BETWEEN ADDITION AND DIFFERENCE: A PLACE FOR RELIGIOUS UNDERSTANDING IN A WORLD OF SCIENCE

by Edward L. Schoen

Abstract. Among contemporary religious believers, some follow in the footsteps of Newton, allowing their religious understanding to fill in gaps left by the sciences. Others take a more Wittgensteinian approach, discretely separating religious from scientific ways of thinking. Because neither of these relatively irenic positions captures the important element of cultural reform that is prevalent in so much of the religious life of the past, George Lakoff's recent work in cognitive studies is used to suggest ways that religious ideas may be used to challenge and enrich scientific thought. A scrutiny of Richard Dawkins's biological analyses of human behavior reveals the distorting limitations of exclusively scientific understanding, thereby clearing conceptual space for genuinely religious values, actions, responsibilities, and forms of human life.

Keywords: AIDS; cognitive models; cultural critique; Richard Dawkins; human behavior; image schema; George Lakoff; Pierre-Simon Laplace; metaphor; Sir Isaac Newton; science and religion; time; Ludwig Wittgenstein.

Concluding that his famous laws could explain neither the fact that all the planets revolve about the sun in the same direction nor the fact that the planets in the solar system all seem to fall into nearly the same orbital plane, Newton cheerfully attributed these matters to divine activity. Turning his gaze away from the skies, he also saw the hand of God in the symmetry of living organisms, the intricacies of physiology, and the surprising way that instinct serves the specific needs of animal life (Newton [1729] 1934, 543–44; [1730] 1952, 402–3).

As the legendary story goes, however, Pierre-Simon Laplace was not so sanguine about the easy transition from scientific to religious

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understanding. Reportedly, when Napoleon confronted him with the observation that various celestial phenomena should be attributed to divine activity, Laplace shot back defiantly, "I have no need of that hypothesis."

Whether or not this Laplacean legend is apocryphal (Buckley 1987, 325),[1] there can be little doubt that the declaration "I have no need of that hypothesis" has become something of a contemporary war cry. Today scientifically sophisticated people often embrace this Laplacean cry as a slogan for a thoroughgoing cognitive secularism, aligning themselves with the acid diagnosis of Baron Paul d'Holbach, "If the ignorance of nature gave birth to the Gods, the knowledge of nature is calculated to destroy them. . . . Man, when instructed, ceases to be superstitious" (d'Holbach 1970, 1:174). As a champion of the cognitive sufficiency of the sciences, Bertrand Russell proudly proclaimed, "Whatever knowledge is attainable, must be attained by scientific methods; and what science cannot discover, mankind cannot know" (1961, 243).

Ludwig Wittgenstein, of course, was celebrated for his repudiation of such monolithic visions of human knowledge, particularly when they incorporated the conviction that all human cognitive activity must be structured in some unified way. Although his comments regarding the relation between the sciences and religion were more suggestive than systematic (Wittgenstein 1967, 56–57), he sharply contrasted the two in ways that many contemporary thinkers have found attractive. Early in his career, for example, D. Z. Phillips explicitly separated religion from the sciences, refusing to allow either discipline to color the interests or concerns of the other (Phillips 1970, essays 1–3).

Although dramatically different in so many ways, the earlier Newtonian and the later Wittgensteinian strategies for relating religion to the sciences share a common vision, that of peaceful coexistence. Instead of providing penetrating analyses of scientific thought, both locate safe havens for religious understanding within a wider, contemporary cultural environment. Newtonians offer nonthreatening additions to the sciences, gracefully bowing out when confronted with scientific competition. Wittgensteinians quietly emigrate from the conceptual territory of the sciences. Seeking shelter in difference, they isolate religious thought from the sciences by marking it off as a completely separate cognitive enterprise.

Unfortunately, neither of these relatively irenic positions captures the central element of cultural defiance that has fueled so much of religious life. As just one instance of this persistent militance, consider the writings of early Christianity. Saint Paul boldly declared: "[T]he wisdom of this world is foolishness with God. For it is written, 'He catches the wise in their craftiness,' and again, 'The Lord knows the thoughts of

the wise, that they are futile'" (1 Cor. 3:19–20 NRSV).[2] Like so many other religious reformers, Saint Paul found something disastrously wrong with earthly thinking patterns. He regarded the teachings of his master as more than a mere supplement to worldly thought; he expected them to challenge, even supplant, those of his wider culture. Rather than dovetailing with the thinking patterns of his age, he was convinced that Jesus had brought a new message, one that demanded transformation, redemption, renewal.

From a twentieth-century perspective, of course, it is relatively easy to imagine how the teachings of someone like Jesus might replace ancient Roman or Greek ideas. Such teachings might even be used to reform or revitalize Saint Paul's own Jewish heritage. It is another matter entirely to bring such reformist proclamations into a sophisticated scientific context. Today, Saint Paul's declarations sound like so much empty bravado. Surely contemporary believers could never seriously hope to use ancient religious teachings to condemn, criticize, or pronounce intellectual judgment upon the sciences. So far as theoretical challenge is concerned, the Laplacean retort seems to ring all too true. Surely contemporary physicists, chemists, or biologists have no need of Saint Paul's, or anyone else's, religious hypotheses.

Nevertheless, despite the obviously forbidding nature of the project, it is the goal of this discussion to capture something of this ancient spirit of cultural repudiation. Although genuinely religious critiques of the sciences may be inconceivable from a Newtonian or Wittgensteinian perspective, recent work in cognitive studies can open a door to their possibility. Here, a sampling of the findings of George Lakoff will be used to clear new space for a more aggressive role for religion in contemporary cultural life, one that characterizes religious thought as neither a Newtonian addendum nor a Wittgensteinian emigrant.

I. Human Understanding

Although admittedly influenced by the thought of Wittgenstein, Lakoff rejects the traditional Wittgensteinian thesis that various disciplines exhibit discrete logics, methods, or cognitive practices. Instead, Lakoff's research has uncovered a diverse collection of cognitive strategies that people carry from one context to another. To a surprisingly large extent, humans employ these same fundamental techniques both in the service of gaining scientific understanding and in a wide range of other settings, many of which remain well outside the bounds of formal scientific investigation.

In particular, Lakoff stresses the central place of image-schematic concepts as bases for analogical modeling. As an example of one commonly invoked image schema, he says,

> Take, for example, a **container** schema—a schema consisting of a *boundary* distinguishing an *interior* from an *exterior*. The **container** schema defines the most basic distinction between **in** and **out**. We understand our own bodies as containers—perhaps the most basic things we do are ingest and excrete, take air into our lungs and breathe it out. (Lakoff 1987, 271; emphasis in original)

As this example illustrates, the fundamental structures of the most basic image schemata are rendered directly intelligible in the commonplace experiences of ordinary life. In their daily activities people develop an easy familiarity with the container structures of everything from their own bodies to pots, pans, and wastebaskets.

Subsequently, when transferred to new settings, this fundamental grasp of the structure of basic image schemata can be applied to less directly intelligible phenomena. With respect to the container schema, consider "the first few minutes of an ordinary day. You wake *out* of a deep sleep and peer *out* from beneath the covers *into* your room. You gradually emerge *out* of your stupor, pull yourself *out* from under the covers, climb *into* your robe, stretch *out* your limbs, and walk *in* a daze *out* of your bedroom and *into* the bathroom" (Lakoff 1987, 271; emphasis in original). In this case, everything from mental states to bodily orientations to movements throughout the house is understood in terms of the rudimentary features of containers.

Much of Lakoff's research has been devoted to exploring the nature of this nearly automatic practice of imposing familiar structures upon various ranges of phenomena. It is an extraordinarily common strategy for construing items intelligibly. Moreover, Lakoff has found that multiple construals are most often the norm. Typically, the very same phenomena are structured in a variety of ways, each construal providing different insights. Some such structures are useful for the sciences, and others are more suited to other contexts.

Alternative construals not only structure phenomena differently; they also provoke differing responses and justify different actions. For instance, Lakoff notes the following:

> If we view time as a resource that can be wasted, and act upon that view, and even set up institutions that take such a view for granted, then, by our actions, we can create "wasted time." If I live in a society that is constructed on the **Time is a resource** metaphor, and if I accept and function in terms of that metaphor, then it can be *true* that *someone wasted an hour of my time this morning*. . . . Since we act in accord with our conceptual systems and since our actions are real, our conceptual systems have a major role in creating reality. (Lakoff 1987, 295–96; emphasis in original)

The conception of time as a resource contrasts markedly with recent relativistic theories of time inspired by Einstein's work—not to mention the classical Newtonian conception of time as absolute. For an astrophysicist studying the implications of the redshift or a cosmologist trying to

sequence events in the Big Bang, the relativistic conception of time may be most germane. The latest fashions in physical theory are not of any interest, however, to factory managers obsessed with worker productivity. Only if time is a resource can employees be docked for stealing or wasting it.

Furthermore, when it comes to construing something as important or complex as time, no one construal ever seems to emerge as most basic, accurate, or literally correct.[3] Depending upon the context, one or another construal serves the purpose at hand, a purpose that may not be served, or sometimes even imagined, from within the cognitive framework of alternative conceptualizations. When an astrophysicist is scheduling appointments, Newton's conception works just fine. Although Einstein's formulations would be too unwieldy for this scheduling project, they become indispensable for intricate calculations regarding the redshift. Yet, when she interrupts her redshift calculations to chastise her assistants for sleeping on the job, a project manager must shift from conceiving time relativistically to conceptualizing it as a resource.

II. Conflicting Construals

Unfortunately, the human ability to shift so adeptly among different conceptual framings is not currently understood in any detail. Lakoff and others have investigated some of the intellectual orchestration involved, but such studies are still in their infancy. About all that can be said with much assurance is that this everyday cognitive practice is by no means chaotic. It displays a distinctive pattern of its own, though not one that fits traditional models of human rationality. Contrary to the teachings of classical logic, the development, application, revision, and incessant juggling of conflicting framings does not appear to be driven by any overriding concern for the historically revered cognitive virtues of consistency or coherence.[4]

As an illustration of the propensity to use inconsistent or incoherent conceptual framings, consider Psalm 23. In the first four verses of this psalm, God's relation to God's people is given the intelligible structure of a shepherd's relation to the flock. In the final two verses, however, the relation of a host to houseguests replaces this shepherding structure, quite without warning. The silent slip from the image of a shepherd to that of a host occurs in verses 4 and 5, which read, "Even though I walk through the darkest valley, I fear no evil; for you are with me; your rod and your staff—they comfort me. You prepare a table before me in the presence of my enemies; you anoint my head with oil; my cup overflows" (NSRV).

Casual readers do not find this unannounced switch at all shocking or perplexing. Because shepherding and hosting are both such effective, easily comprehensible ways of modeling patterns of care, the completely natural slide from one intelligible structure to the other usually goes

entirely unnoticed. Within the context of the psalm itself, it seems almost impertinent to wonder why the sheep are suddenly sitting down at tables and drinking from cups. The point of the psalmist was not to provide any consistent, or even coherent, story line. Rather, it was to offer a vivid, rich understanding of the relation of God to God's people. In this particular setting, two fundamentally different modeling structures prove most effective. To serve their purpose, neither consistency nor coherence between these images is particularly crucial. Besides providing effective ways of intelligibly structuring an understanding of care, the models of shepherding and hosting are not required to interlock logically at all. Conceptual continuity is maintained not by rigid laws of logic but, more simply, by the fact that both shepherding and hosting are easily understood ways of structuring relations of comfort and protection. Without logically dovetailing, one intelligible structure simply enriches and supplements the insights provided by the other.

The willingness to neglect considerations of consistency and coherence in the coordination of diverse image schemata is not limited to religious contexts, or even to informal ones. In the attempt to understand various ranges of phenomena, conceptually conflicting schemata often occur within the tightly restrictive confines of narrow scientific bounds. Far from being cognitively detrimental, this sort of conceptual clash frequently is indispensable. As Lakoff noted,

> Many functioning scientists . . . who understand electricity only as a fluid tend to make systematic errors in certain kinds of problems—those where the crowd metaphor works better. Students who understand electricity only as a crowd of electrons tend to make mistakes on a different set of problems—those where the fluid metaphor works better. . . . Knowing how to solve problems in electrical circuitry involves knowing which metaphor to use in which situation. (Lakoff 1987, 305)

Inconsistent construals may occur even within the brief span of a single sentence. Consider the scientific remark "We weren't able to use red objects in the experiment because there is no single wavelength that can be perceived as focal red" (Lakoff 1987, 214). Here, the switch is between two quite different construals of red: one whereby red is a sensuously perceptible quality of objects and the other in which red is construed in terms of reflected wavelengths of light, wavelengths that may not sensuously present anything as red in the perceptual sense at all. Far from finding this or similar sentences unintelligible, scientists switch so adeptly among alternative, often incoherent construals that they typically fail entirely to notice the shifts involved. As with a religious understanding of Psalm 23, neither rigorous consistency nor coherence is always needed to bind scientific conceptions into intelligible wholes.

As a result of his investigation into cases such as these, from both scientific and more ordinary contexts of everyday life, Lakoff forthrightly rejects the reality of unified systems of human understanding. Instead, he concludes, "Human beings do not function with internally consistent, monolithic conceptual systems. Each of us has many ways of making sense of experience . . ." (Lakoff 1987, 305). Moreover, shifts among these various construals are the rule, rather than the exception. In the course of everyday life, people switch incessantly from construing their friends, children, or lovers as (among other things) highly evolved biological organisms, complicated chemical factories, bundles of inferiority complexes, containers pressurized with suppressed emotions, bruised egos, or moral crusaders. Despite the fact that no one has the slightest idea how to integrate these or countless other indispensable conceptualizations of human life into any consistent or coherent whole, their daily employment remains thoroughly intelligible and orderly. Whatever the exact principles or procedures of orchestration may be, normal people have little trouble deciding which of their myriad construals is most appropriate in which settings. Biological construals may be useful when it comes to treating diseases. Construing humans as complicated chemical factories may be appropriate for rectifying potassium deficiencies. When trying to enhance self-esteem, construing people as bundles of inferiority complexes or as containers pressurized with emotions may be the best choice. If, in the interests of logical rigor, ways of construing people or situations are limited to abbreviated, artificially harmonized lists, the typical result is gross distortion, an impoverished understanding of the rich complexities of human life. When loved ones are construed purely as biological organisms, chemical factories, or bundles of inferiority complexes, relationships quickly degenerate. Interactions become contrived and mechanical. Intimacy is lost, and genuine love evaporates.

III. A Scientific Construal

For a detailed illustration of just how deeply metaphorical, yet tightly restrictive, even the most productive of scientific construals can be, consider *The Selfish Gene*, published about two decades ago, in which Richard Dawkins described human beings as "survival machines—robot vehicles blindly programmed to preserve the selfish molecules known as genes" (Dawkins 1976, ix).[5] Dawkins began his work in the triumphant spirit of d'Holbach, declaring, "[I]t was Darwin who first put together a coherent and tenable account of why we exist. . . . We no longer have to resort to superstition when faced with the deep problems: Is there a meaning to life? What are we here for?" (1976, 1). Explicating his proudly scientific substitute for "superstition," he wrote,

> We are survival machines, but "we" does not mean just people. . . . We are all survival machines for the same kind of replicator—molecules called DNA—but there are many different ways of making a living in the world, and the replicators have built a vast range of machines to exploit them. A monkey is a machine which preserves genes up trees, a fish is a machine which preserves genes in the water; there is even a small worm which preserves genes in German beer mats [sic]. DNA works in mysterious ways. (Dawkins 1976, 22)

Throughout this passage, of course, Dawkins intends to remain within the narrow parameters of his striking image of survival machines. As becomes immediately evident, however, he finds it impossible to do so. Instead, a complicated mix of clashing, sometimes incoherent construals tumbles out of these few lines. Along with biological organisms understood as survival machines, there is DNA. DNA toils to make a living the way a common laborer does. It also works in mysterious ways, as the God of Christian scriptures does. Moreover, DNA molecules replicate, like memos pouring out of photocopiers, and then fabricate machines as factory workers do, only to exploit their new creations as unbridled capitalists might. Once built and thoroughly exploited, freshly created animal machines proceed to preserve their capitalistic creators in much the way that formaldehyde pickles specimens on the shelves of biology classrooms.

Surprisingly, Dawkins seems completely oblivious to the bewildering cacophony of additional construals he has released into play (Dawkins 1976, 35–42, 48–49, 95, 103–4). At one point, without the slightest hint of irony or embarrassment, he unabashedly proclaims, "For brevity, we shall again use the convention of thinking of the individual as though it had a conscious purpose. As before, we shall hold in the back of our mind that this is just a figure of speech. A body is really a machine blindly programmed by its selfish genes" (157). Here, by insisting that his construal of individuals as purposive agents must be taken as nothing more than a useful manner of speaking, Dawkins struggles to provide a more accurate, more literally correct rendering of his thought. As with construals of time, however, he locates no such literal bedrock. Instead, he lapses immediately back into metaphor (157–58, 161ff.). Rather than eliminate his figurative language altogether, he manages only to replace his initial construal of individuals in terms of personal agency with a fresh selection from his own growing set of metaphors. Piling images of machinery, computer programming, and visually impaired software technicians on top of one another, he smuggles a new collection of associations into his tightly restricted, archetypal construal in terms of survival machines.

After all of this, despite being considerably fortified with so bewildering an array of supplemental images, Dawkins still remains too constrained to reason freely. Transfixed by his original construal in terms of selfish machines, he finally is driven to admit, albeit with a tinge of regret, "Much as we might wish to believe otherwise, universal love and the

welfare of the species as a whole are concepts which simply do not make evolutionary sense" (Dawkins 1976, 2–3). In the end, his vision of ruthlessly selfish genes cuts him off entirely from a range of commonplace possibilities, possibilities easily recognized and understood as genuine from the "superstitious" perspectives he was so anxious to leave behind (1976, 204–5).

A more dramatic indication of how thoroughly Dawkins's biological understanding hems him in comes from a consideration of his comments about adoption:

> In most cases we should probably regard adoption, however touching it may seem, as a misfiring of a built-in rule. This is because the generous female is doing her own genes no good by caring for the orphan. She is wasting time and energy which she could be investing in the lives of her own kin, particularly future children of her own. It is presumably a mistake which happens too seldom for natural selection to have "bothered" to change the rule by making the maternal instinct more selective. (1976, 109)

In fairness, it should be noted that this particular passage follows immediately upon a discussion of monkey behavior. Still, the application to human life is clear. How impoverished personal relations would be for families who took this perspective seriously. What rich possibilities for human caring would be foreclosed forever by any mother who understood her impulse to adopt as nothing more than a biological misfiring! Imagine trying to explain her adoptive behavior to her new children. As a survival machine, she never really wanted them. On the contrary, she is programmed to preserve her own genes, not theirs. Still, thanks to the misfiring of her inborn rules, she has taken them into her home. How fortunate for them! Perhaps she should go on to explain why their adoptive father is racing out the door. He simply has no other choice. Since she cannot bear him children of his own, it is his biological duty to move on to more fertile breeding grounds.

Just as Dawkins's construals narrow and cheapen his vision of the potential for human love, they also limit his sensitivity to the depraved depths of human evil. At one point he asks,

> What simple practical rules could animals obey which, under normal conditions, would have the indirect effect of benefiting their close relations?
>
> If animals had a tendency to behave altruistically towards individuals who physically resembled them, they might indirectly be doing their kin a bit of good. . . . Conceivably, racial prejudice could be interpreted as an irrational generalization of a kin-selected tendency to identify with individuals physically resembling oneself, and to be nasty to individuals different in appearance. (Dawkins 1976, 107–8)

How sanitary it would be to conceptualize viciously racial acts along these lines. Using elementary logical fallacies as models, one could transform hate crimes into misreasonings, something like biological versions of

hasty generalization. Such construals would sound almost as clean and antiseptic as the medical metaphors used in reports from the Gulf War, where blood-spattered walls and the foul decay of lifeless human flesh were glamorized nightly as safely sterile, surgical strikes.

As a final illustration of the pervasive but constraining impact of his metaphorical construals, consider the closing lines of *The Selfish Gene*, where Dawkins tries to strike a more promising chord. Gazing into the future, he celebrates the human capacity for self-conscious reflection and imaginative foresight, and then hopefully announces: "We can . . . discuss ways of deliberately cultivating and nurturing pure, disinterested altruism —something that has no place in nature, something that has never existed before in the whole history of the world. We are built as gene machines and cultured as meme machines, but we have the power to turn against our creators. We, alone on earth, can rebel against the tyranny of the selfish replicators" (Dawkins 1976, 215).

Unfortunately, no matter how comforting they may sound, these brave words cannot ring true. It is simply impossible to reconcile them with the overall biological vision of *The Selfish Gene*. If people really can self-consciously defy their biological nature, this fact alone straightforwardly contradicts the claim that humans are "survival machines—robot vehicles blindly programmed to preserve the selfish molecules known as genes" (Dawkins 1976, ix). Furthermore, neither a Newtonian nor a Wittgensteinian maneuver can soften the impact of this collision. So blatant an inconsistency entirely rules out the possibility of tacking an altruistic supplement, some novel emergent element, on top of the selfish gene model in anything like the way that Newton offered a religious addendum to pick up where his three laws of motion left off. With respect to Wittgensteinian maneuvers, the suggestion of genuine human altruism clashes so directly and violently with Dawkins's biological account that it obliterates any hope for peaceful coexistence. No matter how far they may be separated from each other in the overall framework of his thought, the claim that humans are altruistic cannot be safely isolated from Dawkins's contention that people are just the pawns of purely selfish genes. The two claims simply cannot both be true.

Ultimately, then, Dawkins ends up in the same uncomfortable predicament as his "superstitious" predecessors. He envisions possibilities that his scientific construals foreclose. Transfixed by how much can be learned when humans are construed as the survival machines of selfish genes, he is intoxicated with the sheer explanatory power of contemporary biological thought. Nevertheless, his rigidly narrow understanding is so tightly binding that it precludes his accepting many of the most treasured aspects of human life, those that resist his scientific construals altogether. Instead of stretching the limits of his understanding, Dawkins's genetic concepts

blind him to the point at which he is reduced to wistful groping after some nobler destiny, a brighter future that remains forever inconsistent with his rigorously scientific perspective.

IV. Religious Construals and Human Possibility

It is important to recognize that the restrictive vision of *The Selfish Gene* does not stem from any particular scientific insufficiency. No doubt, there is much to dispute biologically in Dawkins's work. In particular, many writers have questioned his choice of genes as the units of natural selection, preferring individual organisms or groups of related organisms instead. Whatever the best biological theory may be—whether this one, a competitor, or something yet to come—it still will be nothing more than the best biological theory, the understanding most suitable for biological purposes. As Dawkins's construal of adoption reveals, however, not all human purposes are biological ones. Construing a mother's love purely in terms of the survival of biological units, even if they are the most appropriate biological units, simply misconstrues the richest dimensions of her love. Any genuinely loving adoptive mother is devoted to her children, not to the most adequate units of natural selection.

Still, when all is said and done, biological as well as other scientific construals demand a hearing. Although they may not capture all there is to say about adoption, racism, or other matters, such construals offer much that is of indispensable value. Ultimately, then, works such as *The Selfish Gene* pose a fundamental contemporary problem: scientific construals are too restrictive to embrace uncritically, yet they are too powerful to repudiate. When consistently pursued, they yield startling insights. Nevertheless, they also distort, twist, and misrepresent much that is deepest about human life. Erecting impermeable barriers, they exclude crucial kinds of human well-being entirely from the range of conceivability.

Confronted with the limitations of scientific understanding, one finds it natural to want to introduce alternative, supplemental construals. Unfortunately, many truly enriching supplements cannot peacefully coexist with the sciences. Typically, the viewpoints that d'Holbach and Dawkins so condescendingly labeled "superstitious" often clash quite directly with scientific ways of interpreting the world. In particular, religious perspectives tend to be more militant than Newtonian addenda but less isolated than Wittgensteinian emigrants. They chafe against the sciences, compete with scientific thought, even contradict the sciences. Yet, when all is said and done, they also seem fundamentally incapable of removing the sciences from their central place in contemporary intellectual life.

Here is where themes drawn from the work of Lakoff can be introduced to sketch a more productive role for religious construals. Of primary help is his rejection of both the reality and the value of unified

systems of human understanding. As with the conflict between fluid and crowd conceptualizations of electricity or the incoherent connections among diverse construals of time, distinctively religious construals may remain forever irreconcilable with scientific ones yet still manage to expand human understanding in worthwhile ways. Even if incompatible religious understandings cannot be used to justify the wholesale rejection of scientific viewpoints, they may provide a basis for more limited forms of critique. By repudiating the need for cognitive unity within scientifically advanced cultures, sufficient conceptual space can be cleared for genuinely religious calls to intellectual transformation and personal reform, calls that echo something of the passion of Saint Paul's instruction, "Do not be conformed to this world, but be transformed by the renewing of your minds, so that you may discern . . . what is good and acceptable and perfect" (Rom. 12:2 NRSV).

As an example of the subtle interplay among various scientific and religious construals, consider contemporary American analyses of the AIDS situation. In the United States the prevalent biological approach has been to conceptualize the cause of AIDS as a virus, one unusually adapted for survival in mammalian organisms. While the ability of this virus to move from one organism to the next is rather limited, once established in a new habitat it is remarkably hardy. The medical approach has been to construe AIDS as a devastating human disease, even an epidemic. This, of course, moves beyond the purely biological analysis to incorporate distinctive values associated with human health and bodily welfare. Construing the AIDS virus as a threat to human health and life offers a clear motivation for pouring money into research, hoping to find ways of killing or at least incapacitating the AIDS virus. If cures cannot be found, perhaps vaccines can. Because progress along these lines has been so distressingly slow, medical professionals and social organizations have come to embrace an array of technological recommendations, including the use of rubber gloves, condoms, and other barriers against further transmission of the viral threat.

Perhaps the most rudimentary religious response to all of this has come from certain branches of the Christian community. Rather than challenging or reshaping the biological or medical understanding of the problem in terms of viral infection, spreading disease, growing epidemic, and the need for containment, protection, and safety, the impulse has been to embrace these scientific construals as basic, even normative. As a result, the general tendency has been to encourage distance and separation from the infected. With regard to human sexuality, it has seemed appropriate to fall back upon a tradition in which chastity has functioned as an important virtue. From this perspective, the most thoroughly sensible religious recommendation seems to be abstinence. Isolating the carrier of the

dreaded virus from dangerous contact with others will protect the uninfected from contagion, thereby blocking the further devastating spread of the disease.

The obvious attraction of this religious contribution, one that reinforces its popularity, is that it meshes so perfectly with the scientific construal of AIDS as a currently incurable viral invader and humans as infectable organisms. This view provides no real challenge to the encompassing medical vision but simply a nonthreatening supplement to the technological advice of health professionals and public agencies. Sadly, however, this contribution also seems oblivious to so much that is distinctively Christian. At least with regard to its sexual recommendations, it does not appear to be genuinely religious at all. While providing moral admonitions that are traceable to roots in Christian tradition, it preserves little or nothing of the original religious motivations or meanings of abstinence. In contrast with the past, when Christians often understood chastity as a symbol of religious devotion or employed it as an instrument in service of some higher, loving commitment, this particular recommendation of abstinence appears disconcertingly self-oriented. When used for personal safety, it quickly degenerates into an emblem of separation and mutually alienating self-concern.

Setting the recommendation of abstinence within a larger context of other Christian construals might reclaim something of the fuller religious context of chastity. For example, the Christian scriptures teach that humans can be understood both as temples and as living sacrifices to God (Rom. 12:1; 1 Cor. 6:16 NSRV). Although such additions might generate the same behavioral recommendation of abstinence, they would offer something new to the conceptualization of the AIDS situation, something essentially unintelligible from a biological or medical point of view. When people are understood as temples or living sacrifices, they are construed as holy, as items to be kept pure. From this perspective, humans can be polluted or defiled by certain activities—activities that are construed simply as natural, reproductive ones from a biological point of view. From a medical point of view, these acts of pollution or defilement are conceived of merely as ways of transmitting a deadly virus from one human body to another. AIDS, construed biologically as a virus and medically as an infectious disease, is transformed into a blemish, a mark of taint, impurity, defilement. Just as wasted time is unintelligible from the standpoint of relativity theory, this understanding of human pollution is biologically and medically incomprehensible.

Along rather different lines, another Christian framing of the situation could be modeled after a pattern from the life of Jesus. Confronting leprosy, the AIDS of his day, Jesus recognized the medical risks but chose to ignore them. Despising the safety of love at a distance, he also ignored the

religious ramifications of his association with the unclean. Defying the traditional construals of his culture, he stayed in the home of Simon the leper (Matt. 26:6; Mark 14:3 NRSV). Rather than seek the medical security of separation or the religious purity of distance, Jesus chose to identify with Simon and his plight. Framing leprosy in the biologically and medically incomprehensible terms of evil and the need for redemptive love, he responded to this particular source of human suffering in ways that clashed with both the approved medical practices and the standard religious responses of his time.

The point of this brief sketch of scientific and religious construals is neither to condemn nor to recommend any particular ones, but only to highlight some of the ways that shifts from one conceptual framing to another can precipitate dramatic transformations in the ways that human contexts are understood and evaluated. Because personal motivations, goals, and values are shaped so largely by the ways that situations are understood, differing construals often dictate differing actions. As conceptualizations vary, whole ranges of behavior may be justified or condemned. As the pattern drawn from the life of Jesus indicates, possibilities shut off by one perspective may be thrown open by another. Actions censured by one way of understanding a situation may be endorsed, or at least encouraged, by alternative construals.

V. Newton, Wittgenstein, and Religious Understanding

According to the Old Testament record, God gave Moses some construction restrictions. In particular, he said, "[If] you make for me an altar of stone, do not build it of hewn stones; for if you use a chisel upon it you profane it" (Exod. 20:25 NRSV). When geologists categorize rocks by the way they were formed, they do not include the profane among their classifications. Masons have added diamond wheels to their arsenal of cutting tools yet offer no explanation of how chiseling could desecrate a rock. Quite simply, neither science nor technology offers conceptual resources for expressing what, for Moses at least, was a critical distinction among rocks, a matter that demanded very different treatment of chiseled from unchiseled stones.

None of this would particularly disturb d'Holbach. As science advanced, he expected the gods and all that went with them to evaporate (d'Holbach 1970, 1:174). Still, if beliefs have as much effect on behavior today as they did at the time of Moses, perhaps the loss of such distinctive, ancient ideas carries more serious consequences than d'Holbach imagined. Today the earth and its parts, both organic and inorganic, are construed in a multiplicity of ways. Darwin understood the biological world as a fierce, competitive struggle, whereas recent ecological models

tend to stress the dynamic interdependence among species. The technology of space travel has encouraged the vision of the earth as a fragile spaceship, whereas the science of economics has suggested ways to assign environmental debits and credits to everything from wetlands to snail darters.

According to Newton, religious explanations are mere addenda to the sciences. They are used to account for scientifically inexplicable phenomena. As such, they neither overlap nor conflict with scientific thought. Where adequate scientific explanations can be found, religious accounts may dissipate without conceptual loss. None of this is true with respect to the relations among contemporary scientific and religious understandings of the earth. From religious sources come a variety of construals. Historically, for example, Christians have been tempted to view the earth as a temporary residence, a disposable place of preparation for an eternal destiny elsewhere. More recently, increasing emphasis has been placed upon specific biblical passages in which God seems to speak of the earth as a gift and of human stewardship (Gen. 1:26–30; 2:15, 9:3 NSRV). New phenomena are not seen as falling safely outside the bounds of scientific explanation; rather, the very same phenomena are reconceptualized on the basis of such religious ideas. Whether understood biologically as a competitive arena, ecologically as a web of interdependence, technologically as a spaceship, or economically as a system of credits and debits, it is precisely the same world that is construed religiously as a temporary residence, a gift, or a sacred trust.

Moreover, religious construals of the earth do not always mesh neatly with scientific ones. Initially, for example, the Christian conception of the earth as a temporary home may seem fully compatible with the spaceship model, but its emphasis upon eternal destinies elsewhere suggests conflicts as well. Whereas the spaceship model encourages a long-term interest in the earth's environment, the idea of a transitory residence is more like that of a disposable diaper—of essential value in the short term but ultimately to be used up and discarded. This concept of easy dispensability, of course, clashes not only with the spaceship model, but also with other scientific and religious construals. To treat the earth like a disposable diaper or to subject it to crassly economic analyses of cost and benefit is to mistreat it as a divine gift or sacred trust.

Because beliefs so deeply affect human behavior, religious conceptions of the earth and its parts cannot necessarily be jettisoned without consequence. Contemporary builders relate to chiseled and unchiseled stones in ways that would have scandalized Moses. From an evolutionary point of view, *Homo sapiens* is merely one among many species—competitively successful in the short term but perhaps maladaptive in the longer run. In the ecological scheme of things, people eventually may be replaced by

carnivorous beetles. To view human beings as fashioned after the image of God (Gen. 1:26–27 NSRV), however, is to introduce a fresh perspective —one that invokes an entirely new range of considerations, values, responsibilities, and actions. Biologically, a six-toed frog is nothing more than a genetic anomaly, perhaps signifying a budding new branch on the evolutionary tree. Ecologically, that same frog may dramatize the genetic effects of a thinning ozone layer. If anthropocentric values are thrown into the mix, the frog may become a warning of future dangers to the human race. Construed as a sacred trust, however, the frog is a reminder of the earth's desecration, an indictment of humans as earthly caretakers. What may demand no action from a biological or ecological perspective, and only self-interested actions from an anthropocentric point of view, can require repentance or rededication to dutiful responsibility, when considered religiously. For that matter, even when religious and other perspectives happen to concur in their recommendations, there may be a world of difference between them. Self-interestedly anthropocentric care for the environment may be indistinguishable behaviorally from what God demands, but it is not what God demands of caretakers.

Unlike genuine Wittgensteinian language games, the differences among scientific and religious construals of the earth cannot be traced to differences in logic, methods of construction, or fundamental cognitive strategy. While their differences are sometimes startling, each framing is generated using the same basic method, that of rudimentary analogical modeling. Each construal exemplifies the same fundamental cognitive strategy, the one noted by Lakoff as so ubiquitous, that of rendering the earth intelligible by framing it in terms of something already understood. Because all are constructed by means of the same modeling techniques, the striking differences among various scientific and religious ways of understanding the earth must be traced to matters of content. Each appeals to a different source for analogy. Where their analogical sources are compatible, the construals dovetail. Where their sources of analogy conflict, the construals collide. As a result, each way of conceptualizing the earth engages in a tangle of interrelations with the others, sometimes interweaving and interlocking, and other times jostling and colliding.

Finally, although classic Wittgensteinian language games stand in splendid isolation from one another, contemporary religious construals of the earth are not so clearly independent or separated from scientific understanding. To view a wetland as a sacred trust or a gift from God is neither to ignore its economic impact nor to deny the scientific realities of species competition and ecological balance. On the contrary, properly caring for entrusted wetlands may require the very best that science has to offer. Nevertheless, the religious recognition or use of scientific findings should not be confused with an uncritical submission to the sciences. As

Lakoff emphasized, confining the dimensions of human life to the limited conceptual resources of any single model—even a powerfully scientific one—seriously restricts, even distorts, the immense potential for diverse forms of human prosperity. Religious values, goals, and purposes are not scientific ones, nor are they even always compatible with those of the sciences. Although the sciences may provide much that is fertile and enriching in contemporary life, scientific understanding frequently turns out to be every bit as stifling as it is enlightening. If religious traditions are to play a genuinely useful role in scientifically sophisticated cultures, they must be willing not only to make use of scientific information but also to break free from the conceptual stranglehold of the sciences. Saint Paul called for intellectual transformation, not subjugation.

Obviously, various disciplines offer a wealth of models for human understanding beyond the sampling sketched here. If literary, aesthetic, social, political, or other traditions were added to those of science and religion, the scope of possibilities would stretch almost endlessly. Each conceptualization structures human relationships in its own way, opening possibilities for understanding or interaction that may be ignored, obscured, or precluded altogether by other alternatives. Precious few of these worthwhile construals could ever be orchestrated into any thoroughly compatible, harmonized unity of thought. The real value of so formidable an array of clashing, chafing, and jostling models does not reside in any systematic consistency, however, but in the capacity to galvanize the human imagination to new visions of the extraordinary complexity and potential for human well-being.

In an age where AIDS and massive environmental destruction are joined by ceaseless warfare, consuming hatred, and countless other evils of unprecedented virulence, the most appropriate religious response to the Laplacean retort "I have no need of that hypothesis" is not to concede the sufficiency of any scientific understanding, no matter how powerful or impressive it may seem. Rather than retreat in the face of scientific success, a more productive form of religious response would be to protest that none of the hypotheses entertained by scientists, or anyone else for that matter, has proven nearly sufficient for confronting the overwhelming problems that afflict contemporary, scientifically saturated cultures. Instead of passively seeking peaceful coexistence, religion must be willing to confront the sciences with fresh patterns of understanding, patterns that seek not to enslave but to liberate the potential for human life—sometimes in scientifically incomprehensible ways.

NOTES

1. Stephen Toulmin (1993, 139–53) suggests that Laplace intended not to eliminate God from human understanding but to repudiate the suggestion that God was an incompetent craftsman.

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2. Translations of biblical passages are taken from the New Revised Standard Version of the Bible.

3. See Lennart Lundmark, "The Mechanization of Time" (Haken, Karlqvist, and Svedin 1993, 45–65), for a discussion of the interplay among various ways of measuring time and assorted conceptualizations of time.

4. See Lakoff 1987 for a presentation of his own work as well as summaries of the work of others.

5. For an extended analysis of the conceptual influence of metaphor on this work, see Colin Grant 1991. An interesting collection of studies of the role of metaphor throughout the history of scientific development can be found in Haken, Karlqvist, and Svedin 1993.

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