, we do not expect this understanding to somehow substitute for science. It can, however, help to clarify the larger picture and possibly offer some hint in integrating the conclusions of the various sciences. Before tackling the problem of emergence, we must say something about a topic that at first may seem quite removed from our central topic—statistical inference and the nonsystematic.

In his treatment of empirical method Lonergan considers two basic knowing processes, classical and statistical ([1957] 1992, 23–69). In classical knowing we are attempting to understand, and ultimately affirm, the intelligible content of scientific law.[2] Classical knowing determines what we usually speak of as the laws or theories of nature, at least on the level of physics or chemistry, usually expressed as a mathematical function. On the level of subatomic physics we study quantum chromodynamics, on the level of atomic physics we may speak of quantum electrodynamics, in the world of chemistry we speak of valence and molecular dynamics, and so on as we move up the tiered levels of reality. Classical laws are abstract in the sense that to use them one must add the boundary conditions and other constants of the system to be studied. They are also abstract in that they are normally verified under conditions in which extraneous influences can either be accounted for or presumed not to interfere.

Statistical knowing considers not abstract laws but frequencies and distributions of actual events. The distributions studied by statistical method are normally grouped in some fashion around the moments of the distributions, most frequently the first moment, more commonly known as the

average or norm of the distribution. These moments are often defined by classical laws. We may, for example, experimentally determine the charge on the electron. But, as any experimentalist will verify, we determine not one unique electronic charge but a range of values in which we presume the average value somehow represents the real value. We also can determine frequencies of more mundane things. What was the average birth weight of all children born in 2001? What was the average in Taiwan? in Australia? We somehow feel that these two examples are not quite the same, and I agree that they are not. But they are both examples of statistical method, by means of which we determine frequencies of values—which, if the sampling is correct, group around ideal frequencies or norms, in these examples the charge on the electron and the average birth weight.

Here we face a key question in the philosophy of science: What is the nature of statistical inference?[3] Some would argue that statistical inference is simply a way to deal with systems that are beyond our detailed understanding. Presumably, if we could continue to improve our experimental techniques we could determine something very close to the "true" charge on the electron; but we will not be able to determine the "true" birth weight of all children born in the year 2001. Here the determined reductionist may argue that if we had a big enough computer and sophisticated enough physics, chemistry, biology, and related algorithms, we could predict the birth weight of all babies. Abstract laws not only provide verifiable conclusions when taken in relative isolation; they also provide a seamless scheme that completely explains everything. Statistical inference is a method that is, to use a common expression, just a cloak for ignorance.

The generally accepted interpretation of quantum mechanics would seem to indicate the statistical nature of reality on the level of subatomic and atomic physics. A statistical explanation of matter at this level does not imply a lack of intelligibility, but the intelligibility is statistical in nature, involving empirically verifiable distributions of classically defined variables (Heelan 1965). However, even if one does not accept the standard interpretation of quantum mechanics, there are still clearly random events—random in the sense that there is no classical law that brings the events into order. Chance in this sense involves seemingly unrelated trajectories' coming together, whether it be that of the poor fellow whose car is hit by a boulder coming down the mountainside or the random motion of molecules in a gas or liquid.

Earlier we talked of things. A *thing* for Lonergan is "an intelligible, concrete unity differentiated by experiential and explanatory conjugates" ([1957] 1992, 280). *Experiential conjugates* refers to properties of the thing in relation to the knower, and *explanatory conjugates* refers to properties implicitly defined by scientific laws and correlations that consider things in relation to things. Lonergan then makes use of the traditional categories of potency, form, and act. In keeping with Lonergan's starting point of

cognitional analysis, these three are related to each other as experience, understanding, and judgment are. Thus, *central form* refers to the source of the intelligibility of a given thing and *conjugate form* to the intelligibility of a given property or conjugate. *Central act* refers to the in-principle verifiable existence of the thing itself and *conjugate act* to that of the properties of the thing.

Emergence

With these definitions we are now ready to define *emergence*. Lonergan defines it as the process in which "otherwise coincidental manifolds of lower conjugate acts invite the higher integration effected by higher conjugate forms" ([1957] 1992, 477). For example, on the level of subatomic physics there exist things such as protons, electrons, and neutrons. "Lower conjugate acts" here refers to the existing properties of these things on this level. These conjugate acts are intelligible, and this intelligibility is in accord with what Lonergan describes as both classical and statistical laws of physics. However, there exists a basic randomness, which on one level a physicist might describe as a collection of random particles or events and Lonergan describes as a "coincidental manifold." However, given the right set of initial circumstances (in other words, the right probabilities), from this random situation (what Lonergan calls "coincidental manifolds of lower conjugate acts") there may emerge a higher integration with its own conjugate form.

What is the nature of these emergent entities? Here Lonergan distinguishes between two levels—schemes of recurrence and new things. As noted earlier, schemes of recurrence refer to intelligible systems that circle in on themselves. If A occurs, then B occurs; if B occurs, then C occurs; and so on to the point that A recurs and the circle begins again ([1957] 1992, 141). Lonergan likes to use the example of the planetary system. Somehow in the development of our area of the Milky Way, there emerged a group of planets that orbit around our Sun. The recurring pattern of the orbits leads to the emergence of a degree of stability in what otherwise would be random movement. Examples of schemes of recurrence are essentially infinite—from the subatomic through the artifacts of human industry to human society and economics. In the emergence of schemes of recurrence, new conjugate forms will arise. We can describe the mechanics of the solar system, the nature of phase changes in chemistry, the symbiotic relationship of plant species, and the nature of business cycles in economics. Yet, as can be seen from the examples given, schemes of recurrence are ontologically reductive. Given the right circumstances, the classical and statistical laws governing the elements of the scheme allow us to predict the nature of the scheme of recurrence.

But besides the emergence of new schemes of recurrence is also the emergence of truly new *things*—now used in Lonergan's technical sense. As

noted above, Lonergan defines a thing as "an intelligible, concrete unity differentiated by experiential and explanatory conjugates" ([1957] 1992, 280). In what many consider one of Lonergan's more puzzling chapters, he argues that there are no things within things. This seems to be at odds with the atomic and molecular theory of matter, which is part and parcel of contemporary science. To understand, we must return to our notion of the real as verified intelligibility. An animal is a concrete unit whose basic conjugates are the subject of zoology. The lower-level conjugates of atomic physics (atomic mass and number, electronic structure) are integrated at the new level of chemistry. And the conjugates of chemistry (valence, reactivity, and so forth) are integrated at the level of the biological. Thus, an animal—say, a rabbit—is a unity in which each of the various levels of matter are integrated. On the level of bodies, of course, the rabbit has various organs—heart, liver, brain—but these are all integrated in one living unity, the rabbit. Terms such as *respiration* and *metabolism* refer to this unity/identity/whole that is the particular rabbit.

I mentioned that when talking of schemes of recurrence, or more simply yet of simple aggregates, the new properties (conjugates) that emerge are in principle reducible to the lower-level properties. I can explain the movement of the planetary system solely in terms of the laws of physics. However, when we speak of the emergence of new *things*—atoms, molecules, bacteria, animals, persons—"the higher integration effected by higher conjugate forms" is indicative of a new central form, a new center of intelligibility.

Harold Morowitz comes to a similar point of view using computational techniques:

> . . . you start at one hierarchical level with a set of agents and rules and apply the rules to the agents. If the rules are nonlinear, then what happens every time a computer scientist does this, is that the system goes *combinatorially explosive*—it becomes *transcomputable*: a computer the size and age of the universe cannot handle it. This happens at every level. To solve that problem, one selects a set of pruning rules or selection algorithms or something in that form, and then they select a subset of this combinatoric transcomputability. That subset has a set of properties that defines what is emerging at the next hierarchical level. (Morowitz 2002, 24)

Morowitz goes on to use the example of the Pauli principle[4] as the pruning principle that allows chemistry to emerge from physics.

Here I return to the main conclusion of my earlier essay. If the basic criterion of the real is its imaginability, *res extensa*, the emergence of really new things seems impossible. New things are just large assemblages of basic particles with some sort of organizational principle added. But if the real is verified intelligibility, each level of intelligibility is equally real, and there is the possibility of a higher level of intelligibility ordering the nonsystematic conjugates of the lower level. Are there, in fact, emergent levels of reality? This is a scientific question. However, if we can free ourselves from the myth that the "really real" is little chunks of imaginable

matter, the structure of modern science seems to point clearly to levels of intelligibility at which new things emerge.

Note that we are not talking about some sort of vitalism. In *Insight* Lonergan critiques vitalism as not being sufficiently critical of a mechanistic view of reality ([1957] 1992, 505). Vitalism presumes the real to be basically imaginable particles in motion and then adds an ordering principle, a vitalist principle, to allow the emergence of a higher level. For Lonergan, the animal is an intelligible unity that systematizes the lower-level manifolds of physics and chemistry, ordering the lower levels without destroying their autonomy.

Emergent Probability

What is the source of this emergence? Again, the details are up to the scientists to discover. Can the nature of our scientific knowing suggest any clues? Earlier I mentioned schemes of recurrence. However, it is clear that to describe the reality of the world in which we live is to talk not of a few individual schemes of recurrence but of an almost infinite number of interconnected schemes, what Lonergan more modestly calls "a conditioned series of schemes of recurrence" ([1957] 1992, 144). I offered what may have seemed a rather simple example of the planetary system. But this involves cycles of energy exchange with our Sun, leading to periods of light and darkness and the four seasons. On Earth, we also have the cycles described by terrestrial physics, geology, and meteorology. At some point on our planet self-replicating life appeared, leading to the complex cycles studied by the physiologist in the individual organism and by the ecologist in the communities of these organisms. Even more recently an animal emerged that was not only intelligible but also intelligent. What had been the relatively simple cycles of reproduction, nurture, and nest building expanded to the more complex cycles of culture, economy, politics, and religion. Thus, we see that to talk of our world we must talk of intricately nested schemes of recurrence.

In the emergence of a scheme of recurrence, there occurs a very important shift from the probability of emergence to the probability of survival (Lonergan [1957] 1992, 143–44). What is the probability that the disconnected events that could in principle form a scheme of recurrence do in fact converge in such a series? The probability may be quite low. Say event A has probability a, event B probability b, and so on. The probability of everything converging would then be $a \times b \times c \ldots$, normally a rather low probability. However, by definition, a scheme of recurrence is such that the elements get hooked together, so that event A leads to event B, which leads to event C, and finally back again to A. In this case the probability jumps to $a + b + c \ldots$. The cycle has stabilized, and the probability has shifted from a probability of emergence to a probability of survival. The probability of the emergence of our planetary system was quite low. But,

given large enough spaces, long enough times, and previous schemes of recurrence, it happened. As professors of mechanics like to tell their students, our planetary system is a chaotic system, and we cannot predict its final fate. That being said, we believe that its survival probability is high enough not to be a major concern.

Thus, the emergence of a scheme of recurrence is determined both by the classical laws describing the individual elements in the scheme and by the statistical probabilities that the various elements will hook together to create the scheme. We are led to Lonergan's notion of *emergent probability*, "the successive realization in accord with successive schedules of probability of a conditioned series of schemes of recurrence" ([1957] 1992, 148).

The foregoing consideration of emergent probability has concentrated on schemes of recurrence. Besides ever more complex and interlocking schemes of recurrence, however, there are also new things ([1957] 1992, 284–87). These things are studied in the semiautonomous disciplines of subatomic physics, atomic physics, chemistry, biology, sensitive psychology, and the human sciences. On one level there exist things T_j with conjugates C_j. For example, things T_j could be the molecules with their chemical properties C_j. These things T_j function within certain schemes of recurrence S_j. Now let us consider a higher-level T_i with conjugates C_i, for example a simple self-replicating cell. From the viewpoint of chemistry, the probability of the various individual chemical events' being involved in cellular biology would be low, and the probability of the aggregate of events that allows a primitive cell to come into existence would be even lower. Yet, given enough time and the necessary underlying successive schemes of recurrence, new things do emerge. These new things T_i, in this case simple cells, emerge with their conjugates C_i, which are the topic of the discipline of microbiology.

If we retain the criterion that the basis of all things is little chunks of matter, the above explanation of emergence sounds like reductionism in different clothing. If, however, we are willing to take the radical step that modern science, especially modern physics, is willing to take—asserting that the real is verified intelligibility and that what we sense, either externally through our sense organs or internally in imagination, are simply data—then no level of intelligibility is somehow more real than another. At the same time, in the developing world in which we live, each new thing implies an integration of what on a lower level would be simply nonsystematic events.

I have already stressed that these metaphysical considerations are a result of considering the foundations of the knowing process itself. There is no exemption from doing the required science. When we compare Lonergan's thought with that of his Thomist or Aristotelian precursors, we can see that even the notion of what counts as a thing is ultimately a scientific question. Atoms, molecules, cells, plants, animals, and human beings

are things in Lonergan's sense. Around each has developed an autonomous science, which we call physics, chemistry, cell biology, botany, zoology, and psychology. To say, however, that these areas have their autonomous laws is not to deny that the conjugates of the lower levels are retained. Because new things emerge as the integration of what would be random events on a lower level, it is these lower-level conjugates that are most important to understanding the higher level. Biologists have to study chemistry, and, while a course in subatomic physics would presumably not be deleterious, most biologists can do their biology quite well without referring to subatomic physics.

It should be noted that the boundaries between new things and schemes of recurrence are not always clear (Oyler 1983). A group of molecular biologists recently synthesized a polio virus from readily available organic materials (Cello, Paul, and Wimmer 2002). A good synthetic chemist tinkers with the probabilities to allow higher integrations to emerge. Was what they "created" a living being, a new biological thing? Most biologists would say no. Will scientists in the future be able to synthesize living cells? Probably they will. But it will require no little effort to "tweak" the chemistry such that the probabilities allow this complex new thing, a synthesized living cell, to come into existence.

In all of this the primary concern has been the intelligibility immanent in the phenomena studied by science. The basic understanding of cause is not that of particles in collision, whether molecules in a gas or the exchange of photons in quantum electrodynamics. Cause is simply an intelligible relationship of dependence (Lonergan [1957] 1992, 563). Once again we return to an understanding of the basic nature of the real. If the basic nature of reality is its extension, it is hard to avoid seeing causality as some kind of mechanical causality somehow analogous to colliding particles. The little pieces collide to form bigger pieces and so on, so that the aggregates studied in biology and the human sciences can ultimately be understood as the sum of the pieces. I argue that there is no smallest little piece. Science is about understanding the intelligibility immanent at each level as well as the intelligibility of the new things that emerge as an integration of the lower manifolds. The conjugates of the lower level retain their autonomy and in a real sense determine the nature of the higher integration. At the same time, the intelligibility of the higher integration, whether of a scheme of recurrence or a new thing, sets the limits and causally determines the nature of the integration and the future trajectory of the higher integration.

A question that is continually brought up especially in biological circles is the question of finality. To simply deny direction, whether in the development of individual things (from fertilized egg to the mature animal) or in the history of life (prebiotic and biological evolution) seems impossible. Yet, science also wants to avoid any kind of cosmic pull—a large "magnet"

somehow leading matter toward increasingly complex structures. Lonergan's definitions of development and finality attempt to walk this fine line. Development is defined as "the flexible, linked sequence of dynamic and increasingly differentiated higher integrations that meet the tension of successively transformed underlying manifolds through successive applications of the principles of correspondence and emergence" ([1957] 1992, 479). The principle of emergence states that "otherwise coincidental manifolds of lower conjugate acts invite the higher integration effected by higher conjugate forms," and the principle of correspondence states that "significantly differing underlying manifolds require different higher integrations" ([1957] 1992, 477). There is on one hand directionality: the manifold of lower-level conjugates is open to and even calls forth the higher integration. By juggling the probabilities we can now do what the early alchemists only dreamed of doing—transmute elements from one to the other. But the principle of correspondence tells us that we must have the right materials to start with. Life as we know it is based on carbon chemistry. Would it be possible to have life based on other chemistries, say, that of silicon? This is a scientific question to be answered by observation and experiment. But the principle of development tells us something we already know from doing the science. Carbon chemistry allows a range of chemical behaviors that allows the integration of chemical events that we call life. Could silicon do the job? It seems unlikely, but no one wants to rule out possibilities too quickly. What is clear is that the further away we get from a carbon substrate, the more unlikely the emergence of life becomes.

Is there, then, such a thing as finality? Lonergan says yes. There is a dynamic reality in the world we know: "finality is an immanent intelligibility operating through the effective probability of possibility" ([1957] 1992, 474). This directionality is attained through a subtle interplay of statistical and classical law. Thus, there is direction. But finality is not that of the usual, determinist variety. Whether in the development of the cosmos or of the individual and society, there are false starts, breakdowns, and tragedy, but there is also development and direction.

The Current Debate

To many readers of this journal, what has been said may seem strangely out of touch with the current debate. In this section I put Lonergan's thought on reductionism and emergence in the context of at least some aspects of the contemporary conversation.

William Stoeger (1999, 140–41) follows the lead of other philosophers in speaking of "mereological" and "causal" irreducibility. Mereological irreducibility has to do with situations in which the emergent properties cannot be simply reduced to the functioning of the component parts. Chemistry deals with properties of molecules that are not mereologically

reducible to the properties of their atomic components. Similar statements could be made about simple cells, complex plants and animals, and ultimately human beings. This is opposed to mereologically reducible systems such as the aggregates studied in geology, the properties involved in phase changes, or the complex biological systems studied in ecology. Things, as defined by Lonergan, are clearly mereologically irreducible.

Causal irreducibility refers to a situation in which the higher level is not explainable simply in terms of the lower-level causes. Are things, in Lonergan's sense, causally irreducible? I would answer yes, but with a caveat. By its very definition, a scheme of recurrence, and even more so a thing, has a certain element of top-down causality. If there were a large enough perturbation, the planets of our solar system could go off in an infinite number of trajectories. However, once hooked into the scheme of recurrence, they are maintained in a particular pattern. In a new thing, a new unity/identity/whole emerges that even more radically holds the emergent reality to a subset of the possible behaviors present before the emergence of the new thing. There can, of course, be breakdowns. The computer I am using, a human-engineered scheme of recurrence, can go amok. Cancer is probably the most egregious example of the failure of an organism to integrate the lower-level conjugate biological and chemical activities. I add the caveat because emergence is not some sort of magic addition when a certain level of complexity is reached. There can emerge new things (new central forms) with mereologically irreducible properties (higher conjugates). But this emergence is strictly limited by the lower-level realities and is in accord with the schedule of probabilities, referred to as emergent probability.

Ernan McMullin (2000, 373–75) suggests another difficulty when talking of emergence. We live in a tiered world in which entities of various levels of complexity already exist. To what level should we assign the capacities that allow integration at a higher level—the lower level or the higher level? For example, the Pauli principle is often cited as the principle that allows the emergence of the periodic table, which is basic to chemistry and ultimately to biology. Does the need to deal with higher-level entities lead to an "enlargement of the lower-level science" (McMullin 2000, 373)? Is the Pauli principle (see note 4), which allows for the formation of atoms, a basic property of subatomic matter or an emergent property of chemical systems? I argue that these are primarily scientific questions. However, this question also brings us back to what I consider the basic problem. If the basic components of reality are the smallest chunks of matter, it would seem somehow logical to "attach" properties such as the Pauli principle to those smallest pieces. This approach is evident in those who argue that experience is a basic component of nature and who therefore feel compelled to talk of an experiential component, even the subatomic level, rather than of experience as a conjugate that emerges in more complex living

systems (Griffin 2000, 165ff.). In the intellectualist position outlined here, there is no smallest chunk of which higher-level things are somehow composed, and each level has equal ontological priority and is equally "real."

Much of the current debate has concerned understanding the logical structure of scientific explanation and to what extent it is compatible with a strong reductionist program. The terms most often discussed are *supervenience*, *multiple realizability*, *functionalism*, and what this would imply for the possibility of downward causation.[5]

In the description of emergence given above, higher-level integrations, schemes of recurrence, and new things are realized in the set of lower-level conjugates, which they systematically limit and integrate. Molecular properties are realized in the processes described by the atomic conjugates. Cells are realized in the chemical processes, which are integrated to form the cell. Organisms are realized in integrations of complex cellular, molecular, and atomic conjugates. The conjugates that define the properties of higher-level things are multiply realizable in the sense that there is usually no single underlying manifold in which the higher-level conjugates are uniquely realized. The thermodynamic and kinetic properties of chemical systems are realized through a multitude of atomic-level processes—this is why their calculation always involves a statistical component as well as what has been called a "pruning rule" to constrain the dimensions of the problem. The robustness of living organisms is a result of the multiple realizability of physiological processes on the chemical and cellular levels. Again, no one physical path can explain the complex higher-level phenomena.

However, multiple realizability does not, in itself, preclude a reductionistic explanation, although it may preclude the possibility of our knowing clearly what the reductionistic explanation of a multiply realizable phenomenon is. The precise way in which upper-level explanations are realized at a lower level is a scientific question to be answered on a case-by-case basis. My point is that whatever the nature of the manifold being integrated at the higher level, it is a mistake to give automatic ontological priority to the lower level. Admittedly, this statement is made on epistemological grounds. If the real is presumed to be imaginable particles in motion, it would seem logical to give ontological priority to the smallest piece, and causality will be seen as somehow analogous to collisions of particles. However, if the real is the true—verified intelligibility—there is no level that has automatic ontological priority (why should it?) that is somehow more real than any other. This is the primary argument of my earlier article.

Functionalism seeks to circumvent the problems caused by a rigid reductionism by noting that higher-level causal explanations are functional and are not defined by a particular realization of that function at the micro level. The concept is closely tied to that of multiple realizability. To explain, for example, the evolution of drug resistance in a given bacteria is

not to describe a single pathway by which it was realized in one particular instance. The detailed account of a particular pathway does, of course, provide an explanation of a particular case. However, such an explanation is scientifically useful only if it is accompanied by an account of how the same effect can be realized through multiple pathways. The question can also be viewed from the opposite direction. Detailed explanations of particular pathways may also be the realization of quite different functional explanations. Essentially the same microexplanation of bacterial mutation and adaptation may be used to explain quite different macrolevel changes. This is what Theo Meyering (1999, 173) refers to as multiple supervenience. On the epistemological level, multiple realizability, functionalism, and supervenience describe the actual nature of scientific explanation and do seem to provide a kind of middle ground between a strong reductionism and an understanding of emergence such as I have argued for here.

However, such arguments ultimately do not deter the convinced reductionist. At most they suggest that a truly reductive science is so complicated that it may be impossible to have a truly predictive science of the complex. If the real is a huge imaginable network of fundamental particles interacting by some perhaps still not understood laws of nature, we could, in principle, if we had a big enough computer, calculate all future states of the cosmos. But how do we know of these fundamental particles? No one has ever observed them directly. If quantum mechanics and relativity theory have taught us anything, it is that these particles are a far cry from the imaginable hard spheres of traditional atomism. They are, rather, intelligible answers to questions raised in elementary particle physics. There is good evidence that the answers we have are the correct ones, but this is far from certain. What I am suggesting is that this basic criterion of reality—verified intelligibility—has to be used equally at all levels, and to give ontological priority to the smallest unit is uncalled for. Arguments about multiple realizability and multiple supervenience clearly point to intelligible unities at various levels, but, unless there is also a rethinking of the nature of the real, they will be insufficient to deal with the problems raised by reductionism.

Similar statements can be made about the nature of so-called downward causation—the possibility of higher-level, complex systems having causal influence on lower-level systems. Accounts of upward and downward causation are both amply represented in the sciences as actually practiced. Humans create a world of technology, animal populations have a causal effect on their environment, cellular organisms select from their environment those nutrients that will allow them to continue to live, the chemistry of the atmosphere causally determines the distribution of atomic and subatomic events. Again for the hardened reductionist, real top-down causation is hard to imagine. The properties of macro systems are determined by the interactions of their smallest components. However, from my point

of view, the emergence of increasingly complex schemes of recurrence and finally of new things opens the way for downward causation; higher-level integrations intelligibly integrate the lower-level conjugates.

I want to stress that emergence takes place in both the development of individual things and the evolution of our world. The development of a fetus implies highly probable schemes of recurrence allowing interaction with the environment (nutrition from the parent, etc.) resulting in the emergence of the formed animal that is very different from the fertilized egg from which it began. Because of the starting materials, the probabilities of the emergence of the formed organism, while not unity, are quite high. In the evolutionary schema, the number of possible outcomes is larger, but the probabilities of emergence are often close to zero. Only with large amounts of space and time does emergent probability allow for the emergence of schemes of recurrence with the open-ended emergence of ever more complex schemes and ultimately new things.

Perhaps this whole edifice still seems somewhat hazy and unreal. To speak of the emergence of a new central form seems quite out of touch with our experience. There is one example of emergence that we all experience, however—the emergence of an idea, the emergence of insight (Lonergan [1957] 1992, 112). The experimentalist discovers a new phenomenon: an unexpected wiggle in what was thought should be a smooth curve. Is it an artifact of the experimental setup? Is it something that should have been expected? Is it something new? More data are collected; curves are drawn; various possibilities are considered. Sometimes slowly, sometimes very quickly, the insight emerges. "I've got it! That's it!" Of course, this new idea has to be verified, initially by the individual scientist and then by the scientific community through publication and testing by peers.

To many writers in the philosophy of science, this emergence of understanding is simply a logical outcome of the data, nothing new. This is not the experience of scientists, however. Some data are discarded as irrelevant; other aspects of the data, while not conclusive, are taken as particularly critical to the new understanding. From what to the uninitiated seems like random marks on a paper, a new understanding emerges. There has been a development in understanding. As any scientist or teacher knows, such developments are not automatic or guaranteed. At the same time, they are not just random. To use an expression from another context, we have to tweak the probabilities. The teacher does this by selectively presenting the data to maximize the chances of the insight's emerging in the student, the scientist by training for years yet keeping an open mind toward the possibility of something new.

Conclusion

Where has this taken us? I have attempted to outline the features of Lonergan's notion of emergence. The treatment is pretty standard from

the point of view of Lonergan circles, but I have not been afraid to make statements that might be controversial among Lonergan scholars or that go beyond the words of Lonergan himself. Good secondary resources for more detail include Joseph Flanagan (1997), Philip McShane (1970), and Hugo Meynell (1998). Of course, the best source is Lonergan himself, especially his *Insight* ([1957] 1992).

I hope that those engaged in the science-religion dialogue, as well as philosophers of science in general, will consider what Lonergan has to offer. I want to mention a few key points that should make Lonergan especially appealing to the scientific community. First, Lonergan takes science very seriously. Despite protestations by some philosophers, science is arguably the clearest example of knowing that we have had in the past two centuries. It is for this reason that Lonergan turns to mathematics and science to provide the basis of his cognitional analysis. Lonergan also continually insists that philosophy does not provide a shortcut for scientists. Only scientific study can provide the details of the process of emergence on the levels studied by science.

In both my previous essay and this one I argue that we must abandon imaginability as the criterion of the real. When I was an undergraduate chemistry major, there was a standing joke about what the basic science really was. Psychology was just biology. And biology, of course, was really just chemistry. And chemistry was really just atomic physics, and atomic physics was just subatomic physics, and subatomic physics was just mathematics, and. . . . Where does one stop? Where does one find that final indivisible chunk of matter? I am suggesting that this is the wrong question. There is no smallest indivisible chunk.

It has always struck me that most talk of reductionism is limited to two levels. Psychology is just biology, biology is just chemistry, chemistry is just physics. . . . With the developments in genetic engineering, the big question is whether we are determined by our genes. To take reductionism seriously, we cannot stop at the next lower level. Some would argue that the complexity of our world makes it impossible to penetrate any deeper; there is no computer big enough to make the necessary calculations. This is one answer. In this essay I have suggested looking at another possibility.

In the last analysis Lonergan considered himself to be a theologian, not a philosopher. *Insight* was a preparation to the development of theological methodology (Lonergan 1972; Budenholzer 1984). The latter part of *Insight* and Lonergan's later works are concerned with the nature of ethics, theological method, and the human being's relationship to God. Because of the tiered nature of reality and the emergence of new things with their own sets of classical and statistical laws, it is perfectly legitimate to begin a study on that level. We do not necessarily need physics, chemistry, and biology to study the nature of the love between persons. On the other hand, if we neglect the layered reality that we are, as studied in physics,

chemistry, biology, and sensitive psychology, our knowledge of ourselves is only partial and sometimes dangerously so. In this article I have talked mostly of physics, chemistry, and biology. I have only alluded to that higher integration of the biological that is both intelligible and intelligent. There is obviously much more to say about the basic questions of the nature of the human being, a question with which we began this essay. But that must be the subject of yet another article.

Notes

1. Lonergan's most important work in epistemology and metaphysics, *Insight: A Study of Human Understanding*, was first published in 1957, and many students of Lonergan still use the 1957 or 1958 editions. References in this article are to the 1992 critical edition of the *Collected Works of Bernard Lonergan*. Secondary works that use Lonergan's thought to develop areas in the philosophy of science are relatively few in number. Particularly relevant to this study is the work of William Danaher, *Insight in Chemistry* (1988).

2. Lonergan's use of the word *classical* does not completely conform to the usage of contemporary physicists and chemists, according to which classical usually refers to Newtonian mechanics as opposed to quantum mechanics. In Lonergan's usage, quantum theory has both classical and statistical elements. This can, perhaps, be seen most clearly in those areas of chemical physics in which classical Newtonian physics and quantum mechanics have overlapping areas of applicability. Quantum mechanical results can be compared with the results of Newtonian mechanics only if a classical statistical theory is also included in the calculations (Heelan 1965, 112–21).

3. Relatively little has been written concerning Lonergan's understanding of statistical knowing. An important monograph, though somewhat densely written, is the work by Philip McShane (1970).

4. The Pauli principle is a basic principle of quantum statistics: "When the labels of any two fermions are exchanged, the total wavefunction changes sign. When the labels of any two identical bosons are exchanged, the total wavefunction retains the same sign." While seeming quite abstract, it is this principle that allows the existence of complex structures such as atoms and molecules (Atkins and de Paula 2002, 385).

5. For a good summary of the meaning and implications of supervenience, multiple realizability, functionalism, and downward causation, see Meyering 1999; also Clayton 1999, especially pp. 199–202. For a more detailed consideration of supervenience see Murphy 1998. See also the primary philosophical literature as listed in these articles.

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Questions that Shape Our Future

INTRODUCTION TO THE SYMPOSIUM

by Philip Hefner

At a symposium 1–2 May 2003 the Zygon Center for Religion and Science celebrated the inauguration of Antje Jackelén as its director. The symposium marked a transition, the sort of event that is critical in the life of any community. In this case the transition is from the founding generation to the successor generation that will actually establish the character and worthfulness of the Center. Although it is a matter of opinion whether a successful transition indicates that the community has become an institution, there is no question that this event defines an important accomplishment. Transitions are not to be taken for granted; they indicate that the Center's enterprise is more than a program or the expression of one group's personal interests and abilities. Through the transition the Center becomes an ongoing spirit, a persisting influence in its world.

Appropriately, the theme of the symposium offered an occasion for reflection on what it is that this Center or any such venture should be about. In the moment that such basic issues are considered, the entire enterprise that is known as the religion-and-science dialogue comes into purview. The questions that shape the future of the Zygon Center are those that shape as well the entire broad interface of religion and science. There are other questions that the symposium did not address, but the questions that were examined belong to all who work in the religion-and-science field or who have a stake in it.

The symposium unfolded in four acts, so to speak. The first of these comprised four keynote addresses, two of which are published here. Mihaly Csikszentmihalyi (psychology) reminds us that the major challenge we face is that "of contributing to the well-being, or indeed the survival, of our

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species." This challenge requires that we attend to the welfare of the planet, to social justice, and finally to discovering "joyful ways to direct the evolution of consciousness in the future." Willem Drees (theology, physics), under the rubric of looking for "guidance," suggests that moral and motivational interests lie at the heart of the religion-science engagement. Guiding this engagement, therefore, becomes a way of addressing the larger human concern for moral guidance. In relating religion and science, we do not resolve issues so much as we exemplify that broader human quest.

Mary Evelyn Tucker (religious studies) and Ursula Goodenough (biology) also presented keynote addresses that are not published in this collection. Tucker identified a broad-gauged need to deal with the future of the planetary ecosystems, while Goodenough focused on emergence as a fundamental constituent shaping the religion-and-science discussion. The substance of her address appeared in the December 2003 issue of *Zygon* in her article (authored with Terrence Deacon) "From Biology to Consciousness to Morality."

The second "act" was a panel of five persons who addressed the subtheme "Writing the Agenda." Ann Pederson (religious studies) chaired the discussion by Vítor Westhelle (theology), Ian Barbour (physics, theology), Grace Wolf-Chase (astronomy), and V. V. Raman (physics, Hindu philosophy). Pederson's brief essay here reflects on the panel's contribution and introduces the individual articles by the panelists.

In a third segment, Antje Jackelén and Philip Hefner (outgoing director) offer a dialogue presentation in which they articulate their own personal visions for the Center and the mission of religion-and-science.

In his valedictory, "The End of All Our Exploring," Arthur Peacocke (biology, theology) sets forth a program for how theology can be carried out in light of scientific knowledge. His final note expresses the hope "that the shared global experience and perspective generated by the sciences might form a more common and acceptable starting point than hitherto for the exploration toward God of the seekers of many religious traditions and of none."

These reflections on the questions that shape our future grow out of a specific, local community of exploration as that community, the Zygon Center, ponders its future. A larger significance emerges from this local occasion, however. These essays demonstrate that the future under consideration is the future of us all.

WHAT WE MUST ACCOMPLISH IN THE COMING DECADES

by Mihaly Csikszentmihalyi

Abstract. In order to survive as a species and grow in complexity, humanity must adopt a new image of what it means to be human, rediscover a reward system beyond the merely material, and see that young people find joy in challenges and in cooperating with others.

Keywords: challenge; complexity; cooperation; evolution of consciousness; human responsibility; joy; reward system; social compact.

Let me say first of all that I did not choose the title for my talk, which is a bit too ambitious for my style: "What we must accomplish in the coming decades." I think that is probably the work of Philip Hefner's fine hand. When I first heard it, I recalled an interview we did with one of the leading poets in America, at that time the poet laureate of the United States. The interview started with a question: "What is it that you wish to accomplish in the next two years?" We expected him to give some great notion, a premonition of some glorious epic that he was about to write. After thinking about it very seriously he said, "Well, actually, what I hope to accomplish is to get my dog toilet-trained as soon as possible." Except that he used a much more earthy expression. I was impressed by the humility of his ambitions. But, if you think about it, at the personal level we all just try our best to remain civilized and lead a life that is useful and blameless. And this in itself is not an easy task; it is feasible, but quite difficult.

However, we are faced now also with a much larger responsibility, beyond that of leading a life that is somewhat civilized within the limits of

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our own allotted years. We are becoming increasingly aware that we have responsibility for a much larger project—that of contributing to the well-being, indeed the survival, of our species. We realize that humanity is unlikely to survive if we do not take on the burden of helping to avoid mistakes that we have committed in the past, and we are not likely to continue to exist unless we work to prevent those mistakes.

One of the basic intuitions of all religions has been that we have a responsibility larger than just for ourselves, beyond our individual lives. All religions try to make us aware of the responsibility for our own actions and also for the consequences for the larger and larger scope of effects that our actions have.

Now science also is becoming increasingly aware of the same responsibility and is beginning to take it seriously. This goal is one of those links that Phil was talking about, joining science and religion. I think it is axiomatic that we cannot depend on divine providence or chance or a beneficent fate of some sort for our survival. We have become a force in evolution for good or ill; we must take responsibility for our own destiny. This is the goal we must consider when we think about what we must accomplish in the coming decades. So I focus here on three kinds of topics that I have been involved with in my own research, which is part of the very humble contribution that the young science of psychology can make to our understanding of what we need to do in the near future.

My first article written for *Zygon* was published in 1970 with the title "Sociological Implications in the Thought of Teilhard de Chardin." I want to discuss how the ideas contained in that article have informed my thinking in the thirty-some years that followed. There are three main points.

Complex Humanity: the Cutting Edge in Evolution

The first point is that we need a new image of what it means to be human. We have been quite schizophrenic as a species about our own identity. On one hand, we have thought of ourselves as the supreme goal of creation, as masters of the universe. On the other, we describe ourselves as organisms run by greed and lust and governed by genes that have no interest in our destiny or in the destiny of the world except for their own replication. Neither notion of ourselves—as angels or as selfish gene robots—is very constructive or realistic. I like to think of us as the cutting edge in the evolution of complexity, for good or for ill. It is an incredibly powerful and more interesting way of conceptualizing what human beings can be.

Complexity, as most biologists who are interested in the philosophy of evolution would say, consists of the tendency toward differentiation, individuality, and refinement of specialized functions and is also marked by integration—belonging to expanding circles of relationships. In the case of human beings, integration means belonging not only to a community

of other people but also to systems of value, to ideas, and to the ecosystem.

After a century of debunking old certainties, the social sciences are beginning to take a more benign view of human beings. Arguably, the debunking started with the biological writings of Charles Darwin that inspired Herbert Spencer and other social scientists, continued with the work of Karl Marx, who reduced human beings to the puppets of property relations, and Sigmund Freud, who saw human beings as slaves to libidinal tendencies necessary for survival and reproduction.

Recently, however, the social scientists have become more and more aware of other forces that are just as evolutionarily sound. Just to mention two recent books by persons I happen to know: Robert Wright's *Non-Zero*, a popular view of the evolution of nonzero sum relationships in the world, especially in human history, and David Sloan Wilson's *Darwin's Cathedral*, a good example of that zygotic tendency of drawing together evolutionary biology with the insights of religions. Many other recent works express the awareness that not only greed and sex are necessary for survival but also cooperation, altruism, and even spiritual empathy with the universe at large.

In my own work I have been collaborating with colleagues to try to change psychology from a science of pathology to one of meaningful fulfillment. It is not enough to just correct what goes wrong with human beings and turn them into "normal" persons. That is not a very inspiring task. We have been trying instead to see how normal persons can be elevated to have experiences that are transcendent. For instance, my colleague Martin Seligman at the University of Pennsylvania and I started a movement (I don't like to call it a movement, but everybody else does) called "positive psychology." Essentially it is an attempt to redirect attention toward human behavior that includes courage, hope, optimism, and creativity, and see how these can be fostered and supported.

Another project that I have been working on for nine years with colleagues at Harvard and Stanford universities is a series of studies under the conceptual umbrella of "Good Work." We have looked at people in various professions, ranging from journalism to genetic research to several art forms to higher education, and asked such questions as: How can you do good work in these professions? What prevents individuals from doing good work? More important, How does one overcome the pressures to cut corners or just try to feather one's own nest, and keep in sight the larger good that the profession is supposed to serve?

These are two movements within psychology, and there are signs in other social sciences as well that the dialectic has swung away to a certain extent from a radical critique of humanity to something a little more optimistic.

In my work, I am interested in the evolution of consciousness, which means essentially to know ourselves. Psychology obviously is one of the sciences for which that question is paramount. I think of this as having

two general goals: how to free ourselves from the control of genetic instructions and how to free ourselves from the control of social conditioning—without denying or trying to repress or avoid the reality of these instructions, which we have in our chromosomes and in our early experiences in the family.

The point is that if we just blindly follow those instructions we are probably adapting ourselves to conditions that existed hundreds of thousands of years ago in terms of genetic evolution and thousands of years ago if we consider cultural evolution. I follow the old Latin saying *natura non fecit saltum*—nature does not advance by jumping—despite what Stephen Jay Gould and other catastrophe theorists of evolution may say. Radical changes take time, and we cannot free ourselves easily from these long-standing conditioning forces in our history. But we need to understand them, and we need to know how and under what conditions we can do better than what the past programmed us to do.

That is the first of the three topics: to know better what our nature is like and understand how to control our psychic energy so that we are not simply responding to selective forces that existed in the past but are no longer relevant.

A New Social Compact and Reward System

The second goal to accomplish in the next decades is to develop rules for a new social compact. For decades now we have lived under the impression that Karl Marx's notion of material inequality had been surpassed by the triumph of capitalism, especially with the implosion of the Soviet Union and Eastern Europe and the changes in China. Perhaps we were too optimistic. We believed that there was no longer need to worry about the increasing gap between those who own the means of production and those who have to work for it. If you really look at what is happening, though, it seems that Marx has been vindicated, if not on the local, at least on a global level. We have exported the proletariat, we have globalized poverty, and we think that we can forget the material conditions under which the majority on this planet must live; we can forget them because they live far away from the reach of our attention.

Yet, unless some new rules are developed to decrease—not eliminate completely, but at least decrease—material inequality, that is going to be a severe problem. So will be the inequality of power. It has been said over and over since Lord Acton's time that power corrupts and absolute power corrupts absolutely. We have seen many examples of this recently, when powerful corporations turned out to have achieved power by ignoring laws and ignoring the expectations of their shareholders. And consider the cavalier attitude that our political leaders are taking with respect to the rest of the world. We need to worry, because power does corrupt; it makes us think that we do not need to play by the rules that the rest of the world

lives by and that we can impose our will on other nations, other groups. This is clearly one of the issues that Christianity set out to correct two thousand years ago. We have a long way to go to redress these problems, which reappear in new guises every few generations. If we become complacent, these problems will eventually destroy the system in which we live.

As far as less global problems, one of the issues that I have become more and more aware of as I work in this area is the impoverishment of our reward system in American culture and in many modern cultures in Europe and elsewhere. Human rewards such as respect, honor, and deference that used to be given to people who had different skills or contributed differently to the body politic—all of those rewards have collapsed. Essentially, we now focus on material rewards, and people are responding to an incredibly restricted set of compensations for their work.

I work in a business school now, and so I am more aware of it, but even before it was quite obvious to me that, even at the top universities, with each passing decade people were thinking of themselves more and more in terms of how much money they could secure for research or consulting, which defined how much they were worth. Of course, financial benefits are zero-sum, to use Robert Wright's notion; that is, they include always a scale that makes invidious comparisons necessary. So one thing that is very important for this new social compact is the revitalization of symbolic rewards—rewards that express human appreciation in a variety of ways, not just material ways. In this respect preliterate societies, most nomadic or hunting-gathering societies, are much better able to do that, in a sense making life richer by having different forms of recognitions and rewards for performance that are not reducible to a single and contested metric.

To make the story somewhat less dire, in my new book *Good Business* (2003) I include the stories of forty CEOs, nominated by other business people and by people who knew what happens in business. They were nominated for being very successful and also very socially responsible. These are people who, as the saying goes, walk the walk. An example is Aaron Feuerstein, whose factory burned down; he paid his workers for a year afterward, while the factory was being rebuilt, even though he had no contractual obligation to do so. He wanted his community to survive. An amazing number of people, even in business, invest energy in goals that are larger than their self-interest.

There is a beautiful word that seems to have almost completely disappeared from our vocabulary. It is the term *magnanimous*, which means "having a large soul." There is a word for it in many languages. In Hindi it is *mahatma*, as in the Mahatma Gandhi, which means the "great-souled Gandhi." It is comforting to know that even within such a compromised profession as business there are people who are magnanimous, who invest their life energy into goals that transcend themselves.

We have to do a better job of recognizing and reproducing this behavior. Business schools teach business ethics and medical schools medical ethics, but most of this is about not stealing too much and not hurting people. Little is learned about having great souls. We need new rules for a social compact.

The Power of Joy

The third topic is the one that I have done the most work on and feel the most confident talking about. It is about the power of joy. We must realize that unless we have passion and joy in life we are not going to survive much longer as a species. We need joy to keep the dark night of the soul at bay, to feel that life is exciting and expanding, and to grow in the process of living.

Here again there is bad news and good news. The bad news is that many children are growing up in environments where they almost never experience joy. They have to sit in school, doing abstract tasks they don't care about and without moving their bodies, which were selected by evolution for movement and action. Many live in environments that are boring and essentially meaningless.

Barbara Schneider, my colleague at the University of Chicago, and I have been following a thousand teenagers for nine years in twelve communities across the United States that were chosen to be representative; each has a different economic and social makeup. One amazing thing we have found is that the amount of joy, happiness, and involvement of teenagers goes down as social class goes up, except for the very affluent suburbs. In typical suburbs, where both parents are professional workers and away most of the day, teenage children are essentially left to themselves, and they tend to be worse off in terms of personal commitment to life than the ones from the ghettos and from the inner city. This is one of those ironies of our evolution: we create environments that we think are going to improve our lives because they are more comfortable, secure, and so on, but in the long run they actually undermine the very essence of what makes life worth living.

There are two elements in the experience of these young people from junior high that predict a healthy, happy, and involved young adulthood nine years later. One is the amount of challenge that the child reports in his or her life. To do this research, we provide watches that are programmed to beep ten times during the day. The individuals wear this watch for a week, so in a week the watch beeps at random moments about seventy times. When that happens, the subjects take out a little booklet and fill it in, saying where they are, what they are doing, and whether they are happy, sad, concentrating, or feeling challenged. The amount of challenge that a young person of twelve to fourteen years reports predicts successful adap-

tation to college and work nine years later better than almost anything else.

Only one other thing predicts as well, and the two together make the best predictor. That other component is cooperation. There is an item that says, "at this moment when the watch beeps, on a ten point scale, do you feel cooperative or competitive?" The more toward the cooperative end the child reports being at the moment, and the more challenged he or she is—these are the best predictors for young adulthood. It is an interesting combination, one that I would not have predicted. But apparently these two attributes are essential for healthy maturation into adulthood.

However, often they are completely missing. Cooperation is inversely related to material well-being, because wealthier children have less need to cooperate. They may have hired people mowing the lawn, washing the dishes, and catering to every material need. These individuals grow up without experiencing much cooperation. Challenges also are almost absent from their lives, so they may go out and try to find challenge in ways that are antisocial. Some wealthy suburbs have gangs of young delinquents who, for example, use radio transmitters to blow up a garage at a distance, watching with binoculars to see the roof erupting. One of my students did a study of four hundred teenagers in a West Coast city who were arrested for arson. They were mostly well-to-do boys for whom blowing things up and burning things down were the most exciting challenges they could find, because their life otherwise was just a cocoon. They had no other place to test themselves and find out what they were able to do.

Challenge and cooperation bring joy and commitment to life. Unless we provide that kind of joy in productive activities, materialism and selfishness will consume more and more of our lives. Twenty-five centuries ago Plato wrote in the *Republic* that the most important task for educators is to teach young people to find pleasure in the right things. He knew that children find pleasure in things that promise enjoyment, even if they do not lead to either personal development or social order. It is our responsibility to make sure that there are opportunities for joy that lead to growth.

We need to challenge ourselves to help young people find joy in helping evolution. Perhaps we can come up with ways to make the support of ecological health and diversity into a rewarding game, into a great adventure that stirs the imagination of young and old alike. Instead of hitching our lives to greed and selfishness, we need to find ways to make social justice and cooperation into goals that are challenging. We have to increase the complexity of consciousness by finding ways to make it enjoyable, instead of letting children fall into mindless activities—which is what many of our young people end up doing when they spend many of their hours in activities that do not engage them in anything that builds skills, character, or cooperation. They end up opting for vicarious thrills. The challenge is how to make the task of helping the planet, helping social

justice, and helping the complexity of consciousness enjoyable. If we devoted even a small part of our energies to making these tasks into exciting, adventurous, meaningful activities, that would be one of the best ways to prepare ourselves for the coming decades.

So, to return to the title that was put to me as a challenge by Phil, in the coming decades we must develop self-confidence in our role as stewards of the planet; we must find ways to cooperate and live with each other in peace and mutual respect; and we must discover joyful ways to direct the evolution of consciousness into the future.

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WHERE TO LOOK FOR GUIDANCE? ON THE NATURE OF "RELIGION AND SCIENCE"

by Willem B. Drees

Abstract. For moral guidance we human beings may be tempted to turn toward the past (scripture, tradition), toward present science, or toward future consequences. Each of these approaches has strengths and limitations. To address those limitations, we need to consider how these various perspectives can be brought together—and "religion and science" is an area in which this may happen. That makes the question of where to look for guidance potentially a central one for religion and science, setting the agenda differently from apologetic questions with respect to religion or to science. However, "religion and science" does not solve the issues, leading to a single normative perspective; the way that current knowledge is integrated with past wisdom is highly dependent upon ideals that relate to the future. Thus, rather than resolving the need for guidance, the religion-and-science conversation becomes one way of addressing our need for guidance, bringing into the conversation past, present, and future.

Keywords: axiology; consequences; cosmology; guidance; questions; religion and science.

Among the questions that might shape our future is one that I offer in the title: Where are we to look for guidance? Although reflections on religion in a scientific age often seem to be driven by other questions, I suggest that a moral and motivational interest may be more prominent than is often recognized and acknowledged.

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For instance, the debates on evolution associated with creationism and intelligent design seem to be about the explanation of life forms. But is that really driving the advocates of creation science or intelligent design? Is the explanatory issue not the surface, whereas concern about the authority of the Bible as guide in social and moral affairs is their real interest? Or, to refer to a quite different example, the interest in religion and ecology, about which Mary Evelyn Tucker spoke at this symposium (2003), is not merely about ideas regarding human relationships with nature but seems to be driven by the moral urgency of ecological problems. Another example would be the organized skeptics, whose interest is also, to a large extent, moral—exposing fraud and illusions. One of the last books by Carl Sagan (1996) was subtitled *Science as a Candle in the Dark.* Many engaged in religion and science might dismiss such a title and the wider movement of skeptics as "scientistic," trusting too much in science—but they deserve respect from religious believers at least for their moral concern and engagement, if not also for many of their conclusions. As a fourth example, consider the Center for Theology and the Natural Sciences (CTNS) in Berkeley. Its primary interest may seem to be in theoretical issues in the sciences such as quantum physics and theological subtleties such as the Trinity. But on the CTNS Web site, Robert J. Russell (2003) asks for "an interaction which aims at serving the broader concerns of the global human and ecological communities." Last but not least, the Zygon Center for Religion and Science itself describes in the brochure for this symposium as one of its major aims "how the joint reflection of scientists, philosophers, and theologians can contribute to the welfare of the human community."

Let me distinguish the question Where to look for guidance? from other questions that may seem to drive projects in science and religion. Some agendas are apologetic and defensive for the sake of a given tradition. Questions may include: How to save the tradition? Is faith still possible? Is theology plausible? Other agendas may be revisionist in intent, seeking to formulate a "theology for a scientific age," to quote the title of one of Arthur Peacocke's major books (1993). Yet other religion-and-science agendas may not be interested in reflecting upon religion but rather in science communication and advocacy for a religious audience.

Given this variety of agendas, the question of where to look for guidance raised in the context of religion and science is closely related to a particular answer to the metaquestion What do we seek to do when we "do" religion-and-science? Or, to ask it differently, What is the nature of the *and* in religion and science?

The question regarding guidance may suggest a simplistic answer: Science needs guidance, and religion can offer it. For instance, in the Foreword to *The New Faith-Science Debate*—a book based on a conference on Cyprus with both the departing and the new director of the Zygon Center,

Philip Hefner and Antje Jackelén, among the participants—Paul Abrecht describes a shift in the interaction of science and theology near the middle of the twentieth century:

> In the earlier confrontation the fundamental issue was the clash between Christian belief and scientific knowledge, especially between the scientific understanding of the world and Christian views on creation. In that debate the churches were generally on the defensive. . . . Today, as a result [of the rapid progress of modern science], science and science-based technology are on the defensive, and religious faith, speaking in the name of a troubled and anxious humanity, has begun to ask questions about the consequences of the scientific world view. (Abrecht 1989, viii)

I consider this too simplistic an understanding of our situation. It contrasts *guidance* and *worldview*. It puts science and technology on the side of the problem, downplaying their contributions to solutions, and makes religions the solution, whereas a realistic assessment of the contribution of religions in our time, whether Islamist or Christian varieties, may be that they often contribute also to environmental and military problems.

In this essay I explore three possible sources of guidance—past traditions, present science, and future consequences—and consider problems associated with each of these sources. I then discuss religion-and-science efforts as attempts to combine these various resources in a fruitful way. In that context I offer further reflections on the nature of religion, of science, of morality, and of their relationships—the *and* and the ends of religion and science.

Guidance by Past Traditions?

In debates on the social acceptability of genetic technologies, religious expressions ("playing God," "sacredness of life," "creation") have been used alongside metaphors from the social and political domain ("boundaries") and from mythic material and fiction (Frankenstein). "Playing God" is often invoked with negative connotations but may be appreciated theologically as the proper way of "playing human" in a perspective where creation is not finished and redemption or liberation is deemed more important than the conservation of an existing order (Drees 2002). Advocates of environmental responsibility also have drawn upon religious traditions (Tucker 2003). New developments in technology, economy, and society have resulted again and again in responses regarding desirability (or undesirability) that draw upon the past.

There are problems, however, in appealing to past traditions. Some problems are due to the standing of the traditions. If the plausibility of a tradition is itself challenged, should we nonetheless accept its moral recommendations as commandments? If God did not speak to Moses, why treat the Ten Commandments as given by God? Furthermore, why would we appeal to commandments of a particular tradition in cultures that have accepted religious pluralism as a political given? Such an appeal seems

politically useless in pluralistic cultures, even though their strong appeal to insiders may make them motivationally useful. Such motivational impact for insiders seems to be the primary ambition of the "Ecology and Religions of the World" series edited by Tucker and John Grim (1997–2004). Appeals to the past thus may be useful, not as a source of guidance in making choices but in strengthening commitment to choices already made.

Additional problems arise as a result of the distance between the original context and current needs. Historical-situational distance, for instance, is obvious when biblical statements about how humans ought to relate to "wild" nature are transplanted from a setting in which humans were threatened by wild nature to one in which humans are the main threat to wild nature. Furthermore, the traditions did not anticipate modern technological options and thus did not speak directly about cloning and similar possibilities. Applying certain notions in new circumstances, therefore, creates hermeneutical problems; the same word may not even have the same meaning in the new circumstances.

If one seeks guidance by going back to the original texts of a tradition, many such problems arise. Such a form of orthodoxy is thoroughly modern in style and strategy, treating language ahistorically in a fairly straightforward way, bypassing the rich tradition of interpretation and thus the dynamics that have always been present within religious traditions, whether those of longer ago—Jewish oral traditions, Islamic hadith, Christian patristic theology—or more recent developments. Religious visions and vocabularies are dynamic. Appealing to the past cannot settle the question of whether a particular traditional interpretation is legitimate or goes beyond its boundaries, and it cannot settle the question of whether past wisdom is applicable in present circumstances.

Present Science as Guide?

In pluralistic cultures, when guidance by one's own tradition has lost some of its hold, some may turn to science for neutral insights. These may be found at two quite different levels. On one hand, there is the appeal to science for factual and theoretical knowledge regarding our world. A good example is the research, summarized by the International Panel on Climate Change (IPCC), that analyzes available knowledge on global warming. This information is very important for determining environmental policies. The fundamental problem of such a strategy is, however, in the subsequent transition from facts to an evaluation—a transition many philosophers consider impossible ("the naturalistic fallacy").

On the other hand, there are more far-reaching proposals in the search for guidance in a science-informed view of the world. The journal *Zygon* has given space to such attempts, sometimes formulated in terms of "the evolutionary epic" (Rue 1999), "the sacred depths of nature" (Goodenough 1998) or "biophilia" (Wilson 1984). The gains in motivational impact

thus made, however, do have as a drawback that the authority of science behind it is compromised. The vision presented may be relevant and laudable, but its standing is not comparable to the standing of the scientific insights invoked.

Future Consequences as Criterion?

Consequences may well be an important consideration when it comes to moral and political decisions. This has been the conviction of utilitarians or consequentialists of various stripes but can also be defended in reference to religious traditions—for instance, as an interpretation of the command to seek the well-being of all our fellow beings (*agape*). Thus, one may hear the protection of biodiversity argued for because plants may contain important, yet-unknown pharmaceuticals useful to future generations. Or organ donation may be justified on the basis of its future individual value—its ability to afford someone a longer and healthier life (see the discussion in LaFleur 2002). Ronald Dworkin (1999) considers the use of religious metaphors such as "playing God" ways of articulating insecurity regarding the distinction between what is given and what is the domain of moral considerations, an insecurity that is transcended when we accept responsibility and seek to use new developments' potential for good.

We need to take future consequences into account when considering our actions, and consequences of our environment-degrading policies, as discussed by the IPCC, are a good example. But such consequences by themselves are not enough to guide us. We still face the question of how we value the various possible consequences—morally? in terms of happiness or beauty? In his comparison of views of organ donation in the United States and in Japan, William LaFleur (2002) made clear the role of culture, including religions, in shaping the norms according to which we weigh possible courses of action and their consequences. Furthermore, utilitarian considerations always run the risk of being too restricted in terms of justice; distribution (of burdens and of benefits) may well be a separate, deontological desideratum (Frankena 1963). Also, emphasizing future consequences in moral considerations may not be enough to motivate us; the future consequences—and, even more, consequences remote in time or geographically distant—are beyond our horizon. Traditions from our past, which have shaped our identities, may therefore be valuable complements.

Where to Look for Guidance as a Question for Religion and Science

In this brief tour of three possible orientations in the search for guidance—toward the past (tradition), the present (science), or the future (consequences)—we have seen that each has its limitations. They all are relevant, but none is sufficient. It may be that we need to think harder about how

these perspectives might be combined. That is precisely what we might do when we engage in reflection on religion and science in our time. Thus, asking where to look for guidance might be considered one major means of shaping reflections on religion and science in a way that differs from articulating questions in terms of religious apologetics or revisions, metaphysical interests, or advocacy for and communication of science.

Not that such reflection offers a quick and easy answer to the demand for guidance; problems similar to those considered here arise also when the matter is approached as a religion-and-science issue. What is the nature of the *and* in religion and science? How are such different human projects brought together? And what is the nature of the various contributors of current science, religious traditions from the past, and ideals regarding the future? What should we aim for? What should we try to avoid?

"Religion *and* science" makes the two linguistically parallel. This fits well approaches of those who treat religion as ideas (theology) that compete or partner with the sciences in understanding reality, as if the two offer competing or complementary understandings of our universe. Thus, one expects to come to a position in terms of conflict (metaphysical or methodological), separation, substantial dialogue, or integration, as articulated in the widely used classification by Ian Barbour (1990). Assumptions that often come with such a "symmetrical" understanding of science and theology are similarity in cognitive kind and status, an explanatory ambition for theology as well as for science, and expectations regarding "consonance." Such assumptions generate various problems, as I have argued elsewhere (Drees 2003).

A different reading of the *and* in religion and science can be achieved by expanding our view of science and of theology and allowing for asymmetries in the relationship. As for a wider view of science, there is a continuum within the sciences from cosmological disciplines to those that also study human beings, such as evolutionary biology and cognitive sciences and, beyond those, the social and psychological sciences. In consequence, we have to acknowledge that religious ideas and attitudes themselves are also involved as objects of research and reflection. This shifts the focus from theology and science to a "scientific understanding of religion," that is, from a quest for a joint understanding of the world to one where the role of religious beliefs and practices becomes the object of science. Thus, we have a science of the world *and* of humans, including their religions. Theology and science then moves on to become a "science of religion," or at least of religion in the light of the sciences. At the same time, I argue, it is possible to expand the scope of theology and envisage a theological understanding that incorporates all human understanding, including the sciences. This would be asymmetrical, too, but in this case it would become a theology that addresses scientific knowledge as well as our valuational intuitions.

A symmetrical understanding is challenged especially when we consider overly optimistic expectations regarding "consonance" (see Drees 2003, 117–18). One reason for questioning consonance is methodological: we do not *find* harmony between scientific knowledge and already given theological ideas but rather *reconstruct* our ideas to make them as coherent as possible. The other concern is not methodological but moral or praxiological: assuming consonance between our reality and theological ideas regarding a good God runs the risk of denying too much the ambivalences of our reality and the possibility of meaningful human action.

The dissonance discerned, morally and methodologically, may be an incentive for reconsidering religion and science as a creative and constructive project. *Constructive* may be understood in the intellectual sense, as any consonance we claim is a human articulation of the way we see and value the world, despite its unattractive features. It may also be understood morally, in that religious traditions are concerned not only with what is but also with what ought to be but is not—a recognition of disharmony that calls for action and has critical consequences for any easy claims about consonance between scientific insights and religious language. Thus, acknowledging "creative dissonance" calls our attention to constructive human action and thus to human creativity as manifest in culture, in art, and in technology. I consider both aspects in turn—the constructive character of our understanding (images) and the constructive character of our world (technology).

Appropriating the Past in the Present. Creative dissonance and its constructive implications can be appreciated as an understanding of human existence that sees human identity as unfinished and human beings as culture-creating animals. The project is, one might say, "poetical," in the double meaning of poetry and of *poiesis*. The Greek verb in the word *poiesis* is about making things and images. We even need to change ourselves, as individual persons and as complex cultures. What would be the best way to proceed with images and concepts offered by religious traditions as part of our heritage? I think that the development of physics offers a helpful analogy (Drees 1998). When we consider major transitions, such as those from Newtonian conceptions of space and time to Einsteinian views or from classical to quantum conceptions of matter, we may be struck by the lack of continuity at the level of ontology, of conceptualization of reality. However, there is in these cases also continuity at less abstract levels of knowing, for instance with respect to predictions for the orbits of planets. The way from the earlier to the later view is not via a translation at the level of theories but through developing new theories that do better justice to experiences and experiments coded to a large extent also in the old theories.

Similarly in religion—we need not aim at continuity at an abstract level, one or more interpretative steps away from actual life. Continuity with the insights of earlier humans, including those found in the Bible and the writings of the early churches, should be sought at the level of life as lived. The more abstract levels, including notions such as the Trinity, the virgin birth, heaven, and even God, are constructions, and these constructions or interpretations may change drastically even though one seeks to be fair to the underlying experiences. Fundamentalists, and those who reject Christianity because they think it has to be fundamentalist, often make the error of conflating different levels. They take the original form of expression of human concerns and experiences to be as important as the experiences and concerns articulated in those expressions. One may attempt to develop new worldviews in which everything of old has an equivalent and end up in complete failure because the new images do not relate sufficiently to the experiences that led to their predecessors.

In my view, therefore, the best way to renew religious language and models is to think about images as they functioned for humans in earlier periods and uncover what the underlying concerns and experiences were. Insofar as we recognize those experiences and concerns and see them as our own, we can develop new ways of dealing with them in images and models that are credible in our time, in the context of all else that we take seriously, including science. If we create new images and models, we do not so much find guidance by the past but rather appropriate past experiences and insights insofar as they can be represented in ways recognizable and acceptable to us.

Creating Futures. Science offers more than understanding; it provides us with tools to change our world. Chemists seek not only to understand nature but also to make things not present before—artificial things. In our days almost all of the sciences have this active, creative side. Think of the creation of new materials with new properties, of electronics that have given rise to information and communication technologies, and of biotechnologies of various kinds that have had major consequences for food production and medicine. An active attitude is deeply rooted in human nature; we are as much *Homo faber* as we are *Homo sapiens.*

I doubt whether a morally sensitive person could wish that we had done without this active side. There is, of course, the mythical image of paradise, of an effortless pastoral life with fruit in abundance. But if we are realistic, we realize that we need our technology. and we need it for morally lofty purposes: to feed the hungry, clothe the naked, and care for the sick. If we speak of *co-creation* we distance ourselves from the idea that creation is in principle finished and from the idea that God bypasses human beings in arranging everything; the history of God's creation is one in which humans have responsibility. In this approach, we do theology not merely on

the basis of an appreciation of the past, of positive experiences of beauty and goodness, but rather out of engagement with justice, with love, with the idea of making this world better. But we cannot work for a better future without addressing the wealth of visions and values that have been handed down to us from the past, which help us articulate our judgments of better and worse.

Theology as "Cosmology and Axiology"

If we look to science for guidance, we assume that science offers us not only an adequate understanding of phenomena within reality but also an answer to our search for moral guidance. However, there may well be aspects of reality that are intelligible but not acceptable, and these have traditionally been the focus of theological interest articulated in prophetic or soteriological terms. Typical of theologies as systematic positions seems to be that they offer views of the way the world is *and* of the way it should be, of the True and the Good, of the real and the ideal. Each theology is a particular mix of—a particular relationship between—a cosmology (in the metaphysical sense), a view of the way the world is, and an axiology, a view of the values that should be realized. Thus, as a heuristic to clarify and explore a complex area of discussion, I use the "formula" for understanding the nature of theologies: *a theology = a cosmology + an axiology*. The + sign is not a mere addition but the crucial issue: how the two are brought together.

Let me elucidate some aspects of this formula. I speak of *a* theology to indicate that there may be different theologies, not only in relation to different religious traditions but also within a tradition. By *theology* I mean not the academic discipline of studying religious convictions but the object of such studies—a complex of convictions. *A cosmology* is used here for a view of the way the world is. Theological interest in cosmology is not only in questions of origins ("creation") but in the whole way that reality is envisaged, including such issues as time and eternity, determinism and contingency, and divine and human action. Thus, cosmology is more than the astrophysical study of the universe, even though in our time the natural sciences determine to a large extent our cosmological visions. *Determine* may actually be too strong a term, because there is some leeway between scientific knowledge and the interpretations given. The sciences constrain rather than contain interpretations that deserve to be considered plausible. Belief in a flat Earth with the heavens above and the waters beneath is certainly untenable, as is belief in a young Earth (counting in terms of thousands of years rather than millions or billions). But the theories themselves do not tell us how to interpret quantum theories, general relativity, and their potential integrations with respect to determinism, contingency, and the nature of time.

An axiology is understood here as a view of moral and other values, of what is considered "the highest good." Our values have been influenced by lessons from history; slavery and discrimination between men and women are deemed unacceptable, as is cruelty against animals. Impartiality has become an important criterion in evaluating moral norms; the golden rule about loving our neighbor as we would like to be loved is in many ways part of human cultural and social history—not as a descriptive statement, as if we were to live accordingly, but as a constraint on acceptable proposals regarding the highest good.

Finally, there is the +, the *and*. A theology has both cosmological and axiological elements. This is essential. Theology is not only a theory or metaphysical explanation of the world; nor is it merely a view of values. Both are brought into relation, and philosophically such a relation is very problematic because of the *is-ought* distinction, but combining *is* and *ought* is characteristic of theologies. In this respect theologies are heirs of mythical thinking, as it grasped reality before the rise of philosophy and sciences of nature. The *and* is not an addition but a keeping together of two components that we humans like to keep together even though we cannot justify the way we do that, and even though we know that moral and intellectual gains have been made by distinguishing and separating values and facts. My scheme is a heuristic for exploring the field rather than a substantial thesis about the (singular) proper view of the relationship between theology, ethics, and the sciences. I do not consider atheists necessarily deficient in understanding or values; they simply hold a different existential position, a different view of the relation between moral criteria and natural characteristics. In my opinion, the attempt to combine *is* and *ought* statements is what makes theology both problematical and valuable. The difficulty finds expression again and again in the problem of evil, which typically concerns the relationship or tension between the two main components.

This tension is also present within religious naturalism, both in the introduction of normative elements in a naturalistic understanding and in the variety of positions adopted. Whereas some understand God primarily in ontological terms—as the most powerful reality upon which we are dependent, for instance, with all the moral ambivalence that is thereby imported into the concept of God (see Burhoe 1981)—others use the concept of God primarily valuationally, as a label for elements in reality that are deemed sacred, concentrating on that which is ultimately significant, on regulative ideals, and the like (Hardwick 1996; Stone 1992); their challenge is to articulate how this concept of God can be considered real and effective. My own program is naturalist in the sense that it views human existence, including human cultures, moralities, and religions, as the fruit of, or even as part of, nature. At the same time it is antinaturalist in atti-

tude, in that humans are seen as called to go beyond and against that which has been handed down by nature to us.

The definition of theology as cosmology-and-axiology allows one to respect the autonomy of science and also of moral discourse. One can further differentiate between science and any interpretation of science as a view of reality—that is, any cosmology, metaphysics, or philosophy of nature. A cosmology, in this sense, is a view of what the world (with its substances and relations and its conceptions of space, time, matter, forces, and causality) might be like, given what we know and what we know not to be the case (science may well be stronger in what it excludes than in what it includes). Any such metaphysics is an interpretation of scientific knowledge, constrained but underdetermined by the sciences.

As far as theology is concerned, the definition allows one to concentrate on existential issues, which become prominent when our reality is not in accord with what we think ought to be (the + in the formula), rather than on supernatural or magical elements. Religion need not be about that which upsets the cosmological order. It is about the way the axiological and the cosmological are related, in harmony or in tension. This means that a religious naturalistic theology need not be conservative and defensive; it can well allow for the longing for redemption and for improving reality—an attitude in which we envisage the sciences as involved not only in understanding our reality but also in transforming it.

Where to Look for Guidance as a Central Question for Religion and Science

I have considered the possibility of turning toward past traditions, present science, or future consequences for guidance. I have argued that none of these can fulfill this role by itself. Seen thus, the role of theologies is to integrate these important dimensions of our thinking. Thus, religion-and-science could be seen as a major way of addressing the concern for orientation and motivation.

However, religion-and-science does not resolve the issues or lead to a single normative perspective, because the way current knowledge is integrated with past wisdom is highly dependent upon ideals regarding the future. Rather then resolving the need for guidance, religion-and-science becomes one way of addressing our need for guidance, bringing into the conversation past, present, and future.

Note

The second half of this article draws substantially upon Drees 2003.

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"WRITING THE AGENDA," SUMMARY AND RESPONSE TO THE PANEL PARTICIPANTS: V. V. RAMAN, GRACE WOLF-CHASE, IAN BARBOUR, VÍTOR WESTHELLE

by Ann Milliken Pederson

Abstract. This essay highlights the basic issues, goals, and questions for the future of ZCRS.

Keywords: Ian Barbour; borders; consonance; dissonance; imagination; liminality; V. V. Raman; Vítor Westhelle; Grace Wolf-Chase; ZCRS.

Examining the future agenda of the Zygon Center for Religion and Science (ZCRS) entails scrutiny of its mission and goals. In the essays that follow, which are versions of their presentations at the Symposium, four panelists who have been involved at a variety of levels and in many different ways offer their perspectives on shaping the questions and issues for the future of ZCRS. The agenda set by the panelists corresponds to the mission of ZCRS: ". . . the purpose of the Center is to bring together scientists, theologians, and other scholars to discuss and carry out research on basic questions and issues of human concern" (Program Notes 2003, 9).

My purpose here is to pull together and highlight five of the basic questions and issues.

1. A distinctive task of ZCRS is interpretive—to help us "understand the world in which we live and our place in that world" (Program Notes 2003, 9). The panelists, particularly Vítor Westhelle, remind us that this task requires an examination of not only what we know but also what we do with what we know. Interpretation is both an epistemological and a pragmatic task that draws us back to basic boundaries and relationships.

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While many in the religion-and-science dialogue advocate a kind of consonance between religion and science, attention must be paid to the distinct differences that each brings. To utilize a musical metaphor, the relationship is one not only of consonance but also of dissonance. Dissonance is not outside of harmony; the harmony itself embraces the tensions. Paying particular attention to those dissonances may raise new questions and agendas for the religion-and-science dialogue. Dissonance, a model for interpretation, highlights the differences and distinctions as well as the similarities between religion and science. For example, Westhelle makes a modest plea for science to "take into account precisely the experiences and knowledges in the liminal borders of its domain as questions that might broaden, instead of threatening, the territory of modern science" (Westhelle 2004, 386). The same can also be said for religion and theology. The challenge is to continue the expansion of what religion and science include and how that shapes and changes the dialogue. What counts as data in the dialogue? Who determines those data? The interpretive task is complicated, nuanced, fluid, and expansive. The challenge of the Center is to negotiate this task, which "promotes dialogue and cooperation," while remaining sensitive to the tensions and dissonances that arise (Program Notes 2003, 9). Westhelle uses the metaphors of borders, liminality, and twilight to articulate the agenda for ZCRS. It will be at these edges of the conversation between religion and science that ZCRS will find its center.

2. The future of the human community is frightening and uncertain. To understand our place in the world requires a kind of fearless examination of the changing nature of what it means to be human. Every day new scientific and technological discoveries challenge religious and theological practices and beliefs. Ian Barbour notes that these current debates "raise fundamental questions about human selfhood and are relevant to personal and social choices we have to make today" (Barbour 2004, 391). The challenge of ZCRS is to help human beings understand these questions and provide discernment through the ethical mazes that we face daily. ZCRS can help both the scientific and religious communities confront these ethical tasks in a spirit of cooperation. This requires nuanced discussions that give credence to many different points of view. Pluralism is both gift and challenge.

3. Grace Wolf-Chase warns us about the disconnection between not only science and religion but also "public perception and understanding of both" (Wolf-Chase 2004, 393). If ZCRS appeals to promoting the "welfare of the human community," it must pay specific attention to the zeitgeist of that community (Program Notes 2003, 9). What is the role of education for ZCRS? Toward whom is the Center reaching? What is the relationship between the public and the academy? What impact will the Center have on the dialogue, not only at the level of the professions and academy but also of people in their personal lives and communal life in the

public square? ZCRS resides in a university-centered neighborhood and within a faith community. The diversity that this location provides shapes the educational mission of ZCRS. The religion-and-science dialogue must address cosmic issues set within the particularities of people's everyday lives, especially in a world that is filled with pain and suffering. What difference will this dialogue make? ZCRS can be a leading and prophetic voice in promoting agendas that help contribute to the "common goal of a world where love, justice, and ecologically responsible styles of living prevail" (Program Notes 2003, 8). This is indeed a risky task.

4. With powerful zeal, Varadaraja V. Raman issues a call "to spread the message to the world of religion that one can have meaningful religious experience through the complex world-pictures of science, and to the world of science that one must also recognize and respect the religious dimensions of the human spirit in whatever mode of manifestation" (2004, 399). Raman alerts us to the challenges of pluralism but also reminds us of the dangers of a religious history that "is marred by persecutions in the name of God and scripture" and that "growths from scientific knowledge have resulted in pain and potential disaster for our species" (p. 398). He advocates building a relationship not only between religion and science but also among the faith traditions that reside in the human family. As ZCRS continues to maintain this challenge as part of its mission, the possibilities for making a difference in the world that needs healing from so much religious conflict are desperately needed.

5. To a world fatigued by the commonplace and vulgar, ZCRS can provide imaginative insight into the task at hand. The fine and performing arts can provide such imaginative insight into reality with new metaphors. In the words of a Finnish composer, Einojuhani Rautavaara, "Music is a language where we can probe those other realities, without words. Besides immense pleasure, music gives to the listener information. The information is not anything you can transcribe in words" (Heffern 2002, 30). To interpret is to give information. To understand is to find new images about the world, which is often a reality that we can better describe without words. Such is the task of ZCRS. All of the panelists offer vision, imagination, challenges, and deep insight into the world in which ZCRS lives out its mission.

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TOWARD AN ETHICS OF KNOWLEDGE

by Vítor Westhelle

Abstract. Modern science is one form of knowledge, demarcated by its time (modernity) and by other "knowledges." There is a fair amount of clarity as to what does not count as scientific, but there is a twilight zone of knowledges whose scientific status is ambivalent. In this zone the encounter between science and religion takes place. The particular contribution of religion and theology in this encounter is to call for an ethics of knowledge in the epistemological endeavors of science.

Keywords: epistemic claim; epistemic territory; epochal threshold; ethics of knowledge; knowledges; liminality.

Dominant, hegemonic, and globalized as modern science is, it is but one form of organizing knowledge, assessing information about reality, and devising tools to intervene in it. This is the underlying assumption I am working with. Modern science is demarcated, first, by its epoch (modernity) and, second, by other contemporaneous knowledges. The emergence of modern science in Western history is marked by emblematic events that took place in the middle of the last millennium, the "epochal threshold around 1500" (Habermas 1993, 5), which gave it specific features. The Copernican revolution, by challenging the geocentric paradigm, opened the way for eliminating the possibility of having an Archimedean absolute and secure reference for astronomic certainty. The Reformation freed consciousness from external authority and allowed reason to rule unhampered on issues regarding our finite existence. The discovery of maritime routes and the "conquest of the new world" positioned Europe, aided by resources from abroad, to have a truly global dominion. Gutenberg's mechanical

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printing press allowed for a qualitatively new stage in which information could travel fast and virtually cover the whole globe without the distortions that plagued previous modes of reproduction, creating for science an "immutable mobile" (Latour 1990, 26) for the dissemination of ideas.

Along with this temporal demarcation there is a spatial demarcation, which is equally important and more relevant for the examination of the relationship between science and religion. The development of modern science within this period created a body of knowledge and a form of discourse that coexists with other epistemic realms and forms of discourse more or less external to the self-referential systems of science and its "régime of truth" (Foucault 1977, 133). In this sense, science can be said to be a "local" knowledge, however expanded this locale and bright the field it enlightens.

However, the exploration of what lies beyond the epistemic territory of science is severely restricted by certain limitations. The very irreducible multiplicity of scientific disciplines indicates the impossibility of a precise demarcation of the boundaries of what is scientific. Gone are the days of the Vienna Circle's dream of a unified language of science based on physics for its grammar and on mathematics for its syntax. The distinction between "hard" and "soft" sciences is in itself not hard but elastic, and not as certain as once fathomed. For instance, which would be "harder" (that is, more purely scientific)—Newton's laws or Heisenberg's indeterminacy principle? Nonetheless, although the scientific canon is not a closed one, it does have some margins, however shifting they might be. We know what does not count: that which clearly falls outside "disciplinary matrixes" (Kuhn 1977, 463)—astrology, magic, scientific socialism, superstition, phrenology, immaculate conception, alchemy, voodoo, creationism, and spontaneous generation, to name a few. What characterizes these fields of knowledge with their truths or beliefs is that their epistemological claims are self-consciously incongruent with most of what would be considered scientifically tenable by contemporary canons of scientific rationality, even if some have been regarded as scientific or reasonable at a given time. These knowledges find themselves in epistemic dissension, if not at war, with the scientific regime of truth. The case of creationism illustrates such an overt conflict over the legitimacy of epistemic claims.

There is, then, a twilight zone between the luster of scientific clarity and the obscure realm of the knowledges that surround the scientific territory but are clearly excluded from it. What is characteristic of this zone is that the knowledges produced here are problematic in the sense that they do not necessarily contest scientific epistemic claims; they are not in open epistemic dissention with them but regard these claims as either insufficient or exclusionary. For these knowledges, modern science either claims an excess of meaning or surrenders to a deficit of meaning; science either says too much or too little. As opposed to the knowledges clearly outside

of the scientific canon, i.e., those with which it has epistemic dissension, these in the twilight zone are approached by science. However, their own explicit or implicit epistemic claims are viewed with suspicion or are plainly ignored. They are, as such, colonized territories; science seeks to assimilate them into its own canons, accepting the reality of the experience they claim while disqualifying their epistemic claims, in the process reducing them to pathologies. Experiences of marginalization, madness, some illnesses, near-death experiences, delinquency, human sexuality, and, indeed, religion are examples of what have been called "sequestered experiences" (Giddens 1991, 156) or "subjugated knowledges" (Foucault 1977, 81–87).

In order to make a proper approach to this twilight zone, which is for me the territory for the encounter of science and religion, I offer an illustration from astrology, one of the now excluded knowledges. Not more than five hundred years ago, well into the "epochal threshold" I referred to, astrology was within the contours of what was then scientific territory. Early great champions of modern astronomy were known then for casting horoscopes, among them Tycho Brahe (1546–1601) and Johannes Kepler (1571–1630). Holding astrological convictions were also theologians, including the likes of Thomas Aquinas (1225–1274) on the Catholic side and Philip Melanchthon (1497–1560) later in Protestantism.

There is an anecdote that in the late eighteenth century, when J. C. F. von Schiller (1759–1805) was writing the play for his tragedy *Wallenstein*, he felt embarrassed putting on stage the figure of an astrologer, whom the historical Wallenstein in fact had in his employ. Legend has it that his friend J. W. von Goethe (1749–1832) offered him assurance by reminding him of the noble features of a belief that had earlier commended itself to great minds for bringing about the perfect yoking of religion and science.

The tale is telling in more ways than one. Schiller's embarrassment reveals how much astrology had been exiled from territorial science by the end of the eighteenth century. Goethe's counsel was an affirmation of the frail character of historical judgments. But, most important, the comment attributed to Goethe, in an ironic way, also suggests that a blessed blending of science and religion can happen only retrospectively, in a time in which science (and religion for that matter) was not refined enough; albeit noble, a time in which science did not have its boundaries defined well. And this time is never our time, because supposedly we know it better.

It should be noted that historically the flexibility of science to incorporate knowledges that would allow for a compatible relationship with theology and religion is not the whole story. In the case of astrology, its possible incongruities with science were at least as foundational as they were for theology. In both Islam and Christendom, the civilizations in which it flourished up to the middle of the second millennium, astrology was not a partner easy for theology to intermingle with. These monotheist religions, affirming human free will and the unlimited sovereignty of God, had to

make considerable adjustments and compromises to allow for the validity of astrological causation by influences of stars and planets and their conjunctions. Theological tolerance was significant enough to accept claims that were at variance with its ontological foundations, claims still harbored within the domain of accepted science. This is not to deny the many other cases in which overt opposition and even repression are documented. The cases of Nicolaus Copernicus (1473–1543) and Galileo Galilei (1564–1642) are examples of ecclesial intolerance during the same period, even as we are well advised to distinguish religion per se or theology as such from ecclesiastical politics.

The present engagement of science and religion (to which the very existence of the Zygon Center for Religion and Science attests) seems to belong neither to that idyllic yoking that Goethe referred to in relation to astrology nor to the contemporary incompatibility between science and astrology. The recent typologies accounting for a score of possible practical and theoretical scenarios in the relationship between science and religion, developed by Ian Barbour (1990), Philip Hefner (1996), Ted Peters (1996), Niels Gregersen and J. Wentzel van Huyssteen (1998), and others, already indicate that this encounter inscribes itself in that twilight zone. In other words, the relationship between science and religion is neither an incompatible external one, as between science and astrology, nor an internal one, as between science in general and astronomy or any other of its traditional disciplines.

The task ahead includes further exploration of this twilight zone in the relation of contemporary science with religion and theology, because in this dialogue the very questions of the threshold and limits of scientific knowledge and of the legitimacy of religious claims are raised. This chiaroscuro is the region in which human endeavors dwell on queries about liminality, ultimacy, and infinity, which modern science with its three fundamental operations—classification, calculation, and genealogical ordering—does not address in principle. Conversely, this twilight zone is also the area in which religious postulates and teachings (with their endemic theocratic verve) will find their limit by entering the world of quotidian existence in the finite realm of nature and technology. Religion and science are after all human affairs; it is in and through their encounter that the finitude of human endeavors is realized; both the scientific Faust and the religious Icarus find their end.

This is not a call for a new metaphysics. It is rather a modest plea for science to take into account precisely the experiences and knowledges in the liminal borders of its own domain as questions that might broaden, instead of threatening, the territory of modern science. By doing so, science might welcome the cries and silences of those whose questions are so many times too urgent and too pressing to be responded to by the *modus operandi* of calculation, genealogical ordering, and classification. And, let

us not forget, a corresponding challenge addresses religion and theology as well, which have often capitulated to the scientific canons of rationality or, worse, exiled themselves into solipsistic territories of nonaccountability.

There is an old rule in theology that comes from the fifth century (Prosper of Aquitaine, *c.* 390–*c.* 465), which says that what ought to establish the agenda for the theological endeavor is the plea of the supplicant, the one curved down by the weight of sin and oppression (*ut legem credendi lex statuat supplicandi*—that the rule of believing be set by the rule of the supplicant). This would not be an irrelevant starting point for a yoking endeavor. As much as theology in modern times has often relegated ethics to a discrete discipline within its own domain, so has science. Prosper's rule suggests for both science and theology a common ground, which could be no other than the very examination of the moral foundations on which our epistemologies work. The compatibility between the epistemic regimes of religion and of science might never be achieved; however, this does not rule out that the very willingness of keeping the conversation going is already an indication that there is a more fundamental agreement, an agreement not in theory but in the very practice of the endeavors we are engaged in. This is what Jacques Monod prophetically called, decades ago, an "ethic of knowledge":

> The ethic of knowledge is also in a sense "knowledge of ethics," a clear-sighted appreciation of the urges and passions, the requirements and limitations of the biological being. It is able to conform the animal in man, to view him not as absurd but strange, precious in his very strangeness: the creature who, belonging simultaneously to the animal kingdom and the kingdom of ideas, is simultaneously torn and enriched by this agonizing duality, alike expressed in art poetry and in human love. (Monod 1972, 178)

This "agonizing duality" (begging Monod's indulgence) is as much expressed in art and eroticism as it is in religion, and all of these are human endeavors to address the "requirements and limitations" of our "precious strangeness."

As Martin Luther (1483–1546) once suggested, the twilights in our existence—and indeed the very twilight in the experience of the encounter between science and religion—might be not the nocturnal dread of an approaching night but rather a dawn of a bright new day. It is in approaching this twilight in this perspective in heart and mind that we have seen the work of CCRS (Chicago Center for Religion and Science) and its present incarnation in ZCRS (Zygon Center for Religion and Science). For the last couple of decades this has been its mission under the leadership of Philip Hefner and all the collaborators and associates who have helped him (in particular I want to mention Tom Gilbert). This is a legacy for Dr. Antje Jackelén . . . a legacy that is ongoing, an ellipsis for Antje herself to fill in.

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FUTURE DIRECTIONS FOR THE ZYGON 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.

Keywords: biological sciences; CTNS; evolution; physics; world religions; ZCRS.

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.

TOWARD UNDERSTANDING EACH OTHER: BRIDGING GAPS IN THE SCIENCE-AND-RELIGION DIALOGUE

by Grace Wolf-Chase

Abstract. The high degree of specialization in society and compartmentalization in education have resulted in increasing difficulty in communicating across different fields of study. I propose that these gaps in communication across disciplines must be addressed to ensure a fruitful ongoing science-and-religion dialogue.

Keywords: compartmentalization; cross-disciplinary communication; disconnect; process-oriented approach.

My experience as a research scientist within the academic community and at a major institution for public outreach, as well as my involvement as a lay person within a community of faith, tells me that the biggest barrier to progress in dialogue between science and religion is the huge disconnect that exists across disciplines such as science and theology as well as between these disciplines and in public perception and understanding of both. Widespread misunderstanding of the language and jargon used in science and religion, and the historical development, methods, and questions that most concern these disciplines, has resulted in far more talking past each other than talking to each other at both the academic and lay levels of discussion. People in highly specialized fields often have the most difficulty communicating both with nonspecialists and with specialists in different fields of study. Ironically, vehement disagreements often arise between

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persons who do not understand each other well enough to even identify the similarities and differences in their positions.

I think that much of this disconnect stems from the compartmentalized way in which individual disciplines are generally taught, from elementary school through the university level, with little attention given to the methods used by different disciplines and how these methods compare across disciplines.

In my experience, many people of faith who are hostile toward science know something of the results of science but have had little exposure to the actual *process* of science. Similarly, many who are hostile toward either science or religion have had a Sunday-school level of exposure to theology, with little background in the historical development and methodology of religious traditions. This situation is made worse when media stories abound with tales of science and religion at each other's throats, and other views are not heard by the great majority of people. *Dialogue* should not mean presenting people with a vast array of bewildering end products; it should mean giving them the tools they need in order to make better-informed decisions for themselves. One of the wisest pieces of advice I have heard regarding education is to always assume that people are smarter than you think they are but know less than you think they know.

My recommendation for moving ahead with the science-and-religion dialogue is to shift from a product-oriented approach to a process-oriented approach. Perhaps, using Ian Barbour's four categories of conflict, independence, dialogue, and integration, which describe different perspectives on the relationship and interaction of science and religion, it is time to begin to address the question of how one reaches a position in the first place. Before a person can make an informed decision, it is necessary for that person to have some basic understanding of the underlying assumptions and methods used in science and religion, the historical development of these methods, and the types of questions of most concern to each—How are these questions approached, and how are the "big ideas" developed? How are the methods similar, and how are they different? This process-oriented dialogue should be pluralistic, to enable people to come to a better understanding of cultures different from their own. Unity ought to be able to exist with, and benefit from, diversity, but the only way that we'll ever begin to understand each other is to first identify our similarities and our differences.

The urgency for proceeding in this direction is great. Compelling arguments can be made for the importance of improving scientific and technological literacy among all religious communities. In recent years, major scientific efforts have been initiated to address two questions of enormous potential significance to humanity—Where do we come from? and Are we alone? Science has made significant progress in understanding the "how" of our cosmic origins, and within the next couple of decades we will be

able to take images of entire planetary systems around stars other than our Sun and study the atmospheres of planets in these systems for indications of life as we know it. There is a great irony in the fact that we can understand so much of our cosmic origins, yet, on our own world, in our small corner of the vast cosmos, we often can't understand our next-door neighbors, let alone people who live in very different cultures. In my opinion, addressing this need to understand each other should be the driving priority of future dialogue. In doing so, the discussion must reach much further out of the ivory tower than it has to date.

SCIENCE AND RELIGION IN THE TWENTY-FIRST CENTURY

by Varadaraja V. Raman

Abstract. To achieve peace on our planet we must bridge the gap not only between science and religion but also among faith traditions. Accepting the doctrine of multiple paths can reduce interreligious tensions. Every view of the Divine is partial, every faith system rests upon supreme spiritual experiences, and each one provides fulfillment in the yearning to connect with the Cosmic Mystery.

Keywords: Cosmic Mystery; doctrine of multiple paths; interreligious tensions; religious pluralism.

What began as wonderment about human awareness and poetic visions of the beyond grew into the magnificent framework of religion. Religions explore our relevance and destiny in the cosmos. Sages, poets, and the spiritually awakened have given humanity a rich backdrop that transforms mechanical and aimless existence into meaningful life. Choirs in churches, chants in temples, readings in synagogues, calls from minarets, and other invocations give joy and enrichment to the humdrum of night and day.

What began as clever ways of explaining planetary motions and quantitative descriptions of phenomena became modern science. Modern science has brought every facet of human inquiry under its overarching sway of reason, experimentation, and commitment to objectivity. It has erected a transcultural and international community of investigators who probe, prove, and provide answers, ceaselessly extending the bounds of knowledge. Revelations about the nature of the phenomenal world are given to the sage-searchers of the scientific realm.

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Religions have also splintered us into groups that sometimes regard with condescension those who pay allegiance to different visions of the Unfathomable Mystery. Religious history is marred by persecutions in the name of God and scripture. Likewise, growths from scientific knowledge have resulted in pain and potential disaster for our species.

For peace and harmony in our interconnected world we must strive to bridge the chasm not only between science and religion but also among the faith traditions of the human family. For the safety of our species we must be careful not to let science become an unbridled wild horse or allow religions to bicker and quarrel among themselves instead of serving to actualize the best in the human spirit.

Every believer proclaims his or her religious heritage with love and pride. This must be respected. But when this becomes belligerent, it is incumbent upon those who speak for science and religion to call for the arrest of interreligious hate and hurt.

At the doctrinal level, religious leaders will have to reformulate the dogma that the message of one's own faith system is the only voice of the Divine. Even while attaching primary value to our Sun because it is our sustaining source of energy, we must acknowledge that there are countless other suns, each central in its locality. In the same way, leaders and interpreters of religions must stress that no one faith system is final and for all. We cannot with moral dignity or rational legitimacy call one religious system inferior to another. Without falling into the simplistic error of proclaiming that all religions reveal the same truths, we can affirm that those aspects of religions that respect human dignity and mutual respect are superior to those that preach hate and intolerance.

To reduce interreligious tensions, there is no alternative to accepting the doctrine of multiple paths. When it comes to such ethical guideposts as love, compassion, caring, humility, respect for others, and reverence for the sacred, the religions of the world are bound in commonalty, not shorn in animosity. In postures of humility in prayer and in the surrender to cosmic transcendence, religions resemble rather than reject one another. Religions differ in their historical roots, not in the spiritual sensibilities they evoke.

Every view of the Divine is partial. We proclaim our visions differently. Like the blind men who wanted to know the elephant, each of us gets a glimpse of the Ultimate, which is like a gem that glitters in different ways when viewed from different angles. It is enriching to see a facet of the Divine in the Star of David, in the Cross, in the Crescent of Islam, and in the abstract sound of the sacred *Om*. A Hindu prayer says:

> *Âkâsâd patitantoyam yadâ gacchati sâgaram*
> *sarvadeva namaskârah srî keshavam pratigacchati*

As the waters falling from the skies go back to the self-same sea;
Our prayers to all the gods go back to the same divinity.

It is important to spread the message to the world of religion that one can have meaningful religious experience through the complex world-pictures of science, and to the world of science that one must also recognize and respect the religious dimensions of the human spirit in whatever mode of manifestation.

Religious pluralism is not abandonment of one's faith or naive embrace of all but rather the awakening that every religion enshrines some of the wisdom of the ages, that every faith system rests upon supreme spiritual experiences, and that every tradition of humanity provides fulfillment in the yearning to connect with the Cosmic Mystery.

As I see it, these should be among the goals of humanity for the new century.

CONCLUDING DIALOGUE: CHALLENGING THE PAST, GRASPING THE FUTURE

by Antje Jackelén and Philip Hefner

Abstract. A dialogue between the outgoing and incoming directors of the Zygon Center for Religion and Science took place as part of the inaugural symposium. In their conversation they speak of the past and present challenges and goals of the Center, outline what is foremost in their minds, and offer glimpses into what they see as the Center's priorities for future work.

Keywords: continuous reform; dialogue; *diapraxis*; feminism; hermeneutics; postmodernism; science and religion; yoking; ZCRS.

Challenging the Past

[Antje Jackelén] When I here try to challenge the past, I do it in a way that may provoke disagreement and alternative views. My purpose is to look to the past as a means of grasping the future, of finding the best possible answers to the question of where we want to go.

I am not going to anticipate the panel to whom we have given the task of actually suggesting an agenda for the future. I leave the precise work to them and present a rather rough outline instead.

When the dialogue between religion and science got some fresh starts during the last century, they often originated with questions pertaining to biology. Basically, the dialogue was about a constructive apprehension of

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the theory of evolution. The outcome of these efforts has taken two contradictory directions. On one hand, the evolutionary perspective is taken for granted in many respects and applied in many different areas, including epistemology, psychology, and religion. Occasionally it seems so well integrated that critique is called for: the process of making evolution a commonplace concept runs the risk of ending up with watered-down ideas that equate evolution with a general notion of development. In that sense, evolutionary theory has come to be almost too successful. On the other hand, we still see too much energy invested in promoting creationism and design theories. A quick look beyond the United States and beyond Christianity suggests that these questions, as important as they may seem in certain areas and circles in this country, are far from being central issues in other parts of the world. Maybe this outlook helps us to avoid wasting energy on issues that do not have any future. Science has moved on, and Christian theology has moved on, too. The issue of "God at the edges of the universe" today experiences a very healthy competition from questions about "God in the messy middle of life in the world" (Rita Nakashima Brock).

In many places, step two of the new dialogue between religion and science came with a focus on physics and religion. In the wake of an attempt to understand interpretations of the theories of relativity and quantum physics, questions about time, cosmology, and God's action in the world appeared at the forefront. This was a phase of the dialogue that interested philosophers, physicists, and theologians alike. This type of dialogue often came to be flawed in terms of mutuality. Rather than an encounter of equals, it seemed to be a learning experience in physics for religious scholars. Its positive outcome, however, was a significant consolidation of the dialogue between religion and science as a respectable field. This period of the dialogue also gave us systematizations of the history of the interplay between scientific and religious worldviews and provided us with a number of typologies that have proved useful, especially from a pedagogical point of view. It would not surprise me if future scholars assessed this phase as a time that produced vital research traditions in the area of religion and science but also as a period that operated pretty far off from common human concerns.

Looking at more recent developments, it seems that the focus has shifted back to biology. The reasons are obvious. The Human Genome Project, biotechnology, bioethics, genetically modified organisms (GMOs), stem cell research, genetic engineering, cloning—in this part of the world, nobody, even with the most modest attention to the media, can have escaped these topics. Whatever media did when using these words, they conveyed the message: it is about *bios*, biology, about knowledge of life. And you don't mess around with life arbitrarily. If it was the nuclear bomb that first made us ask questions about the responsibility of scientists for the use of

their discoveries, it was progress in biology that seems to make this a concern of real public interest. So, while the cry for ethics is very understandable and heartening, the ways we have developed to handle ethical questions are not always equally encouraging. Yet, there is more about biology than the aspects that make it into the headlines of public media. Neuroscience and evolutionary psychology are examples of other areas from which we can expect a lot of challenging issues to discuss.

Thus far, dialogue between religion and science often looked as if it were about bringing religion up to date with science. Science, not religion or theology, seemed to set the agenda. However, these things are subject to change, in the general public as well as in the dialogue partners themselves. I remember two very different experiences from the beginning and the end of my ministry in the Church of Sweden. In the early 1980s I often encountered people who said, "Why believe in God? Science measures and weighs it all, that's reality—I only believe in what I can see and put my hands on." And I found myself saying, "Don't be so sure. There is so much more to life than you can lay your hands on." In the mid-1990s, there was another song to be sung. People often said things like "You know, I don't care what the experts say; truth is what I feel is right for me, truth is what makes me feel good, no matter whether it is blue stones or a horoscope." Much to my surprise, I found myself replying something very different from what I used to say in the early 80s: "Don't believe everything. There is much more rationality to life than you think."

At this point, the clash of what C. P. Snow famously called the two cultures—the cultures of the sciences and the humanities—is no longer our main problem. Cultural rifts are no longer just a matter of scientific knowledge opposed to faith. The challenge we are facing is people's escape from the rationalities of both faith and knowledge into self-inflicted irrationality. This kind of irrationality, if it takes hold of a sufficient number of people in a society, is a threat not to either science *or* religion but to both of them. If this assessment is correct, we are in need of a new enlightenment, once strikingly well defined as a person's emergence from his or her self-incurred immaturity. In this sense, the Enlightenment motto "*Sapere aude!* Have courage to use your own understanding!" is as valid as ever, especially if we can extend it beyond the interests of the individual to include the needs of communities.

Phil, your assessment may be very different from mine. I assume that the profile and history of ZCRS, seen against the background of this roughly painted picture, will form a vibrant contrast?

[Philip Hefner] I am struck by your comments on the dialogue between religion and science. I am reminded that the "dialogue" has never been at the core of the Center's vision and activity. This may be a distinctive feature of ZCRS. The two excerpts from our Mission Statement that appear in the Symposium Program bear this out:

We are dedicated to relating religious traditions and the best of scientific knowledge in order to gain insight into the origins, nature, and destiny of humans and their environment, and to realize the common goal of a world where love, justice, and ecologically responsible styles of living prevail.

The purpose of the Center is to bring together scientists, theologians, and other scholars to discuss and carry out research on basic questions and issues of human concern that include:

Understanding the world and our place in it
Relating religious traditions to this understanding
Joint reflection to contribute to welfare of the human community
Dialogue and cooperation among world's religions
International discussion of these themes

The Center has always had an eye on the world situation and how humans can live in that situation viably and wholesomely. The "yoking" of science and religion is considered necessary for this task. Although the aims of ZCRS as expressed in these statements appeal to academics and involve academic programs, they have not fit into the regular activities of the academic peer group, nor have we sought to do so. This is clear from the profile of participants in our programs. They include academics from many disciplines, scientists in nonacademic settings, clergy, other professionals (doctors, lawyers, social workers, school teachers), and persons who clearly qualify as amateurs in relating religion and science.

This Mission Statement is part of a tradition that was promoted by our cofounder, Ralph Burhoe. His work is rooted in the American Academy of Arts & Sciences after World War II. The leaders of the Academy at that time were scientists who believed strongly that the sciences before and during that war had failed in their responsibility to society. They had not properly educated the public about science, they had not shown an adequate concern for ethical issues, and they had not dealt with meaning-of-life questions. Burhoe and his colleagues, who included the great historian of religion Erwin Goodenough, insisted that such responsibilities could not be dealt with adequately except through a yoking of science with religious traditions. All of the organizations that Burhoe had a hand in founding had basically the same mission statement: IRAS, the *Zygon* journal, CASIRAS, and ZCRS. The statement that appears in each issue of *Zygon* may be the clearest expression of this perspective.

The Academy group worked with a comprehensive view of the history of Western civilization. They were convinced that Western civilization was in crisis because of the rupture between the traditions of knowledge, which they identified with science, and the traditions of wisdom and moral reflection, which they identified with religion and humanistic philosophies. Let me read from the *Zygon* Mission Statement:

We provide a forum for exploring ways to unite what in modern times has been disconnected—values from knowledge, goodness from truth, religion from science. Traditional religions, which have transmitted wisdom about what is of es-

sential value and ultimate meaning as a guide for human living, were expressed in terms of the best understandings of their times about human nature, society, and the world. Religious expression in our time, however, has not drawn similarly on modern science, which has superseded the ancient forms of understanding.

The image of yoking is introduced as the reuniting of knowledge, truth, and science with values, goodness, and religion. The idea of dialogue can be very pale indeed when measured by the vision of yoking.

Consistent with your comments, Antje, the Center has attempted to go beyond dialogue. The traditional thrust of ZCRS points in another direction. In other words, both your comments and the history of the Center may well raise the questions, Is dialogue an adequate concept for relating religion and science, or do we need to go beyond dialogue into a more socially responsible direction? Does the past of ZCRS point to an alternative to dialogue? By providing this alternative, ZCRS and its tradition have in fact been a challenging factor on the terrain of religion and science.

Both science and religion aim at a larger constructive outcome than dialogue. They both seek a public impact. The American Academy scientists recognized this in the late 1940s and 50s. The purposes of science and technology have always been expressed in terms of benefiting human life and the world in which we live—even when they have actually not been beneficial. We may consider the corporate motto "better things for better living" to be naive or manipulative, but it states the sincere motivation of many scientists through the centuries. Religion and theology also seek a public outreach. In the United States this has been difficult, since both religion and theology are encouraged by our constitution to define themselves as private expressions of private feelings. We may be at a turning point in American history just now when the public significance of religious traditions of wisdom and morality is being recognized—along with the public significance of religious prejudice and bigotry.

All of this points to the fact that much more than dialogue is required in the interactions between science and religion.

What Is on Our Minds Right Now?

[A.J.] I would like to pick up two thoughts from you that seem to me important for the future and elaborate them.

One: At the beginning of the Zygon enterprise there was an insight that things can go wrong and have gone wrong, especially in terms of failed responsibility to public interests. I affirm this perspective in that I think that the dialogue should never be *a l'art pour l'art exercise*, an academic exercise in the pejorative sense of the word—highly theoretical, highly exclusive, intellectual amusement for a few with no or little relevance for the rest of the world. Instead, it needs to be a continuous exercise in the best sense of the word *academic*; that means collegial and intellectual responsibility toward the academic world, challenging and supporting religious

communities in their search for a better understanding of life and world in the light of the best knowledge available, and pursuing all of this in critical solidarity with society.

Although interdisciplinarity seems to be increasing in academia, compartmentalization remains a problem. Apart from structural and financial obstacles, true interdisciplinarity also needs to overcome the natural resistance of scholars to expose their ignorance in fields other than their own. When it is hardly possible to keep up with the most important journals in your own field, how dare you get involved with others? It is hard to walk that extra mile. Encouragement from academic institutions and religious communities is often badly missed, both by scientists and by theologians. I meet theologians dealing with religion-and-science who are frustrated with the disinterest and introversion of their church bodies. I meet scientists in the midst of their careers who have a strong sense of vocation about their scientific work and a desire to bring their expertise to a forum that at its best can contribute to a more wholesome future for humans and the whole of creation, yet who have not found such a forum. I regret that our educational system is such that especially many scientists feel that they have to wait until they approach retirement before they can explore their interest in religion-and-science without fear of reprisal.

This leads me to the second thought I want to pick up from what you said. And this is a provoking question, namely, Should it be dialogue at all? Is the concept of dialogue the right one? Should we abandon it at a time when it is finally seeming to become popular in many areas?

Zygon of course means more than talk. It means *yoke*. I must admit that my very first reaction to that metaphor was not wholly positive. A yoke is a thing you use to subdue two powerful animals, traditionally oxen, and make them go your way. That does not look like freedom of exploration at all. However, *yoke* also has other connotations: a yoke is a means to make two wills look toward the same goal—a goal that you, Phil, have described as birthing the future that is most wholesome for the nature that has birthed us. In other words, the yoking helps to make those stubborn oxen pull in the same direction so that eventually a harvest can be gathered.

A more tender association is the relation between *zygon* and *zygote*, which means "the union of genetic heritage from sperm and egg, a union that is vital in higher species for the continuation of advancement of life," as the statement of perspective for the journal *Zygon* has it.

All of this suggests that conversation or dialogue alone are not enough. In this case, it is not through the word alone, *dia-logos*. What we need to aim at is *dia-praxis*—developing a common praxis of linking the best understandings of our time about human nature, society, and the world with the best of wisdom nourished and represented by our religious traditions. I think that this view of diapraxis answers and transcends the question of why it is worth dealing at all with science-and-religion. A switch from a

policy-oriented toward a more problem-oriented approach becomes as good as self-explanatory here.

How does this fit with what is on your mind?

[P.H.] You have added another idea to the ZCRS treasury of ideas—*dia-praxis*, common action linking religion and the sciences in response to the issues that challenge us.

The sciences that pertain to the human being and human ways of living are central to praxis, and it is to these sciences that ZCRS and its forerunners have given a great deal of attention over the years. As early as the 1960s, we were thinking through the kinds of scientific methods and research that became the fields of sociobiology, evolutionary psychology, neuroscience, and the cognitive sciences. This was prescient, because, as you mention, these sciences today are at the center of both practical moral challenges and theoretical understandings that are churning violently in our society today. They touch our society as a whole and every person in it, and they present special difficulties to religious traditions. The practical ethical challenges are obvious, and you have underscored their importance, so I will not elaborate on them. These are the stuff of daily headlines, even in a time of war. It seems clear that only *dia-praxis*, a "yoked" response, is viable today, one that both scientific and religious persons can affirm and present as public positions.

I underscore here theoretical issues that need to be explored. The map of the religious consciousness, even of our inmost belief, is being redrawn by sociobiology, evolutionary psychology, neuroscience, and the cognitive sciences. This is so because these sciences are redrawing pictures of what a human being is and what human life and behavior are about. This redrawing results in staggeringly difficult issues for philosophical, religious, and moral reflection. Where are we now? We are in the position where we dare not postpone giving our attention to the agenda presented by these sciences. Because they will require the reformulating of our religious doctrine and preaching, they promise to shake theologians and religious believers to their roots. But this shaking will also be life-giving and liberating. I sketch two of the issues that I consider most critical.

First, to what extent are we governed by natural selection in our moral, religious, and spiritual lives? If these sciences have established anything at all, it is that even in our most precious inner beliefs and actions we engage in adaptive behavior that is finally either selected for or against—that is what natural selection is about. Adaptation and selection are rich and complex, much more so than we generally understand by the cliche "survival of the fittest." The processes are not always Darwinian, but nevertheless, they are adaptation and selection. As a Christian theologian, I believe that this is the way God has created the world—God has woven the creation on the web of adaptation and selection. We are very far from

understanding the significance of this aspect of God's creation and also far from integrating this truth into our systems of belief.

Second, along with adaptation and selection, we must recognize naturalistic, causal explanations of religion, morality, and spirituality. In the audience today are several persons associated with ZCRS whose work exemplifies the ongoing attempt to take these explanations seriously. Charles Smith's doctoral dissertation explores how the person and message of Jesus Christ has been carried by cultural evolution. Mladen Turk's dissertation analyzes cognitive and socially and ecologically adaptive understandings of religion. The Metanexus Science and Spiritual Transformation project, headed up by Sol Katz, researches spirituality from the perspective of several of the sciences I have mentioned. James Moore is incorporating evolutionary understandings of religion in the ZCRS Interfaith Project, which has focused on the concrete issues of HIV/AIDS, and will take its discussions to a next level at Barcelona in the 2004 Parliament of the World's Religions. Carol Albright relates the natural processes of complexification to moral and spiritual development. Ursula Goodenough probes the transcending character of nature itself in the concept of emergence.

Some think that this attention to the sciences is to be feared, that it reduces religion and faith to molecules, genes, and neurons. On the contrary, it throws light on how God has created our world and on what the actual purpose of faith and religion might be in the divine purview. These sciences can free religion, faith, morality, and spirituality to be richer, more constructive, and, from a believer's perspective, more faithful. We have much more to fear if we ignore or reject these scientific perspectives. They must be embraced and integrated into our traditional faith and theology.

In these comments I have already pointed my eyes toward the future. Let me conclude my part of this dialogue with a final reflection on the future that may help to explain the stance I have taken thus far.

Grasping the Future

[P.H.] I want to elaborate what I think underlies all that we do in the Center and that calls out for attention. I approach it from two perspectives.

1. For those of us who begin with God, the challenge is to recognize that science is revelation—revelation of what God has done, what God is doing now, and what God intends.

2. For those of us who begin with science, the challenge is to recognize that in and of itself science touches on the great realities of our lives, the fundamental questions of what it means to be human, and the basic issues that we must act on as we enter the future.

These two perspectives come together in an urgent common understanding: that science is serious and that science is one way that we access

the great and ultimate realities of human life today. Science is exciting, yes! It is beautiful in its reach and in its theoretical constructions. It is effective, particularly in its alliances with technology, in enabling us to do the work that we have set ourselves to do. But beyond these—its excitement, its beauty, and its effectiveness—science reaches for the deepest facts of life and creates an agenda for human action. This is in and of itself a religious engagement.

Religion is about the deepest facts of life and the important tasks of human action. Science is intrinsically involved in this sort of religious engagement. Even if scientists never leave their workplace, never enter a church, synagogue, mosque, or temple, their engagement with the facts of life and action brings them into the territory we associate with religion.

In some ways, scientists, political leaders, policy makers, and ordinary citizens seem to have grasped this dimension of depth in science more clearly than religious communities and their leaders and thinkers have. The human genome effort, sparked by the discovery of DNA fifty years ago, the multiple projects to chart the depths of the universe through astronomy and cosmology, the integration of computers into nearly every aspect of our lives and of genetics into everyday medical practice and of ecological science into our relations with the natural environment, as well as the widespread attention to ethical guidelines for these domains—these witness to the seriousness with which our society takes science and the agenda it creates. The United States Congress, the American Association for the Advancement of Science, medical schools, and business corporations together are pouring billions of dollars and millions of person-hours into the effort to take the measure of science and the human agenda it engenders.

But where are the religious communities and their leaders and thinkers? There are efforts, but in contrast to the billions of dollars and millions of hours that I have just mentioned, we might say that the religious communities are investing thousands of dollars and hundreds of hours. The religious communities, for the most part, do not recognize the religious dimension of science and its agenda. They do not recognize that science gives us knowledge of God as reliably as revealed scriptures do and that God's meaning for our lives is embedded in the agenda that science sets for our action.

Consequently, if our society and if the scientists in our midst are to become aware of the deep, religious seriousness of their work, they must make the discovery on their own, without the help of religion.

Science is knowledge of the ways God works—in the past and today. Religions must not only recognize this but also understand what this insight calls for—the renovation and reformulation of belief and worship. Religion finds meaning in its old, rich symbols and beliefs, and this is good. But we who are members of religious communities must come to the point

where we recognize that exploring the old and reinterpreting it is not all that we have to do. We also must engage in what the reformers of the sixteenth century called "continuous reform," putting aside that which is an obstacle to faith today and accepting the new scientific understandings as the framework for restating our faith and reconstructing our worship.

Recognizing the essentially religious character of science and reformulating our faith in the context of our current understandings of the world—these two convictions underlie my work in the field of religion-and-science, and they have marked much of the work we have done here at the Center.

The future is new, the past is prelude. With all its flaws, we join another notable Swede, Dag Hammarskjöld, and say "Amen" to what has been. And then we turn to the future and utter our "Yes" to it. We are bold and eager to enter in where the future leads.

[A.J.] Phil, you pointed to the need of taking seriously the specifics of the situation in which we work. And you criticized religious communities for not taking seriously enough the revelatory character of science, including the facts, possibilities, and problems the sciences put before us.

If we are to be intentional about our willingness to engage contemporary thought, I think we need to add three other topics that are very much part of our current situation: feminism, hermeneutics, and postmodernism. And as you criticized religious thinkers for not paying enough attention to science, I want to admonish especially scientific communities and their leaders and thinkers for not giving nearly as much attention as needed to these realities of our world.

It is fair to say, however, that during recent years both science and science-and-religion have taken some notice of feminist research. Scholars have, for example, analyzed the consequences of the interplay of masculine and feminine gender typologies in religion and science. In the early seventeenth-century world of Francis Bacon, science was presented as the saint who gathers her followers in monasterylike noble communities, whereas nature was the wild woman that needs to be forced into submission. Historical examples as well as current scientific conceptualizations indicate that beliefs in the inferiority of woman still form part of our inherited scientific, religious, and philosophical framework.

Feminist scholarship has raised issues of ethics and politics that are basically human issues, equally involving women, men, children, and the nature we all relate to; it also has addressed issues of exclusion and inclusion of women and their work, and of minorities and their cultures; and, demonstrating how gender categories inform and bias both research agendas and the interpretation of data, it analyzes and suggests different ways of doing science. I want to stress that I am not talking about feminism because I am a woman. Feminist scholarship is carried out by and relevant to both women and men. It is and needs to be part of the world we are living

in, in the same way as hermeneutics and postmodernism are part of our context.

Hermeneutics is usually defined as the theory and practice of understanding. What started out as reflection about how we understand and interpret texts has developed into knowledge about the nature of understanding itself. Therefore, its place is not only in the humanities but wherever we claim to understand something. It disperses naivete about the crystal clarity of facts, and it provides us with methods that allow us to handle the process of understanding and interpreting in rational, intelligible ways. Hermeneutics reflects on the nature and limits of the language or languages we use. This reflection sharpens our awareness of the ideological potential in scientific and religious concepts. It raises consciousness about the dynamics of interdisciplinarity and alerts us to the significance of the socioeconomic situatedness of our intellectual endeavors. Three examples of how hermeneutics is relevant to science are the discussions about different interpretations of quantum physics, the debates initiated by Thomas Kuhn's use of the concept of *paradigm*, and Bruno Latour's analysis of laboratories as places where the future reservoirs of political power are in the making.

Many of us grew into a religion-and-science dialogue that assumed without further ado that the questions we raised were of global interest and that we were able to make assumptions that are valid for all people. Hermeneutical sensibility unmasks such an attitude as an anachronistic illusion, which is a euphemism for imperialism or colonialism.

Of the three challenges I have mentioned, postmodernism faces the strongest resistance from the science community. And not without reason. If it were to lead us into total relativism and bring about a culture of disrespect for every single truth claim, it would indeed be a danger. But even as such a danger it still needs to be taken seriously.

However, I think that there is a lot to be gained from a constructive engagement with postmodern thought. Postmodernism questions at least two myths of modernity, the myth of progress and the myth of secularization. It is not true that every development is progress, and it is not true that where science goes in, religion goes out. Criticizing these myths of modernity does not make research impossible. It does not make it easier, either. Rather, it makes it more complicated—but maybe even better. I do not embrace an extreme form of constructivism that suggests that pretty much everything is social construction. But I do think that pretty much everything comes along with construction. I do not deny the value of so-called hard data, but I do think that our representation of data is always embedded in construction, a construction that informs how we talk about science, how we teach science, and how we do science.

In my view, postmodernism in its most helpful form shares the best fruits of modernity, especially of the Enlightenment, while at the same

time avoiding some of modernity's most serious mistakes. Such a postmodernism offers an exciting way between the Scylla of boundless relativism and the Charybdis of rigorous nonambiguity, of totalization and totalitarianism, of reduction to sameness.

Taking seriously these challenges that are before us will help to successfully enact the triangular drama between faith in knowledge, knowledge of faith, and their common responsibility for the world. This will be part of the agenda as ZCRS relates to the academic community of scholars in religion, the humanities, and the sciences, to religious communities, and to society.

These challenges describe what is important to me now and what I bring with me as director of the Zygon Center. But in and by themselves, these challenges do not represent the program of the Center for the next decade or so. Hermeneutics, feminism, and postmodernism will not form the core of the probram. Rather, they will work as catalysts at the core of the program. The catalytic process that they generate challenges compartmentalization in science. It challenges introversion in religious communities. It claims a place on the public agenda for the science-and-religion dialogue and will not give up the conviction that an increase in both scientific and religious literacy will have a healthy impact on societies. It will not accept any theological framework that is unable to cope with religious and cultural diversity. It will not accept any scientific framework that is not self-critical of its own methods and that does not ask questions about who is deciding on, doing, and presenting research for them and from which perspective.

I see the current science-and-religion project that we at ZCRS are working on for the upcoming Parliament of the World's Religions as a very good embodiment of these ambitions.

Cultivating religion-and-science work means cultivating unrest. Let me express what I mean by that in both theological and more biological language. Expressed in the theological language of my Protestant Christian heritage, this notion of cultivating unrest is a faithful expression of what the Reformers called *ecclesia semper reformanda*—a church always in need of reformation, a community always in need of renewal. Thinking in terms of biological imagery, I like to think of science and religion as complex bodies of knowledge. In order to keep well and alive, the muscles of the body need to keep up a certain level of tension, something for which the Greek had the lovely word *eutonos*, good tension. It is this vision that I see as a promise for the future of the Zygon Center as a vibrant voice in and for the academic world, in and for the religious communities we relate to, and in and for the societies we are part of.

"THE END OF ALL OUR EXPLORING" IN SCIENCE AND THEOLOGY

by Arthur Peacocke

Abstract. The present malaise of religion—and of theology, its intellectual formulation—in Western society is analyzed, with some personal references, especially with respect to its history in the United Kingdom and the United States. The need for a more open theology that takes account of scientific perspectives is urged. An indication of the understandings of God and of God's relation to the world which result from an exploration starting from scientific perspectives is expounded together with their fruitful relation to some traditional themes. The implications of this for the future of theology are suggested, not least in relation to the new phase, beginning in 2003, of the development of the Zygon Center for Religion and Science. In a concluding reflection the hope is expressed that the shared global experience and perspectives generated by the sciences might form a more common and acceptable starting point than hitherto for the exploration towards God of the seekers of many religious traditions and of none.

Keywords: Ian Barbour; Ralph Burhoe; co-creating creatures/created co-creators; T. S. Eliot; energies of God; evolutionary epic; Genesis for the third millennium; Philip Hefner; immanence; inference to the best explanation; Antje Jackelén; New Testament scholarship; open theology; panentheism; postmodernism; sociological surveys; special divine action; theistic naturalism; Ultimate Reality; Wisdom of God; Word (*Logos)* of God.

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Little Gidding is a small village in Huntingdonshire, England, to which Nicholas Ferrar, a politically well-connected doctor, retired with his family in 1626 to lead an ordered life of prayer and good works (medical, book binding, etc.) in a lay community—the first one in England, lay or ordained, since the English Reformation. It lasted for twenty-one years before being broken up by Puritan Protestants. In May, 1936, T. S. Eliot visited its seventeenth-century chapel, which still exists, and later he composed the last of his influential *Four Quartets*. The poem, titled "Little Gidding," is a profound reflection on the significance of time in the divine purpose, and four of its lines provide the *leit-motif* of this lecture:

> We shall not cease from exploration
> And the end of all our exploring
> Will be to arrive where we started
> And know the place for the first time.
>
> —T. S. Eliot, "Little Gidding"

Ferrar had been a Fellow of Clare College, Cambridge, where I was for eleven years Dean. Among my great experiences at that college was when, once a year, we used to go with students to Little Gidding. There we worshipped in its dignified small seventeenth-century chapel with the light of the setting sun streaming through its west door. The words of Eliot's poem thereby acquired a new power as he spoke of "the intersection of the timeless moment" in that place "where prayer had been valid," which was "England and nowhere. Never and always." That experience grounds my hope for one of the tracks I shall be following here, for science is one of the major spurs goading believers in God into new paths for expressing their beliefs and commitments. In the exploration from the world of science towards God, although the ride may be bumpy (for not all Christians will necessarily concur with what emerges), the goal is in itself unchanged. It is simply that, as at Little Gidding, to God's own self. If indeed God exists, *is*, at all, the honest pursuit of truth cannot but lead to God. It will not be God who has changed in our quest but we in our perception and experience of the Divine.

The Present State of Religious Beliefs (and So Theology) in Relation to Science

That time when I was Dean of Clare College proved to be a very fruitful one for my own thinking—not least because, while I was preparing my 1978 Bampton Lectures on *Creation and the World of Science*, Philip Hefner was a visiting scholar in Cambridge. We had previously met at a conference at Renssalaerville in October, 1972—and the Lutheran theologian (hotfoot from Germany) and the Anglican priest-scientist (still then at Oxford) soon found that they were on the same wavelength! Phil's later

stay in Cambridge could not have been more propitious, because in preparing those lectures I at last had a theologian to engage with who took seriously the challenge of science to theology. Our dialogues shaped that work of mine and, I hope and suspect, were subsequently not uninfluential upon his thinking. Certainly we later, during one of my happy and repeated visits to the Chicago Center, had a great tussle about whether, with the same intentional meaning, he should expound humanity as "created co-creators" or, my suggestion, "co-creating creatures." (He won, you will not be surprised to hear!)

Although those Bampton Lectures, when published (Peacocke [1979] 2004), were my first major work on the interaction of science with theology, they were not actually my first. While still struggling as a full-time scientist and university teacher to maintain my research group, working on the physical chemistry of DNA and proteins, I had acquired a training in theology. I exercised my newly acquired theological expertise, such as it was, by writing a book, *Science and the Christian Experiment* (1971), which was the result of the stimulus I had received from a number of authors (most of them scientists or mathematicians, including two professional theologians with a background in these disciplines) in the U.K., and some in Germany, who after World War II had in the 1950s actively addressed issues in science and religion—C. A. Coulson, D. Lack, E. Mascall, C. E. Raven, A. F. Smethhurst, E. Whittaker, J. Wren-Lewis, G. D. Yarnold, and (in Germany) K. Heim. This interaction was real but spasmodic, and it was certainly true by the early 1960s, at least in Britain, as John Habgood noted in *Soundings* (1963, 21–41), that the public and academic relation between science and theology had lapsed into a kind of "uneasy truce." Across the Atlantic, the dialogue appears to have been inhibited in the United States after the 1925 Scopes trial, on the teaching of evolutionary theory in schools. The truce was even more uneasy than in Britain, it would seem, until Ralph Burhoe, at first in Boston and then in Chicago, began, as a unique and lonely figure, single-handedly nurturing the debate from the early 1950s—in CASIRAS (Center for Advanced Study in Religion and Science) and in the predecessor to the present Zygon Center, who together published *Zygon,* and in the Star Island gatherings of IRAS (Institute on Religion in an Age of Science). Then, while I was in Oxford writing in the later 1960s that first book of mine in this field, there appeared in 1966, seemingly out of the blue, Ian Barbour's significant overview, *Issues in Science and Religion*. He tells me that he, too, had read the British authors of the 1950s whom I have already mentioned and later, as I had also done, Pierre Teilhard de Chardin and (from the U.S.) W. Pollard and H. Schilling, both physicists, and the process theologian D. Williams.

In the last thirty years, the momentum has gathered pace, and we all are aware of the burgeoning activity in this field of which this symposium is the latest manifestation—though whether its impact on theology and public

religious belief has had the hoped-for enlightening effects we shall have to consider later. There are nevertheless some encouraging signs in the world of science itself. In 1997 and 2001, widely and sympathetically publicized conferences in Berkeley (Richardson et al. 2002) and Boston brought to the platform two dozen leading scientists to talk about their spiritual quests as Muslims, Jews, and Christians, and even as seeking agnostics. There was a striking shared sense of wonder in their attitudes toward the natural world which itself fired their individual spiritual paths. The quests for intelligibility, in science, and for meaning, in religion, can apparently work together, even though this has not been the popular perception for the last one hundred fifty years. Many felt what Carl Sagan had so well expressed in his 1995 book *Pale Blue Dot*:

> How is it that hardly any major religion has looked at science and concluded, "This is better than we thought! The Universe is much bigger than our prophets said, grander, more subtle, more elegant"? Instead they say, "No, no, no! My god is a little god, and I want him to stay that way." A religion, old or new, that stressed the magnificence of the Universe as revealed by modern science might be able to draw forth reserves of reverence and awe hardly tapped by the conventional faiths. (quoted in Dawkins 1999, 114)

In spite of the attempted corrosions of postmodernist relativities, scientists and religious believers share a common conviction that they are dealing with reality in their respective enterprises. (Recall the Alan Sokal hoax!) Scientists would leave their laboratories and believers their churches, or mosques, or synagogues, for good if they did not think that they were dealing with the realities of nature or of God, respectively.

Yet what I have to say is, in fact, not naively but critically realistic with respect to both science and theology. Both disciplines aim to depict reality; both use metaphorical languages and models that are revisable in the light of experiments and of experiences. The aim of both is to tell as true a story as possible. Only thus, be it noted, can the religious quest have intellectual integrity, a quality that also demands recognition of the blinders to our perceptions resulting from the social milieu in which we are embedded. Such a quest for truth about God has acute problems today, because our perception of the world differs radically from the perception that shaped, two to three millennia ago, the language of the Abrahamic religions in the Judeo-Christian literature of the Bible and of the Koran.

So how might a contemporary "Bible" begin? Here is one possibility:

Genesis for the Third Millennium (or at least the twenty-first century)

There was God. And God Was All-That-Was. God's Love overflowed, and God said: "Let Other be. And let it have the capacity to become what it might be, making it make itself. And let it explore its potentialities."

And there was Other in God, a field of energy, vibrating energy—but no matter, space, time, or form. Obeying its given laws and with one intensely hot

surge of energy, a hot big bang, this Other exploded as the Universe from a point twelve or so billion years ago in our time, thereby making space.

Vibrating fundamental particles appeared, expanded and expanded, and cooled into clouds of gas, bathed in radiant light. Still the universe went on expanding and condensing into swirling whirlpools of matter and light—a billion galaxies.

Five billion years ago, one star in one galaxy—our Sun—attracted round it matter as planets. One of them was our Earth. On Earth, the assembly of atoms and the temperature became just right to allow water and solid rock to form. Continents and mountains grew, and in some deep, wet crevice or pool, or deep in the sea, just over 3 billion years ago, some molecules became large and complex enough to make copies of themselves and became the first specks of life.

Life multiplied in the seas, diversifying and becoming more and more complex. 500 million years ago, creatures with solid skeletons, the vertebrates, appeared. Algae in the sea and green plants on land changed the atmosphere by making oxygen. 300 million years ago, certain fish learned to crawl from the sea and live on the edge of land, breathing that oxygen from the air.

Now life burst into many forms: reptiles, mammals, and dinosaurs on land, reptiles and birds in the air. Over millions of years the mammals began to develop complex brains that enabled them to learn. Among these were creatures who lived in trees. From these our first ancestors derived.

And then, 40,000 years ago, the first men and women appeared. They began to know about themselves and what they were doing; they were not only conscious but also self-conscious. The first word, the first laugh, was heard. The first paintings were made. The first sense of a destiny beyond—with the first signs of hope, for they buried their dead with ritual. The first prayers were made to the One who made All-That-Is and All-That-Is-Becoming. The first experiences of goodness, beauty and truth—but also of their opposites, for human beings were free.

I have given (being me) this "epic of evolution" a theistic perspective on cosmic and biological evolution—the "epic of evolution" has become an "epic of creation"—but however much *private* revelations of God may be important to individuals, they are of no use, being incommunicable, to anyone else. Now science has found a reliable method for establishing *public* knowledge about nature that is adequate for its practical and conceptual purposes. Hence, the key question is: Can thinking hard about religious beliefs (theology) exercise a method or procedure of comparable reliability that can carry conviction and be heard above the cacophony of siren calls from other sources today?

All of the social barometers indicate that in the formerly predominantly Christian Western world the Christian church is failing to convince more and more people of the validity of its traditional beliefs. Sociological surveys of Western Europe (Britain, Germany, the Netherlands, Sweden),

Canada, and Australia record a steady decline in participation in religious (mainly Christian) institutions, and this is beginning to happen also in the supposedly very religious United States, at least in most of the mainline churches and certainly in the universities. For example, in Britain in the 1990s, two-thirds of those in the 18–24 age group said that they had no religion, and less than a third reported themselves as having been "brought up religiously at home," compared with over four-fifths of those over 64 years old. In two generations those younger ones will be the elderly, and those of the younger age group who will have been "brought up religiously" will have dropped to a tenth, if the trend continues (Gill 2001, 279–91). This decline in religious influence is, not surprisingly, accompanied by a marked increase in scepticism about particular traditional beliefs—for example, in a personal God, in the divinity of Christ, and in life after death. (Oddly, belief in reincarnation and in horoscopes has remained steady at about a quarter of the population for three decades.)

I know best my own English scene, and I find I have to concur with the diagnoses even of journalists: John Lloyd, Associate Editor of the *New Statesman,* writes, "It [the church] has not been able to develop a working model of a faith in which rational people could wholeheartedly believe" (Lloyd 1997). Wistful agnostics abound in educated circles.

> Now Christianity seems to matter only at the margins. The past 150 years have witnessed a slow but ceaseless decline. A. N. Wilson's erudite survey, *God's Funeral,* charts the loss of faith among nineteenth-century European intellectuals, Carlyle, Eliot, Spencer, Marx, Darwin: these were the precursors of a great discarding that has gone on ever since, as science effaced belief and rationalism the irreplaceable notion of mystery. (Young 2000)

Western society is returning a negative answer to my question. The Western intellectual world has yet to be convinced that theology can be done with the kind of intellectual honesty and integrity that are the hallmarks of scientific thought. In religious circles, some have rejoiced that a recent survey in the United States has shown that 40 percent of general scientists believe in a personal God (which means 60 percent do not) but have overlooked the other finding, namely, that 93 percent of "top scientists" do not do so (Larson and Witham 1997, 435–36; 1998, 313).

Among less exalted circles, I detect an increasingly alarming dissonance between the language of devotion, doctrine, and liturgy and the way people really perceive themselves to be in the modern world—a world they now see in the light of the sciences, especially of that "epic of creation." Intellectual, educated, thinking people, if they are still attached in any way to the Christian churches of the West, are, as it were, hanging on by their fingertips as they increasingly bracket off large sections of the liturgies in which they participate as either unintelligible or, if intelligible, unbelievable in their classical form—and in the end they vote with their feet, certainly in Europe; I suspect that they will increasingly do so in the United

States as well. Our world is full of wistful agnostics who want to believe with integrity and respect the person and life of Jesus of Nazareth but are unable to buy into the traditional ontology and images.

This deep alienation from religious belief, especially among key formulators of our Western culture, is becoming almost lethal, for such belief has nearly always been based on some sort of authority: "The Bible says," "The Church says," even "Theologians say"! Educated people have come to know that such authoritarian claims are circular and cannot be justified because they fail to meet the demand for validation by an external, universally accepted standard.

I am convinced that that standard can only be reason based on experience—reasonableness for short. A strong case can be made that the natural and human sciences have done just that and have achieved their goal of depicting, provisionally and metaphorically, the realities of the natural world by *inferring to the best explanation.* This method employs criteria such as *comprehensiveness,* giving a unified explanation of a diverse range of facts not previously connected; *general plausibility,* giving the best fit with previously established knowledge; *internal coherence and consistency*, avoiding self-contradictions; and *simplicity* of explanation.

A theology based on these principles would be one that has been characterized by my colleague at Oxford, Regius Professor of Divinity Keith Ward, as follows:

- It will seek a convergence of common core beliefs.
- It will seek to learn from complementary beliefs in other traditions.
- It will be prepared to reinterpret its beliefs in the light of new, well-established factual and moral beliefs (science and philosophy).
- It will encourage a dialogue with conflicting and dissentient views.
- It will try to develop a sensitivity to the historical and cultural contexts of the formulation of its own beliefs [so, science again], with a preparedness to continue developing new insights in new cultural situations (Ward 1994, 339–40).

Such an open theology, I propose, by inferring to the best explanation, could enter the fray of contemporary intellectual exchange and, I am convinced, have a chance of surviving in its own right.

Unfortunately, this is not how theology is currently practiced, even in *academe*. Looking at the field today, we find a variety of theological procedures that do not meet those criteria, involving, as they do, excessive reliance on an authoritative book and/or excessive reliance on an authoritative community, including that of the academic theological community.

These and other a priori practices make it difficult for theology to come to terms with the world, particularly with realities discovered by the sciences. The resources of theology are the inheritance of claimed classical

revelatory experiences (including sacred books, liturgies, aesthetic experiences, music, and architecture) leading to received orthodoxies. But now the data should include the realities of the world and of humanity discovered by the sciences and should lead, in my view of specifically Christian theology, to a radically revised theology. To these will very soon have to be added the perceptions and traditions of the other world religions, leading perhaps one day to a global theology. But for our present purposes, in relation to concerns of the Zygon Center, let us focus on the positive enrichment of theology by science.

Exploring from Science towards God

Exploring from science towards God means seeking an open theology that takes account of the world of science. The world as perceived by the natural sciences provides vistas and raises challenges and questions, most of which are entirely new, though some go back to the days when the Ionian Greeks first woke up to the world around them, some to the discussions between Christian, Jewish, and Muslim philosophers in twelfth-century Cordoba, and some to the philosophical reflections provoked by the rise of science since the seventeenth century.

Let me try to give you some inkling of the issues and, in somewhat staccato fashion and ludicrously briefly, outline at least the beginnings of those tracks towards God, as it were through the jungle, beginning from the world as it is—a kind of "still shot" of its moving panorama.

Oddly, we start with a question that science significantly cannot answer: *Why is there anything at all?*

Whatever the physical milieu (fluctuating quantum field, superstring, whatever) from which the universe expanded twelve or so billion years ago, there is no specific explanation in science of its existence as such nor of the laws and regularities it manifests.

We infer that: *There is a self-existent Ground of Being (X) giving existence to and sustaining in existence all-that-is.* This ultimate reality, X, must in principle have a nature beyond the capabilities of language to state explicitly; hence the need to resort to metaphor, model, analogy, and extrapolation. An exploration starting from the realities of the world as perceived by the sciences has led me to infer—and I present these only as a possible set of inferences to encourage others to undertake a similar exercise—that the best explanation of all-that-is and all-that-is-becoming is an:

Ultimate Reality (X)

"God"

Who

- is the self-existent Ground of Being, giving existence to and sustaining in existence all-that-is

- is One
- is a diversity-in-unity, a Being of unfathomable richness
- includes and penetrates all-that-is, but whose Being is more than, is not exhausted by it (panentheism)
- is supremely and unsurpassedly rational
- is omniscient (knowing all that it is logically possible to know)
- is omnipotent (able to do all that it is logically possible to do)
- is omnipresent and eternal
- is (at least) personal or suprapersonal—yet also has impersonal features
- gives existence to each segment of time for all-that-is-becoming (but does not know the future which does not exist to know)
- has a self-limited omniscience
- has a self-limited omnipotence
- is the immanent Creator creat*ing* in and through the processes of the natural order
- is the ultimate ground and source of both law ("necessity") and "chance"—an Improvisor of unsurpassed ingenuity
- has something akin to "joy" and "delight" in creation
- suffers in, with and under the creative processes of the world
- took a risk in creation (Peacocke 2001, chap. 7)

"Arriving Where We Started" and "Knowing the Place for the First Time"

I am not claiming to have proved from my reflections on what we now know of the world from the sciences that there is an Ultimate Reality, *God*, with just these attributes—only that I infer that this is the *best* explanation. These reflections are together cumulative in their effect and make a more convincing case, in my view, than any of the rival explanations, especially that of atheism (often under the guise of agnosticism). As a scientist, I cannot help going on asking "Why?"—and this does not stop when science runs out of answers.

What I have inferred, however, is too abstract to be accessible to personal and communal life. We need to develop concepts, images, notions, and metaphors that represent God's purposes and implanted meanings for the world as we actually find it to be through the sciences. Transition to such an enriched (what some call a "thick") theology is, in my view, unavoidable if believers in God are not to degenerate into esoteric societies communing only internally, among themselves. A rebirth of images is desperately needed to satisfy the spiritual hunger of our times.

Let me, again ludicrously briefly, draw on resources known to me as a Christian. I would invite those of other faiths to share with us their resources for enriching this current impasse in our understanding of the divine. I mention a few that I think can help us at this stage of our exploring as we arrive closer to the place "where we started," namely, God, and to illustrate the more positive aspects of an exploration towards God from the world of science.

Immanence: A Theistic Naturalism. One of the positive affects of Darwin's eventually accepted proposal of a plausible mechanism for the changes in living organisms was that it led to the ultimate demise of the external, deistic notion of God's creative actions. For example, we find Aubrey Moore, an Anglican high churchman, saying already in 1889 that "*Darwinism appeared, and, under the disguise of a foe, did the work of a friend.* It has conferred upon philosophy and religion an inestimable benefit, by showing us that we must choose between two alternatives. *Either God is everywhere present in nature, or He is nowhere*" (Moore [1889] 1891, 73; emphasis added).

Such an emphasis on the immanence of God as Creator 'in, with and under' the processes of the world unveiled by the sciences is certainly in accord with all that the sciences have revealed since those debates of the nineteenth century. These processes have the seamless character of an interconnecting web that has been spun on the loom of time: the process appears as continuous from its cosmic "beginning" in the "hot big bang" to the present, and at no point do modern natural scientists have to invoke any nonnatural causes to explain their observations and inferences about the past.

The traditional notion of God sustaining the world in its general order and structure now has to be enriched by a dynamic and creative dimension. The processes are not themselves God but the *action* of God-as-Creator. God gives existence in divinely created time to a process that itself brings forth the new: thereby God is creat*ing*. This means we do not have to look for any extra supposed gaps in which God might be acting as Creator in the living world.

A musical analogy may help to convey what I have in mind. While one is listening to music, say, to a Beethoven piano sonata, if one were to ask "Where is Beethoven the composer now?" one would have to reply that he is in the music, and you are experiencing him, as composer, in the very music itself. The music, as appreciated, is itself the musical action of Beethoven. Correspondingly, the processes of the natural world, explicated by the sciences, are themselves the very creative action of God's own self. This perspective can properly be called a *theistic naturalism* to encapsulate where our explorations have so far led.

Panentheism. This is "belief that the Being of God includes and penetrates the whole universe, so that every part of it exists in God but (as against pantheism) that God's Being is more than, and is not exhausted by, the universe" (Oxford Dictionary of the Christian Church). Recall Paul's address at Athens, when he is reported to have said of God, quoting with approval a local poet, that "In him we live and move and have our being" (Acts 17:28). This notion is also deeply embedded in the Eastern Christian tradition. The whole concept is surveyed constructively in *In Whom We Live and Move and Have Our Being* (Clayton and Peacocke 2004).

For classical philosophical theism there was a "space" *outside* God "in" which the realm of created substances existed. This way of speaking has become inadequate, for it has become increasingly difficult to express the way in which God is present to the world in terms of substances, which by definition cannot be internally present to one other. In such a model God can only "intervene" in the world. Yet, we have just seen, natural processes in the world need to be regarded *as such* as God's creative action. In other words, the world is to God rather as our bodies are to us as personal agents—with the necessary qualification that God as Creator is distinct from the world (pan*en*theism, not pantheism). Interestingly, this personal model represents better how we are now impelled to understand God's perennial action in the world as coming, as it were, from the inside, and the need for feminine models of divine creativity: God creates the world within *her*self, we may find ourselves saying.

*The Wisdom (*Sophia*) and the Word (*Logos*) of God.* Biblical scholars have in recent decades come to emphasize the significance of the central themes of the so-called Wisdom literature (Job, Proverbs, Ecclesiastes, Ecclesiasticus, and Wisdom). In this broad corpus of writings the feminine figure of Wisdom/*Sophia* is a "convenient way of speaking about God acting in creation, revelation and salvation; Wisdom never becomes more than a personification of God's activity" (Dunn 1980, 210). This Wisdom endows some human beings, at least, with a personal wisdom that is rooted in their concrete experiences and in their systematic and ordinary observations of the natural world—what we would call science. All such wisdom, imprinted as a pattern on the natural world and in the mind of the sage, is but a pale image of divine Wisdom, that activity distinctive of God's relation to the world.

Wisdom as an attribute of God, personified as female, has been of special significance to women theologians. Celia Deane-Drummond argues, on the basis of a wide range of biblical sources, that the feminine in God refers to all "persons" of the Christian Triune God, so that Wisdom (*Sophia*) becomes "the feminine face of God as expressed in all persons of the Trinity" (Deane-Drummond 1999, 55). One cannot help recalling that the greatest church ever built in Christendom was, in Constantinople in the

sixth century C.E., dedicated to *Hagia Sophia* (Holy Wisdom). This important concept of Wisdom/*Sophia* unites intimately the divine activity of creation, human experience, and the processes of the natural world.

So also does the closely related concept of the Word/*Logos* of God, which is regarded in John 1 as existing eternally as a mode of God's own being, as active in creation, and as a self-expression of God's own being, becoming imprinted in the very warp and woof of the created order. (It seems to be a conflation of the largely Hebraic concept of the "Word of the Lord" as the will of God in creative activity with the Stoic divine principle of rationality that is manifest in the cosmos and in human reason.) It is, needless to say, significant for Christians that this Word/*Logos* was regarded as "made flesh" in the person of Jesus the Christ (John 1:1–14), who is also seen in the New Testament as the very Wisdom of God's own self.

A Sacramental Universe. The "epic of evolution" recounts in its sweep and continuity how over aeons of time the mental and spiritual potentialities of matter have been supremely actualized in the evolved complex of the human brain in the human body. In persons, matter manifests a unique combination of physical, mental, and spiritual capacities. God, it appears, is using matter in that process as an *instrument* of God's purposes and as a *symbol* of the divine nature, the means of conveying insight into these purposes.

In the Christian tradition, however, this is precisely what its sacraments do. They are valued for what God is effecting *instrumentally* and for what God is conveying *symbolically* through them. Just as William Temple ([1934] 1964) came to speak of the "sacramental universe," we can come to see nature as sacrament, or, at least, as sacramental.

For Christians, this could be developed further in relation to the doctrine of the Incarnation and to the new valuation on the very stuff of the world that ensues from these significant words of Jesus at the Last Supper: "This: my body" and "This: my blood"—referring, in the words of a well-known prayer, to the bread "which earth has given and human hands have made" and to wine as "fruit of the vine and work of human hands."

The Uncreated Energies of God. The Eastern (Orthodox) Christian Church has long maintained a distinction, which today still has potential for expressing the continuing, dynamic, creative activity of God, between God's *essence* and God's *uncreated energies*. God's essence (Gk. *ousia*) is hidden, infinitely transcendent, and beyond all understanding, yet it is regarded as made known in God's uncreated energies (Gk. *energiai*)—that is, in God's work, the outcomes of the divine creative activity. These uncreated energies are the manifestation of God in the general realm of the structures, patterns, and organization of activities of the world. The divine energies are God's own self in action. This is an essentially panenthe-

istic perception of God's relation to the world, for God is seen in everything and everything is seen in God.

I find this profound emphasis of Eastern Christians more congenial to my scientific presuppositions than much Western traditional religious talk of the supernatural as the milieu of God's activity. Indeed, we find V. Lossky eschewing this term: "Eastern [Christian] tradition knows no such supernatural order between God and the created world. . . . That which western theology calls by the name of the *supernatural* signifies for the East the *uncreated*—the divine energies ineffably distinct from the essence of God" (1991, 88).

The "place" we have arrived at is indeed richly furnished from the past.

The Future of Theology

Up to this point I have been positive and (I hope) constructive in developing theological insights enriched by reflection upon the best knowledge, possessed through the sciences, that we have today of the world. However, this is only one aspect of the current situation, and I cannot conceal my anxiety about the present state of Christian theology, specifically, and indeed others in which I am not involved enough to speak.

There are two main sources for this gloomy diagnosis in my own thinking. The first is not unfamiliar and has been with us for nearly one hundred fifty years, namely, the way in which systematic theology seems to ignore the challenges of biblical scholarship to the historicity of both Old Testament and New Testament narratives. This is an enormous issue that is far beyond my professional competence to address satisfactorily, so I speak only as a layperson in this context. Leaving aside the doubtful historicity of great swathes of the Old Testament on which the presumed historical action of God in a supposedly chosen people has been based, studies on the New Testament cast doubt on many assumptions both of ordinary Christians and of systematic theologians.[1] New Testament scholars widely contend, for example, that the birth narratives are nonhistorical (Jesus was born and lived in Nazareth, with Joseph as his likely father); that the virginal birth cannot be attested historically (and is also paradoxical biologically, for Jesus should, on that hypothesis, have been female, lacking a Y-chromosome); that the historical Jesus had no sense of being divine and that his knowledge and understanding was limited to what would have been available to a first-century Jew in ancient Palestine; that he was possibly mistaken about the immediate, historical advent of the Kingdom (certainly enough to mislead his followers into expecting his imminent return); and that his tomb was possibly, even probably, not empty (the early witness of his followers was that they experienced that he was "risen"—not the same thing)—and so on and on.

Some of this leaks through to the general public, generating scepticism,[2] and one has to ask when theology will stop building unstable, inverted

pyramids of metaphysical speculation on inadequate biblical evidence. As Leslie Houlden has recently documented (2002), the formative church councils formulated their classical doctrinal statements, many now enshrined in the creeds to which church members are expected to assent, neglecting the Gospels and with little knowledge of and reference to the life and teaching of Jesus. As my resort to the concepts of the *Logos* and *Sophia* and their applicability to the historical Jesus indicates, such reservations do not, in my perception, in the end undermine the universal significance of what Jesus was and is, as the Christ. But for honesty's sake, let theology not go on pretending that there is no problem here.[3]

Enough of my nonprofessional reflections on the significance of biblical studies—reflections, it must be said, that will and ought to be shared by any thoughtful inquirer into the validity of Christian beliefs. Let me address now my second major concern, namely, some of the challenges to received Christian theology posed by our broad understanding of the world that the sciences now afford.

Our current perception of the world as a closed nexus of events renders the idea of God "intervening" in the world to rupture its God-given regularities incoherent. "Miracles" as breakings of the regularities of the divinely created natural world are inconsistent with the nature of the God who is creating the world through its natural processes. If we are going to postulate them, we must have overwhelming historical evidence, and that, in most cases, is not forthcoming. But this is only one aspect of the immense problem of how to conceive consistently of God's action in the world over and beyond the divine sustaining in existence of all-that-is and all-that-is-becoming (God's "general providence"). This is the problem of "special divine action" (SDA) in the world. After a magisterial survey of the attempts to tackle this problem in intensive and extensive cooperative investigations by scientist-theologians and philosopher-theologians undertaken over more than a decade, Nicholas Saunders, in the final chapter of his *Divine Action and Modern Science* (2003) titled "Is SDA really tenable?" asks, "Would it be correct to argue on the basis of the foregoing critique that the prospects for supporting anything like the 'traditional understanding' of God's activity on the world are extremely bleak?" and he responds, "To a large extent the answer to this question must be yes. *In fact it is no exaggeration to state that contemporary theology is in crisis.* As we have seen, such a wide range of doctrine is dependent on a coherent account of God's action in the world, and we simply do not have anything other than bold assertions and a belief that SDA takes place" (p. 215).

Other issues have been with us longer: the demise of all kinds of dualisms in a monistic world with its inappropriateness of talk of the "supernatural" and the ambiguity of many uses of the term *spiritual*; the relation of "original sin" to those aspects of human behavior (about a half) under the leash of the genes; the evolutionary evidence of humanity as "rising

beasts" gradually emerging into self-consciousness and the apprehension of values and the notion of a historical Fall from which humanity needs redemption; the role of chance in divine creation; the possibility of life on other planets and their relation to God and the claimed uniqueness of Jesus as Savior; the biological role of physical death of the individual in evolution and the rupture of its claimed relation to human sin ("the wages of sin" as death); and the relation of God to time in the light of relativity. (For a fuller exposition see Peacocke 2000.)

There is little doubt in my mind that the major responsibility for developing the dialogue between science and theology that has been increasingly fruitful over the last thirty years now lies with theologians. They must become truly open in the sense I expounded and, frankly, infer to the best explanation of their own special (and not unwarranted) data rather than invoking any other source of authority that claims to express a revelation from God that is perennially binding. I get the impression from the current literature that very few Christian theologians have been engaged in this urgent task—with the notable exception of Philip Hefner. He has been, on my reckoning, almost unique among systematic theologians in actually listening carefully to what the sciences are delivering before rethinking his theology. That is why the Zygon Center has made such a significant contribution to that dialogue and, even more significantly, why its future is so vital to us all.

Insofar as an Anglican blessing can be effectual in a Lutheran setting, I wish it Godspeed now with Antje Jackelén at its helm. I first met Antje (and I think gave her a reading list?) in late 1987, at the beginning of her career in science and theology, at an ecumenical conference in Cyprus sponsored by the Lutheran World Federation that convened "forty-five men and women still young enough to work the concern of faith/science/ethics/technology into their life agendas," in the words of John M. Mangum (1989, vii), who had the farsightedness to initiate that exercise and to persuade his church to back him! I genuinely believe that a new truly catholic, evangelical, and liberal Christian theology can be and is in the process of being forged in the heat generated in the furnace of science, which in the culture of our time could well be the divine agent of regeneration of theology, as were Greek philosophy in the early centuries of the church and Aristotelian learning in the eleventh and twelfth centuries.

Earlier I prescinded from any attempt at developing a global theology. But let me now share a concluding reflection on what I have been attempting, namely, to start from the world as we best understand it and to find paths leading towards God.

The paths we have been following from our knowledge of the world as described today by the sciences towards an understanding of God and of God's relation to that world have led towards various kinds of insight. From this point, the seeker has to ask him- or herself what the general

significance is of Jesus the Christ who was successively designated "Son of Man" (possibly by himself), "Son of God" (in the New Testament), and "God the Son" (by the church). He came to be seen as the incarnation in some sense of God as Word/Wisdom in a human person. The way our understanding of God's relation to the world that I have been developing here now allows, I would suggest, an *inclusive* interpretation of this central theme in Christian belief that may be amenable to those of other faiths. For Christians Jesus continues to be the unique, historical embodiment of God as Word/Wisdom, but this does not preclude God as Word/Wisdom being expressed in other peoples, cultures, and times. And who would dare affirm that God was *not* at work expressing Godself, as Word/Wisdom, through the great founders of other religions and in the continued experience of their disciples and followers? So Christians, indeed everyone, should be ready with humility to hear and to be open to the Word/Wisdom as it is manifested in other religions as not at all derogating from their own distinctive insights.

I therefore hope that the place at which we have arrived in this exploration may turn out to be one from which the seekers of many religions have started, and that we all might be prepared to know it "for the first time."

Science is a truly global, cognitive resource accepted across all cultures; might not these inferences from the scientific perspective constitute a common pool of resources for the exploration towards God of the seekers of many religious traditions, or of none? For to "arrive where we started" by that route signposted by the sciences and to "know the place for the first time" is an opportunity to establish a new, surer, more widely accepted base from which the long pilgrimage of humanity towards God might set out. In that pilgrimage our resources will certainly be richly diverse and often other than scientific—historical, aesthetic, symbolic, mystical, experiential, philosophical—but at least we might, with the help of our new scientifically informed insights, then share a starting point for it more common than in the past.

Then it would indeed be true that we should not be ceasing from exploration, and the end of all our exploring would then indeed be to arrive where we started and know the place for the first time.

Notes

For a fuller exposition of some of the themes of this essay see Peacocke 2001.

1. Look, for example, at the summary "Retrospect: A Short Life of Jesus," which concludes the didactic survey of Gerd Theissen and Annette Merz on what is known of the historical Jesus (1998, 569–72).

2. Richard Holloway, who recently retired as the Primus of the Episcopal Church of Scotland, has warned, "By depriving our people of insight into the different approaches to biblical interpretation, because we are afraid of upsetting them, we are driving others out of the Church who mistakenly believe that naïve realism [not *critical* realism] is the only approach on offer" (Holloway 2000).

3. Sophisticated theologians often claim that historicity is not the point, though "ordinary" people and seekers who hear dogmatic statements assuming the historical veracity of the Bible may be excused for not being aware of this. Thus, Anthony Phillips, an Old Testament scholar: "While faith cannot be divorced from history, both evolving within it and being formed by it, the historicity of the traditions nonetheless remains theologically irrelevant. It is in the words which the community of faith used to express their faith that the revelation is to be found" (1986). Clearly, the less historicity is emphasized, the less any special divine action (SDA) needs to be postulated as operative in any particular historical event.

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Toward a Theology of Disease: HIV/AIDS and Religion/Science

INTRODUCTION TO THE SYMPOSIUM

by James F. Moore

Abstract. The articles in this section were presented at the conference "Toward a Theology of Disease" sponsored by the Zygon Center in October, 2002. This was a second conference designed to address the question of what the science-religion dialogue could contribute to the larger discussion of the rapid spread of HIV/AIDS. The conference brought a wide range of perspectives to this question from different religious traditions. I draw them together here around the idea that Philip Hefner introduced in his keynote address: our fragmented experience of the world. The notion of fragmentation opens the door for both a recognition of several possible approaches to building a theology of disease and the pluralism of religious traditions, as well as providing a framework for integrating our full awareness that HIV/AIDS is a problem without solutions and requiring a level of humility in posing any real answers. The essays clearly suggest that the question remains perplexing but that our efforts do show that a multifaith, multidisciplinary religion-science dialogue can contribute significantly to the larger discussion.

Keywords: disease; fragmentation; Philip Hefner; HIV/AIDS; stigmatization.

The essays in this section are a sample of the presentations given at the second symposium on HIV/AIDS sponsored by the Zygon Center for Religion and Science in October 2002. The theme was "Toward a Theology of Disease," and the essays show how problematic each of these terms is

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and how difficult the project of developing such a theology. The idea behind this and an earlier symposium in 2001[1] has been to find a way to bring the dialogue between the religions to bear on a science-and-religion conversation so that the agenda of the discussion takes seriously the aims of the religions but also incorporates the best information available from the sciences.

Initial conversations in previous years had turned the conversation in our dialogue group in the direction of ethics and, more specifically, to a global issue that could provide a forum for a common goal for the religions, such as with HIV/AIDS. As we proceeded to make this more specific, however, we became increasingly aware of how the basic terms that we might use to talk about disease or about common goals are not easily shared—not even, for example, the idea of "evil." Thus, this second symposium sees itself as an effort to progress *toward* a theology, with the full realization that we make tentative steps. The essays included here show how both the agreements and disagreements become resources for the process.

The idea that we are on the way, moving toward a goal, is a hopeful projection of our efforts. Still, this is a precarious assumption. In fact, Philip Hefner, using an idea developed by Zygmunt Bauman in *Life in Fragments* (1995), describes this process as fragmented. The prevailing view is that we live with a fragmented sense of meaning, not only because of the pluralism so keenly symbolized by a dialogue between the religions, and our awareness of a plurality of views even within each religion, but also because we approach knowledge with a sense that *knowing* means that we simply see more clearly what we do not know. Our efforts to bring meaning are, thus, broken by this awareness of gaps in our knowledge.

It is revealing as well that the current huge effort to commit the resources of biological research to gathering information from the sequencing of the genome means not only a lack of continuing attention to specific research work, such as on HIV/AIDS, but also a recognition that we are in an era of gathering bits of information far beyond what we can actually assemble in a meaningful way, as Gayle Woloschak reminds us. Thus, we not only sense gaps in our knowing but also realize that the enterprise of science is captured in a fragmentation that means these gaps will be sustained, at least for now. We might meaningfully say, for example, that new breakthroughs in treating disease are on the horizon without actually knowing whether these claims are an accurate reflection of the current best information we have.

This fragmentation is clearly seen not only in our efforts to find meaning but also in our living life together. Mary Hunt calls us to a shift in our thinking, because she sees that our efforts to shape a unifying and satisfying ethic of sexuality and our focus on sexual identity and behavior as the center of a discussion about HIV/AIDS are flawed and rather fruitless. Instead, we need to consider issues that are more powerfully consequential

for our discussion such as class and gender, especially as made evident in their richness by a cross-cultural conversation. But to make such an important shift is to take into the heart of our dialogue the fragmentation that Hefner noted. And, of course, the profile of HIV/AIDS is itself shifting, both as a disease, with the alarming information that we now have about the virus, as Woloschak makes clear to us, and also in terms of the key areas of mode of transmission and high-risk populations, as Joseph Edelheit shows us. As these defining elements of our discussion shift and fragment, the difficulty of any effort to shape a common approach is made more complex.

We are aware of the striking irony that the disease is caused by a virus, itself a fragment of DNA, which also is the key to life. The virus requires the living organism to survive even while creating the possibility for it to fail and die. The virus is, then, an image of the flow of life and the webs of connections that define societies. This strange conjunction of life and death (which describes many diseases, by the way) shakes us to realize that disease is a construction both in its meaning for us as individuals and for us as societies. Barbara Strassberg further unravels the ease we might have thinking about the "reality" of disease by setting what we say about HIV/AIDS alongside what we say and experience about the various forms of terror. Our language reflects both our desire to shape disease as we believe it should be understood and our realization that the virus and its impact, both in our current settings and in the evolutionary process, are out of our control. But is this feeling of being out of control also a part of the construction of meaning, which chooses terror of the virus as our response? We are certainly aware of the power of such constructions as we hear the numbers: 40 million infected, 20 million orphans, a pandemic that can affect all populations and is spreading wildly. There are a few success stories, of course (Uganda is one), indicating that there are ways that these trends may yet be reversed.

But is this sense of bringing the disease under control yet another delusion, a construction? Part of the wonder here is that we are not really talking about actually stemming the tide but about isolated cases in which we have made progress at effectively treating the symptoms. (Are retrovirals enough to maintain a sense of control among the countries that have access, creating yet another interesting dilemma of shifting to think seriously about a significant population of those "living with AIDS" rather than merely those "dying of AIDS?") Embedded in this discussion is our readiness to act in ways that honestly make a difference, as Edelheit and Hunt challenge us to think about. Or will we be constantly caught by our own constructions of terror, which disable us from thinking in ways other than our own interests, as Strassberg challenges us to consider? Above all, moving toward a theology of disease might require thinking more about how

people act—especially those who have the power and ability and motivation to act—than about the causes and treatments for the disease.

This is the problem that seems to underlie all of the presentations. Our ability to act is not shaped merely by our constructions of reality but also by the way those constructions are reinforced so as to create barriers, even for those who are fully motivated to act morally. James Moore argues that the religions might be ill prepared to act primarily because they are not geared to see disease or acting to meet social crises as central to their agendas. This seems surprising if we think about the religions as shaped by their "theologies," since these theologies are often portrayed as setting moral action aimed particularly at the plight of those in need. Yet, the actual activity of the religious community, including the texts that shape the minds of those who are active members of these communities, points toward other priorities.

Religious communities also are caught between the values of compassionate action and the barriers that are thrust before them through the processes of stigmatization, as Moore argues, which dismantle the effort to respond to HIV/AIDS—especially because the behaviors so often associated with the disease and its transmission put us face to face with populations that are stigmatized for their behaviors. Can this internal problematic be overcome so that religious communities can be a resource for action rather than a stumbling block to understanding? We are back at our sense of fragmentation. Perhaps we should not expect that a theology of disease that produces an effective ethic of disease will be a source that defines the religious communities as such, except for purposes of self-interest. As harsh as that proposal is, we must realize that any effective action will also fragment religious communities further through disagreements about moral and behavioral questions related to differing ways people understand shared religious traditions. On the other hand, we may find that the community that emerges, the dialogical community, will be a hopeful alternative. That is the next step in our conversation.

Note

1. Essays from the 2001 symposium appear in the March 2003 issue of *Zygon*.

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A PANDEMIC OF TERROR AND TERROR OF A PANDEMIC: AMERICAN CULTURAL RESPONSES TO HIV/AIDS AND BIOTERRORISM

by Barbara Ann Strassberg

Abstract. The cultural construction of American societal responses to the HIV/AIDS pandemic and terrorism is addressed. The use of metaphors of war, survival, extinction, and of those related to God in public narratives is analyzed. Issues of gender, sexuality, money, and power are also discussed within the context of the religion-science dialogue. Suggestions are made about a possibility for a global ethic of survival based on an ethic of care.

Keywords: ethics; gender; God; HIV/AIDS; pandemics; power; sexuality; survival; terrorism; war.

If we want to undertake more effective actions to combat the HIV/AIDS pandemic and world terrorism, we first need to better understand the responses of the West, especially of the American government and society, to these two global phenomena.

The conceptual narrative I present here focuses on the cultural and social contexts within which the religious and scientific narratives about HIV/AIDS have been embedded and on their social and cultural ramifications. This social-scientific narrative offers a potential for bridging the other two, hopefully showing that there is a continuum rather than a dichotomy between stories told by religions and by sciences and that somewhere on that continuum we may find answers to our questions related to various constructions of a threat of human extinction.

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From the perspective of local American culture, the processes of the social and cultural construction of the HIV/AIDS epidemic and terrorism reflect the transformation of the interpretation of human sexuality, gender identities, and gender roles within the context of our culture of violence. I would call this transformation a death spasm of the dominant position of the rugged white Christian heterosexual American male.

From the perspective of the global human community, the American responses to HIV/AIDS and terrorism reflect the shifts of power within the world system and the decline of the hegemony of the United States among the core (first-world) countries. Internationally, the U.S. has lost considerable moral power, political power, and economic power. It maintains military power, but "militarism is often the *last gasp* of power for dying empires. Our obsessive rallying around the flag belies fundamental weaknesses and insecurities" (Elias 1997, 142; emphasis added).

Even though the process of change in our understanding of sexuality and gender and of the power relations based on sexuality and gender started much earlier, we can consider the period right after World War II as the final moment of the unchallenged dominance in the American society of the white Christian heterosexual male. The postwar period can also be viewed as the last time in modern history when the United States enjoyed unchallenged hegemony among other countries. Currently, cultural and sociopolitical changes are forcing our society to take a new, more informed look into our own "soul" and to pay more attention to the dynamics of the interface between sexuality, gender, and power in our society and within the world system as a whole.

A closer look, from the perspective of global cultural and political changes, at the responses to the HIV/AIDS pandemic and world terrorism may help us better understand why we Americans pay relatively little attention to a virus that is spreading and killing millions of people, acting as if it were a weapon of mass destruction aimed at humanity by natural forces. At the same time, however, we do pay a lot of attention and spend a lot of money trying to create the most effective man-made biological weapons of mass destruction and/or to protect ourselves from such weapons in case they are used against us by people we now label as terrorists.

By embedding the responses to HIV/AIDS and terrorism in global cultural and political changes, we might be able to address other important questions as well. Why is it that, as the self-appointed leaders in the human struggle for survival, Americans are much more inclined to notice and care about interactions that are founded on conflict and violence than those that are based on harmony? Why are we so strongly predisposed to get involved in the solution of social problems when such solution means annihilation of the partner of the interaction? Why is it so much more difficult to get involved in solving problems that require making an effort to assure survival of the partner?

Finally, why is it relatively easy for our leaders to allocate disproportionately larger amounts of our resources to the development of the machinery of mass killing to defend us against a man-made attack by deadly viruses than to support research and health care for those who are already infected with a "natural" deadly virus? Answers to these questions may help us start constructing ideological counternarratives, build new channels of influence, elect decision makers more wisely, and initiate a social movement on behalf of people who already now suffer and die all over the world because of viruses we are unable to control.

In May, 2001, United Nations Secretary Kofi Annan stated that "a war chest of 7 billion to 10 billion U.S. dollars is needed annually, over an extended period of time, to wage an effective global campaign against AIDS" (Stine 2002, 451). The United States offered Annan $200 million in addition to the $760 million already pledged for 2001. That was the largest gift ever to the AIDS fund. For comparison, it has been estimated that the U.S. spent $225 billion on the Y2K problem. All nations, globally, spent about $600 billion on Y2K (Stine 2002, 452). At the end of the 1990s, the U.S. government spent $1,148 trillion on "wealthfare" (farm subsidies, "creative" bookkeeping, tax breaks, and so on) per year and $271 billion for military expenses. (One submarine costs $2.3 billion.) In October of 2002 it was estimated that deploying U.S. forces to the Persian Gulf in order to invade Iraq, defined as a state presenting a bioterrorist threat, would cost $9–13 billion and that the monthly cost of combat would be $6–9 billion (Abrams 2002).

It is not only our government that prioritizes allocation of funds in an interesting way. In an average year, cat owners in the U.S. spend $2.15 billion on cat food and $295 million on cat litter. Americans spend $1.8 billion on toothpaste, $950 million on toothbrushes, and $625 million on breath fresheners. American women spend over $30 billion per year on dieting, while one third of Americans are considered obese.

In this essay I look closely at the American cultural responses to the HIV/AIDS pandemic and to bioterrorism. I restrict my analysis to these two phenomena because they both relate in an interesting way to what human beings have already learned about epidemics, pandemics, and global healthcare challenges. I am aware of the differences in the mechanisms by which the HIV/AIDS pandemic started to threaten humanity's survival and of those that might lead humanity toward biological warfare. These differences, however, do not disqualify the validity of observations pertaining to societal responses to both of these threats. I want to explore how our society transforms the meanings of a lethal viral global disease and a lethal viral (combined with other pathogens) global warfare to make them fit the tapestry of its culture. The theoretical framework for my analysis consists of selected elements of culture-change theory and world-systems theory.

Theoretical Framework

Culture. For the purpose of my analysis, I define *culture* as a tapestry of intertwined narratives told by the universe through human beings about its own processes of becoming. Among these are narratives of survival and of extinction, meganarratives, and stories about individual human experience. There are narratives that not long ago served as metanarratives and others that explain why the former ones must be abandoned as dysfunctional and replaced with new, emerging narratives. Even though stories do not necessarily have to be told by means of words (our actions also are a means of communication), in this age of electronic communication and information we can justifiably focus on the pragmatic power of language. Most of us are aware of that power, but sometimes we do not pay sufficient attention to the ways in which this power is misused or even abused by those who can manipulate their audiences because their narratives are heard more often and by more people. Often we do not even notice whose story is being told by means of silence, or why.

Because many of us do not regularly perform metaphorical analyses of the language with which we are addressed by the power elites, it is interesting to step back from time to time and take a closer look at metaphors to see when and why they are selected for a given social and cultural context. Among the numerous metaphors used in political discourse, I focus on the metaphors of war, of survival and extinction, and of God's approval of American governmental and societal responses to challenges that we have faced throughout history. Also, using the culture-change theory, I look at the issues that emerge at the intersection of American interpretations of sexuality, gender, and power.

Society. Focusing on the social dimension of AIDS and terrorism, I define society in a way that best matches my definition of culture. According to that definition, *society* is a web of conversations that together constitute social life (Rigney 2001, 197). We can apply this definition also to the world human community and view this community as a vast and complex system of conversations carried by all humans through time. These conversations are conducted largely through metaphors, which represent unique voices and viewpoints. Sometimes the voices giving accounts of their diverse social experiences are listened to and heard with respect, sometimes they fall on deaf ears, sometimes they meet with adversarial responses, and sometimes they bring death to the messengers.

The social dimension of my analysis is framed with selected microlevel sociological presuppositions and macrolevel interpretations that stem from world-systems theory. First, I want to emphasize that from a social scientific perspective people do not respond to events but to their own interpretations of those events. This basic truth has significant implications for

human interactions. Interactions between two human subjects, two agents, start from the moment of their mutual categorization according to the "knowledge" they have of each other. And it is not ignorance that matters but rather people "knowing" things that are not true. This "knowledge" triggers a whole range of emotional responses (to people's own beliefs about reality) from love to hate, with fear as one of the most powerful emotions shaping predispositions toward action. Perception of similarity leads to attraction; perception of difference, expressed by social speciation, often leads to genocidal actions. In today's postmodern globalizing world, among numerous new developments we observe these three: (1) awareness of connectedness; we know that the boundary that divides can also be viewed as one that links, that human connections are neither linear nor cyclical—they are a web; (2) the moral sentiment of compassion leads to the construction of new bonds even between persons who do not know each other; news about torture evokes disgust, physical revulsion, outrage, declaration that something has to be done, a belief that persons who torture others are the exception; (3) voluntary involvement in efforts to construct a social context within which all people would be empowered and could develop their potential to the fullest. Connectedness, compassion, and social activism open the door for individuals and small groups to become agents of social transformations.

Now we move from the micro to the macro level of analysis. World-systems theory, developed by Immanuel Wallerstein, introduces the perception of the modern world system as "a capitalist system, that is, a system that operates on the primacy of the endless accumulation of capital via the eventual commodification of everything" (1998, 10). Systems have boundaries that shift, rules that evolve, contradictions that have to be dealt with, and built-in mechanisms to return them to equilibrium. They are dynamic, and besides "pulsating" once in a while they also can move so far from equilibrium that they bifurcate and transform into new systems. Wallerstein believes that we are "living in the transition from our existing world-system, the capitalist world-economy, to another world-system or systems. We do not know whether this will be for the better or for the worse. We shall not know until we get there" (1998, 35). Among the manifestations of the changes he mentions (1) the delegitimization of the ideology of inevitable progress (many third-world countries reject the idea of endless accumulation of capital); (2) the democratization of world armaments; nuclear proliferation is unstoppable; and (3) the increase in individual emigration from poorer states to richer ones; almost all migrants are socially defined as nonwhite. Wallerstein invites us to think about "what kind of world do we in fact want; and by what means, or paths, are we most likely to get there" (p. 65). He writes, "If we wish to seize our opportunity, which seems to me a moral and political obligation, we must first recognize the opportunity for what it is, and of what it consists. This

requires reconstructing the framework of knowledge so that we can understand the nature of our structural crisis, and therefore our historical choices for the twenty-first century. Once we understand the choices, we must be ready to engage in the struggle without any guarantee that we shall win it" (pp. 88–89). He believes that equal access to education, to health services, and to a guaranteed decent income throughout life should be the starting point of our activism. The new order that will emerge out of the chaos will be shaped by what everyone does, both those with power in the present system and those without it.

Wallerstein also introduces a distinction between core countries, characterized by advanced industrial production and distribution, strong state structures, strong bourgeoisie, and large working class (the U.S., Canada, Western Europe, Australia, and New Zealand); periphery countries that produce raw materials, have a weak state structure, small bourgeoisie, and many peasants (sub-Saharan central Africa, the Caribbean, and Latin America); and semiperiphery countries, which are intermediate between the other two (former Soviet bloc, North Africa, the Middle East, Asia, and the Pacific rim countries, excluding Australia and New Zealand) (Hall 200, 5; Treichler 1999, 111).

The system exhibits several trends, with globalization among them, that unfold in continuing cycles. These are cycles of revolution, war, and inequality, and they find expression in vertical and horizontal social mobility of countries of all three categories. Among those cycles, the one I am most interested in is the "pulsation" of hegemony. In any given period in history, one state in the core dominates the world-system without overt coercion simply by means of its economic, political, and military power. Once its power peaks, hegemony declines, and the rivalry and competition between core states becomes much more intense.

World-systems theory provides a link to general systems theory and thus also to theories of chaos and complexity (Hall 2000, 3–17). It allows us to interpret social and cultural evolution in terms of gradual transformation embedded in episodic rapid changes and to view the pulsations of the world-system in terms of the self-organizing tendency that characterizes all complex systems.

Jean Baudrillard, for instance, applied the system approach to his discussion of the analogy in the development of viral diseases such as AIDS and of terrorism:

> Just as there seems to be no political solution to the problem of terrorism, so there seems to be no biological solution at present to the problems of AIDS and cancer. Indeed, the causes are identical: anomalous symptoms generated at the most fundamental level by the system itself represent a reactive virulence designed to counter, in the first case, a political overmanagement of the social body, and in the second case, a biological overmanagement of the body *tout court*. (Baudrillard 2000, 36)

In other words, with the continuous development of medications to help our immune system defeat diseases, we got to the point when now the immune system itself kills us. In a similar way, we made sure that there were enough weapons for everybody to defend themselves against undefined enemies, and now we are threatened by the very defense system we created.

The high degree to which AIDS, terrorism, crack cocaine or computer viruses mobilize the popular imagination should tell us that they are more than anecdotal occurrences in an irrational world. The fact is that they contain within them the whole logic of our system: these events are merely the spectacular expression of that system . . . a single terrorist act obliges a reconsideration of politics as a whole in the light of terrorism's claims; an outbreak of AIDS, even statistically insignificant one, forces us to view the whole spectrum of disease in the light of immunodeficiency thesis. . . . (p. 39)

And then, Baudrillard challenges us with questions that stem from the belief that all things are ambiguous and reversible. He encourages us to ask, What is AIDS a resistance to? What even worse eventuality is it saving us from? "As for terrorism, does not its secondary, reactive violence shield us from an epidemic of consensus, from an ever-increasing political leukemia and degeneration and from the imperceptible transparency of the State?" (p. 38) If we agree to view things not as either good or evil but as good and evil depending on where we stand, Baudrillard's invitation to take a look at the "positive" functions of AIDS and terrorism for the world-system might help us realize that what seem to us today to be complete chaos and a state of total immunodeficiency of biological, sociopolitical, and technological-information systems are in fact new aspects of the emerging order.

The world-systems theory also helps us explain cultural change. It prompts us, for instance, to interpret changes in indigenous cultures by emphasizing the processes of the incorporation of more and more people into the expanding world-system. Instead of viewing indigenous people as passive victims trying to resist such incorporation, we are encouraged to focus on their role as proactive participants in those processes. At the same time, cultural contact, exchange, and diffusion inject changes into the world culture, because elements of indigenous culture become absorbed and integrated and then influence other components of that culture. Among various cultural changes, the one I focus on is the change in cultural construction of human sexuality, gender identity, and gender roles.

Finally, world-systems theory helps us move the analysis to the level of international relations, which is crucial for our understanding of any phenomenon that occurs on a global scale. I include here some observations made by African scholars that we might take into consideration in our discussion of AIDS. Manthia Diawara writes,

> There is a globalized information network that characterizes Africa as a continent sitting on top of infectious diseases, strangled by corruption and tribal vengeance,

and populated by people with mouths and hands open to receive international aid. The globalization of the media . . . also creates a vehicle for rock stars, church groups, and other entrepreneurs in Europe and America to tie their names to images of Afro-pessimism for the purpose of wider and uninterrupted commodification of their name, music, or church. (Diawara 2001, 103)

Diawara also emphasizes that many of the African political leaders to this day are ambassadors of European countries or the United States rather than actual independent leaders of their nation-states.

In the same spirit, Ioan Davies (2001, 131) quotes Ngugi wa Thiong'o, "I have nothing against English, French, Portuguese, or any other language for that matter. . . . But if Kiswahili or any other African language were to become the language for the world, this would symbolize the dawn of a new era in human relations between the nations and people of Africa and those of other continents." In other words, we are invited to listen to the voices of the intellectual elite of the periphery, who are fully aware of our arrogant monolingualism and therefore try to communicate with us in our own languages. Davies reminds us that almost everyone in any African city speaks at least two and often three languages. This multilingualism is important because people "may be functionally literate (able to read street signs, newspaper headlines, and job instructions), culturally literate (able to acquire knowledge about political and cultural norms of a society by reading about them in accepted works of literature and science), and critically literate (able to identify ideological positions of texts and cultural forms that challenge the status quo)" (2001, 132). In individual empirical situations people may have some of these literacies in one language and other literacies in another. Moreover, book literacy may be in one of those languages, two, or none. African intellectuals, who end up as "Other" in both worlds, marginalized between the cultures of their origin and cultures of the West, often try to either "translate" the indigenous cultures in order to educate the West or "translate" elements of Western cultures in order to educate members of their own societies. As a result, they try to name the unnameable, translate the untranslatable, and interpret the uninterpretable.

> The Aborigines "belong" [to] a land which cannot be abstracted, transferred, translated (*trans-latio*, lift across, move, transfer); it is not a land *on* which humans live, which they exploit, but a land to which humans and non-humans belong in ways that cannot be mapped conceptually . . . the language of the Aborigines is untranslatable into the language of the court, heterogeneous to the language of common law, of common humanity . . . [it] is insistently local, rooted in the land from which it comes. . . . (Readings 2000, 125)

If that is the case, following some of Lyotard's observations (Lyotard and Thebaud 1985), Readings encourages us to consider in what ways such totalizing concepts as humanity and justice can or should be used in reference to explicitly local circumstances.

Cultural Construction of the American Responses to HIV/AIDS and Bioterrorism

War. I agree with Robert Elias that "we are a nation at war with ourselves" (1997, 123) and that in our culture violence is viewed as a legitimate means of solving problems, even if the problem is violence itself. Capital punishment and police brutality are our weapons in the war on crime; in 1990, we declared war on Iraq to reverse their invasion of Kuwait. Armed raids on neighborhoods characterize our war on drugs, and military supplies and training define our war on drugs abroad. Cutting public assistance and pushing people off welfare are examples of our war on poverty, and exploitation of raw materials and of workers in third-world countries mark our war on world poverty. Even women and children in our culture are often defined not as assets but rather as "problems" that are also best "solved" by means of violence. People who are not members of our society are viewed as unruly, immature, disobedient, ignorant, incapable, and underdeveloped. These are the same traits that we attribute to children and often also to women. Violence seems to be the only language we really understand.

Interestingly, during the 1990s, the language of warfare entered even the scientific descriptions of the HIV virus. "The viruses . . . constantly mutate, changing their fingerprints. The AIDS virus, most insidious of all, employs a range of strategies, including hiding out in healthy cells. What makes it fatal is its ability to invade and kill helper T-cells, thereby short-circuiting the entire immune response" (Treichler 1999, 31).

It is much less surprising to find the language of warfare in the narratives about bioterrorism. Many Americans were made to believe that our government "started" a war on terrorism after the September 11, 2001, attack and that the only moral and just thing to do is to annihilate terrorists, who are now defined as the source of evil in the world and the source of all our current economic, social, and political problems (Crenshaw 1998).

Survival and Extinction. In order to look more closely at metaphors of survival and extinction, we might turn to religious stories of creation linked to the stories of the "end of the world" and of eternal life and to the scientific stories of evolution linked to the theories of the future of the universe. They tell us about the pulsation of the universe and of all its components; they tell about beginnings and ends, about emergence and disappearance, about an ongoing process of transformation from one form of being into another. In a way, we can view them as narratives of birth, of survival, and of extinction. We learn from them what to do and what not to do if we want to continue our existence in our present form.

Very often ideologues, politicians, and military leaders construct compatible political narratives of survival and extinction. They implant them

in the social soil fertilized by the religious and scientific narratives and make these narratives grow until they are ripe enough to lead people to action. Contrary to religious and scientific narratives, which primarily relate human survival or extinction to what we humans do to ourselves or others, political narratives focus on a threat coming from outside our own social entity. These are some "others," who, either because of who they are or because of what they do, present a threat to us. The best defense against or prevention of a threat is the annihilation of the threatening agent.

I agree with Paula Treichler (1999) that when people encounter a new phenomenon that is complicated, frightening, and unpredictable, they have a tendency to first frame it within familiar narratives, thus giving it meaning and constructing an illusion of the potential for its control. They also link the new phenomenon with existing issues, social arrangements, and institutional networks.

HIV/AIDS and bioterrorism are relatively new cultural phenomena in the U.S. national narrative, and because of their unique nature they are impossible to comprehend. Thus, right now they are more frightening than many other threats. From the perspective of sciences, we are dealing with living organisms that are invisible, extremely adaptable, resilient, and lethal. Therefore, they have to be immediately embedded in narratives that would give them at least some meaning, and they have to be incorporated into the web of existing conversations (social structures).

The narratives about the threat of extinction by the HIV/AIDS virus became a part of the history of commonly known epidemics that goes at least as far back as 1157 B.C.E., to the death of Egyptian pharaoh Ramses V from smallpox. This virus also killed two thousand Romans a day in the second century C.E., more than two million Aztecs during the 1520 conquest by Cortez, and some six hundred thousand Europeans per year from the sixteenth through the eighteenth century—altogether hundreds of millions of people. Three out of four persons who survived were left deeply scarred and sometimes blind. Malaria killed over 20 million people in India and Africa in the years 1847–1875, and even now it afflicts 300 million people, killing between two and three million each year. In 1918 and 1919, influenza killed nearly 23 million people in the U.S. and Europe. In the years 1981–2002 there were 68 million HIV infections recorded worldwide. At least 27 million people have died (Stine 2002).

When the narratives about the HIV/AIDS pandemic started to be constructed in the Western world, the competition between various centers of power, knowledge, and credibility for the right to define the reality of HIV/AIDS—that is, to construct it as "their own" cultural phenomenon—was quite obvious. There is no argument today that the language of the discourse about the pandemic is English in words, imagery, argumentation, evaluations, and predictions. The awareness of the necessary relation be-

tween AIDS and culture helps us realize that any possible "pedagogy across culture involves more than translating prescriptions for behavior change into different languages; inevitably, we need to know more about the meaning of given practices and conceptions, their place in a community's social and cultural life, the political economy that frames them, and the contingencies that sustain or discourage them" (Treichler 1999, 153). Many scholars who do cultural research on the AIDS epidemic have at least a rudimentary grasp of virology and immunology, but there are very few scientists who would have at least a rudimentary grasp of social and cultural theory, on one hand, and of social and cultural (including religious) diversity, on the other. As a result, even in medical literature we encounter the process of Western/American cultural construction of HIV/AIDS. The need for cooperation of scholars representing various disciplines, including the social sciences, is unquestionable.

On the other hand, the narratives about the threat of extinction by bioterrorism joined the already existing stories about human manipulation of pathogens in order to make the weapons more lethal. For instance, around two thousand years ago, Scythian archers dipped arrowheads in manure and rotting corpses; in the fourteenth century, Tatars hurled bodies of people who died of plague over the walls of enemy cities; during the French and Indian War, British soldiers gave the Native Americans blankets contaminated with smallpox; in World War I, the Germans spread glanders, a disease of horses; and in World War II, the Japanese dropped fleas infected with plague on Chinese cities, killing thousands of people (Miller, Engleberg, and Broad 2001, 38).

It is not surprising then that, once humans learned how to manipulate the code of life that resides inside all living organisms, they started to transform various pathogens into weapons. These organisms had billions of years to develop their mechanisms of adaptability that today are close to perfection. Even though in political narratives biological weapons are often mentioned together with chemical and nuclear ones, they are not the same, and the biological ones are the most lethal. Chemical agents are relatively easy to contain, neutralize, or wash out; nuclear agents make a lot of noise, which enables individual survivors to immediately respond to the attack, and they also are relatively easy to contain. Biological agents cannot be contained, neutralized, or washed out. They multiply exponentially, adapt quickly, and work silently. In order to live and multiply they need "only" a human host. In addition, compared to chemical and nuclear weapons, biological weapons are the least expensive to produce in large quantities. During the Cold War, the competition between the former Soviet Union and the United States led to the production of extremely effective, lethal pathogens. Japan, China, and many other countries have developed biological weapons with no difficulty.

"God Bless." Throughout the history of humanity, leaders constructing ideological and political narratives have turned to religious and scientific narratives for arguments to support their goals or means, because average citizens have always been more familiar with the languages of religion and science than with the language of politics. Many of our American presidents have tended to frequently make rhetorical invocations of God on behalf of the United States, including our involvement in wars.

The role of religion in violence and war is well known, so I am going to move on to other dimensions of our culture that are closely linked to the responses to HIV/AIDS and bioterrorism. Since their inception, the narratives emerging within American culture about these two phenomena have been interlocked with narratives about sexuality, gender, power, and social class. They have been spread primarily by means of mass media and, to some extent, the film industry.

Sexuality and Power. In the early days of the awareness of the epidemic, HIV/AIDS became linked to homosexuality. It was constructed as a gay disease and thus immediately redefined both the disease and male homosexuality. "In the eyes of straight America, death gave gay men a humanity they had long been denied. . . . People facing mortality responded courageously and seized the chance to proclaim their identity. And it forced society's institutions—from hospitals who barred gay men from seeing their dying lovers to employers that denied them bereavement leave—to recognize gay relationships" (Stine 2002, xxiii). At the same time, "the strength of the gay male construction of the AIDS epidemic forced gay men to confront the epidemic; and to confront it was, necessarily, to claim it. One consequence of this claim was that gay men began, early on, to criticize the academic terminology through which they were being represented. Terms like *promiscuous* were forced to give way . . . to more neutral terms like *sexually active*" (Treichler 1999, 71–72). However, self-identification as gay in connection to HIV/AIDS caused many gay men to start functioning under an identity label that reduced their humanness even more than the gay label itself. If infected, they became one-dimensional patients living a waiting-for-death type of life. The pathology of their existence became their master status (Ogilvie 2002).

Numerous religious and scientific narratives started to pop out, spreading facts and myths about the gay lifestyle. The epidemic of a transmissible lethal disease gave rise to an epidemic of meanings and significations. The new meanings were multiplying widely and very quickly. It is interesting to take a look at a list of ways in which AIDS has been characterized (Treichler 1999, 12–13):

1. An irreversible, untreatable, and invariably fatal infectious disease that threatens to wipe out the whole world.
2. A creation of the media, which has sensationalized a minor health problem for its own profit and pleasure.

3. A creation of the state to legitimize widespread invasion of people's lives and sexual practices.
4. A creation of biomedical scientists and the Center for Disease Control to generate funding for their activities.
5. A gay plague, probably emanating from San Francisco.
6. The crucible in which the field of immunology will be tested.
7. The most extraordinary medical chronicle of our times.
8. A condemnation to celibacy or death.
9. An Andromeda strain with the transmission efficiency of the common cold.
10. An imperialist plot to destroy the Third World.
11. A fascist plot to destroy homosexuals.
12. A CIA plot to destroy subversives.
13. A capitalist plot to create new markets for pharmaceutical products.
14. A Soviet plot to destroy capitalists.
15. The result of experiments on the immunological system of men not likely to reproduce.
16. The result of genetic mutations caused by "mixed marriages."
17. The result of moral decay and a major force destroying the Boy Scouts.
18. A plague stored in King Tut's tomb and unleashed when the Tut exhibit toured the United States in 1976.
19. The perfect emblem of twentieth-century decadence; of fin de siecle decadence; of postmodern decadence.
20. A disease that turns fruits in vegetables.
21. A disease introduced by aliens to weaken us before the takeover.
22. Nature's way of cleaning house.
23. America's Ideal Death Sentence.
24. An infectious agent that has suppressed our immunity from guilt.
25. A spiritual force that is creatively disrupting civilization.
26. A sign that the end of the world is at hand.
27. God's punishment of our weaknesses.
28. God's test of our strengths.
29. The price paid for 1960s.
30. The price paid for anal intercourse.
31. The price paid for genetic inferiority and male aggression.
32. An absolutely unique disease for which there is no precedent.
33. Just another venereal disease.
34. The most urgent and complex public health problem facing the world today.
35. A golden opportunity for science and medicine.
36. Science fiction.
37. Stranger than science fiction.
38. A miserable and expensive way to die.

When we read this list of meanings, we see that there is a continuum between popular and biomedical discourses. Our social constructions of AIDS are not based on objective, scientifically tested reality but on what we are told about this reality. And the stories we hear come from a variety of sources, rarely from scientists only. Journalists, religious activists, and politicians inject their stories into the pool of stories provided by scientists, and the audience try to somehow make sense out of all these pieces of information.

Treichler observes that the AIDS story entered Western culture as a story told by the body of a homosexual male. Thus, it was constructed as a sexually transmitted lethal disease but one that would not become a threat for all people. By being linked to homosexuality it automatically put heterosexual practices on a level of ideological superiority. In the late 1980s, the construction of populations of high risk was expanded but was still limited to homosexuals, hemophiliacs, heroin addicts, and Haitians and their sexual partners. What made such constructions detrimental was their foundational belief that the major risk factor in acquiring AIDS was being a particular person rather than doing particular things. It was easy to keep disseminating the extinction narrative of the risk populations, because there was not much that people not belonging to these populations could do about their condition of being. People's behavior—what they did—could have been modified, but who they were obviously could not be easily changed. By the same token, those who did not belong to any of the four "H" categories did not have to fear being infected by HIV.

Today, when HIV/AIDS is being acknowledged as a worldwide pandemic, the gayness of the gay man gets dissolved, and he becomes homogenized and universalized into just one more person facing death because of HIV. This change of perception occurs in spite of the fact that in core countries the majority of people getting infected still are gay men.

Gender and Power. The focus on male homosexuality created some resistance to acknowledging HIV infection in non–male-homosexual bodies. But homophobia quickly found a companion in sexism. For a while people believed that women were inefficient transmitters of HIV and could not get infected or pass the virus to others. Only with the passage of time did women enter the scene as possible victims of AIDS. At first they were seen not as innocent but as the "deserving victims," such as prostitutes and African women, who were getting infected because of their involvement in what was believed to be exceptional sexual practices. "Representations in leading biomedical journals, mainstream media discourse including women's magazines, and alternative and feminist publications suggest that the insights of the women's health movement and of feminist theory did little to illuminate AIDS for women" (Treichler 1999, 7). Gender has been downplayed, ignored, stereotyped, and misrepresented. If women were por-

trayed by media in the context of reports about AIDS, most often they were performing traditional roles of mates or caretakers. Even now, quite often women are still portrayed as "natural," that is, passively accepting what is happening to them, rather than as free-acting rational agents (Bobel 2002) actively involved in social and political processes (Armstrong 2002). As Paula Rabinowitz observes, "Speaking is always already something done to us or for us by others whose presence as antecedents, as authorities, as interpreters, overpowers ours, even when one inhabits the most privileged of positions—that of the Western, educated, middle-class professional, like myself. How can the stories of others far outside the circulation of narrative, capital, goods, and so forth be heard?" (2000, 42)

With time, however, it became obvious and more readily admitted that women could get infected and could transmit the virus not only "horizontally" to their partners but also "vertically"—to their babies. Those babies, undoubtedly, were viewed as innocent victims:

> . . . mothers of babies with AIDS acquired a peculiar duality, both as "not women" and as "not normal." If they acquired the virus "unknowingly" and "innocently," they were seen as passive victims or invisible transmitters. But if they were found/alleged/believed to have gotten (or stayed) pregnant knowing that they were HIV positive, they acquired instant agency—and sinister agency at that, transformed in a flash from passive receivers to culpable agents invidiously transmitting infected blood to their unborn babies. . . . Many years later, pregnant women who sustained on experimental antiviral treatment to reduce the likelihood of vertical HIV transmission would find their medication withdrawn as soon as they gave birth; their unborn children had been the only real patients. (Treichler 1999, 65)

Moreover, even when data relevant to women were reported, they still had no identities of their own and were often referred to as heterosexuals, prostitutes, mothers of pediatric AIDS victims, or sexual partners.

Interestingly, lesbians remained almost completely outside of the discourse, or, if they were included, they also acquired a dual presence in AIDS statistics. "Faced with the factual evidence of HIV-positive lesbians, investigators had three available alternatives: assign the case to one of the 'not women' categories (intravenous drug user, etc.,); assume that she was not 'really' a lesbian and had been infected by a male partner; or assume that she had engaged in 'deviant' sexual activities (not wholesome, not gentle) and was therefore 'not normal'" (Treichler 1999, 66). From around the mid-1980s, the slow process of recognition began that AIDS was transmitted primarily through male-female sexual intercourse, with almost as many women infected in some locations as men.

Both terrorism and AIDS are relational, and they are outcomes of human interactions. Terrorist actions and the responses to such actions, whether on a world, national, or regional level or even on the level of family relations, all have foundations in a system of negative beliefs, feelings, attitudes, and motivations, reflecting a substantial social distance and a high level of intergroup social and cultural speciation.

The HIV/AIDS pandemic, however, stems from the most positive social interactions, because it spreads by means of an exchange of body fluids between human beings. Sexual contact, a blood transfusion, sharing a needle, or being conceived and delivered by an infected parent—these are among the most intimate interactions (next to organ transplantation) we can imagine. They occur either within the boundaries of a particular narrative of speciation or across such boundaries in spite of such narratives of speciation. The pattern of interaction that leads to HIV/AIDS infection is then a reversal of the pattern that leads to terror:

HIV/AIDS			TERRORISM		
ACTOR	←——→	ACTOR	ACTOR	>——<	ACTOR
"ATTRACTION"			"REJECTION"		

But once these interactions do occur, the societal responses to them are constructed according to a similar model of strong negative moral judgments and stigmatization. Interestingly, both of these interactions are most commonly viewed as interactions only between males. Even though globally the percentages of men and women who have died of AIDS are close to 50/50, in the United States, 82 percent of people infected are males (*aids101.com*); also, globally, 80 percent of terrorists are male (Morgan 2001, 63).

Applied to terrorism, this model illustrates a conflicting interaction between a male terrorist trying to get the attention of a male political leader. Applied to HIV/AIDS, it illustrates an intimate interaction between two males. Being an HIV/AIDS carrier or a terrorist becomes a stigmatized condition of being from which you never have a chance to "recover." It is hard to reenter your own family, community, and society after being medically diagnosed as a carrier of HIV, and there is no way to reenter your own society and the world community after being politically diagnosed as a terrorist. But there is a difference here as well. As Brad Ogilvie reminded me, "the hardest part for many HIV/AIDS infected individuals is their *self-stigmatization* linked to their fear, entitlement, and identification as a *dying person*. One way is to know that *re-entering* is not going back, but *moving forward*" (2002).

Moreover, once these two outcomes of male interactions collide, the perceived threat of the extinction of humanity dramatically increases. A terrorist attack always leads to some form of retaliation that causes mass destruction, mass murder, and mass refugee movements. Any "war on terrorism" is a breeding ground for the HIV/AIDS virus and provides very favorable conditions for the spread of other lethal pathogens as well. In the context of world terrorism, and especially bioterrorism, to win the war on AIDS might be close to impossible. The abolition of existing walls of

speciation and the introduction of nonviolent forms of resolution of political conflicts present themselves as key objectives for all who dream about a world of peace and justice.

I end this brief overview of gender in the context of the pandemic and bioterrorism by drawing our attention to an interesting process that followed the September 11 attack. An instant polarization of males occurred—those engaged in the attack as perpetrators and those who became both primary and secondary victims. On one side were terrorists who did not deserve to be named soldiers and warriors. They were labeled "cowards," as if they had no courage to face their enemy or the victims of their attack. On the other side was an instant construction of "macho male heroes"—firefighters, police officers, and members of rescue teams, among whom we often saw President Bush trying to be viewed as one of them, as one of the righteous rugged white Christian real American men. These two categories of men were dichotomized beyond any normal boundaries of group speciation. The suicide terrorists of September 11 were well educated, not very young, and extremely well prepared for their mission, they carried it on without hesitation, and in the process they sacrificed their lives for the cause that motivated their participation. However, because a description like this would suggest that they were heroes for the social and cultural context that they represented, their gender identity and role, for the purpose of the American cultural narrative, had to be deconstructed and presented in terms that assured only negative connotations. Interestingly, there are many narratives from the times of past wars that tell stories about fighters involved in suicide missions on behalf of their societies, such as Japanese *kamikaze*, that do not refer to those fighters as cowards.

Social Aspects of the American Responses to the HIV/AIDS Pandemic and Bioterrorism

"When all things are held equal, the most important identifying variable is income. Regardless of race, orientation, or language, those in the lower economic brackets are more likely to become HIV-infected" (Stine 2002, 11). The same is true for terrorists; they can be quite easily recruited from places where people have nothing to live for and everything to die for. These observations help us notice that the images of HIV/AIDS victims and of terrorists from the core countries are dramatically different from those that depict parallel phenomena in the countries of the periphery.

In the developed countries, AIDS is portrayed as a social and medical issue, a challenge to conflicting values, and an unprecedentedly complex cultural phenomenon. In the third-world countries, AIDS is seen as just one among many scientifically understood infectious diseases that, without help from the West and cooperation of the global human community, will devastate whole countries whose citizens struggle against it in vain

(Treichler 1999, 99). The lack of a socially and culturally complex narrative about HIV/AIDS or terrorism in those countries reinforces the stereotypes about the savage, alien, and incomprehensible but also simplistic social life and monochromatic culture in those countries. It also helps maintain the sense of Western superiority, of Western right to intervene and to control.

To this day AIDS in the third-world countries is represented monolithically, even though there are numerous known manifestations of the disease, absence of manifestations, and multiple manifestations unique to different parts of the world. Also, terrorists from those countries are portrayed in a similar simplified fashion. Even if we focus on those who are Muslim fundamentalists, first of all, not all of them are Arabs (Arabs make up 20 percent of all Muslims). There are various factions of them fighting in different countries for different causes, they use different means to accomplish their goals, and they follow different leaders and ideologies.

The representations of AIDS epidemics and of terrorism in less-developed regions of the world usually fulfill Western expectations of what they "should" look like and often reinforce familiar stereotypes about those regions: "wasted, naïve, and passive 'natives' lie on mud floors, under trees, on bare mattresses in stark hospital wards," or patients are "abandoned, passive, waiting for death" (Treichler 1999, 7, 106). The images of hopeless, apocalyptic devastation of the world's poor provided by external reporters are in sharp contrast to the reports about the epidemic in core countries. It is extremely important to juxtapose different accounts and representations and construct complex narratives to address not only the truth but also power and representation. Treichler makes another interesting observation, that articles about global issues of HIV/AIDS, focusing mainly on Africa, can be encountered more often in magazines, such as *National Geographic*, than any other publications. This fact might be interpreted as a way to reinforce the perception of the pandemic as alien and exotic (Treichler 1999, 20). In addition, references to AIDS in "Africa" hardly ever mention that on that continent there are 53 countries, 900 ethnic groups, and 300 language families and that AIDS has not spread equally in all of them. Actually, only a few of them are "epicenters" of the pandemic.

Terrorists from outside the U.S. are viewed in a similar way. Their national cultures and histories are almost never taken into account, the intra-group conflicts and violence are as if of no significance, the global and local causal factors of their involvement in terrorist activities are disregarded, and often they are portrayed as individuals with some kind of emotional or mental problems rather than highly trained, determined, and devoted soldiers fighting for causes they believe in to the same extent as any other soldiers do.

When we analyze HIV/AIDS from a global perspective, the distinction between core, periphery, and semiperiphery countries helps us notice the different patterns in the development of the pandemic. In the core countries, HIV infection initially appeared in the late 1970s and rapidly spread primarily among gay and bisexual men, intravenous drug users in urban coastal centers, and recipients of blood products. Now AIDS is spreading among heterosexual adults and among children, but the infection of the population is estimated to be less than 1 percent.

In the periphery countries, the infection first appeared in Africa in 1959, then in other countries in the late 1970s, but it was not identified as AIDS until 1983; there, heterosexual transmission has been the norm, with equal numbers of infected males and females, and the infection of children is quite common; transmission by gay sexual contact or intravenous drug use has been estimated as very low or absent.

In semiperiphery countries, it was once believed that HIV/AIDS appeared in the early to mid 1980s and that only a few cases had been identified, primarily among persons who traveled or got involved in high-risk behaviors with people from core or periphery countries (Treichler 1999, 111). Today, we know that this belief was unfounded, and the number of persons infected in that region of the world is growing as well.

How do we know what we think we know about AIDS in the third world? The power of numbers, of statistical data, in the construction of what we believe we know cannot be overestimated. Numbers have always played the central part in the Western, scientifically oriented (when it is convenient, of course) mind. But it is necessary to look beyond numbers, because even though they constitute a narrative based on a specific kind of knowledge, they not only leave certain important questions unanswered but also fail to ask them. Analyzing AIDS in third-world countries, we must confront questions of decolonization, urbanization, modernization, poverty, endemic disease, development, civil war, the influence of the churches in discussions of health education, the independent press, and the crisis of healthcare systems. Also, we must finally stop projecting our Western interpretation of sexuality on the whole world. For instance, in some countries there is "no fixed correspondence among the components of sexual desire, actual practice, self-perceived identity, and official definition, but it is culturally complicated as well" (Treichler 1999, 118). In other words, culturally sensitive approaches are necessary, because "English as the international language of AIDS discourse is blind to non-Western worlds of meaning. It is necessary to acknowledge how language works in culture, how stories contradict each other, how narratives perform as well as inform, how information constructs reality. . . . Different accounts of truth produce differing material consequences" (1999, 119–20).

In regard to hard statistical data, the situation of terrorism is even worse. There are no reliable data pertaining to numbers, location, distribution,

geographic mobility, education, or group membership of terrorists. And maybe that is why they can be so easily employed by American narratives of extinction. They are like pathogens, or God—very difficult to identify or localize.

Prevention and education are considered primary resources that can be used to stop the spread of AIDS in less-developed countries. There is little emphasis on the treatment alternatives being explored and tested in the U.S. and other industrialized countries. Are they inappropriate for Africa? If so, why? Prevention by means of education is almost the only means of intervention today, but bringing about individual behavioral changes requires translating the knowledge and findings of Western biomedical science and medicine in ways that are meaningful to those in non-Western cultures.

Because AIDS is cultural and linguistic and not just biological and biomedical, this cannot be done by means of a literal translation but rather by means of interpretation within a specific cultural context and discourse. Hybridal representations linking the Western medical vocabulary and indigenous health-related cultural discourses appear to be the most promising educational tools for the time being.

In order to find out in what ways the biological and medical vocabularies of HIV/AIDS have been injected into our own health-related cultural discourse, we might take a quick look at the mass media. In a historical perspective, neither the liberal nor the feminist media seemed ready to enter the conversation about HIV/AIDS. "Network television could 'do' condoms better than anyone and should be held responsible for colossal failure" (Treichler 1999, 8). What did the media do, then?

Network television, addicted to simplicity and convention, only contributed to further simplification of the representations of AIDS. Even though all individual cases presented were always part of a larger story, that story was hardly ever included. Political, sexual, cultural, social, ethnic, gender, and class identities seemed not to matter in those representations, and people were hardly ever given a chance to speak for themselves. When AIDS stories were mentioned, viewers were quickly assured that the epidemic's spread remained confined to other people, to the growing category of "them," and the viewers, representing the shrinking general population, did not need to be afraid.

During the 1990s, virtually every media outlet got involved in the presentation of the AIDS story, and awareness grew of the threat of the spreading pandemic. In spite of the increasing numbers of people dying of AIDS all over the world, in spite of the awareness that no vaccine or cure for HIV/AIDS had been found, neither the mass media nor the film industry ever managed to construct a terror of the pandemic that would encourage the general population of core countries to become active and join the efforts to prevent the spread of the virus or at least intervene by making

sure that more resources were allocated for the research and health care related to HIV/AIDS.

Is this because even today HIV/AIDS is still not perceived as a "real man's" disease? How many more have to die before our Western power elites, even today composed mainly of white Christian heterosexual males, understand that this virus has a genocidal potential and might exterminate a substantial chunk of their God's creation? How much time do they need to understand that AIDS is "a fundamental force of twentieth-century life, and no barrier in the world can make anyone 'safe' from its complex material realities. Malnutrition, poverty, and hunger are unacceptable in our own country and in the rest of the world; the need for universal health care is urgent. Ultimately, we cannot distinguish self from not-self" (Treichler 1999, 40), and, as Albert Camus warned us, "'plague is life,' and each of us has the plague within us; 'no one, no one on earth is free from it'" ([1948] 1991, 229, quoted after Treichler 1999, 40).

I agree with Treichler that a politically progressive cultural theory might challenge the unquestioned supremacy of the mainstream Western narratives about the epidemics. The epidemic today is connected to far-reaching transformations of labor patterns, courtship, erotic life, marriage, childbearing and child rearing, family life, household arrangements, patterns of discrimination, health care, cultural production, and the national and international economy. "Cultural knowledge relevant to the AIDS epidemic is being produced at a variety of geographic and cultural sites, but few opportunities exist for international discussion" (Treichler 1999, 234). Maybe, if we link this theory with a politically progressive world-system theory, challenge the unquestioned supremacy of the core over semiperiphery and periphery countries, and engage and intertwine a wider audience in the web of conversations that constitute humanity, we will find a platform for such an international or global discussion.

Lessons from a Comparative Analysis

This brief comparative analysis of the American responses to the HIV/AIDS pandemic and bioterrorism has allowed me to formulate the following "top ten" observations:

1. *From the perspective of Western culture, according to official macronarratives, both AIDS and terrorism come from "outside" of the mainstream of that culture.* In a typical way, that stranger (HIV victim or terrorist) is interpreted as simple and monochromatic and fits well the preconceived notions. Categoric knowing and typification allow people to force such a stranger into existing stereotypes. Xenophobia helps them develop a sense of fear of that stranger or even construct an atmosphere of terror. The well-developed predisposition toward discrimination against anyone and anything that is believed

to come from outside the mainstream Western culture provides legitimization of non- or minimal action on behalf of HIV/AIDS victims and a lot of very expensive actions against bioterrorism.

2. *Constructing the imagery of HIV/AIDS and terrorism as coming from "outside" of the mainstream American culture pushes the occurrences of HIV/AIDS and terrorism outside of the cultures and societies of the "real" man, who is white, Christian, and heterosexual.* In the United States, HIV/AIDS to this day is interpreted as a *non-* white, Christian, heterosexual male disease, with all the consequences of that perception for both our society and the world. Terrorism is interpreted as a form of violence that presents a threat only if it is perpetrated by *non*-white, Christian, heterosexual males. Even though we know that there are terrorist groups whose members are white Christian males, from the perspective of the images constructed by the American government and disseminated in the society, the most dangerous terrorists are usually Middle Eastern, Muslim, and "cowards" (similar to gays, women, and children, they are less than "real" men). Interestingly, contrary to the "natural" HIV virus that threatens humanity today, genetically manipulated viruses have been created and distributed primarily by white, Christian, "real" males. However, they present a threat to humanity only if they are used by nonwhite, Muslim, cowardly terrorists.

3. *HIV/AIDS and terrorism are global phenomena, in many ways linked to processes of globalization that redefine the rules of traditional competition between countries for hegemony in the world.* I interpret globalization as a system of processes that bring a new polarization of humanity (Bauman 1998). Globals are people with resources, independent of space, who move around the world because they want to. Locals are people who are bound to the territory, and if they do move around it is because they have to. They are the ones who pay the price of globalization that enhances mobility among globals. Globals and locals function in all human societies and in a way complexify the older division of human societies into first-, second-, and third-world countries. The highest percentages of people infected with HIV/AIDS are among locals. Also, the pool from which terrorists are recruited is provided by locals.

4. *Today, both AIDS and terrorism are mentioned in the American culture by many sources and with increasing frequency. This leads to an "epidemic of signification"* (Treichler 1999, 171). As a result of that epidemic of signification, the apocalypse metaphors, or metaphors of extinction of the Western world, flourish and are well received by a large public, because they reaffirm the traditional American culture of terror and violence. The extinction is expected to be performed

by some unidentified non-Western agents who can be defeated only by the white Christian heterosexual male, who in this context has an opportunity to reestablish for himself a platform where one more time he can present himself as a protector or even a savior.

5. *Any macro military action undertaken to fight world terrorism creates conditions favorable for the spread of HIV/AIDS and other lethal diseases unleashed by biological weapons.* Even though death in battle is the most common death related to war, in many contexts the worst killers have been epidemics, not opposing armies. For example, Napoleon's forces in Syria and Egypt were severely decimated by plague and in Russia by typhus. "During the American Civil War, the vast majority of deaths on both sides were due to disease . . . incarceration was a virtual death sentence" (Stine 2002, 2). In most cases the infections were accidental. But there were other cases when intentional contamination of the enemy was practiced.

6. *Terrorism, war, and AIDS threaten the backbone of societies and thus the entire fabric of the global human community.* They strike regardless of age, sex, social class, and education and cause the deaths of thousands of workers, teachers, nurses, civil servants, and other persons who are young and of production age. They destroy the biological foundation of human societies.

7. *For ideological and political reasons, AIDS, terrorism, and biological weapons have been wrapped in a shroud of secrecy, especially in the United States.* It was 1987 before the general American public was informed by President Reagan about the AIDS epidemic (known in Africa since 1959), and it was only recently, mainly after the September 11, 2001, attack, that information about testing of biological weapons on the territory of the U.S., with all its consequences for the people involved, about the production, distribution, and testing of such weapons worldwide, and about the U.S. shipments of such weapons to Iraq reached the general American public.

8. *Both HIV/AIDS and terrorism lead to labeling and stigmatization of all involved, usually because of lack of information or the intentional dissemination of false information.* There are many more rumors about HIV/AIDS and bioterrorism than reliable factual information spreading quickly among large populations. Fear is being casually transmitted, and it gets implanted among already existing social and cultural factors that are causing a sense of insecurity, uncertainty, and unsafety for members of our postmodern societies (Bauman 2000).

9. *The actions undertaken by the U.S. government or the decisions not to undertake any actions have contributed both directly and indirectly to the threat presented today by AIDS and by bioterrorism.* For instance,

in regard to AIDS, "By the time former president of the U.S. Ronald Reagan delivered his first speech on the AIDS crisis in 1987 over 40,000 men, women, and children had been diagnosed with AIDS and over 28,000 Americans had died of AIDS. It took nine years and over 115,000 AIDS deaths before the U.S. Congress and former president George Bush enacted the nation's first comprehensive AIDS-care funding package—the Ryan White CARE Act (1990)" (Stine 2002, 420). In regard to bioterrorism, according to the Centers for Disease Control and Prevention, the Senate Banking Committee, and United Nations weapons inspectors, the U.S. sent to Iraq strains of many germs used to make weapons, including anthrax, the bacteria to make botulinum toxin, and the germs that cause gas gangrene, as well as the West Nile virus. The transfers were made in the 1980s, when the U.S. supported Iraq in its war against Iran (Kelly 2002).

10. *The narratives about AIDS and terrorism constructed and disseminated by Western (American) media fail as ideological deterrents of actual occurrences of infections or terrorist attacks and as means of building protection against them.* The main goals of spreading such narratives are to maintain power, to divert the nation's attention from the "collapse of the empire" from governmental corruption, exploitation, economic depression, and lack of concern for social needs, and to keep people believing that they can be protected and maybe even saved only by the ruling elite. This elite manipulates fear and terrorizes the general public in such a way that the power to make decisions profitable only to them is unchallenged and even finds support of large portions of society.

These ten points might help us in our efforts to provide leadership on behalf of HIV/AIDS victims, to develop and implement preventive measures, to stimulate and finance research, and to widely disseminate scientific and medical information.

Conclusion

I internalized a quotation many years ago in the context of a fight for freedom, human rights, and social justice: "The greatest human revolution would be the liberation of human beings from the fear of other human beings." This statement was made by Father Tischner, chief ethicist of the Solidarity Movement in Poland that brought about the collapse of the communist regime.

When we look at the world today, we might want to ask ourselves whether this new post–Cold War world is a place where we can start replacing fear of other human beings with trust. Today, more and more books are appearing with "trust" in their title, but the phenomenon of trust does not

seem to be ready to replace fear in this world. Ogilvie (2002) reminds us about the complexity of fear and trust among persons infected with HIV/AIDS: "Many that I know, people who have been traumatized by religion, abuse, etc., have a 'globalized' fear, and erroneously try to place it outside themselves, rather than realizing that they are 'wired' to live in fear. If we can allow for the internal journey towards safety, trust and self-worth, fear dissipates. Also, people and organizations fear change, and would rather rationalize this than acknowledge." Personally, I prefer to talk about resistance to change than about fear of change.

I believe that the world cannot move on without awareness that there is an alternative, an anti-thesis to the thesis offered by the West led by the United States today, and that we are all engaged in the creation of that new order. I am inclined to agree with a proposal of Natan Sznaider: "Compassion is the moral self-organization of society. It is the first moral campaign not organized by the church or the state. . . . Compassion is about pain, about sensing other people's pain, about understanding pain, about trying to do something about it" (2001, 1, 25). If, for instance, we look into the history of medieval Europe, we immediately see to what extent—in spite of churches and governments, which were quite often actively engaged in constructing narratives encouraging people to torture or kill other people—we as a species have evolved far away from the times of public displays of cruelty. Now we cannot even think about punishing people by publicly tearing them apart or burning them with sulphur, molten lead, or boiling oil. When we hear stories of torture, pain, and suffering, even far away from us and committed on people that we do not know, we still respond with anger or despair. Sznaider invites us to transform sentiments of compassion into organized social activity—to translate our already existing emotional responses into activism to lessen the suffering of strangers.

With the same belief in the new emerging order, Saul Mendlovitz envisions a global polity of a world without war. In his view, we need to encourage the development of *specie identity*, global citizenship, and world government. Specie identity is "the notion that each human being has the capacity to identify with the human race as well as the particular group into which one has been socialized" (Mendlovitz 1998, 8). *Global citizenship* means the possibility and even necessity that "more and more individuals throughout the world claim the planet as the territory to which they belong and claim a set of principles that clearly states minimum decency standards for the 6.5 billion humans circa 2010" (p. 9). Finally, *global government* would provide the necessary web of connectedness through which specie identity and global citizenship would manifest themselves. Mendlovitz believes that to think, feel, and act as a global citizen is an essential requirement for participation in the movement to abolish war and establish a just world order.

Those of us who believe in the theory of evolution are quite surprised when we listen to politicians and also some scholars predict that democracy and capitalism, as the best systems of all, are soon, and with our assistance, going to be established in all societies of the world. The collapse of the Soviet bloc is often presented as an argument in support of that belief. To me, coming from post-World War II Poland, this sounds scarily familiar and similar to statements made by Communist leaders who wanted people to believe that the system they supported was about to become the dominant system in the world. To all of us trained in the theory of evolution and the Marxian theory of social development, this belief was unacceptable, because it implied the end of evolution, and this is an oxymoron. How can we talk about evolution as an ongoing, unending process of becoming of everything that is, with no known or well-understood beginnings or ends, and then, almost in the same breath, talk about social, economic, and political arrangements that seem to some world leaders to be the "best" arrangements humans could ever imagine?

In my view, such ideologies and actions are doomed because they are "counterevolutionary." The fact that Americans are prepared now to pick political leaders for other nations, change their political regimes because our leaders don't like them, and remake the whole world in our own image is in my view the death spasm of the Western "thesis."

I agree with my first sociology teacher, Zygmunt Bauman, who emphasized that

> the world does not have to be the way it is . . . there is an alternative to what presently seems to be so natural, so obvious, so inevitable. . . . [H]umans do not *have* to be inhuman even if they live in social and historical circumstances which make the cruel treatment of the other seem to be easy and without consequence. It is always possible to choose to be moral. In that choice lies our human dignity. And it is the role of sociology to show that the choice to be moral can always be made since all the structures and thoughts which tell us that the choice is impossible are themselves entirely contingent. (Bauman 2001, 9, 13)

I believe that the alternative, the anti-thesis, to the world as we know it is emerging in front of our eyes. It is much more difficult to notice and identify it, because the world no longer seems to fit the traditional Western either/or conflict model. With the processes of globalization, in spite of all their negative side effects, the world is coming closer and closer together, and various nations and societies are accepting the world system based on cooperation rather than on the hegemony of one country over all others. The European Union and the lack of support for the invasion of Iraq are good examples. The emerging alternative is all-encompassing, and in a way it seems ready to devour the leftovers of all traditional arrangements rather than just oppose and try to defeat and replace the one that seems dominant right now.

The United States became the target of terrorists because it is losing power. The political narrative that assures us that we have been, are, and

will be attacked because we are the best, the greatest, and the most powerful does not hold in the light of any social-scientific theory. The history of humanity shows that most often the stronger attacks the weaker, and if the weaker attacks the stronger it means that the stronger is already weakened. When the U.S. government decided to intervene in Vietnam, no one was consulted. In the first Gulf War, a coalition was built. When the second Gulf War was planned, the U.S. government did not have the support of the UN or its allies and only very weak support of the nation. The economy is in trouble, and political authority is all but nonexistent. What remains is the military might that can still be displayed. But the threat of the use of biological weapons by all nations that have them does not allow anyone to be very optimistic about the outcomes of such a war.

In conclusion, I suggest that today we as humanity need to make an intentional collective effort toward the construction of a global ethic of survival, based on an ethic of care embedded in the theory of accountability. This ethic should be based on moral literacy, moral competence, and social activism. The mythical narratives that used to define one group as "chosen" and all or most others as less than human have already done enough damage to humanity. The spread of HIV/AIDS in the social and cultural context of world bioterrorism makes it imperative to develop rules of conduct explicitly addressing the consequences of both the other's and the self's behavior toward the self, the other, and everybody else who might be affected by a given action. If literacy and competence regarding HIV/AIDS would allow more people to take into account the unintended but foreseeable consequences of their actions of sharing bodily fluids, we would not have to fear the threat of extinction by the virus.

Various scientific disciplines provide us with information necessary to become morally literate and thus morally competent human beings. To make true choices and to be fully accountable for actions, people need to expand their intellectual horizons and build the foundations of their social literacy, cultural literacy (including religious literacy), ecoliteracy, and cosmoliteracy. Intentional hybridization, an intended, planned, well-defined effort to construct a merger of ethical rules grounded in religions and those grounded in sciences, is not an easy endeavor. However, unintended hybridization, a spontaneous merger of such diverse ethical rules, occurs daily all over the world, all the time at every moment, when human beings are making choices and decisions about their conduct. Very often, however, these decisions are not grounded in all the information that is already available for any given empirical life situation.

So what needs to be done? Here are some concluding suggestions.

1. In the cognitive dimension of human interactions, we need to construct ideological counternarratives that are based on various sources of knowledge obtained from various scientific disciplines and various religious traditions.

2. In the emotional dimension, we need to intentionally stop teaching social speciation and fear of human beings ("stranger danger") and develop predispositions to respect and care about everyone and everything that is within the universe as we know it.

3. In the dimension of action, we need to develop channels of influence, to find economic resources and political support to (a) stop oppression and exploitation by core countries; (b) assure access to education to all, to empower people within their own social and cultural settings; (c) assure health care for all, within their own social and cultural settings; and (d) assure employment and living wages for all who are able to work, thus empowering people to take control over their lives and begin to realize their individual and communal potential in ways that could open new possibilities for them and their children.

4. Above all, elect the decision makers wisely.

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AIDS: GLOBALIZATION AND ITS DISCONTENTS

by Mary E. Hunt

Abstract. HIV/AIDS has changed from a disease of white gay men in the United States to a pandemic that largely involves women and dependent children in developing countries. Many theologies of disease are necessary to cope with the variety of expressions of this pandemic. Christian theo-ethical reflection on HIV/AIDS has been largely focused on sexual ethics, with uneven and mainly unhelpful results. Among the ethical issues that shape future useful conversations are globalized economics and resource sharing, the morality and economics of the pharmaceutical industry, and the need for sex education and access to reproductive choice. Considering such issues in international, interreligious, multiscientific contexts is a concrete next step for the religion-and-science dialogue. It will put the powerful tools of both fields to the service of the common good.

Keywords: globalization; HIV/AIDS; religious pluralism; reproductive health care; sexual ethics; theo-ethical questions; theologies of disease, transgender persons.

AIDS is the most graphic example of globalization that I can imagine. Its current form outlines global injustice: poor women and their dependent children, gay men, and migrants make up the vast majority of its sufferers. I offer a look at the situation from a U.S.–based, white, feminist perspective with the hope that I can encourage religious people, especially people from the Christian tradition to which I belong, to think anew about this common problem.

My approach includes three dimensions. First, I sketch a panoramic view of the HIV/AIDS situation and say why I am intuitively leery of global definitions for *disease*. Second, I look at the HIV/AIDS pandemic

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from a Christian feminist perspective, specifically, how it has changed from a gay men's issue to a mirror of global injustice, and what this implies for changes in theological thinking about it. Third, I offer modest suggestions for moving the religion-science conversation forward toward action so that an interfaith effort can become more than an intellectual exercise.

A Panoramic View of HIV/AIDS—and Why I Am Leery of Global Definitions for *Disease*

I am not an apologist for Freud, but I think he was ahead of his time in predicting what has come to pass in the HIV/AIDS pandemic, namely, that our ability to control much of nature has outstripped our moral ability to seek the common good. Technology, travel, business, communication, and disease have become globalized such that fewer and fewer people make more and more choices that affect all of us. HIV/AIDS is a disease that actually has profoundly different manifestations depending on where and how one lives. For example, when a poor black South African woman is infected she might as well plan on a short life. In contrast, a white gay man in Chicago who has generous health insurance and good nutrition can expect to cope for some years with a chronic disease that may or may not be the cause of his death.

The current contours of the HIV/AIDS situation were outlined at the 14th International AIDS Conference held in Barcelona, Spain, in July 2002. The new approach is to examine AIDS in a globalized economy, not simply as a disease in one country or one group as previous privatized analysis has tended. The face of the disease is changing so quickly that statistics and trends of ten years ago, even five years ago, are outdated.

I am especially concerned to broaden the religious reflection from sexual morality to unjust power dynamics as the epidemic changes from its early presentation as a seemingly white gay male disease in the United States to one that now infects mainly poor women of color and their dependent children in developing countries. I am, of course, concerned about the well-being of gay men, especially young gay men who may not choose safer sex practices. But I want to see them in the larger context so as to have a realistic picture of the problem as it is growing around the world.

The nexus of religion and science can be a cooperative one, with religious people asking useful questions that scientists will factor into their work and scientists sharing data that will help religious people make realistic assessments. We have already seen the disastrous impact of religious prohibitions on condom use, something that no responsible scientist would recommend. It is to prevent such problems that religious and scientific colleagues collaborate.

AIDS in a Globalized Economy. The earliest reported cases of AIDS in gay men more than twenty years ago occurred when the world was far

more compartmentalized than it is today. It is fair to say that globalization has made all the difference in the world! "Globalization is a phenomenon that has remade the economy of virtually every nation, reshaped almost every industry and touched billions of lives, often in surprising and ambiguous ways," states *New York Times* editorial writer Tina Rosenberg (2002). From computers to Coca Cola, nothing has "benefited" more from globalization than the spread of disease. Indeed, 20 million people have died; 40 million are currently living with the HIV infection. But how they live, how long they live, and why they live at all with HIV/AIDS is not a mystery or a case of luck. It is now a predictable phenomenon that can be eradicated in time and managed in the meantime. This is the current medical consensus, despite grim statistics and painful problems for every person who is infected.

What was first noticed in 1981 as a strange set of symptoms found in a number of urban-dwelling gay men in the United States is now one of the most complicated and far-reaching pandemics in human history. According to Peter Piot, Director of UNAIDS, the United Nations and World Bank agency with specific concern for the disease, "We are only at the beginning of the AIDS epidemic in historic terms" (Brown 2002). In the African country of Botswana, 45 percent of pregnant women treated in city prenatal clinics and 39 percent of the adults in general are infected. In Zimbabwe and Swaziland, one-third of the adult population is infected. World Council of Churches official Sam Kobia observes that "HIV/AIDS in sub-Saharan Africa is a plague of genocidal proportions. No other calamity since the slave trade has depopulated Africa as AIDS has" (2001).

The Caribbean is not far behind, with Haiti and the Bahamas suffering high infection rates. However, even larger numbers lie ahead, when the huge populations of India, China, and Indonesia begin to feel the impact of their rapidly rising rates of infection. China is a great unknown, because data are hard to come by in rural areas. Current estimates of a million people infected may indeed be five to six times too low. The Chinese government has finally acknowledged the seriousness of the problem and is promising to copy some of the available therapies if prices are not lowered by their Western manufacturers (Rosenthal 2002). Such numbers are almost incomprehensible in that they represent not only those who are likely to become ill but also their children, who will be orphaned, and their jobs, which will need to be filled. A cultural revolution of another kind is happening in a globalized economy that feels the ripple effects.

Despite these numbers, the fastest growing rate of new infections is in parts of the former Soviet Union, especially in the Russian Federation, where the loss of industrial jobs results in poverty. Prostitution and intravenous drug use, breeding grounds for the infection, are poverty's accompaniment. It is not so much a matter of sexual mores but of economic, racial, and gender considerations that determine the ever-changing aspects of HIV/AIDS.

More recent concern has focused on HIV/AIDS as a security threat (Altman 2002). This approach is debatable, since it plays into the hysteria that has been used to rein in certain human rights. But it may prove to be the fastest road to big funding. While the HIV/AIDS situation is different in each country, the National Intelligence Council reports that the cumulative impact will be disastrous (AIDS 2002). Nigeria, Ethiopia, Russia, India, and China, where the disease has not peaked, make up more than 40 percent of world's population. Russia fears the loss of military personnel that will be potentially destabilizing for that country. Nigeria worries about its United Nations peacekeeping force, another cause of insecurity. Migration of peoples and high-risk sexual behavior in these countries contribute to mounting infection rates.

The consensus at the Barcelona meeting was that if prevention and vaccine are not on the horizon soon, more than 68 million people will die of the infection in the next two decades. Earlier projections for southern Africa turned out to be 30 percent lower than what actually happened. Those infected are well beyond the cohort of those first considered at high risk, namely, intravenous drug users and those who have unprotected sexual relations with infected men. The general populations of these countries are at risk. This is a significant change that underscores the need for broad-based education and social change. In addition to prevention strategies and the development of a vaccine, the task is to diminish risk factors such as being illiterate, being a woman in a male-dominated society, being a male who has sex with males in a homophobic culture, and being a person of color in a racially stratified society. These conditions are often exacerbated by religious beliefs and religiously fueled prejudices.

If there is good news out of Barcelona, it is that in some parts of the world the rate of infection is dropping. Piot reports, "Nations with accelerating epidemics must move quickly to adapt proven responses from countries that have succeeded in turning the epidemic around. The essential elements for reversing the disease's spread are frank, widespread HIV prevention, including access to voluntary counseling and testing, leadership at the highest levels of government, and access to care for people infected and affected by AIDS" (Altman 2002a). Countries such as Australia and Poland have done a remarkable job of keeping the problem at bay. The overwhelming factors shaping the pandemic seem to be economic, not moral. Jobs and egalitarian mores, not sexual sanctions and quarantines, work to stem the tide when it comes to prevention and dealing justly with those who are infected.

In the United States, the disease is increasing among African American women and their dependent children. Shockingly, 90 percent of African American gay male teens, 70 percent of their Hispanic counterparts, and 60 percent of white gay male teens tested and found to have HIV had no idea that they were infected (Altman 2002c). Moreover, 55 percent of the

new cases from 1994 to 2000 as reported in twenty-four states were African Americans, despite the fact that they made up only 12 percent of the population (Altman 2002c). This means that prevention efforts and access to advanced treatments, which may soon make HIV a chronic but survivable disease for many white gay men, are simply not available now where they are most needed. With so many people in the United States lacking access to adequate health care, and even more without even rudimentary information on the disease, it is time to move beyond gay bars and baths to the street corners, grocery stores, neighborhood houses of worship, and soup kitchens with prevention materials.

A new drug, T-20, helps many patients who have developed resistance to other antiretroviral treatments. However, even those who have access to the best medical care and support systems live with enormous problems. Recent studies indicate that the protease inhibitors, once hailed as wonder drugs for keeping infected people alive and healthier longer, are showing links to increased risk for heart disease.

Theology and Disease. In the face of a situation that seems so uneven and unjust, the matter of a theology of disease leaves me feeling a little queasy. Just the word *theology* seems to have Western Christian and Jewish overtones. In my experience, unnuanced by terms like *feminist, liberation, black, Asian*, and other qualifiers that state up front the perspective of those whose reflections on the divine and whose life situation will be most deeply affected, *theology* tends to reflect and serve the needs of those in power. This is the lesson of the past thirty years of theological work. In the increasingly pluralistic religious framework that is now the reality in the United States, it is even more important.

I do not mean to suggest that colleagues engaged in the work of finding adequate theological expressions have this approach in mind. To the contrary, I would expect that those of us who are white and Western have learned from those who have been marginalized that how we name the divine, the *logos* we use about *theos*, shapes to a great degree the customs and behaviors of a culture. In a globalized culture that harbors an unequal-opportunity disease, I would prefer to look at *theologies of diseases*. Such a formulation suggests a participatory approach in which many experiences, beginning with those who are most marginalized, could be brought to bear. This avoids the risk of further hegemonic discourse aimed at an umbrella category like *theology of disease* that would privilege certain starting points. Instead, we would structure our common listening to hear the varied strains of divine and human suffering as an essential step toward their eradication.

Let me demonstrate how the tendency toward a single theological approach has taken shape in the Christian tradition with negative results, before suggesting ways to move the conversation forward. I limit myself to

the Christian tradition out of a sense of both interreligious politeness and responsibility for transforming my own tradition.

How the Pandemic Has Become a Mirror of Global Injustice, and Theological Implications

I begin with some voices, because I have suggested that listening, rather than pronouncing, is a good first step:

- Bishop Rainy Cheeks, an HIV-positive religious leader from Washington, D.C., put the matter bluntly at an August 2002 conference on Women and AIDS sponsored by CLOUT (Christian Lesbians Out): "The church is responsible for the spread of HIV/AIDS."
- "If the Catholic Church does not change its teaching on the use of condoms to prevent the spread of AIDS, it should be held responsible for the deaths of thousands of AIDS victims," proclaimed Joanna Manning, a Canadian religious writer, at the opening of the Vatican-sponsored World Youth Day in Toronto, in July 2002.
- "I hope that all of you gathered here, and those you represent, want to break the silence barrier, that you are going to be ready—responsibly, urgently and in an engaging way—to speak and teach people about sex, about reproductive health," urged Desmond Tutu, Anglican Archbishop Emeritus of South Africa, addressing religiously affiliated African health organizations in 2000 at the 13th International AIDS Conference held in his country.
- "Unfortunately and shamefully, the church has been somewhat asleep on this issue, and maybe it's because of the social stigma," said the Reverend Franklin Graham, son of evangelical preacher Billy Graham. Despite his tradition's insistence on heterosexual, monogamous married sex, he asked, "How can people who have different opinions at least work together to help the people who are dying? How can we provide hope? That's my heartbeat right now."
- "Some leaders are still afraid of them. They don't want to touch them," said the Reverend Jane Nuthu, a pastor of the Assemblies of God in Kenya who works with street children in Nairobi. "We take any kid that is desperate. And we don't judge them," she claimed as a little girl whose mother had died of AIDS clung to her.
- "A powerful missing ingredient has been the voice of the churches, the mosques, the temples—the entire religious constellation," indicted Stephen Lewis, special advisor on AIDS to Kofi Annan, UN Secretary General. "Dare I say that the voice of religion has been curiously muted?" he asked at an interfaith conference on religion and AIDS organized by the World Conference on Religion and Peace in Kenya in June 2002.

As HIV/AIDS grows into a global pandemic, these powerful challenges emerge from diverse segments of the Christian tradition and beyond. They stand in stark contrast to the ambivalence and rejection that characterized much of the early reaction from Christian churches to a disease that will soon have taken more lives than all of the armed conflicts of the last century. Perhaps such tremendous loss is necessary to awaken the sleeping giant that organized religions have been in the early decades of the HIV/AIDS pandemic. Such frank talk may even put religious people in the vanguard of those who seek prevention and a vaccine. More to the point, it may catalyze those seeking to restructure the economic, social, and religious frameworks that ground an increasingly globalized world in which HIV/AIDS acts as a mirror reflecting injustice.

As part of the early Christian response to HIV/AIDS, the ethical focus was almost exclusively on sexual morality construed in the most privatized way to the exclusion of globalized, systemic analysis of the conditions that ground the pandemic. One of the best antidotes to that approach was crafted by Jonathan Mann, a medical doctor and World Health Organization AIDS pioneer. In 1994, he gave a prestigious talk at Harvard Divinity School, the Ingersoll Lecture on Immortality, titled "Health, Society and Human Rights." It was a marvelous example of religion and science in collaboration. He wondered why he, a physician, a public health worker, was asked to address so lofty a theme as immortality. He mused that in all his medical and public health training he had never heard the word *immortality*. But he went on to say that in his judgment the old model of chasing after the virus was no longer adequate. Rather, he argued,

> The history of our confrontation with AIDS illustrates that how we define a problem determines what we do about it. . . . The critical discovery was that the spread of HIV is strongly determined by an identifiable societal risk factor . . . in the scope, intensity and nature of discrimination that exists within each community or country. We are not speaking principally about discrimination against already HIV-infected people and people with AIDS, as important as that is; we are considering those forms of discrimination in society which antedated the arrival of human immunodeficiency virus. (Mann 1994, 9)

This was early on in the history of the disease, but his insights set a trajectory for looking usefully at the disease by focusing on the racist, sexist, economically unjust system and calling it the cause of illness. It is this system that is sick and in need of healing. This approach signaled a move away from a privatized analysis of a person who was infected to a social analysis of a disease in a culture that proved a welcome host for the infection for its most vulnerable citizens.

Expanding the Focus to Women and Children. Despite Christian theologies' worries about homosexuality and AIDS, women and children are most at risk in a globalized economy that sanctions sexism and leaves most

childrearing to women. Like gay men, who were among the earliest infected, women and children are considered marginal. Nowhere is this more evident than in the projection from Barcelona that by 2010, more than twenty million children will be orphaned in Africa because of AIDS, five million in other parts of the world (Altman 2000). In some of the hardest-hit African countries, by 2010 one of seven children will have lost one or both parents. The impact of such loss is staggering in terms of children's well-being, economic means to sustain families, and indeed nations' abilities to develop. It bears repeating that the worst is yet to come.

Happily, one new initiative unveiled at Barcelona is MTCT-Plus, a short-course antiretroviral medicine designed to prevent the transfer of the virus from mother to child (MTCT). For the first time in the history of this disease, women will benefit first and not in some derivative way from a new therapy. The effort has received an initial $50 million in funding—a good start, but hardly enough to handle the millions of lives that might potentially be saved. In the United States, African American women comprise the fastest growing cohort of newly infected. In Washington, D.C., for example, one-third of the newly infected are women. Racism and poverty combine to make that the case and to keep their well-being from public scrutiny.

Another recently identified issue is the difficulty faced by transgender persons. One study revealed that one-third of all male-to-female transgender persons in Washington, D.C., are HIV-positive. Of those, two-thirds are African American (Washington 2000). In addition to the usual risks, transgender persons are at risk from prostitution, invasive cosmetic therapy by nonprofessionals, exploitation because of their transgender status, and high incidence of alcohol and drug abuse. This is a community whose needs have never been taken seriously by religious communities but whose reality is now part of our common concern.

Given how most Christian churches have treated gay men, it is no wonder transgender persons are pessimistic. Gay men, especially young gay men of color, face virulent opposition from many Christians with regard to their sexual choices, whether they are infected or not. What began as a personal religious protest against anal receptive sex by men with men is now a condemnation based on the fact that such high-risk practices contribute to the spread of HIV. The result is the same: wholesale dismissal of the goodness of gay men's lives and undue focus on their sexuality.

Some gay men intentionally engage in anal receptive sex without condoms for reasons of closer connection to the other person, internalized homophobia, pleasure, intentional risk-taking, and spirituality (Goss 2002). This is a complicated matter that weighs private choice against communal well-being and personal proclivity against public consensus. If health care were socialized (which it is not in the United States), the decision to put oneself at increased risk would have a growing social component. But

everything in the system says "private," including such choices. Moreover, the homophobic focus some churches have taken on certain sexual practices while passing over the fullness of gay men's lives does not instill confidence that the men's well-being is at the heart of the matter. To the contrary. Listening to gay men on their terms, even if one disagrees, is the first step toward changing the conditions that create alienation, despair, and discrimination. Otherwise, religious groups, especially conservative Christian ones, remain significant barriers to welcome, inclusion, and celebration of gay men in the larger culture, putting them at higher risk.

Economic issues are key to the end of HIV/AIDS, and they are moral matters. Funding remains the most contested aspect of the HIV/AIDS crisis. UN Secretary Annan has emphasized the need for a fund of $7–10 billion *annually* to stem the tide. He has made clear that September 11 and its aftermath have only intensified the call for the world we want, one in which "a child does not die of AIDS every minute," as is now the case (Annan 2001). However, the Bush Administration has thus far steadfastly refused to allocate more than $500 million over a three-year period.

Protestors in Barcelona booed Secretary of Health and Human Services Tommy G. Thompson when, as head of the U.S. delegation, he announced a modest increase in AIDS funding. In the face of the $10 billion needed, it seemed a drop in the bucket from the world's only economic and military superpower. Even staunch conservative Republican Senator Jesse Helms from North Carolina urged $500 million to prevent mother-to-child transmission[1] (Helms 2002). Despite Helms's myopic view of the problem and longtime antipathy toward anything gay, his voice and vote are a help this time, proving that the health as well as moral implications of the pandemic are clear even to the recalcitrant. In the end, however, the Bush White House prevailed, and during the next three years the $500 million pittance is all that the new fund will receive from the richest nation in the world.

Democratic Representative Richard Gephardt led the opposition as a result of his travel to Africa: "AIDS, AIDS, AIDS. I came away knowing and believing that this is the moral issue of our time" (Stolberg 2002b). This remark followed his 1999 visit to southern Africa, where the faces and stories of women and children living—more likely, dying—without medicine or an adequate infrastructure to receive medicine even if available led him to push Congress toward contributing $2 billion a year to this global struggle. In the present climate, one way to persuade his colleagues may be to consider the link between terrorism and political instability, playing the national security card, because AIDS deaths can exacerbate already fragile national infrastructures. As the pandemic spreads, some African countries have already seen the deaths of a whole generation of teachers and engineers, because the ones who die are often the ones with job-related mobility and other circumstances that keep them away from home, where they are more likely to engage in high-risk behavior.

One remarkable federal move, no doubt influenced by the religious right, has been the decline in condom donations by the U.S. government to developing countries from 800 million in 1990 to 360 million in 2000 (McNeil 2002). This decline is the result of complicated economic factors including "buy American" laws when U.S.–manufactured condoms are more expensive than some others. It also is linked to changes in various countries' status with regard to U.S. foreign aid. But the biggest problem is ignorance of condom use and the need for education at very basic levels to dispel the myths and beliefs that discourage condom use. This education is lacking, and at an enormous price. The United Nations estimates that for every $1 million not spent on condoms there are 360,000 unwanted pregnancies and 800 maternal deaths, not to mention 25,000 deaths of children under age 5 (McNeil 2002).

Available funding goes a long way. Contemporary studies indicate that HIV/AIDS prevention is not as difficult as it might seem. In fact, the know-how is at hand even when the money is lacking. Steps include what experts have been saying from the beginning: that improving women's social and economic well-being, making condoms available and their use normative, offering counseling and frequent testing, and improving educational offerings, especially sex education, for young people and workers will go a long way toward reversing the trends (Altman 2002b). Although the consensus is less solid on needle exchange, it, too, appears to be a significant factor in lessening transmission. In the absence of a vaccine, and knowing how difficult developing a vaccine will be, this public health approach seems the wisest course in the short run (Thomas 2002). However, gearing programs to specific populations and getting access to women and children in settings where men dominate can be next to impossible. This is where religious groups can be helpful—though many choose not to be.

Religious Issues. In light of the many factors that make up the current HIV/AIDS situation, I suggest that issues of sexual morality, specifically gay male sex, be considered only when all other issues have been aired. I urge this because of the disproportionate amount of religious energy that has gone into debating gay adult consensual behavior, which in my view needs no more scrutiny than any other form of consensual sex. To do so is to distract from the myriad issues for which religious insights, in my case from the Christian tradition, may be very useful.

Among the many possibilities for Christians in the United States are theo-ethical concerns in the following areas, which could have far-reaching implications and constitute the broadest rubric for understanding and eradicating the HIV/AIDS pandemic.

1. Economic globalization and the need for resource sharing
2. The morality and economics of the pharmaceutical industry
3. Sex education and access to reproductive choice as basic human rights

First is economic globalization. As Rosenberg argues, this is at best a mixed blessing. Trade is essential to growth, and growth is key to raising living standards. Treaties such as the North American Free Trade Agreement (NAFTA) and other World Bank/International Monetary Fund (IMF) solutions systematically privilege the rich and use the labor and resources of those from poor countries to fund it. The sex trafficking of women and children in prostitution that in many countries accounts in large measure for the spread of HIV/AIDS is a logical by-product of such a system. Likewise, the collapse of the Soviet economy and the now astronomical numbers of persons in that region who are HIV-infected seem to have a cause-and-effect relationship.

I urge religious people, especially Christians who claim gospel-based values such as love and justice, to forsake their worries about homosexuality and focus their attention and resources on the economic system that grants their privilege. A critical analysis of the racist, sexist, and colonialist dimensions of contemporary capitalism and of its transnational caretakers, such as the IMF, would keep Christians busy for years to come. Such an exercise would, I believe, take us much closer to the root causes of HIV/AIDS in the social sphere than any comparable expenditure of energy on sexuality.

The results of many previous efforts to deal with sexuality have been disastrous. Methodists, Presbyterians, Episcopalians, and other mainline Protestant churches have come scandalously close to schism on this matter. Gay men and lesbian women have been subject to shockingly uncharitable discourse that has had tragic consequences including hate crimes, job losses, and custody battles. My strong recommendation in the absence of any consensus is a moratorium on such discussions until capitalism as a system and as a theory is thoroughly and critically deconstructed and rethought.

Second on my list is a related religious issue, the morality of pharmaceutical companies that keep a lock on so many of the HIV/AIDS drugs. Great strides have been made in the development of drugs that prolong and enhance the quality of life for those living with HIV/AIDS, but when it comes to equitable distribution, the picture is dismal. Routine treatments in developed countries are still out of reach for those in the poorest countries. Encouragingly, some countries, including Zimbabwe, have moved to sidestep patent requirements in order to import substitute generic compounds (Cauvin 2002). This move, in the spirit of Act-Up[2] and other activist groups, shows an ethical way for a country with an acute problem, with more than a quarter of its adults infected, to take action.

The theo-ethical question is how such inequity has developed so that the same disease can be a quick death sentence for one and a treatable chronic illness for another. Religion and science could focus on no more relevant a concern with the common goal of doing something to change

this. I urge religious people to take on the pharmaceutical industry in all of its moral and scientific complexity. This means not vilifying those who work in it but assuming that they are partners in the provision of health care who want to act ethically. This applies both to treatment drugs and to any potential vaccine yet to be created.

Fundamental to this discussion is ethical reflection on how much profit is acceptable in the face of death. Much of the argument on the part of pharmaceutical companies is the need to keep profits for research and development of future drugs (not to mention for their stockholders). But there is no consensus on what this means, what numbers are morally acceptable—how to balance profit with lives that could be saved now.

Another important matter to consider is why racial disparity is found in so many AIDS clinical trials (Stolberg 2002a). For a disease that is increasingly prevalent in racial minority communities, it seems extraordinary that African American and Hispanic people living with HIV are only half as likely as their white counterparts to be part of trials involving treatment drugs and only half as likely to be among those who receive experimental drugs. Who knows about this pernicious form of racism, and why is it countenanced in the medical/scientific community? These are the theo-ethical questions of the day, the ones for which science as well as religion has wisdom to share.

None of these questions is easy to answer, and fruitful discussion will require massive doses of good will on all sides. Nevertheless, I predict that there will be more productive questions to wrestle with in terms of human life than the now tired, polarized, and divisive discourse on homosexuality. For a change, religious people will sink their ethical teeth into a topic worthy of their best theological considerations.

The third issue is the highly polarized matter of reproductive health care, both for people living in the United States and for those whose care is compromised because of governmental decisions to de-fund programs that include abortion services. In fact, sex education is one of the most effective means of preventing sexually transmitted infections (STIs), including HIV. Family planning courses and radio, television, and print media, which shape public consciousness about the needs and rights of women and are communicated in language and images appropriate to the target population, are crucial—especially for young people who are at the heart of this pandemic. Yet, such educational tools, and the issue of easy availability of condoms, remain beyond the scope of most religious communities' concern. I submit that conservative religious efforts to couch reproductive health matters in moral terms are a major contributing factor in the rise of HIV/AIDS, because they pass over the life-threatening aspect of unprotected sex.

Catholics for a Free Choice is one group that makes a strong case in its global effort to get out the message "Banning Condoms Kills" using bill-

boards and subway ads as well as newspaper and Internet outlets. Its president, Frances Kissling, states forthrightly, "The Vatican and the world's bishops bear significant responsibility for the death of thousands of people who have died from AIDS. For individuals who follow the Vatican policy and Catholic health care providers who are forced to deny condoms, the bishops' ban is a disaster. Real people are dying from AIDS. Real bishops are silently acquiescent. We can no longer stand by and allow the ban to go unchallenged" (Kissling 2001). Her words take on even more vigor in light of the Catholic Church's pedophilia and coverup scandal.

Roman Catholics are not the only ones who have work to do on reproductive health policies as they relate to HIV/AIDS. The Religious Coalition for Reproductive Choice launched a solidarity effort in South Africa, sharing its "Keeping It Real!" sex education dialogue model in an effort to prevent the spread of HIV/AIDS. Material of this kind needs to be distributed in the United States as well, where sex education is considered largely a private, family matter and where church and school discussion is dictated by the use of abstinence-only curricula. It is obvious that such a head-in-the-sand approach must end.

I have purposely limited my religious reflections to the Christian tradition, hopeful that those from other traditions will do the same from different starting points. I conclude with some modest suggestions for how this strategy might be broadened.

Moving the Religion-Science Conversation Forward toward Action

A clear-eyed reading of the "signs of the times" indicates that the tip of the HIV/AIDS iceberg is all we have seen. As the populations of China, India, and Indonesia begin to cope with the impact of a devastating public health disaster, it is obvious that the face of the disease—and, therefore, of the world—will change. Unfortunately, those who will bear the brunt of its fury will be women and children of color, the "throwaways" whose lives can be expended in the service of globalized economic privilege for others. Even in the United States, the most deeply affected population is African American women whose place in the pecking order is low. In my religious view, this is an abomination. Creation belongs to everyone equally; anything less is a perversion.

We live in a religiously pluralistic world (see Eck 2001). Efforts to deal with HIV/AIDS need to reflect this pluralism. As I indicated, I am leery of developing a theology of disease that results in a least common denominator. I find Hans Küng's efforts to develop a global ethic as problematic as they are promising for just this reason.[3] "Theologies of diseases" is closer to the mark. My suggestions are meant to move us in that direction.

First, I suggest that we keep the wide-angle lens on our ethical cameras and frame all of our analyses and proposed solutions in a global context.

Note my effort to do so in this essay by couching all U.S. concerns in terms of what is happening elsewhere. Otherwise, we persist in the pattern that puts our well-being first. Our issues, no matter how urgent locally, take on disproportionate importance in the global arena without this corrective.

Second, we need to declare a moratorium on sexual ethical debate, especially on homosexuality, until we have made good-faith efforts on other major concerns, especially economic and racial matters. This is not to say that sexual ethics are unimportant. Rather, it is an acknowledgment of their ability to eclipse other issues and distract from a broader analysis, serving the purposes of those who would uphold the status quo. Religious conservatives seduce religious progressives (and perhaps vice versa) into debates that lead nowhere, because we do not share the same worldview on such fundamental matters as how many sexes there are, much less how they should behave. The same might be said for those in science. Debates that skirt those basic issues are pointless and can be destructive, especially of the lives of those gay, lesbian, bisexual, and transgender persons who are objectified in the process, and of those who live with HIV/AIDS but will live shorter lives if we waste our time. I suggest that we at least temporarily halt such ineffective discussions and covenant instead to stop the deaths with concrete actions like condom distribution. Perhaps after a decent interval we can return to those controversial matters. But for now I strongly urge action to prevent infection and to seek a vaccine.

Third, I urge a systematic rethinking of the relationship between church and state—or, better, religion and politics. When it comes to lobbying, the institutional religious expressions are simply not the only voices. For example, I am a Catholic who favors use of condoms, a view that U.S. Roman Catholic bishops do not share. Decisions are often made on funding overseas population programs or distributing condoms without adequate reference to the pluralism of beliefs within religious groups as well as among them. Such fair play is the only way I know to break the political logjam that keeps funding for HIV/AIDS low and political capital for those who oppose it high. If the likes of Jesse Helms and Franklin Graham can see their way to support some funding for HIV/AIDS even with their conservative religious convictions, perhaps there is hope after all.

The religion-science conversation will live up to its potential when it becomes a forum for diverse and even competing voices to air views on crucial topics. On the religion side I see hope in a variety of efforts, from that of Ma Jaya Sati Bhagavati, founder of the River Fund and leader of a community in Melbourne, Florida, that works with people with HIV/AIDS, to the Salvation Army, which, while anti-gay, still extends its services to all persons with AIDS. I assume that the same diversity can be cultivated among scientists.

I expect that such a renewed religion-science conversation emanating from a range of religious sources will focus its attention on twin goals: to eradicate the disease and its underlying social, economic, and political causes, and to turn this dastardly disease into a vehicle for globalized interreligious (and indeed multiscientific) dialogue on what it means to share the planet creatively with people from a variety of starting points. Accomplishing the first is obviously my priority. But accomplishing the second might be one of the few good things HIV/AIDS will ever produce.

Notes

1. In a fervent conclusion to his opinion piece, Senator Helms wrote, "But not all laws are of this earth. We also have a higher calling, and in the end our conscience is answerable to God. Perhaps in my 81st year, I am too mindful of soon meeting Him, but I know that, like the Samaritan traveling from Jerusalem to Jericho, we cannot turn away when we see our fellow man in need."
2. Act-Up is short for AIDS Coalition to Unleash Power. It is a group of individuals who use nonviolent direct action to stop AIDS.
3. Hans Küng has been working on a global ethic for some years. He was recently part of a UN–sponsored "Group of Eminent Persons" that drafted the document "Crossing the Divide: Dialogue among Civilizations," which calls for compromise and cooperation with religious differences understood as a resource, not a barrier. This is similar to Daniel C. Maguire's notion of "renewable moral energies" (2000, 10). Such moves have real merit but are also subject to scrutiny with regard to their tendency to imperialize, however unconsciously, certain content.

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THE NEW BIOLOGY AND ITS IMPACT IN BIOMEDICAL STRATEGIES AGAINST HIV/AIDS

by Gayle E. Woloschak

Abstract. The sequencing of the human genome and the initiation of the structural genomics projects have ushered in a new age of biology that involves multi-lab, high-cost projects with broad task-oriented goals rather than the more conventional hypothesis-driven approach of the past. The new biology has led to the development of new sets of tools for the scientist to use in the quest to solve mysteries of human disease, biomolecular structure-function relationships, and other burning biological questions. Nevertheless, the impact of the new biology on the field of AIDS investigation has been minimal, predominantly because many of the tools in the HIV field of study were developed before the full advance of the new biology was felt in the biomedical community. Many of the high-cost megaprojects that involve large technological advances and are marketed as projects of promise to the biomedical community are not likely to significantly impact the field of HIV/AIDS research and cannot serve as a substitute for direct funding to the HIV/AIDS scientists working for vaccine development, an understanding of mechanisms of disease causation, and new tools for therapeutic intervention.

Keywords: Acquired Immune Deficiency Syndrome (AIDS); AIDS and ethics; AIDS and scientific inquiry; ethics and decision making in AIDS patients; Human Immunodeficiency Virus (HIV).

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The New Biology

High-cost projects that involve many different interdisciplinary laboratories have been important in space biology, high-energy physics, and other fields requiring specialized expensive equipment. The dedicated commitment of a group of scientists devoted to a particular project is perhaps best shown in the efforts of the United States and the National Aeronautics and Space Administration (NASA) to place a person on the moon during the 1960s. Large teams of investigators from all over the world were employed at a great expense in manpower and hardware to accomplish this single goal; determination and ingenuity both were required for the final accomplishment. The landing of a man on the moon cannot be attributed to the accomplishments of any single individual but rather is the collective accomplishment of a large team effort. Such accomplishment has generally been a result of a "big science" initiative that was developed as a package and marketed to the government based on the promise of the final goal.

Biology has not usually been driven by big-science initiatives but rather has been the realm of individual investigators working in their laboratories and with their lab groups to chip away at a problem of significance to the community of biologists in a relatively narrow field of investigation. This changed with the onset of the Human Genome Initiative in the 1980s, a project that was marketed to the government as changing the way we treat disease and even challenging our views of who humans are and where we come from. This field of genomics evolved into the sequencing of multiple genomes including those of bacteria and viruses, yeasts, the nematode worm *Caenorhabditis elegans*, fruit flies, humans, mice, rats, and more. Certainly this work has led to great advances in our understanding of each of the organisms sequenced. For humans, we learned more about genes important in repairing damage to our genetic material, genes important in specific diseases were more easily compared with their evolutionary counterparts, and sequence information told us about relationships between genes and gene families.

The field of genomics—sequencing genomes—led to the development of a structural genomics initiative, which aims at determining the three-dimensional structure of every protein encoded for by every gene. While the initiative is only partially completed, the information gained from this work has already had significant impact on the area of drug design, in which molecules that mimic three-dimensional structures of abnormal proteins can be used therapeutically to intervene in abnormal processes such as tumor progression, inflammation, and infection.

More recent efforts have gone into functional genomics—megaprojects designed to determine the function of every gene in the body of an organism. These studies have been initiated for small organisms such as the nematode worm *C. elegans* that can be genetically manipulated, but for

humans such studies are not possible with current approaches. The general methods that have been employed include the functional knocking out or inactivation of every gene, one by one, in a single organism to determine what impact this has on the function of the whole organism. Recent work with *C. elegans* has attributed functions to several genes that, up to that point, had unknown functions (Kamath et al. 2003).

By-products of these new biology initiatives have led to major biomedical developments in recent years. Most areas of medical treatment and diagnosis are likely to be impacted, including discovery of genetic causes of some hereditary diseases, genetic screening for disease susceptibility, molecular profiling of tumors to ascertain genetic alterations, improved preventive and therapeutic modalities based on molecular profiling, and early diagnosis of disease.

In general, the new biology is expensive, requires special laboratory equipment and software, and can best be accomplished in large groups that have teams of bioinformatics specialists, molecular biologists, engineers, biochemists, and others. In addition, it has been predicted that because of the high costs some of the new technology will be made available only to those who can afford it. The cost of sequencing human genomes in a few years has been estimated at $500,000 per person, and the cost of expression profiling and analysis is estimated at $20,000. There are general concerns that the actual benefits of these technologies, while felt to a limited extent by all people, will mostly benefit the wealthy who can afford the new tests that will result from the technology. Furthermore, some fear that inexpensive mini-tests for disease susceptibilities will enable health insurance companies to segregate insured people into different cost categories based on their projected risk estimates for disease.

While these new big-science biology initiatives have contributed significant new information to the broad community, they still have not replaced the smaller-scale studies done by individual investigators working with a small team of scientists perhaps collaboratively on a focused hypothesis-driven project.

Impact of the New Biology on HIV/AIDS Investigations

While the new biology has been marketed to the government as holding great promise for biomedical tools against HIV/AIDS, most of the important discoveries relevant to new treatment and diagnostic tools against HIV/AIDS have not been significantly affected by the new biology discoveries. HIV strains had been sequenced before the new biology genomics era, and structures of HIV proteins had been solved and placed on government Web sites before the onset of the structural genomics initiative. Drug design in the field has progressed predominantly by conventional methods, and, while gene expression chips have yielded useful information about

HIV-infected cells, breakthrough discoveries have not been forthcoming as they have been, for example, in tumor-cell classification, in which new categories of tumors have emerged from these gene-chip studies.

One area of HIV/AIDS investigation that might be impacted by the new technology in the coming years is the use of gene chips for determining HIV strains and sequences of individual viral isolates. This could be important if particular isolates are associated with an effective therapeutic advance or a particularly good or bad prognosis. Such HIV-sequencing chips have been developed and depend upon new technology that came about as a result of the Human Genome Initiative.

In general, most fields of biomedical research, including cancer biology, genetic medicine, and neurobiology, have benefited more from the new biology than the field of HIV/AIDS research has (Woloschak 2003). Some spillover to the HIV field is inevitable, but AIDS is not likely to be the direct beneficiary of the science of technology of the new biology.

Responsibility and the New Biology

Responsibility has not yet been (and is not likely to be) found to be encoded for in the human genome, but responsibility is one of the hallmarks that distinguishes humanity from other creatures on Earth. From an evolutionary perspective we can observe expressions of humanlike responsibility in other animals: reptiles and birds build nests and protect their young, and mammals feed and protect their young until they can fend for themselves. In human beings, though, this expression of responsibility carries beyond care for our young and for the members of our clan into a responsibility for all things—fellow humans, all creatures on Earth, the planet itself, even the cosmos. The importance of this responsibility is seen in our stories. In Genesis, God gives humanity dominion over the earth and responsibility for all things, and Cain as a murderer rejects responsibility when he says "Am I my brother's keeper?" (Genesis 4:9 RSV) Christian teachings emphasize responsibility for others—those who hunger, those in prison, those in need.

How can human beings show responsibility in the way we develop tools and strategies to combat HIV/AIDS? To date, humanity has not had an outstanding performance in equalizing treatment and therapies around the world. Most of the therapies that have been developed to counter HIV infection have benefited developed nations (Ammann 2003). Africa, the Caribbean countries, and Asia are losing large portions of their young populations to this horrible disease, and strategies to eradicate it have not even slightly impacted those nations. Examples of irresponsibility in the HIV/AIDS front abound. In the United States, there has been little effect on the deaf population of education about how HIV is transmitted, because educators have relied on verbal presentations and not on signing. In some

African nations, funding exists to punish with death those who have AIDS and commit rape, but none exists to protect the unborn from HIV transmission when the mother has HIV, even if such a child is a result of a rape that might be punished by a death sentence. Like the new biology, treatment for HIV/AIDS is available only to the few who can afford it, both in the United States and elsewhere. Many drugs, such as some of the protease inhibitors, are cost-prohibitive for development and/or therapy. Yet, unsafe new drugs (such as HAART, highly active antiretroviral therapy, which has caused liver damage and led to death in some cases) are released without sufficient testing, again showing a lack of responsibility.

The Nuffield Council on Bioethics was convened to discuss the problem of HIV/AIDS in developing nations, and their discussions resulted in a list of duties crucial for evaluating actions and policies for research in developing countries. Among the duties listed as most important for HIV/AIDS research are the alleviation of suffering, showing respect for all persons, being sensitive to cultural differences, and taking great care to not exploit the vulnerable. It is especially noted that care should be taken to address health problems of developing nations hand in hand with addressing the health problems of the developed world (*www.nuffieldbioethics.org*).

As in all things, humans must act responsibly in the development of tools and approaches to treating HIV/AIDS. Options to consider as approaches to counter this disease include the following:

1. Research that applies to developing nations must be supported.
2. Poverty is a source of ignorance about HIV/AIDS worldwide, and battling AIDS requires battling poverty as well.
3. Educational programs that reach out to the disabled, to underdeveloped nations, and all people must be developed.
4. Humanity must not depend exclusively on new biology for a cure; individual efforts in vaccine development and therapeutic intervention must continue through government-funded programs.
5. We all must work to change attitudes about materialism, to establish responsible actions, and to engender compassion in the world.

Saint Isaac the Syrian offered the following advice on compassion: "Brother, this is what I recommend: to let the weight of compassion within you tip the scale to the point that you might feel within your heart God's own compassion for the world" (The Ascetical Homilies of St. Isaac the Syrian, Holy Transfiguration Monastery, 1984).

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THE NECESSITY FOR A THEOLOGY OF DISEASE: REFLECTIONS ON TOTALITIES AND FRAGMENTS

by Philip Hefner

Abstract. Our ideas of disease try to explain it, and they aim at facilitating cures. In the process, they become entwined in sociocultural networks that have totalizing effects. Disease, however, counters this totalizing effect by revealing to us that our lives are fragments. Unless we engage this fragment character of disease and of our lives, we cannot properly understand disease or deal with it. HIV/AIDS clarifies these issues in an extraordinarily powerful fashion. Medical, legal, commercial, political, and institutional approaches to disease overlook the fragment character of disease in favor of totalizing worldviews. A theology of disease is necessary in order to maintain the focus on fragments. Unless we recognize this fragment character, we do not really understand our lives, and we do not really understand either disease or healing.

Keywords: disease; fragment; HIV/AIDS; medicalizing; Ann Pederson; Robert Potter; totalizing.

The Necessity for a Theology of Disease: The Thesis in a Nutshell

Our ideas of disease try to explain it, and they aim at facilitating cures. In the process they become entwined in sociocultural networks that have totalizing effects. By totalizing I mean that they create and implement entire personal and social worlds. No one has described this totalizing effort more vividly than Donna Haraway in her commentary on technomedicine (Haraway 1991, chaps. 1–3, 10; 1997).

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The history of medical philosophy and practice is a history of paradigms self-destructing and expanding. Disease, however, is the enemy of totalizing explanations and practices, the nemesis of world construction and paradigms. Disease reveals to us, in very harsh ways, that in our actual daily existence we live in fragments, not totalizing wholes. Our lives themselves are fragments in a world that is fragmentary. That the fragments are pieces of a whole is the discourse of faith, not a conclusion derived from what is empirically given.

Disease points to this fragment character of life and the world. Disease reveals that our physical and mental vigor are fragments, that the time allotted to us in our life span is a fragment, that our dreams and hopes are fragments, that our communities are fragments, that the work we do and its accomplishments are fragments.

Our theology of disease must give prominent place to this fragment character of life and reality as we live it. Why is such a theology of disease a necessity? Because the medical, legal, commercial, political, and institutional approaches to disease are predominantly totalizing.

Unless we recognize this fragment character, we do not really understand our lives, and we do not really understand either disease or healing.

Preparing the Way for a Theology of Disease

The title of this symposium is "*Toward* a Theology of Disease." I emphasize the initial word because I consider a theology of disease to be a project, a conceptual framework under construction, not a ready-made, finished achievement. It is itself a fragment. This is why I begin the task with reflections on "preparing the way," that is, surveying the considerations that must precede the construction of a theology of disease.

The Role of Ideas. First of all, we must recognize that our discussion of disease will proceed on the basis of our ideas concerning disease. Disease is as much an idea as an empirical actuality, and how we approach that actuality is inseparable from our prior ideas of disease. Furthermore, these ideas are decisive, not banal. They make a profound difference in how we perceive disease. What is disease? is a question that is never fully answered.

Let me give an example that pertains to both secular and Christian understandings of disease. If disease is viewed as that which is "unnatural," interpretation requires an idea of what is "natural." Aristotle and the Stoics believed that human well-being is fostered by following the laws of nature. The Christian application of natural-law theory associated the laws of nature with the creation by God and God's purposes. Disease and even the diseased person were then not infrequently considered to be opposed to God's purposes. This reasoning has been applied to homosexuality, masturbation, and HIV/AIDS.

Natural-law theology, however, leads to several possible applications when we are dealing with specific diseases. Heart ailments, congenital crippling, genetic defects, cancer—all of these could be considered to be unnatural by certain criteria. However, not all curative or healing procedures are considered to be natural. Embryo manipulation aims at curing the unnatural Parkinson's disease, but, because it destroys the embryo, which can be understood to be, by nature, a human being, embryo research is denoted by natural-law theory as unnatural. So, not only is there more than one possible application of this theology of disease, but the various possibilities are in conflict with one other.

What are the lessons here? That we must be critical of the idea that disease is unnatural and critically aware also of the consequences of attaching the idea of "unnatural" to disease. This is, of course, only one example of the difference our ideas make. Other ideas of disease are comparable, such as the ideas of disease as dysfunction, or disorder, or happenstance, or evil, or demonic possession. Before we construct a theology of disease, we must be aware of the ideas we employ to think about disease, and we must follow a consistent methodology for criticizing and selecting the ideas on which we build.

Historical and Cultural Conditioning. Second, we must recognize that our ideas of disease are historically and culturally specific, with the result that a plurality of ideas resides in the very heart of our thinking. For instance, we can point to examples of how the understanding of pain and fever has changed historically in medical practice. In the eighteenth century, pain was classified by Linnaeus as one of ten major classes of disease and by Sauvages as one of eleven classes. Today, pain is considered a symptom, not a disease, and tends to be downplayed unless it is shown to have a pathoanatomical or pathophysiological cause (Engelhardt 1996, 196). The same could be said of fevers. The classifications of homosexuality and masturbation have evolved in the twentieth century. In 1952, homosexuality was described in DSM-I as "an instance of sociopathic personality disturbance," whereas in the current DSM-IV, it is a "mental disorder only if the individual has a persistent concern to change sexual orientation" (Engelhardt 1996, 193). A similar change could be noted in premenstrual stress syndrome.

Cultural location also is a significant conditioning factor. Feminists have described the difference that women's culture makes for approaching disease. We know very well how significant native cultures are for dealing with disease. Traditional Chinese culture and folk cultures of all sorts condition people's ideas of disease and healing.

The lessons here are that we must be critically aware of how our historical and cultural location conditions the ideas of disease that we attempt to incorporate into a theological interpretation. We know well how this affects our theological interpretation of homosexuality. We want to avoid

the kind of interpretation that we find in Thomas Aquinas' *Summa Theologica* 2-2 (153–54), where he judged, as Engelhardt writes, that, "all things being equal, masturbation is a greater sin than a naturally performed rape" (1996, 198). We can ascribe this to his metaphysical position, but it is also rooted in his historical and cultural location. As recently as the 1860s, physicians in Europe practiced clitoridectomy to cure women of the disease of masturbation (1996, 192). To refresh our minds on how recently this happened, remember that Abraham Lincoln was President of the United States 1861–1865.

Why cite such indelicate and disturbing examples? Because we do not experience disease as an empty abstraction. It is a concrete experience, and ugliness is one of its characteristics. Our theology must recognize this fact. At the very least, these examples, as repugnant as they seem, demonstrate how fragmentary the insights and great truths of even our greatest thinkers and practitioners are. Our critical awareness on this point may prevent us from giving too weighty theological credence to relative judgments, but, more likely, it will also move us to incorporate some kind of diversity and multicultural pluralism and critique in our theology of disease.

Changing Paradigms of Medicine. Our perspectives on HIV/AIDS will necessarily give considerable weight to the medical understanding of the disease, and our understanding of disease in general will to a greater or lesser extent do the same, depending on the disease and the situation. Consequently, third, our attempts to fashion a theology of disease must give attention to the paradigms that govern the practice of medicine itself. Terms like *medicine* and *the practice of medicine* do not refer to a static, abstract thing or set of practices but rather to a constellation of knowledge and practices that are in the process of redefining themselves. A theology of disease that relates itself to medicine must take this dynamic and unfinished character of medical practice into account. Furthermore, to the extent that a medical paradigm influences our perspectives on HIV/AIDS, changes within that paradigm are important for us.

Robert Potter (1991) documents how in the last twenty years the paradigm within which medicine is practiced has moved from the orthodoxy of a biomedical model to the recognition of a biopsychosocial model. He joins with Harold Koenig and others in moving further, into a model that incorporates spirituality, in their *Handbook of Religion and Health* (Koenig, McCullough, and Larson 2001). In that same volume Jeff Levin speaks of the "body-mind revolution in biomedical science several decades ago, which radically transformed the clinical practice of medicine and medical education." Now, Levin asserts, "the arrival of a newer and broader body-mind-spirit perspective promises to transform medicine and medical research just as radically" (p. viii). Potter likens this to a paradigm shift from modernity to postmodernity.

Theologian Ann Pederson, following ethicist Karen Lebacqz and speaking from her own experience of teaching in a medical school and a nurses' training program, speaks of this paradigm shift in large terms that pertain not only to the practice of medicine by physicians but also to caregivers, including nurses, and to the formation of healthcare policy as it affects patients, families, and communities (Pederson forthcoming). Pederson analyzes the paradigm shift in medicine under four rubrics: (1) health is a broader concept than the traditional medical model allows for; (2) human health is linked to ecological/cosmological health; (3) in matters of health, women (and I would add children) are comparable to the canary in the mineshaft in that they provide early signals for judging the health of the larger community and of the planet; (4) there must be a coherence in how we approach disease and health among all sorts and conditions of people and in our approach to the different stages of the life cycle.

1. Health is a broader concept than traditional medical models allow for. Disease and health are relational as surely as they are physiological. In 1999, I visited a farm outside Harare, Zimbabwe. HIV/AIDS had so decimated this family that a grandmother was in charge of the farm, joined by two of her daughters and a small grandson in the actual farming. All of the men in this extended family had died of the disease. Terry Williams writes that "an individual doesn't get cancer, a family does" (1991, 214). We can just as well say that an individual doesn't get HIV/AIDS, a family and a community do. In Zimbabwe and certain other places, we can say that a nation gets HIV/AIDS. Kofi Annan and other African leaders have been trying to tell us in the West that an entire world gets HIV/AIDS.

2. Human health is linked to ecological and cosmological health. A strictly biomedical paradigm emphasizes that pharmaceuticals are essential for treating HIV/AIDS. We also know, however, that the pharmaceuticals require a certain kind of strong infrastructure of support persons who monitor the distribution and the taking of the medicines, teach afflicted persons how to take the medicines, and follow up on their progress. It is one thing to press Western pharmaceutical companies and governments to supply medicines for African nations; it is another thing to recognize that the necessary infrastructural supports may not be in place in Africa. The challenge of this disease is not that individuals are sick and need medicines supplied by generous persons in the West but that communities are sick and require the assistance of communities.

3. Women and children are the signaling "canaries." Miners in earlier times took canaries into the mines with them, in cages. If the canaries died in the mine shaft, the miners knew that toxic gases were present and it was time to get out. In Cape Town on December 1, 1999, the Parliament of the World's Religions gathered in its opening ceremony with all those who were marking International AIDS Day and the presentation of the AIDS Memorial Quilt. Many of the speakers that day were loud in their criticism of the South African government for not endorsing the treatments

for pregnant women who suffered from HIV/AIDS that would enable them to deliver babies free from the disease. The speakers charged that the government leaders were motivated to withhold medicines for the mothers because they knew that, if the babies were saved, the country would be faced in a few years with a colossal number of orphan children. The women themselves were clearly in great need, but they and the babies they carried within them were also signals of a disease that went far beyond their own bodies and even the bodies of their babies. They signaled a disease of the society, of the political structures of South Africa, and of the world that could not or would not care for this megadisease.

The lessons here are that, if we fashion a theology of disease, it must be large enough, capacious enough, to touch not only the changing paradigm of medicine but also the realities that are opened up by the changes in the paradigm. The provisional statement of the Evangelical Lutheran Church in America on "Health, Healing, and Health Care" points in the right direction when it asserts that an adequate approach to illness and health must give attention to the efforts of activism that advocate for the policies and sociocultural changes that are required to support genuine health (ELCA 2001, 13–14). HIV/AIDS reveals to us that these required efforts include attention to the corporate business structure, including the pharmaceutical and insurance companies, to the governments and their policies, to the infrastructures of society, and to many other facets of human life in community today around the world.

Medicalizing Language and Reality—Attempts at Totalizings. Tristram Engelhardt makes the point, both in depth and in breadth, that "medicine medicalizes reality. It creates a world. It translates sets of problems into its own terms. Medicine molds the ways in which the world of experience takes shape; it conditions reality for us" (1996, 189). It would be foolish to attempt to ignore this world of medicine when we fashion our theology of disease and when we approach HIV/AIDS in particular. Medicine may even be the single most salient element in our understanding of disease and our theology of disease. It certainly seems to me to be the dominant force in our society for understanding disease, and generally public policy seems to be dominated by the older, biomedical, paradigms of medicine. Therefore it is essential that we understand the medicalizing that medicine works on our reality—both in order to build upon it in our theology and also in order to free ourselves from its potential bondage.

Engelhardt suggests that medicine shapes reality through what he calls the "four languages of medicine." He enumerates them: disease language as evaluative, as descriptive, as explanatory, and as shaping social reality (1996, 196). These categories are useful for our theological thinking and also for interpreting HIV/AIDS.

First, medical language is a language of *values*. When we speak of disease, we assert that something is wrong; disease is a disvalue. Disease refers

to some sort of failure. It may be a failure to achieve a condition free from pain or anxiety; this failure may be called suffering. Or, it may be failure to reach a level of beauty and grace, such as a deformity; or, failure to function normally; or, failure to reach an expected life span. These failures may be seen as pathologies or as problems to be solved. "The central point is that we encounter diseases, illnesses, disabilities, sufferings through a web of important values" (Engelhardt 1996, 206). When we say that a person is diseased, we are making a negative value judgment of some sort. It may be nonmoral; we disvalue broken legs, but generally we do not make a moral judgment against the victim. But it may also be a moral value. Health is often considered a moral value when it comes to smoking behaviors, to alcoholism, and, even more, to HIV/AIDS. We may not make a moral judgment about liver disease or emphysema, but people often intertwine those diseases with moral judgments about drinking and smoking. Quadriplegic activists and deaf mutes have in recent years made it very clear that they often feel disvalued as persons because of their afflictions. Handicapped persons and deaf people mostly want to be enabled to live with their diseases, not segregated as people whose value depends on their being repaired. This may also apply to persons with HIV/AIDS.

Disease language is *descriptive*, with no intended value judgments. But values do enter into our efforts to standardize descriptions and treatments. And descriptions raise expectations that are value-laden.

Disease language is *explanatory*. Medicine has made spectacular advances because of its increased power to explain the causes of diseases. The focus then becomes the nexus of causes and manipulating the causes so as to cure the diseases. The causal network becomes the essence of a disease. Disease tends to be not what the patient feels, nor the patient's disrupted network of relations in family or community, not even the patient's pain. The disease lies in the causes of the pathology, and that is what healing focuses on. Focusing on causes enters the realm of values, because there is pressure to do more research in order to understand the causes more fully. This has been very important in the HIV/AIDS context. Furthermore, there is the expectation that if we know the causes we can cure, and everyone ought to be cured. Responding to these pressures, we promise ourselves that HIV/AIDS will be cured one day, and that cancer, diabetes, cystic fibrosis, Parkinson's disease, and many other diseases will be cured. The pressure to do more research and find a cure and effect the cure becomes moral pressure. When I take my car in for service, I expect the service people to discover the causes of its malfunctioning and to repair them. That creates a value-laden situation which is nonmoral in character. When the same procedures involve human bodies, they are transformed into issues of moral value.

Disease language *shapes our reality*. When we are told, "You have cancer" or "You have AIDS" or "You are fifty percent disabled" or "You will

not recover from this ailment," our reality is changed. We are moved into a specific social category, a pigeonhole, with certain prescribed benefits and certain prescribed limitations.

Our theology of disease needs to take the medical languages of disease seriously, both positively and critically. If the medical language speaks of terminality, suffering, and disability, we need to develop theologies that can respond positively and constructively to those realities. Our theology of disease should motivate and inspire active work in the world in behalf of health. We will also want to respond critically to what the medical language leaves out or distorts. Medicine cannot, for example, teach a person how to die, even though death awaits us all and bonds patient, physician, and caregiver as nothing else does. Our theology of disease needs to include death in its purview.

Medicine may be more oriented toward expensive procedures for the well-to-do few than toward public health services for many who are poor. Or it may focus on diseases that seem more glamorous or that can attract more research dollars. Our theology will include critique of inequalities and underscore the drive for justice.

Theologizing Disease

I have focused on the medicalizing of disease. Disease is also, of course, legalized, as when stem-cell research on Parkinson's disease is legally regulated. Disease is commercialized, by hospitals that must abide by the bottom line and by pharmaceutical and insurance companies that must bring a return to their stockholders. Disease is politicized when it requires the interventions of elected officials. Disease is bureaucratized or institutionalized when caregivers must structure their caring through organizations, private and public. On one hand, theology of disease must take all of these "izings" into account, because they constitute much of the real world of disease. People do not suffer diseases abstracted from medicine, law, commerce, politics, and bureaucracies.

On the other hand, theologizing disease should carry its own distinctive marks as well. What are those marks?

Theology will recognize the significance of *fragment* and work from that basis. What do I mean, fragment? Disease reminds us that we live in fragments and that we are ourselves fragments. Disease reminds us that we are a fragment of what we seem created and destined to be. If I am disabled, I know that my body is created for more, for ability rather than disability, but I live in that disabled fragment. If disease lays me up for a period of time, I recognize that I am losing the days of my life, and I must settle for the fragments of time that I have. If disease takes friends and loved ones from me, or leaves me in a solitary, shut-in situation, I recognize that my community has been fragmented and that I must live in the

fragment of community that is available to me. If disease weakens me to the point where I am more dependent on others to care for me, I recognize that my autonomy is fragmented and that I must live in dependency and give thanks for those who care. If disease thwarts my plans and my hopes for my life, I recognize that plans and hopes are but fragments, and I must work out my destiny in fragments. If disease is bringing my life to an end, I recognize that lifespan is a fragment; even a span of fourscore years and ten is a fragment.

In these fragment situations, theology will focus on the question, fragment of what? My depleted energies, my depleted autonomy, my solitude and even loneliness, my depleted dreams, my depleted life span—what are they fragments of?

The fragmentation of our lives through disease reveals to us that our lives are fragments of a larger and deeper healing. We are fragmented because we live our lives caught between wholeness and integration on one hand and disintegration on the other. Disease clarifies this for us, revealing to us that we live at a fundamental level within this dialectic of integration and disintegration. There are dimensions of integration and disintegration—organic, psychological, personal, communal, and spiritual—and each dimension opens a richer and deeper vista of the healing of which we enjoy only a fragment.

Finally, there is the historical dimension of disease and healing. This is the dimension that takes us out of ourselves and points beyond history. Christians refer to the kingdom of God, and they mean that the history we live in our lives and the history of our people and of our universe are fragments of a larger history. Jewish Kaballah traditions, and apocalyptic and eschatological visions, and the traditions of lament also point to this larger history.

Medicine, law, commerce, and bureaucracy do not speak of what lies beyond the fragment. The benefits they give us derive from their preoccupation with the one-dimensional here and now. This preoccupation also accounts for their demonic aspects. But they point to a richer set of dimensions, and that is what religion and theology speak of. On one hand, this focus on richer dimensions of the fragments of life relativizes the other worlds of medicine, commerce, law, and bureaucracy, relativizes them by saying that they are not enough. This is also a critique of those worlds, and the critique is not all from the outside; the work of Koenig, Potter, and others too numerous to mention is critique and reform from within. Many people within the world of medicine are redrawing the paradigms under which medical practice proceeds and giving attention to alternative medical philosophies and practices. Of course, the world of commerce, law, politics, and bureaucracy must also entertain alternative paradigms, and we know that some people within these worlds are working for the reform of theory and practice.

This focus on the richer dimensions beyond the fragment brings wholeness and healing, because such dimensions testify to the fact that the fragment has meaning and purpose, even when we do not see it. Meaning is wholeness, because it holds that disintegration does not finally define us—or the rest of the creation.

It may be that theology can make its most forceful witness to meaning and to the belief that the fragments of life share in meaning by speaking of death and dying. A theology of disease will teach us about death and how to die, because otherwise we will not know how to live in a diseased world. In reflecting on death, we can advance our belief that disease does not, finally, define us. American society badly needs instruction on how to die. Czech novelist Milan Kundera reminds us that all societies need this instruction. Death is perhaps the single most certain reality that all humans face, and it is also perhaps the single reality which we try hardest to ignore or deny. I recommend Kundera's novel *Immortality* (1991) for a stunning portrayal of our unwillingness to face death. We expend enormous amounts of money and energy in strategies of ignoring and denying death. And a great deal of that energy and money is channeled through the practice of medicine in its fight against disease.

All of these considerations raise the question of God—because, if fragments do cohere with something, if they are fragments of something, if they do mean, then God is real, because God *is* that meaning and that coherence. Saint Paul pointed in this direction when he preached to the Athenians that we "live and move and have our being" in God. He said it even more vividly in Romans, when he wrote, "Whether we live or whether we die, we are the Lord's." The process philosopher Charles Hartshorne made the point in this way: "We belong to God and God never dies. That is all we need to know." Nowhere is this belief more relevant than in the consideration of HIV/AIDS.

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THE PASSION TO HEAL: A THEOLOGICAL PASTORAL APPROACH TO HIV/AIDS

by Joseph A. Edelheit

Abstract. The global pandemic of HIV/AIDS is the most significant challenge of our time. The ongoing conversation between religion and science comes to a critical juncture in this pandemic. The global community has not yet found a vaccine or cure for this virulent virus, which will likely claim five million more lives in the coming year. The global statistics challenge even the most sophisticated imagination, with projections in the tens of millions of people dead, orphaned children, and many more living in various stages of incapacitation or diminished lives. There is a common prophetic religious imperative among Western faith communities that urgently requires both science and religion to respond. Both disciplines define their scope and purpose as universal, and the global pandemic provides a significant challenge to that universal claim. Regardless of the many differences among the nations and peoples challenged by this pandemic, there is a common moral foundation to which the Western religious and scientific traditions must respond. Religion and science cannot deny their respective social responsibilities by claiming the role of neutral bystander. There are several critical ethical choices to be made in response to the pandemic, and the disciplines of religion and science are critical in formulating those choices.

Keywords: biblical prophetic imperative; ethical challenges; global HIV/AIDS pandemic; Abraham J. Heschel; pastoral theological responses to global HIV/AIDS; prophetic responsibility; religion-science conversations.

If twenty years ago someone had been able to get our attention about the full impact of HIV/AIDS globally, would we have known how to understand? The answer, of course, is that colleagues like Jonathan Mann, of

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blessed memory—at that time director of the World Health Organization HIV/AIDS division and later head of Harvard's HIV/AIDS program—did try to warn us, but our denial, shock, anger, and grief were so overwhelming that we heard words and statistics but did not know how to understand. Now, in the twenty-first century, the numbers and projections are so large that even twenty years of perspective makes us numb with disbelief. HIV/AIDS is a consistent priority only within certain communities of concern, while it remains on the border of civility among far too many people. Take the current White House, for instance; given the horrific distraction of September 11, 2001, and the war on terrorism, and then the preemptive war against Iraq, HIV/AIDS has totally fallen off the agenda. We can only wonder whether the Bush administration would otherwise have taken a different position about its importance. Such speculation, of course, is an intellectual and political mind game, something that AIDS activists have argued governments throughout the world have done for more than twenty years.

The present conference is of vital importance. HIV/AIDS needs a public stimulus, a reaffirmation that both the religious and scientific communities can share with integrity. Such a statement would have a significant impact, because religion and science often have been mischaracterized as polarized and fundamentally in conflict. The current malaise and continued denial about the urgency of this global pandemic requires that our disciplines model a concerted effort to forge a moral imperative that cannot be ignored. During this period of indifference, transmission of the virus continues to increase, infecting several new non-Western communities. The crisis requires that we articulate an imperative that illuminates our global interdependence, a shared discourse that emphasizes the universal scope of our responsibilities, and a vision that affirms a fundamental commitment to the plurality of truths that anchor both science and religion.

I suggest that we unpack the title of this conference, "Toward a Theology of Disease." If we use a pastoral theology with its practical application and a reality of urgency as its base, we will find a discourse out of which we can mold such an imperative. A pastoral theology expresses a common discourse that clergy and healthcare workers use in which those most directly impacted by HIV/AIDS, patients and their families or communities of concern, are the shared point of reference. A pastoral theology is radically relational, emphasizing the presence and possibility of healing from within the multiple relationships of patient, physicians/healthcare workers, clergy/chaplains, family/community, and God/the Holy. In every culture, regardless of how religion or spirituality is experienced, the pastoral expression of healing is rooted within these multidimensional relationships and, as such, illuminates the fundamental nature of life as radically relational. If we understand the relationship between religion and science as parallel to clergy and physicians, our dialogue can focus on the critical

need for any joint imperative to express that the fundamental human experience of life as radically relational has a particular claim on our attention within the global pandemic of HIV/AIDS. Such a claim is prophetic in every sense of the word.

Abraham Joshua Heschel, a rabbi, theologian, biblical scholar, literary master, and prophetic social critic, provides us with a valuable starting point. In "The Patient as a Person," a paper delivered in 1964 at an American Medical Association convention, he argued for medicine to acknowledge the prophetic role of the physician and the humanity of the patient:

> Medicine is more than a profession. Medicine has a soul, and its calling involves not only the application of knowledge and the exercise of skill but also facing a human situation. It is not an occupation for those to whom career is more precious than humanity or for those who value comfort and serenity above service to others. The doctor's mission is prophetic. Humanity is an unfinished process, and so is religion. The law, the teaching, and the wisdom are here, yet without the outburst of prophetic men coming upon us again and again, religion may become fossilized. Nature has marvelous recuperative power, yet without the aid of the art of medicine the human species might degenerate. There is a prophetic ingredient in the calling of the doctor. His vocation is to prevent illness, to cure disease, to lessen pain, to avert death. The doctor is a prophet, a watchman, a messenger, an assayer, a tester. (Heschel 1966, 28)

I am drawn to Heschel's insights (despite his male-only references; gender, of course, does not define the role of the doctor). Heschel's analogy has not diminished in nearly forty years, although medicine has changed dramatically. The prophetic role is radically relational, urgently demanding that the community engage with the presence of the Transcendent, affirming a fundamental relationship. Medicine ideally assumes a similar relationship when, as humans, we experience illness and suffering and yearn for the presence of hope. That hope is made incarnate in the physician, who, as the technician of medical knowledge, is granted authority and an intimate role. Heschel argues, "In treating a patient he is morally involved . . . the doctor enters a covenant with the patient; he penetrates his life, affecting his mode of living, often deciding his fate" (1966, 31). The relationship between science and religion is fused by their common concern for healing, and that concern offers us the pool of moral insight to forge an imperative for today. Heschel could not have imagined a pandemic beyond biblical dimensions when he expressed the following to doctors in San Francisco, an initial epicenter of AIDS twenty years later:

> The process of healing is war, and the first casualty when war comes is moral pretentiousness. Sickness ought to make us humble. In a world where recklessness and presumption are the style of living, and callousness dominates relationships between man and man, sickness is a reminder of our own neediness and extremity, an opportunity for the cynic to come upon the greatness of compassion. . . . [F]rom the perspective of the love of God, the work of healing and the work of religion are one . . . it is a grievous mistake to keep a wall of separation between medicine and

religion. There is a division of labor but a unity of spirit. The act of healing is the highest form of *imitatio Dei.* To minister to the sick is to minister to God. Religion is not the assistant of medicine but the secret of one's passion for medicine. (1966, 32–33)

That secret passion—the calling to serve, to heal, to share the suffering of others—fundamentally links science and religion through a pastoral theology and simultaneously offers us a common prophetic role in response to the HIV/AIDS pandemic. That shared context is, ironically, found in an eighth-century B.C.E. Israelite prophet, Amos. The biblical text provides a religious/moral imperative in international terms. Amos is the first biblical prophet to acknowledge that the world around ancient Israel and Judah was of no less concern to the God of all peoples. By establishing a universal moral standard, the prophet's imperative moves beyond a mere communal indictment to be inclusive of the way all should behave. Heschel writes that the prophet was responding to a divine pathos, an insight into God's concern for the plight of the community. "Justice is more than an idea or a norm. Justice is a divine concern. What obtains between God and His people is not only a covenant of mutual obligations, but also a relationship of mutual concern. The message of God is not an impersonal accusation, but the utterance of a Redeemer who is pained by the misdeeds, the thanklessness of those whom He has redeemed" (Heschel 1962, 32). Amos indicted the surrounding countries for international crimes, "although there was no law in existence governing international relations . . . here a conception of law was expressed which was binding for all men, though it was not formally proclaimed" (1962, 32).

The prophet brings the presence of such transcendent justice into the communal reality. Amos is the first to articulate the outrage as universal. "'Are you not like the Ethiopians to Me, O people of Israel?' says the Eternal. 'Did I not bring up Israel from the land of Egypt, and the Philistines from Caphtor and the Syrians from Kir?'" (Amos 9:7 JPS) The prophet uses the nations surrounding Israel to put Israel's relationship with God into a universal context, emphasizing that the standard of justice is for all communities. Using Ethiopians, a people physically different in skin color and used in that age as slaves, and two historic enemies of Israel, Philistines and Syrians, Amos demands that all people be engaged on the same level of moral responsibility. "The God of Israel is the God of all nations, and all men's history is His concern" (Heschel 1962, 33).

Prophetic presence highlights "the plight of man . . . not the mysteries of heaven, the glories of eternity, but the blights of society, the affairs of the market place. . . . The predominant feature of the biblical pattern of unassuming, unheroic, inconspicuous piety, the sanctification of trifles, attentiveness to details . . ." (Brown 1985, 132). Heschel describes the passion of the prophets as "moral madness" which leads them to moral outrage stimulated by the times in which they live. The theologian was always a

rabbi who modeled his prophetic insights, participating in the civil rights and anti-Vietnam War movements. I can only imagine how he might today place himself among AIDS activists, and though the following is particular to thirty years ago, its prophetic tone of moral madness is the model I would seek for our imperative on global AIDS:

> . . . the mire in which we flounder threatens us with an even greater danger. It is the dilemma of either losing face or losing our soul. To speak about God and remain silent on Vietnam is blasphemous. Has our conscience become a fossil? Is all mercy gone? O Lord, we confess our sins, we are ashamed of the inadequacy of our anguish, of how faint and slight is our mercy. We are a generation that has lost the capacity for outrage. (Heschel, quoted in Brown 1985, 136)

The current condition of HIV/AIDS as a global threat surely would have pushed the ancient prophets into ravings of moral madness, and their model is valuable as we attempt to push against the walls of denial and destructive indifference. In the following words from the Presidential Advisory Council on HIV/AIDS one can hear some muted prophetic rage.

> At the dawn of the new millennium, there is no threat to the global community that demands more urgent leadership than HIV/AIDS. . . . Many leaders have used such terms as "state of emergency," "national security risk," and "global economic crisis" to describe this pandemic. Globally, the communities with the most significant increases in new infections are most often poor, and in many of Western/developed nations, these are also communities of color. Exacerbating and fueling the HIV/AIDS pandemic are the social viruses of racism, sexism, poverty, and homophobia. People around the world still face both individual and community barriers to honest and open discussions about sexual behavior, sexuality, and substance use/abuse. And we have neither a cure nor a vaccine to protect ourselves from the lethal mixture of disease and apathy. At this moment in history, the threat of HIV/AIDS challenges the entire human community and thus our global society. In an increasingly interconnected world, there are no safe havens. All peoples and communities, regardless of our many differences, are confronted by the same peril of physical and social devastation. No longer can each community or nation afford to respond in isolation. As a global community, we must accept the obligation to develop and implement a *shared global response and action* plan, acknowledging that the differences of race, sexual orientation, gender, culture, religion, and politics that so often divide us do not differentiate the universal human experiences of suffering and hope. (Presidential Advisory Council 2000, Preface)

This passionate declaration of universal urgency was quantified exponentially in Barcelona in the summer of 2000. Even more alarming, if that is possible, are the projections from the National Intelligence Council. This think tank of academic, private, and governmental analysts argued that by 2010, five nations with 40 percent of the world's population will have more HIV infection than any other five nations in the world. Russia, Ethiopia, China, Nigeria, and India are projected to have an estimated 50 to 75 million infected people. The council provides security information for the CIA, arguing that the rapid infection rate will pose potential security threats to their regions and to the United States. "For instance, the

AIDS epidemic in Russia is likely to help shape how that country emerges in the post-Soviet era" (Annan 2002). If these projections hold, we will jump from a global society in which there are 14 to 23 million infected persons—an increase in eight years of more than three times the number of people coping with the virus. If this information is valid enough to share with the CIA, we must accept that these five nations will at minimum double their infection rate within the next ten years. Amos's words ring with an immediate clarity, "To Me, O Israelites, you are just like the Ethiopians, declares the Lord" (Amos 9:7 JPS).

Given our many different distractions—terrorism, war, the economy, myriad domestic issues, and a political system that is prone to evaluating certain issues as either liberal or conservative—how will the issue of HIV/AIDS receive appropriate ranking? The answer is prophetic imperatives from coalitions of diverse persons from within as many countries as possible. AIDS activists will need to be jailed, as in China. They will need to insist again that AIDS is not a momentary crisis about gays or drug users or poor Africans. We must demand that, until AIDS as a global issue receives the policies, funds, and awareness proportionate to the number of infected and dead, we are morally derelict as a human community. Few of us at this conference may have any question about the absolute globalization of HIV/AIDS, yet it fails to register among many significant social observers of our time.

Thomas Friedman has become a noteworthy spokesperson of contemporary globalism. His award-winning books and columns in the *New York Times* have been instrumental in setting the discourse, both positively and negatively, about globalization. He writes in an updated introduction to *The Lexus and the Olive Tree*,

> Globalization is not the only thing influencing events in the world today, but to the extent that there is a North Star and a worldwide shaping force, it is this system. What is new is the system; what is old is power politics, chaos, clashing civilizations and liberalism. And what is the drama of the post–Cold War world is the interaction between this new system and all these old passions and aspirations. It is a complex drama, with the final act still not written. (Friedman 2000, xxi)

There is not a single mention of HIV/AIDS in the entire book. I surely would have thought that a sophisticated observer of global events would have used the pandemic as a prime example of this paradigm shift.

HIV/AIDS continues to demand that we not become distracted by boundaries of any kind—racial, ideological, socioeconomic, or cultural. We already have faced several challenges in which our "global" perspective on medicine, treatment, and prevention has demanded that we look beyond local answers. The absence of HIV/AIDS in both Friedman's original and updated texts is a significant example of either denial or indifference about the global reality of the pandemic. Following 9/11, Friedman wrote,

But maybe the most important reason why globalization is alive and well post-9/11 is that while pampered college students and academics in the West continue to debate about *whether* countries should globalize, the two biggest countries in the world, India and China—who represent one-third of humanity—have long moved beyond that question. They have decided that opening their economies to trade in goods and services is the best way to lift their people out of abject poverty and are now focused simply on *how* to globalize in the most stable manner. (Friedman 2002)

It amazes me that Friedman, who was so astute in 2002, has missed that India and China are two of those areas of new transmission and infection, and the projections of UNAIDS is that both of these countries are unprepared for the full impact of AIDS. How can we be so out of touch that a 2002 Pulitzer Prize winner for news commentary can assert that an economic process of globalization can move ahead even, as Kofi Annan said on 14 October 2002, as "China stands on the brink of an explosive AIDS epidemic, and has no time to lose if it is to head off vast social and economic costs from the disease"? United Nations officials have warned that 10 million Chinese could be infected by the end of the decade (Annan 2002). After years of denying that AIDS was a problem, China now admits that one million people are infected. How are we to understand Friedman's insights into globalization after such dire projections by the UN?

The prophetic issues that face us go far beyond moral recognition of the suffering or another "state of emergency" regarding prevention. The prophets' role was to push their communities about the fundamental ethics with which a civilized community must live to survive. How much longer will this community wait to determine the complex questions about any vaccine to be created? Here is a problem on which surely science-and-religion can and must take the lead. Given the most recent spate of corporate corruption, including a certain high-profile biomedical company, why are we not demanding that there be a public clearing house for the ethical debate over vaccine testing, ownership, and, most seriously, profit margin? Mann warned us fifteen years ago that the most pressing ethical questions of the twenty-first century would be raised by the AIDS pandemic. Here are the realities of multinational companies determining the economic and healthcare fates of literally millions of people. We already have had several conflicts with Africa and the need for drugs that move outside the rights of "intellectual property." In 2000, a professor, Yale University, and Merck were all engaged in a struggle to determine the value of a discovery and the ethical imperative to help poor infected people.

These are among the most vexing issues raised in the concluding chapter of *AIDS in the Twenty-First Century: Disease and Globalization* (2002) by Tony Barnett and Alan Whiteside, scholars who have dealt with the African pandemic.

> Nowhere more than . . . in the HIV/AIDS epidemic can we see the need to begin creating a "global civil society" and the inadequacies of our existing arrangements. . . . HIV/AIDS is a problem that is not handled easily by the mechanisms and methods of the nation state. It has drawn out from the world community a response that depends on fluidity rather than extreme bureaucracy. . . . This could go far beyond HIV/AIDS towards an engagement with global public health. (2002, 356–57)

Among the specific "systems" needed with the globalization of AIDS are "development of international agreements regulating prices of medications in different markets" and "recognition that management of health and well-being is a common human project and that the for-profit sector can only have limited incentives to meet those needs" (2002, 357). We require more than two African social scholars to challenge the global economic markets and say that AIDS is morally off limits for profits! When will science, the community from within which the discovery will eventually come, demand of itself an ethical standard that the global corporations will not demand? When will the religious community find the voice of moral outrage that it used during the quest for civil rights? Surely science and religion can model a coalition of people committed to a reasonable replacement of research and development funds that will not make this pandemic a boundless opportunity for corruption and unnecessary profits. Let science and religion go together to the governments, to the UN, and to the multinational pharmaceutical companies with an ethical standard. Let us be prophetic as leaders.

Barnett and Whiteside conclude with a prophetic imperative: "Human beings have rights. We began this book with an African woman pleading that 'people are dying,' '*Abantu Abaafa*'; we end by taking her plea further: to recognize the importance of '*ubuntu*,' an African idea, that we are only people because of other people. We are all human and the HIV/AIDS epidemic affects us all in the end" (2002, 365).

We cannot reaffirm often enough the absolute truth that "this pandemic reveals that everyone on this planet is interconnected—not always in ways that are clear or direct, but in ways that have medical and political consequences that inexorably unfold" (Patton 2002, xxvi). Cindy Patton, of Emory University, is someone who has charted AIDS from within the Centers for Disease Control and Prevention and the World Health Organization. She adds this affirmation of our interconnectedness:

> The role of broad systems of medical thought in framing our understanding of our bodies and our places in the HIV pandemic is large. There is no "outside" to scientific thought. A brilliant series of cascading representations, science is made of the best thought of our day, even as it reshapes our vision of the physically possible. The way ahead is one that joins the work of science, in its many registers and modes, with the political sensibilities that have arisen from critical analyses of science, of politics, and of experience. For many of us, "AIDS" has long been and may always be the defining experience of our time. But the paradoxes, tragedies,

and frustrations that have marked our time and our place also connect us to many other world-epoch-defining experiences. (Patton 2002, 132)

Among the most critical connections with science is the dialogue with religion. That dialogue between science and religion is of particular importance as a bridge of knowledge and hope at this particular time. Once again we stand as a human community on a ledge of violence and war, even as poverty and disease threaten the infrastructures of our societies. Our disciplines embody centuries of different perspectives on "truth" as well as the experience of how to adapt knowledge during times of crisis. We cannot wait any longer, having conversations that do not lead to action. HIV is not merely an academic topic for intellectual consideration; it is a virus for which we have neither vaccine nor cure. If even the most conservative projections are applied, there will continue to be millions who suffer and die, while even greater numbers are orphaned and immeasurable stress is added to health care, poverty, and fragile democracies. How many millions will perish in this pandemic before we acknowledge that we have been too late with our response?

Heschel was particularly concerned with the human frailty of being too late. He relates the following tale of how he came to understand his own prophetic impulse when he was only seven years old while studying with a rabbi in Poland. They were studying the Akedah, Genesis 22 from Hebrew Scripture, the story of the sacrifice of Isaac. Heschel reconstructs the scene:

> Isaac was on the way to Mount Moriah with his father; then he lay on the altar, bound, waiting to be sacrificed. My heart began to beat even faster; it actually sobbed with pity for Isaac. Behold, Abraham now lifted the knife. And now my heart froze within me with fright. Suddenly the voice of the angel was heard: "Abraham, lay not thine hand upon the lad, for now I know that thou fearest God." And here I broke into tears and wept aloud. "Why are you crying?" asked the rabbi. "You know Isaac was not killed." And I said to him, still weeping, "But rabbi, supposing the angel had come a second too late?" The rabbi comforted me, and calmed me by telling me that an angel cannot come late. Then Heschel would add to whomever he was speaking, "An angel cannot come late, my friends, but we, flesh and blood, we may come late." (Brown 1985, 138–39)

So it is with HIV/AIDS. Will we realize that we came too late regardless of our stated concern? We must be willing to risk some "moral madness" and find out whether we are a generation still capable of expressing moral outrage. These conversations must reach beyond the safety of these rooms into the reality of a suffering world. Will the Western faiths of Christianity and Judaism have a blessing to give those who do not share our Scripture, our perceptions of God, or any of our rituals of healing and consolation? Are we too late in realizing that if we are not all to be blessed by and through each other's humanness, then surely even the angels will be too late this time?

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IS THERE NONE LEFT TO SAY ANYTHING?

by James F. Moore

Abstract. Remarks made by Lutheran leaders in Africa indicate that the churches have not been responding to the crisis of the HIV/AIDS pandemic sufficiently. In this essay I ask how the churches would be better prepared to act and also, more broadly, how the churches act to begin with. The dialogue between religion and science can assist us with both tasks as we consider the challenge of HIV/AIDS as a focus for this dialogue. First, analysis by social scientists can uncover what problems face any effort to motivate churches to act—and, for that matter, any individual member of a church group. I argue, further, that we can discover the difficulties associated with producing action by religious communities by looking not at abstract theological ideas but by investigating the way those ideas are conveyed in worship. I explore the worship patterns of Lutherans to show what sort of view is actually produced by the week-to-week messages of liturgical texts. I contend that a different approach both to worship and to action can be produced by reconsidering our views of reality as seen through the eyes of contemporary science.

Keywords: compassion; HIV/AIDS; inclusive worship; Martha Nussbaum; stigma; worship.

In the summer of 2001 a number of leaders from the Lutheran churches in Africa gathered and issued a statement of apology for not acting appropriately to meet the crisis of the spread of AIDS in the region and vowing to do better in the future. Such statements are good as such, because they acknowledge that something has failed in the churches. Even so, the crisis in Africa is now so severe that we are left wondering who is left for the churches to respond to. The statement is similar to the indicting epitaph

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that Martin Niemoeller left as he commented on the response of people in Germany in the aftermath of World War II and the Holocaust (Rittner, Smith, and Steinfeldt 2000, 57, 63). People do not respond, it seems, until they experience the impact themselves, and by that time there is no one left to respond.

The issues concerning the churches and their response to the AIDS pandemic are deeply rooted in social, political, and theological factors. My presentation focuses on the theological, with the goal of thinking beyond the apologies and toward the real factors that contribute to inaction and might, if addressed, change the outlook for the future. In fact, the theological issues have to do with several levels of engagement with the problems—the ecological, the moral, and the religious. The interactions of these three levels in a theological perspective are so intertwined that it is false to assume that they can be treated independently, but through such analysis we can more easily see the problems that haunt the theological treatment of disease in the twenty-first century and move to a different sort of stance.

Briefly, I argue that the *ecological* level of engagement has to do with the way that religious communities act as a rule. This style of acting leads from the way such communities define themselves and any others, as well as the way that this defining leads to a particular kind of acting toward the world. The *moral* level has to do with a historical, traditional way of thinking about certain behaviors that even in the most liberal groups has led to a confusion about acting. The African or the Thai settings are surely very different from the United States in their respective traditional moral cultures, but the confusion persists, I think, and plays out in specific ways depending on which religious tradition we speak of. The *religious* level of response is linked to particular ways of understanding sin (or transgression, or inappropriate living), which tends to be connected with a broader understanding of the sacred, human destiny and "divine" justice. Already we can see how the three levels of concern are linked and the way that each determines, in part, how any one comes to understand the other two.

The Ecological Level

The first level is the most basic but also may well be involved with the most important shifts required to change our theologies of disease. I am most interested in the way that religious communities act as communities, and not so much in the larger national and international structures, which have their own policies and forms of operating that have to do more with how bureaucracies operate. This concentration on local practice links with the way theologies are done in practice as well. I return to that matter later on.

I am reminded of the advice that a bishop gave to me on the occasion of my installation in a local parish. He told me that any successful ministry is based on two things: conducting effective worship and contact with parishioners. I discovered that the first of these is critical only at certain

periods in the cycle of religious observances that make up the church year. Of course, most of the major religious traditions also have such a cycle of events that form not only the symbolic pattern of community worship but also the concrete occasions when the community actually gathers to act together. Let us assume that these principal occasions mark critical events that help to define the local community and are repeated in particular ways at more regular events of worship.

The second piece of advice was intended to encourage me to actively visit members of the church community. Over time, I took that to heart and did it consistently. Again, however, this pattern of visiting, meant to personalize what the church community represents to the individual members, is symbolically represented in particular life occasions that are celebrated as important turning points in the lives of individuals and families. These events—deaths, births, marriages—also can crystallize for us how that community acts in personal ways.

So, in key worship events and key life-cycle events, the community acts on behalf of its official members even if this rule is broadened to include others. That inclusion happens as if the others are for the moment members. That is how these events are conceived and understood as communal.

My concern is to think about how the religious community acts, and this simplification of the activity of the community is intended to help us focus on those activities that are fundamental in shaping the sense of community as such and, with that, the way the community acts in general. Of course, communities such as churches do act in other ways, some of which are generally social, in a variety of meanings of that term, and some that have to do with acting to conduct the business of the community. I do not exclude these activities and believe that the first of these, social activities, is precisely what the leaders of the Lutheran churches in Africa were thinking about when they confessed their ineffectiveness of action to confront the issue of HIV/AIDS. These communities do act to address social concerns, sometimes spontaneously and thus sporadically and sometimes within an organized pattern. I would argue, however, that these actions are understood within the communities as an outgrowth of the sense of community formed in regular worship and the personalized sense of community represented in life-cycle events. Thus, the belief is, no matter if this is accurate, that social (that is, moral) activity comes from the spiritual sense of community formed in the primary ways that the community acts.

Worship as Action

Worship patterns are too complex for us to discuss in any complete way here. My hope is that, by choosing some patterns, I can uncover critical matters for constructing a theology of disease. I choose the act of prayer as an example and add to that the use of texts that are considered to be sacred by the community. These two worship activities are reasonably broad so as

to connect with specific acts of different religious communities, including most of the major religious traditions. I focus on group prayer, which may be prayer recited by the group or an assigned prayer ritual that is commonly recited by all individuals in the group. The use of sacred texts is also quite varied in practice and may be formalized in worship patterns, but it also may be integrated into other parts of worship practice such as in prayers or in singing or chanting.

My contention is that both prayer and use of sacred texts are designed as a regular part of worship practice that aims to identify the members of the community as a distinct group (perhaps as part of a larger religious community, but with a well-defined identity). The act of prayer is more fluid in some cases, as it may have the character of extending the concern of the group beyond the bounds of the group and its identity, but the idea of prayer is clear. Prayer serves to reemphasize the relationship between the community and the sacred, the divine, and in so doing mark the community as special (perhaps not necessarily unique, but special). Prayer has an outward form of petition or extending beyond the interests of the group (indeed, maybe designed to turn the attention of the group outside of itself but in such a way as to make that idea of the community integral to the community's identity). Thus, the function of prayer as an act of the community appears to be to reinforce group identity in particular ways.

If the function of prayer appears fluid, the function of using sacred texts is more obviously defined. Of course, any text, even in quite explicitly defined worship contexts, has its own status with a potential for many possible meanings. Thus, those same texts used for the purposes of doing theology will function differently, since a text has the potential for multiple interpretations. That is not evident, however, in most uses of sacred texts during worship. The text is again used to define communal identity through a regular pattern of the recitation of key texts—that is, those texts that are key for defining communal identity. All of this also presumes communal acceptance of the texts as sacred.

The result of this pattern is that worship is an occasion for defining group identity, and this results in an intentional creation of boundaries: this is us, and they are not. This making of boundaries does not have to be malicious, but it is nevertheless central to the way communities act as communities. This is also related to the way communities justify their actions and also conduct self-criticism. I am always amazed by those who believe that it is critical for a community that defines itself as religious to constantly be involved in deciding what that means (my university, Valparaiso, regularly attempts to define what it means to be a Lutheran university). It is also interesting that those who take this task with great seriousness also believe it is important for self-identity to know. Can we argue that there is a Lutheran way of thinking and acting that is distinctive? I have no doubt that such arguments can be constructed, but the point I am making

is that the need to focus attention upon identity as a central concern for religious people is cultivated over and over again in practices of worship. I am already projecting the matter of the way religious communities do things as an issue, because it has enormous importance for how a theology of disease is constructed. Is there a uniquely Lutheran, Jewish, Muslim, or Buddhist theology of disease? I ask this knowing full well that the notion of theology is an alien idea for many non-Christian religious people.

Life-Cycle Events

Another aspect of communal functioning is also of great importance for our discussion, since it is in the level of personalizing the community that the entire area of religious ethics is understood by many religious people. To act morally within a community is to act precisely in a personal way, to act in accordance with what is necessary for special life occasions. I can identify two examples as valuable cases for exploration: the rituals surrounding marriage and death. Different traditions celebrate these rituals in strikingly different ways, so that we can hardly make sweeping judgments about the content of such events except that we can observe, again, how these rituals mark the way communities act.

We can begin to assess the nature of such rituals by asking why religions and religious leaders involve themselves in observing these turning points in the lives of people. What is added to the event by the community's acting? In fact, the community as such is rarely involved together as actor at such events but is more or less represented in action by its professional leaders. Thus, the event does not serve as an obvious reminder of the community itself. But we can see, in marriage services, for example, something of the nature of this observance and why religious communities are involved in acting.

Historically, religions did play a role in marriage events, because marriages were critical for the future of the community. I might argue more fully that marriages were means for control within a society, and religions became a way to maintain that level of social control. We can presume that current rituals are a vestige of this earlier need. Eventually such rituals are likely to disappear as religions are no longer needed to maintain social control in this way. Instead, religious communities tend to function quite distinctively within larger, more pluralistic societies, and the religious wedding is an expression of this independent identity. Now, the theological understanding of this practice (to sanctify the wedding and the marriage) does have an impact on many who participate. Many, even without a good sense of what this might mean, require for themselves a "church wedding." There is a sense that something holy[1] is added to the event.

Despite the attitudes of the participants, however, my point is not why people get married in religious rituals but why religions perform such rituals. This seems to be linked with a sense that there is such a thing as a

Lutheran wedding, a Jewish wedding, a Muslim wedding, and so on. Such rituals are an expression of the identity of the community in the sense of a specific setting-apart of a particular group. Thus, the religious leadership may argue that certain rules of membership must be observed in order to qualify as a community's wedding. It is, again, a way of distinguishing who is who. Does this mean that such rituals are not available for those who do not qualify? It seems that, far more than worship itself, such rituals serve to disqualify the one who does not belong. The rituals are a way for a community to decide who is inside and who is outside.

Such activities are not necessarily a judgment of the validity of noncommunal weddings but only a statement that those who wish to be married and are not members (as defined by the wedding ritual) must be married by someone else. That is someone else's work. In fact, this form of action by the community is likely the principal way that many members actually participate in the activity of the community, if not the only way. The image of how the community acts is projected as a practice of maintaining separated identities. We do not act together in these matters.[2]

Rituals concerning death, like our understanding of prayer, tend to be more fluid, not so much in their pattern but in the way the community views the participation of individuals. Leaders may still restrict the action of burial to members (some communities will restrict who can be buried in a community cemetery), but the individuals present to be involved in mourning can be quite diverse. In fact, the community may view this inclusiveness as a symbol of outreach by the community. Even so, we still ask what role the community plays in its participation. The answer appears to be that the community sanctifies the event. But this means that the community authorizes the appropriate rites for burial for an individual. The effect is similar to that of the marriage event: the appropriate rite is that which is done by (and can be done only by) the community and/or its official leadership. Others can certainly perform burial rituals, but that is for them, and this is for us.

It is not surprising that these formative activities of religious communities serve the exclusionary purpose of forming the particular identity of the community and its members. This form of speciation has been observed and described by any number of observers (see Strozier and Flynn 1996, 51–57). It is important to remind ourselves as we construct theologies of disease that the communities we generally represent form their identities for action around acting that is exclusive. This is bound to affect the way these communities act in general.

We need to ask in our present context what impact this discussion has on our project as such. Above all, the issue is that religious communities act most centrally from a fairly carefully defined and circumscribed identity. It is clearly the case that Lutherans will think that there is a Lutheran way of acting and will consider this question first in terms of the structures

and patterns that their own communities have historically used for acting. Thus, any broader sense of action (a generally ecological ethic) will be conceived as building out from the position of the community and including (in some way) the separate views of others. This is not surprising, given what we know even from this brief description of communal action.

An Ecological Rejoinder

It is striking that this structuring of acting should persist (often under the guise of protecting and respecting pluralism). My own work over the last several years has led me to a view that is supported by others in this science-and-religion dialogue. That view begins with the assumption of an evolutionary model in which both nature and culture (as part of nature) develop wide diversity through an historical process. At the very least, this means that religion develops, and, if our understanding of the emergence of human becoming is correct, religion has developed from early strands of religious believing that were carried over into later strands that ultimately emerged as the early stages of religious traditions that have survived as "world religions." As a rejoinder to the observations given earlier, I offer this extended view of the development of religions, which raises some questions about current community-centered practices.

The ecological perspective suggests that the movement toward distinct communities with clearly defined religious boundaries is a movement against the ecological foundation of human becoming. Diarmuid O'Murchu has argued that the underlying reality of the cosmos is one of connection (1999, 52ff.). This connection does not mean a universe without particulars, without individual uniqueness, but rather a universe that is tied together in a web of connections that is dependent on the notion of a necessary role of each component for the survival of the whole. Thus, this view leads us toward a self-understanding that emphasizes participation in the whole. O'Murchu's image is that of a dance, a metaphor that has certainly been used by others, including Alan Lightman (1996).

My effort so far has been to offer a view of how religious communities are led to act, and I have suggested that communities primarily act in the context of the worshipping community. This liturgical context for understanding identity, indeed, for maintaining identity, is one that produces boundaries. Yet, the ecological reality of our existence requires that we note our participation in the larger whole of interlocking roles and actions. This ecological view implies a need for a liturgy in which the identities that are produced connect us with the larger natural reality, if for nothing else but for the sake of human survival. We need ecological liturgies (prayers, hymns, uses of texts) that make evident these connections, not liturgies that reinforce exclusive identities and boundaries that do not allow for the connections necessary for survival.

O'Murchu's model takes up the example within Christian worship of the *sacrament*, in which the narrative told is one of exclusivity, that is, of the self-contained body of Christ, which acts from that identity toward the outside world (O'Murchu 1999, 153ff.) The image suggests that the sacred home of the divine is in the sacrament within the worshipping community: the community acts as the body of Christ. Of course, there are theologies that attempt to transform this message (I take this up below), but the metaphor of the sacrament localizes divine action.

Another image, that of *covenant*, is also portrayed in various liturgies; the act of worship is designed to reaffirm the community's participation in the covenant. Such images can be used to motivate a look outward (an accountability for the world, a Tikkun olam, the Hebrew for healing the world which comes from the Jewish tradition) but the image again localizes God. Both of these images are products of an earlier age in which one could think of a localized god who acts in these specific ways. The end result is a local and not a global god, despite the possibilities for universalizing these localized images.

But each of these images that dominate worship practices in Christian and Jewish communities can be transformed toward a liturgy of connection that does not seek to focus on communal identity that is distinct but rather locates the individual/community in the web of complex connections in the cosmos. Naturally, such a liturgy would require the freedom to relinquish one's local claim on God, and this is likely to create serious resistance in communities. It is not surprising, then, that religious communities fail to act beyond their defined boundaries despite the theologies that have a vision of nondiscriminatory action.

The Moral Level

A colleague of mine at Valparaiso University wrote an essay years ago in which he played upon the root meaning of the word *liturgy*, which is "work of the people" (Brockopp 1980). The argument he made was simply that the liturgy should be designed to lead people from the point of entry through the narratives that give identity to the community—the narratives of creation, including the fall and the narratives of redemption, including the making of covenant—toward a reaffirmation of moral purpose, which he saw symbolized in both the offering and the sacrament. What sort of purpose would this be? He would argue that the work of the people is to be servants of God. This means both obeying God and serving humans. There is in this theological rendering of the liturgy a foundation for seeing moral purpose as service being the primary message of worship. I suspect that this view is shared by thinkers from many religious traditions.

Defining such moral purpose in the broadest terms makes the analysis risky at best. I want to take this notion of moral purpose and the background already developed regarding the worshiping community as the lo-

cus of communal action and explore the possibility of religious communities forming a basis for response to the HIV/AIDS crisis. In order to understand the content of moral purpose, I examine the notion of *compassion*, which engenders much of what I believe religions suggest for a moral foundation and models the style of action that flows from the community at worship. I do not assess here whether and in what ways communities can actually do this, only the foundations for such action. Other of my colleagues in this forum have looked more closely at the particulars of the HIV/AIDS crisis in various locations. What I am looking for is a series of directions for exploring a theology of disease.

My analysis suggests that the liturgies of communities are more works *on* the people than works *of* the people. They form a clearly distinct communal identity that assures boundaries, determining who is part of the community and who is not, even if the aim is to envision the community reaching out beyond itself. Thus, we might wonder how such inertia from within can actually produce a moral surge in the community. Another problem is that often the community identity produced is not clearly produced to form a community in action but rather is a way of defining a community that gathers only from time to time. Movement toward strategies of action is difficult to assess on the basis of the liturgy itself. Still, the model of compassion might well give us a clue about this problem.

Martha Nussbaum (2001, 297ff.) provides a structure for understanding compassion in her work on emotion, which is basically structured on the understanding provided by Aristotle. Aristotle believed that three basic factors are necessary for any form of compassion to emerge. We are, of course, faced with the problem of understanding exactly what compassion is. The word arises from the Latin root that means "suffering with" and is closely related to other terms, most specifically the word *sympathy*. If this is what we mean by compassion, then what is required, first of all, is our sense that some other is suffering and that the suffering is worthy of our attention. That is, compassion requires that we be aware of the suffering of others and take that suffering seriously. Second, compassion requires some assessment that the person does not deserve the suffering. Third, we who see the suffering must believe that the situation could possibly happen to us, so there is a form of empathy (Nussbaum 2001, 327ff.). Nussbaum, not quite sure of the last of these points, adds that we can modify the need for direct empathy simply by suggesting that the person (perhaps this could be broadened to include animals and even aspects of nature in general) is of some value to us. This latter point may be the most critical and suggests a role for the universal claims of religion, even if, as we shall see, religions tend toward nullifying both the second and third requirements of compassion.

Naturally, the first requirement for compassion involves not only awareness but also an ability to prioritize the suffering of others. To what extent is a particular situation likely to capture our attention enough so that we

can take it seriously? I am reminded of several articles I read recently from a conference on issues related to Catholic and Jewish relations (Pawlikowski and Banki 2000). John Morley (2001), writing about the sensitive issue of the actions of Pope Pius XII during the Holocaust, notes that the whole structure of the Vatican organization of communication made the particular matter of the fate of Jews in Europe only one of many in a complex set of concerns that faced the Pope on a daily basis. Morley's argument seems historically accurate in that it is likely that Pius XII, along with other civic and religious leaders during the time, simply missed the news of the genocide of the Jews in the morass of information being passed on. It is also possible, say historians like Morley, that Pius XII simply had to trade the fate of some for the fate of others, and Pius XII saw his role principally to safeguard the members of his church.

Such arguments can be made with a great deal of seriousness. In fact, if we want to see how arguments similar to this can be made, we need only look at the debate over why the Allies did not bomb the death camps at the end of the war (Berenbaum and Neufeld 2000). The main argument is again a matter of priority that led some to overlook the details of the camps and/or to set other matters as a priority. Even so, we are likely to raise questions more readily about the religious moral urge than the matter of moral decisions made by the military. The point made by Morley is open to challenge, but the fact is that his case is built on an acceptance of the way churches act. If we are inclined to think about individual persons in churches, we are still left with a strong likelihood that actions will be delayed because (1) the attention of members is directed elsewhere and/or (2) other matters take priority for the churches. It is questionable that these communities will become aware of and act on crises at the time they need to be taken seriously. This may well be the case for the Lutherans in Africa, who after the fact confess that they acted inadequately.

The principal structure of action in religious communities even while preaching compassion sets up the members of the community to become self-absorbed. All of this depends on people being made aware of suffering in such a way that it is taken seriously. If we look at Muslim belief, for example, we see a similar structure prevailing in that the notion of almsgiving is set into the context of the Muslim life, which is dominated by acts calling for obedience to Allah. The history of understanding compassionate action does provide a possibility for acting with compassion in the midst of crisis, but the impetus of action is more fully directed to obedience in the standard contexts of action. Could we say with confidence that Muslims are more likely than others to be aware of the suffering of others?

We might argue that Buddhist efforts to understand compassion, such as we see in the work of the Dalai Lama, are different in that compassion is seen initially as the outflowing of a healthy human being. Thus, the value of compassion is rooted in the growing sense of self-awareness that ex-

presses itself in compassion (Dalai Lama 1995). Of course, the Dalai Lama is not particularly keen on religion as a source of this path of seeking health and wisdom. This may be more promising than the structure of religion, which sets obedience to God and the identity of the community as priorities for action. The Dalai Lama is also inclined to view his Buddhism as producing a view of connection similar to what I suggested earlier as part of an ecological viewpoint. More important is that we see how the structure of compassion and the religious viewpoint actually affect our ability to think of the other as undeserving and ultimately in the same camp as we are ourselves.

What Is Undeserved?

Two features of the structure of compassion are already problematic, given my argument to this point. First, our awareness of the other depends on our seeing suffering. How can we think of compassion as grounding moral action if it is dependent on the other's being in a state of suffering? This point of view also leads us to the fateful observation that religions tend to begin an assessment of human living and the context of our living with the assumption that something is wrong. Such a perspective already sets up a context for thinking about what is or is not deserved. Second, compassion is seen fundamentally as a one-way activity in this consideration. Naturally, the assumption is that of reciprocity: if I experienced the same suffering at some other time, I would hope for similar compassionate treatment. But reciprocity must be presumed as an inessential factor for acting with compassion. Thus, the structure of compassion remains action in one direction. This, too, sets up a context for understanding what is deserved, or how I am likely to assess that, since a one-way form of action depends on choosing to act on the basis of what I decide are the criteria for acting. My guess is that this issue was also critical in the failure acknowledged by the Lutheran leaders in Africa.

Yet another problematic with compassion plays into our discussion about HIV/AIDS. Compassion is seen as an emotion by Nussbaum and others in the long traditions of thinking about compassion. This does not mean that it is without reason, but it does mean that awareness is dependent on the complex of emotions that we are likely to experience at any one time and in any situation. (The complexity of our experiencing emotions and sorting through them is too much of a topic to manage in this essay; Nussbaum and others have done this well.) We do know that emotions find their sources in a complexity of personal experiences only a portion of which may be the religious narratives that shape the worshiping life of religious communities. Even understanding this complexity, however, we see readily that, on a horizontal level, compassion alone does not determine our judgment about whether the experience of another is considered deserving of our compassion or not.

Above all, compassion must contend with deeply felt emotions of shame, anger, and disgust within the complex of feelings, and the structure of each of these emotions is also powerful in its hold on us (Nussbaum 2001, 342ff.) Thus, we can understand a negative response to those who are living with HIV/AIDS if ethical norms consider the behaviors often associated with contracting the disease as deserving disgust or shame. Indeed, the power of these emotions is so overwhelming for many that reasonable arguments to the contrary still cannot override the basic disgust. And this includes efforts to make the religious act (giving alms, for example) indiscriminate. In fact, compassion will be next to impossible to generate if we believe that those who suffer do so because they deserve what they suffer.

Let me be clear that this reaction does not have to be a simplistic moralistic response. More likely it is a deeply insidious response rooted in feelings that are reinforced by claims to identity that are themselves reinforced over and over again in the context of normal patterns of worship. We may claim that such norms are fundamentally cultural, and we can note that they do not claim universal standing as such, but the religious response is so clear among many of the religions that reactions of disgust will not allow true compassion to surface. The problem with the spread of HIV/AIDS is that any reluctance to act or slowness in showing compassion is likely to have disastrous effects. I dare say that we cannot expect religious people to act with compassion swiftly regarding AIDS until we are ready to accept without reservation people who are seen as the principal risk groups: homosexuals, persons who are labeled as promiscuous, and those who use intravenous drugs. Any theology of disease that wants to address this issue in its global dimensions must start a step back and deal with the heritage of disgust and shame that plagues us in acting with moral urgency.

The problem is not merely being able to act (and it is there even in the visceral sense of contact, touching); it is also linked with our ability to accept solutions that violate our sense of decorum, our deeply felt norms. For example, despite the obvious ways that India has managed to reform practices to fit a modern democratic sense of justice, it is still difficult in many places to override the religious authority in determining the fate of women in cases of marriage crises and those who are still regarded as part of the subcaste, the untouchables (Nussbaum 1999, 213ff.). All of this remains true even with the reform in national laws. In the same way we must think about the way that *Shari'a* law defines what is called sexual promiscuity in Muslim countries, especially when this very same law is offered as proof that Muslims are ready to deal with HIV/AIDS more successfully (see Hunt, Jung, and Balakrishnan 2001, 16ff.). Can we argue that the underlying level of rejection of human dignity can be a collateral effect of fighting the AIDS pandemic? Of course, we can point to the Roman Catholic position regarding the use of condoms in cultures that must struggle with issues in different terms and with different consequences

than what is the usual case in the Western world. And will the American obsession with a war on drugs make it impossible for us to take seriously what needs to be done to stop the spread of HIV by contaminated needles? If we are asking what religions need to do in terms of a theology of disease, let us say emphatically that if our working theologies cannot help us see and understand the deeply destructive feelings that often guide our acting, we will fail.

The Possibility of Empathy

The last of the criteria that define the presence of compassion may be the most challenging and problematic, for it brings to the fore the basic weakness of any morality based on compassion and theologies that are used to frame such an ethic. Aristotle claimed that compassion can exist only when we can envision that the problem experienced by the sufferer is one that we might also experience. I take up this form of the argument first before turning to what is more often the religious form of the argument, partly because I agree with Nussbaum (2001, 335ff.) that often this factor is necessary before we will act to help others, even if we might hope that our motives for acting are more noble. It is surely true about the way America entered the conversation about the global spread of HIV/AIDS and, in particular, its spread in Africa.

The point is that I am moved to act only when, even though I am not yet suffering, I can imagine that the suffering of the other is something that can also strike me. Why would this be the case? The issue is not that I feel sympathy for the other but that I can see myself in that role. The ultimate aim of compassion on this level is to stop the causes of suffering before they can affect me. The suffering of the other becomes a warning to me. Of course, I am still left with the issues I have already addressed: I must be aware of the other and his or her suffering even to be warned (choosing to set action as priority), and I have to contend with the underlying emotion of disgust that prevents any level of empathy. This is probably the most difficult hurdle to leap. If I feel disgust, I am emotionally unprepared to think of myself in a similar situation, quite apart from any reasonable acceptance of a likely threat. Thus, I can construct boundaries around those who are in high-risk groups and close myself off from the threat. The actual sense of a threat to myself is minimized then to the point of simply rejecting the idea that I could suffer in the same way. All this can happen beyond reason. The issue then is whether we can effectively argue for the likelihood of compassion when there is a rejection of empathy. Aristotle would say no. Nussbaum would say yes, as would the various religious traditions. Still, it may not be so clear that religious people actually are motivated by pure compassion in most situations.

In the case of religions, the power is strong in constructing a view of the self that rejects such a participatory empathy. There is a clear tendency

among the religions to locate the cause of suffering on the moral level. Thus, we are both the cause of our own suffering and the source of possible solutions (transformations, salvations). The religious mind can then universalize suffering as a general problem, a condition of human living. In fact, the very structure of compassion suggests the need for a view of reality such as this. We might be led to a conclusion that all of us deserve suffering to a point, even if all of us have the chance for redemption. Nevertheless, the religious mind also constructs a narrative of righteousness that defines the identity of the follower. This is not an absolute in most cases but is regarded as a process, a path to follow. Thus, I could be drawn into any form of suffering, but the call of religious discipline would suggest that I should be moving closer and closer to a resolution, to overcoming the causes of my suffering. If I call this righteousness, I am likely to have a compelling religious reason not to identify with those who suffer the most. If I were to act with compassion, I would be self-consciously encouraged to think of my action as totally unmotivated, that is, as acting with care for a person who suffers in a way that I am never likely to experience. This level of denial is very powerful in the religious mind and has to do not with the actual experience of suffering but with how reality is perceived both as universally containing suffering caused by our actions and moving toward some existence without suffering in which we are gradually and increasingly participating.

If we agree with Aristotle that these conceptions of world and self are likely to mitigate against acting with compassion, we can understand why religious people especially fail to act quickly even in spite of their own vision of what it means to be religious. We can counteract this assumption only with a belief that the religious mind is also led to act without empathy but with sympathy on the basis of some other way of seeing things. I think that the Dalai Lama expresses this view as clearly as any when he argues that acts of compassion toward other humans are an expression of the fundamental connection with the Divine, the sacred wholeness of being human (1995, 83ff.). Christians might say that acting with compassion (loving our neighbor) is the same as acting with love toward God. All of this depends on how we understand the Divine and divine action.

Divine Compassion—The Alternative

As I move to this topic, I draw closer to the conclusion of my reflections on a theology of disease. If I maintain that compassion depends on our image of the Divine, I am arguing that theology is the end work of this investigation, even though I would say even more that moral action is truly the end result of my reflection. I do not contend that having ideas of God will in any way make me act more with compassion. I doubt that I can remove myself so thoroughly from the factors that I have discussed about the religious mind so as to believe that all can be repaired simply by our changing

our theologies. But we can explore the logic of this religious claim.

Nussbaum believes that we can act compassionately even when we do not empathize with a sufferer because we can still value the other and consider that valuing as sufficient for our action. What we need is a context of thinking that allows us to value the other indiscriminately. That is, if we are to act for any sufferer in any condition of suffering, we cannot act because of the particular qualities of the one suffering. I use a diary for my Holocaust class written by a woman who was a graduate student in Amsterdam during the Nazi occupation in 1942. Some in every class deeply identify with this woman even though they do not expect to ever experience the Nazi threat as she did. Others react negatively toward her as a person because she is so self-absorbed in much of what she writes.

The problem I have with Nussbaum's argument is that even this form of compassion makes the trauma that another is suffering the reason for compassion rather than an honest caring about the person. This thinking about compassion is too much linked to the root meaning of the word—suffering with—and may be too connected with an understanding of the Divine in which the Divine is fully self-sufficient and acts not because there is a real connection with the suffering of humanity. This rendering of a fully transcendent Divine is too easily transposed into a model for loving that is one-sided, as if this sort of giving is the ultimate, perfect sense of loving. Thus, a transcendent model cannot account for an ongoing link with the other that is essential to the becoming of the one showing compassion.

Of course, compassion does not have to be understood in this way, though it seems it is the way philosophers have often understood compassion or benevolent action. The solution is likely to be found in a new conception of the Divine that disposes of the transcendence that isolates the Divine from human community and experience. Still, the human expression of compassion can be understood as already and always a sense of connectedness that does not require the suffering of the other. Compassion is the reality of our existence, not merely an expression of sympathy at times of great injustice.

Unfortunately, the usual meaning of compassion that is rendered as a religious sense of concern for the other is an expression of sympathy that comes at the time one recognizes the need of the other. This structure of acting cannot possibly provide a foundation for ongoing communal action that is sufficient for the issues we face, because it is usually too late when we finally notice the suffering of the other, especially if we do not suspect that this suffering is either undeserved or a threat to ourselves.

The idea of compassion brings with it yet another severe problem that often prevents effective moral action. This structure of responding is often unequal in that it presumes that one party is the compassionate giver and the other the receiver. The divine model emphasizes this inequality, but the structure also persists in human interactions. And we have seen that

often this model of giving does not result in reciprocity, because there is no conceived feeling of threat to the self. Thus, the inequality remains and is not only a foundation for a structure of injustice (to what extent is this a natural path toward a breakdown of respect?) but also results in and requires the decision of the one to give.

Nussbaum argues that this failure of the structure of compassion is overcome by the nurturing process, in which compassion becomes the mode of responding to the other as a matter of course. But this assumption brings us full cycle to the problem that the community as community acts out of the practice of worship, and nurturing does not fundamentally reinforce compassionate action unless the worship is self-consciously shaped to emphasize the connectedness that I have described.

I am speaking here only about why it is that religious communities do not act consistently in ways that we would expect from the implications of religious beliefs. The fact is that, quite apart from the negative factors that block effective moral action, there is built into a normal pattern of understanding of religious morality this basic problem of the structure of compassion. The answer may lie in a radical reconstruction of theology that is not merely directed at a theology of disease but takes into account the problems I have raised to this point about ordinary communal activity.

Notes

1. The word *holy* at its root means to be set apart and thus has to do with the creation of a distinct identity for some reason, even if popular understanding confuses this with a notion of moral purity.
2. Some communities also experience this modeling of action with regard to all worship events, and sometimes the exclusiveness of acting is explicitly mandated, as with the recent actions of the Lutheran Church–Missouri Synod to suspend a bishop for his participation in a multifaith gathering for prayer in New York City.

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In Memoriam

Malcolm R. Sutherland, 1916–2003

Malcolm Sutherland was one of the persons most responsible for establishing the science-and-religion dialogue in Chicago and the journal *Zygon: Journal of Religion and Science*. Educated at Miami University, Western Reserve University, and Meadville Lombard Theological School, he ministered to congregations in Hoopeston, Ill., Charlottesville, Va., Milton, Mass., and Harvard, Mass. In 1959 and 1960 he was Vice President of the Unitarian Universalist Association, and from 1960 to 1975 he was President of Meadville Lombard Theological School.

As the President of Meadville Lombard, Sutherland led the reformulation of the seminary's curriculum to help future ministers reflect theologically in the light of contemporary scientific knowledge. In 1959 he had become acquainted with the work of the Institute on Religion in an Age of Science (IRAS) and especially with Ralph Wendell Burhoe, the Executive Director of the American Academy of Arts and Sciences. Sutherland invited Burhoe and other IRAS scientists and theologians to Chicago during the early 1960s to give lectures on science and religion. In 1964 he offered Burhoe the invitation to become a professor at Meadville Lombard, to direct a new Center for Advanced Study in Theology and the Sciences (CASTS), and to establish *Zygon* as the joint venture of CASTS and IRAS.

Since the first issue of the journal in March 1966, Sutherland has served as the co-chair of the Joint Publication Board of *Zygon*, representing CASTS and its successor CASIRAS (Center for Advanced Study in Religion and Science). He also was President of IRAS (1967–68, 1975–77) and Chaplain at the 1977 and 1982 IRAS Star Island Conferences. In 1982 he received an Academic Fellow Award from IRAS, and he was awarded the most distinguished honor of the Institute, that of an honorary officer, when he was elected in 1980 to the permanent position of Honorary Vice President.

To those who have worked with him, Sutherland will be remembered as a wonderful and supportive friend, a quiet counseling partner, a man with a smile and a twinkle in his eye, a gracious enabler of the work of others, and one who inspired others with his vision and high standards.

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In his 1964 remarks that helped inaugurate the work of CASTS and *Zygon*, which are published in the March 1966 issue, Sutherland envisions an approach to theological reconstruction that

> reflects the faith that the knowledge coming out of the frontiers of learning today is not basically destructive but, on the contrary, is a rich resource for our understanding of our destiny and its determinants. It presupposes taking science seriously, not using it simply to prove the truth of an already accepted doctrine or scripture but to help illumine our understanding of the human enterprise and its environment.
>
> But this engagement also takes theology seriously. We are not abandoning this intellectual enterprise nor ignoring the church and its history, pretending that there is nothing to learn from our rich heritage. Religion has had its superstitions, its naïvetés, and its moments of resistance to newly acquired knowledge that threatened earlier convictions; but the sciences have occasionally had their misconceptions and their own peculiar moments of arrogance, too.
>
> We do not arbitrarily discard the patterns and the myths informing religious institutions of our own or of others but seek, rather, to bring them into significant discourse with the models of reality posited by the various sciences. We do not confuse the task of worship with tests in a laboratory, but we do say that they can no longer remain apart as though one had no message to bring the other.
>
> Our present stress upon the contributions of science for theology should not be interpreted as implying our disregard for the contribution of the humanities, especially the arts, for theological inquiry, or as suggesting that theological affirmations as expressed in the monumental patterns of worship and myth have nothing to say to the scientists and their understanding of the human enterprise. Clearly, we seek reciprocity, a genuine dialogue between these disciplines where participants respect and seek to understand one another.

Sutherland's vision of forty years ago is strikingly current, and his spirit continues to be present in the work of new generations of women and men who stand on the shoulders of one of the originating giants of our enterprise.

—Karl E. Peters

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Purpose—IRAS is an independent society of scientists, philosophers, religion scholars, theologians, and others who want to understand the role of religion in our dynamic scientific world.

Activities—each year IRAS holds a week-long conference on Star Island, ten miles off the coast of Portsmouth, New Hampshire. Topics are selected to be relevant to current scientific thinking and to fundamental religious questions. (IRAS members pay a reduced rate for conference registration.)

IRAS organizes events at the annual meetings of the American Academy of Religion (AAR) and the American Association for the Advancement of Science (AAAS). IRAS has sponsored more than two hundred fifty meetings at universities, colleges, and theological schools.

Publications—*Zygon: Journal of Religion and Science* and *IRAS Newsletter*. IRAS members receive subscriptions to these publications free of additional charge.

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David Klotz, 14 Tyron St., South Glastonbury, CT 06073
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Institute on Religion in an Age of Science

Fifty-first Annual Star Island Conference
Saturday, July 24, to Saturday, July 31, 2004

Earth's Waters in Crisis: A Scientific, Spiritual, and Moral Challenge

Water is wondrous, scientifically and spiritually, and essential to life on our blue planet. Water inspires the human imagination in religion and the arts. It is a major source of ritual and symbol in religious traditions. Yet, today, our waters are in crisis due to population, pollution, climate change, and a multitude of competing local, regional, and global demands. On Star Island, where the experience of conserving fresh water shapes our daily lives, we will explore the roles science and religion can play in developing ethical approaches and moral commitment to actions on critical water issues. Among the questions to be considered are:

- What are water's origins and unique physical and chemical properties? What are the relations between the global water cycle, climate, and sea level change?
- What is the current situation of the world's water supplies? Which water uses are not sustainable? To what extent can conservation and technologies improve the situation?
- How does water serve as symbol and substance in various religious traditions? Has a loss of reverence for water as precious gift and sacred symbol contributed to the current crisis? How can new scientific knowledge inform religious practice?
- How do we mediate competing demands such as those of agriculture, industry, energy production, and domestic use?
- What are the tensions created by market forces, sociopolitical interests, and the demands for human rights and just water policies? How can universal access to adequate clean water be achieved?

The conference site itself, with its dependence on imported fresh water, rain, and salt water, will provide a symbolic microcosm for the emerging planetary crisis.

CONFERENCE CO-CHAIRS: **Sol Katz** (U. Pennsylvania), anthropology, food and water in world cultures; **George Fisher** (Johns Hopkins), geology, Earth systems, and sustainable living; **Jeanie Graustein** (M.Div.), environmental justice and water issues for churches.

CONFIRMED SPEAKERS TO DATE: **Owen Gingerich** (Harvard), astronomy, history of science; **Holmes Rolston III** (Colorado State), philosophy, environmental ethics; **David Haberman** (Indiana U. Bloomington), Hinduism and sacred rivers; **Barbara Rossing** (Lutheran School of Theology at Chicago). *Chapel speaker:* **V. V. Raman**, philosopher-physicist, pan-religionist, science-and-religion dialogue.

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Statement of Perspective. The word *zygon* means the yoking of two entities or processes that must work together. It is related to *zygote*—meaning the union of genetic heritage from sperm and egg, a union which is vital in higher species for the continuation of advancement of life. The journal *Zygon* provides a forum for exploring ways to unite what in modern times has been disconnected—values from knowledge, goodness from truth, religion from science.

Traditional religions, which have transmitted wisdom about what is of essential value and ultimate meaning as a guide for human living, were expressed in terms of the best understandings of their times about human nature, society, and the world. Religious expression in our time, however, has not drawn similarly on modern science, which has superseded the ancient forms of understanding. As a result religions have lost credibility in the modern mind. Nevertheless some recent scientific studies of human evolution and development have indicated how long-standing religions have evolved well-winnowed wisdom, still essential for the best life.

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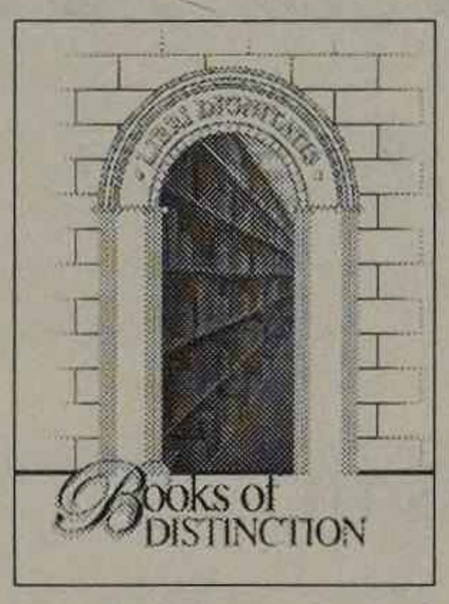
If Christianity—including Christian faith and theology—is to avoid becoming totally out of touch with the world—a museum piece at best, a force of baleful reaction at worst—it must constantly update itself by constant interaction, dialogue, dialectic with all the important intellectual currents, movements, disciplines of today. In the process, it must not lose its soul, or else it becomes useless. But, as Friedrich Schleiermacher said, it must open its windows to the world, lest it become irrelevant or even harmful.

Historians and theologians have traced the development of Christian doctrine, and even offered theories to explain it. On the other hand, various observers of the church in the world—perhaps most notoriously Max Weber—have interpreted how Christianity and the world have, for better or for worse, reacted upon one another. But going beyond such works, *The Dialectical Development of Doctrine* combines the two themes by proposing a necessary two-way ***dialectic*** between theology and the world, a dialectic absolutely essential to the healthy growth and development of both our faith and our understanding of the world, as well as of the culture which we continue to create and will bequeath to our children.

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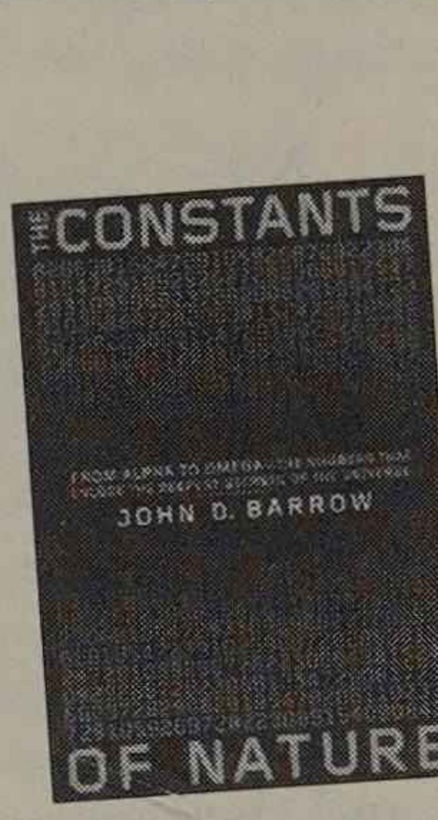
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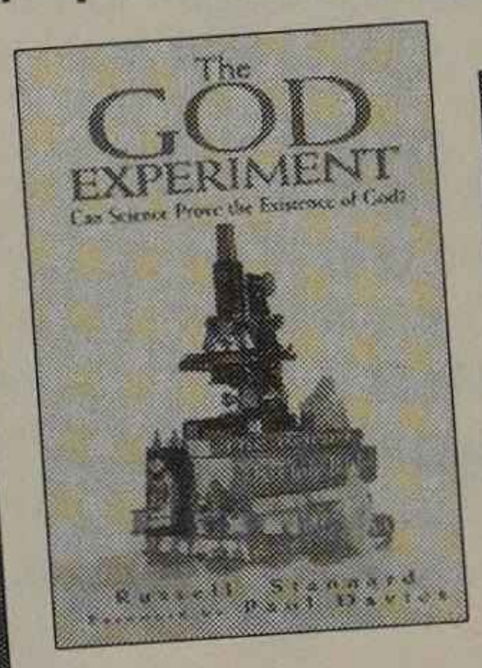
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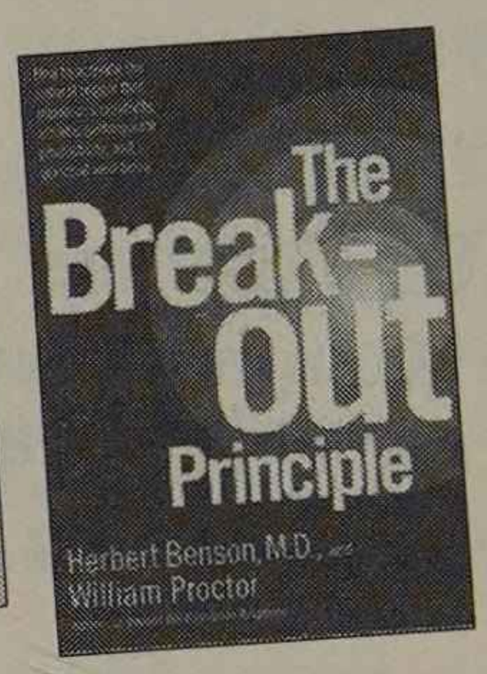


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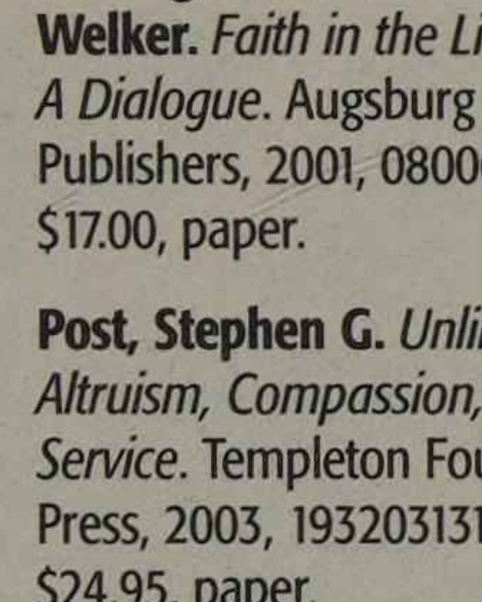
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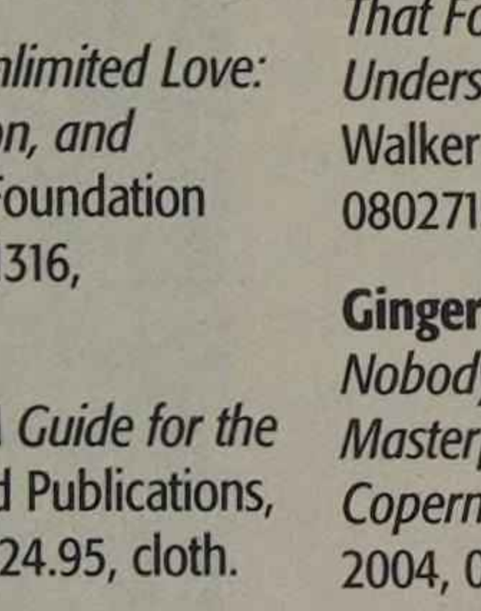
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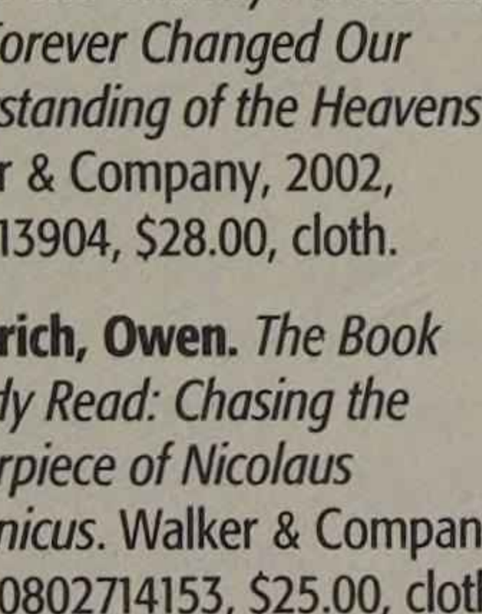
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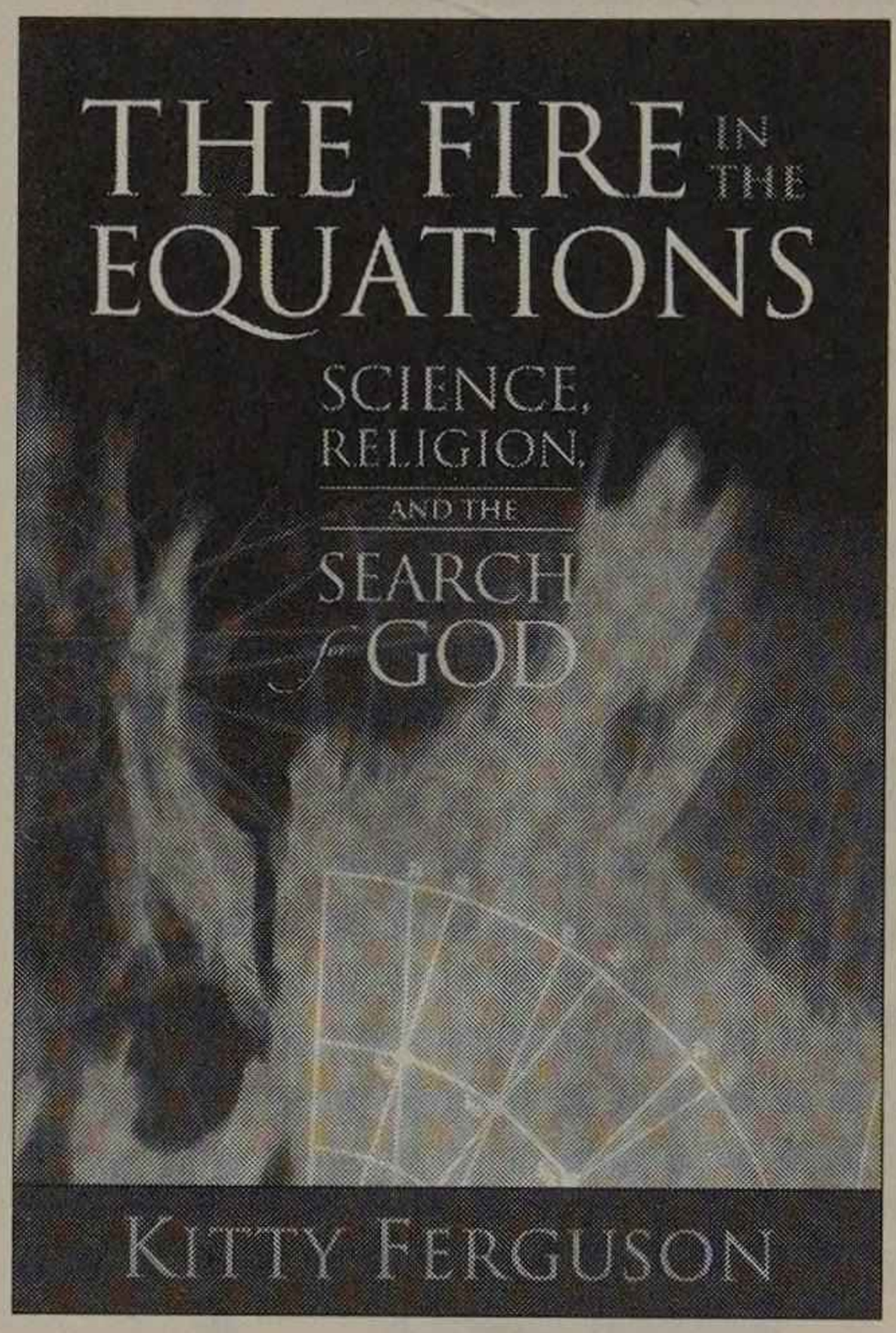




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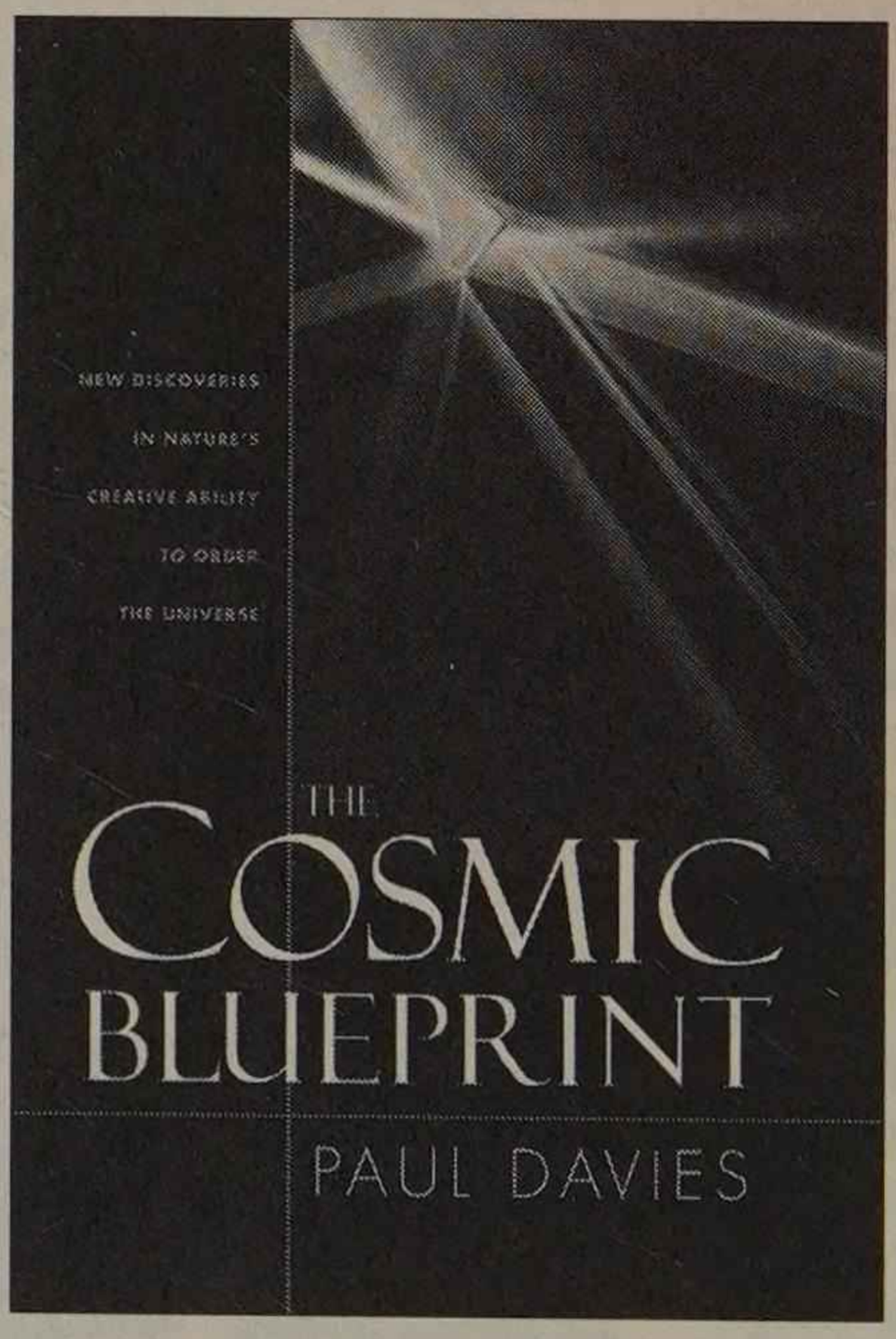
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