Fortieth Anniversary Symposium: Science, Religion, and Secularity in a Technological Society

ATHENS, JERUSALEM, AND THE ARRIVAL OF TECHNO-SECULARISM

by John C. Caiazza

Abstract. Western civilization historically has tried to balance secular knowledge with revealed religion. Science is the modern world's version of secular knowledge and resists the kind of integration achieved by Augustine and Aquinas. Managing the conflict between religion and evolution by containing them in separate "frames," as Stephen J. Gould suggested, does not resolve the issue. Science may have displaced religion from the public square, but the traditional science-religion conflict has become threadbare in intellectual terms. Scientific theories have become increasingly abstract, and science has been attacked from the left as a source of objective knowledge. However, technology, not science, has displaced religious belief, a phenomenon I call *techno-secularism*. Robert Coles's suggestion that secularism is a form of doubt inevitably attached to religious belief, and William James's reduction of religious experiences to psychological states, evaluating them according to their "cash value," are unhelpful. Technology enables us to remake our environment according to our wishes and has become a kind of magic that replaces not just revealed religion but also theoretical science. Techno-secularism has an ethical vision that focuses on healthful living, self-fulfillment, and avoiding the struggles of human life and the inevitability of death.

Keywords: evolution and religion; Stephen J. Gould; psychology and religion; religion; science; science and religion; secularism; technology; techno-secularism.

John C. Caiazza is adjunct professor of philosophy at Rivier College, Nashua, NH 03060; e-mail jcaiazza@Rivier.edu.

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In the third century the dissident Christian theologian Tertullian asked rhetorically in the midst of a theological controversy, "What has Athens to do with Jerusalem?"—condemning in effect the use of Platonic philosophy to defend the Christian religion and provide an intellectual basis for its theology (Copleston 1961, 10). The theme of the two competing cities has characterized the relationship of the Christian religion with Western civilization to this day. According to Leo Strauss, Western civilization attains its vitality and uniqueness because in it two major sources of knowledge and inspiration contend, the secular and the revealed (Hart 2000, 63–71). Ironically, the integration of revealed knowledge found in the Bible and religious tradition with secular knowledge has never actually been accomplished, and it is that fact that provides the essential motive force for the advance of Western civilization, at least so far. In the third century the form that secular knowledge took was the neo-Platonic philosophy that Hellenistic culture of the time inherited from the Greeks, hence Tertullian's reference to Athens. This was the same neo-Platonism later integrated into Christian theology by the great Saint Augustine. Whereas the source of revelation—the Gospels and the authority of the Western and Eastern bishops of the Christian church—remained constant, the source of secular knowledge changed from ambient neo-Platonism in the late ancient world to rediscovered Aristotelianism in the High Middle Ages (Copleston 1961, 13, 14).

In modern times secular knowledge has been represented not by ancient philosophy but by modern empirical science, and the conflict has continued under the rubric of "religion versus science." This conflict between religion and science has taken many turns, and while as the latest manifestation of an 1,800-year-old tension in theology it presents unique difficulties, understanding its history supplies a context in which to understand and I hope clarify current controversies, including whether the conflict is a necessary one and the profound importance of technology in the current stage of the debate. It is in the historical context of the separation between secular and revealed knowledge that the 150-year-old controversy between evolutionary theory and religion is best understood.

STEPHEN J. GOULD, THEOLOGIAN

One of the late Stephen J. Gould's last books is *Rocks of Ages: Science and Religion in the Fullness of Life* (1999). Its tone is, if not elegiac, somewhat tired, for in this short book Gould gives us the benefit of a professional lifetime's effort of a Darwinian publicist and scientist contending with the religious enemies of Darwinian evolution. It may seem odd, therefore, that in it Gould praises no fewer than three popes, including Pius IX, Pius XII, and John Paul II. The latter two published documents permitting Roman Catholics to research and even accept some (but not all) of the main

tenets of "orthodox" evolution.[1] That is, Catholic doctrine excludes the Darwinian materialist thesis that all life is solely a mechanical process and asserts instead that all human beings have been provided by the Creator with an immortal soul. It appears that Gould sets up these popes as a firewall against the objections of religious critics including neo-Creationists and fundamentalists who oppose Darwinism as atheistic and unscriptural.

American public opinion has never accepted Darwinism wholeheartedly, and serious thinkers continue to make effective responses to it, most recently Michael Behe in *Darwin's Black Box* (Behe 1997; see Caiazza 1997). Although neo-Creationists may have lost the recent court cases, their argument that alternatives to Darwinism ought to be presented in high schools is an agreeable one to Americans. Gould probably feared that at some point one of these cases might incorporate Supreme Court Justice Antonin Scalia's contention that American citizens ought to have a say in what their children are taught in public schools, thus countering the Darwinians, and his book must be seen in this light. Gould's proposed resolution of the religion/evolution controversy is "non-overlapping magisteria," or NOMA. The basic idea is easily expressed: science and religion each occupies its own "frame" (a term he borrowed from G. K. Chesterton), and each field should not exceed its proper limit. Gould willingly concedes that evolutionists have often overreached with declarations about matters that are religious, but of course his main concern is with religious believers who use revelation and the Bible to confute evolution (Gould 1999, 125–50). The frames are important for Gould, because he perceives that if science and religion stay within their own frames, there will be no further conflicts, and neither side will be able to suppress the other. It sounds plausible, but religious believers who agree to accept Gould's NOMA may be duped, because clearly he expects science to continue as it has in the past to confine religion into ever narrower and more constricted frames while it expands its own frame into areas formerly occupied by religion. Gould's understanding of religion is completely secular. He sees religion as something that cannot be ignored because of its influence but that should be kept within rigid social boundaries. Further, as one critic pointed out, Gould's understanding of religion is "glaringly inadequate" in that it includes none of the things we normally associate with religion, even belief in God (Carey 2001).

The surprising thing about Gould's NOMA proposal is that it is not new, and he apparently did not realize it. In the thirteenth century at the University of Paris such a proposal was the thesis of a group of philosophers including Siger deBrabant, who was accused of proposing the theory of the "double truth." In those days the issue of conflict was not the Bible versus evolution but the tradition of revelation versus the newly discovered

philosophy of Aristotle. A group of radical theologians, including Albert the Great and Thomas Aquinas, was attempting to integrate this newly discovered secular knowledge with Christian revelation and facing heavy opposition from reactionary theologians. Siger's double-truth theory, like Gould's NOMA, was meant to quell the conflict, which had become fierce and would eventually bring an ecclesiastical condemnation of Aristotelianism (Copleston 1961, 104–5). Aquinas, however, vehemently opposed the theory of the double truth with his famous dictum that all truth, secular and revealed, is from the Holy Spirit (Aquinas 1955, Book 1 Chap. 7).

Although it is useful to understand the present debate surrounding evolution as the latest reflection of an age-old contest between secular and revealed knowledge, there does seem to be something different, more oppositional, in this latest incarnation. Perhaps the reason we sense this is that we are going through it, but I do not think that our sense of an ultimate conflict between secular and revealed knowledge in the contemporary case is just a question of loss of historical perspective. Greek philosophy acknowledges the reality of spirit and the existence of God, whereas science tends, as Cardinal John Newman pointed out, to be atheistic. In other words, Saints Augustine and Thomas had an easier time of it because both neo-Platonism and Aristotelianism are philosophies that acknowledge or attempt to prove the existence of one immaterial God, the reality of mind, and the immortality of the human soul, whereas modern science emphatically does not. Further, science traditionally has tended to deny the legitimacy of the perception of purpose in the universe and to pursue a reductive agenda that attempted to delegitimize revealed knowledge. I question whether modern science is necessarily materialistic, atheistic, and reductive; nonetheless, it is a historical fact that, with the rise of modern science, what was previously a controversy about secular and revealed knowledge between theological academics has become a steel-cage death match.

Science versus Religion—A Draw

The present state of affairs in Western culture is that religion as part of civil discourse is in retreat even in debates in which a religious perspective would be most helpful, such as those about human cloning or fetal research, while science and utilitarian ethics have seemingly captured the field. It may even seem that the tension between secular and revealed knowledge in its present form of science versus religion has been resolved; science has won, and religion is discounted as irrelevant, as a mere survivor from a less progressive time such as the Dark Ages or the 1950s. It must be admitted that there are good intellectual reasons, translatable into formal arguments, for opposition between modern science and revealed religion (just as there are good reasons to observe their deep commonalities). Science has its own implied metaphysics of the Galilean atomism that reduces physical reality

to abstract mass points while discounting colors, motion, and other evidence of our senses as merely secondary qualities. Science has its uncompromising theory of causality, which combines materialism with mathematics so that the actions of bodies can be understood dualistically—as contact and movement of basic particles and as the result of invisible forces described by calculus or probability. Science also benefits in the latest version of the conflict from its own proclamations of impartiality and from the putative superiority of its method, which supposedly produces at the end of its process a sure result, undeniable and irrefutable, so unlike theology and metaphysics. The triumph of the secular in our culture is largely the result of the triumph of empirical science, and considering the formidable arsenal of scientistic arguments it seems as if scientific secularism may have finally carried the day among Western intellectuals.

The triumph of science over religion, however, comes at a peculiar time, namely, when science itself faces challenges to its cultural hegemony as never before since the Enlightenment, challenged not by a Romantic rejection of its distancing from humane values and religious context but by the denial of its very basis that science is a special method of discovering ultimate truth. This challenge comes from postmodernist academics on college and university faculties who have developed entire schools dedicated to the denial of meaning in language that promote the cultural relativity of truth. After attacking the humanities and social sciences, they are aiming now at the hard sciences. In this context, science is fighting for its academic life, for the oxygen of intellectual probity, and for the continued acknowledgment of its epistemological superiority, all of which have provided scientists with approbation, authority, and funding. This postmodernist movement among philosophers, *literatteurs*, historicists, sociologists, feminists, and multiculturalists is antiprogressive, of course, more reactionary in its way than were the theologians and Aristotelian philosophers who fought against Galileo, who at least believed that the universe could be understood by the human intellect (Gross and Levitt 1998). The left-wing attack nonetheless constitutes an intellectual challenge that has not yet been successfully met by defenders of scientific objectivity.

The triumph of science also has been obstructed by developments from within science itself, since some of its basic theories, especially in physics, have developed beyond the simple-minded materialism characteristic of nineteenth-century thinking. Relativity theory and quantum physics propel us into levels of physical and methodological speculation so abstract that, according to philosopher of science Stephen Toulmin (1982), philosophers and theologians have now reentered controversies about cosmology. It seems that physics, the base science, can no longer give us visually precise pictures of either the atom, with its myriad attendant particles and intermingling forces, or outer space, now filled with waves of gravity, black holes, and dark matter. A further effect is that pop culture now freely uses

the terms of contemporary physics—"quantum jump," "expanding universe," "uncertainty principle," "anthropic principle" (in a novel by John Updike), "event horizon" (the name of a television program), and "Big Bang" (the name of a chicken sandwich offered by a restaurant chain). Within his own field of evolutionary biology Gould was involved in sharp controversies surrounding determinism and chaos and was accused by other evolutionists of giving inadvertent support to neo-Creationist deniers of Darwinism. The upshot of these developments is that, as John Polkinghorne has stated, in the arena of religion-science conflicts "we have all left the realm of knockdown argument behind" (1983, 6). No longer are the triumphant put-downs available that allegedly prove that scientific reason must prevail over religious revelation, such as enabled Laplace to assure the Emperor Napoleon that God was an unneeded hypothesis.

Yet scientific secularism still prevails, even as we are beyond the deployment of formal arguments in civilized contexts (as when Bertrand Russell debated Frederick Copleston, S.J., on the BBC about the existence of God[2]). Today instead, the formal science-religion debate has become so trivialized that the form was satirized by Monty Python and has degenerated to the point that a revival underwritten by the Templeton Foundation that took place in 1999 between two particle physicists was notable not for the deployment of further refined arguments but for Polkinghorne's sanguine assertion that religion and science are no longer in opposition and Stephen Weinberg's assertion that religion is "an insult to human dignity" (Kiernan 1999, 17; see also Goldberg 1999). Not only is the day of the knockdown argument over; it seems as if the day of any argument is over in the formal sense that Gould's *Rocks of Ages* implies, because the current state of the science-religion controversy can no longer be settled decisively in intellectual terms. In that sense science and religion have gained some form of parity.

But in what terms can the present state of the science-religion controversy be understood if not in intellectual terms? Ultimately, it seems that the issue is not one of intellectual debate, since scientists must now explain themselves in terms that are as abstract and arcane as those used in theology. Are string theory and multiple universes any easier to explain than the doctrines of justification or the Trinity, and are they not as frankly distant from direct observation or experiment? (Pannenberg 1991, 37–52) What has transpired so as to leave science triumphant despite ferocious questioning of its methodological legitimacy from left-wing academics and, despite its recent turn to high abstractions, amenable to philosophical and theological treatment? To answer these questions we must distinguish scientific theory from its applications—that is, science as explanation from science as technology.

THE ARRIVAL OF TECHNO-SECULARISM

Robert Coles claims in his recent book *The Secular Mind* that the origins of secularism and its recent upsurge are not to be found so much in scientific thought as in the nature of religious faith itself. As religious ideals rub up against the quotidian, secularism as a form of doubt becomes the inevitable psychological complement to faith, he argues. He quotes a conversation with Catholic activist Dorothy Day: "I think you underestimate *doubt* as a constant part of faith—in any century; and I think you are making too much of science (and social science) as the (recent) 'causes' of secularism. I don't deny that today there is the authority of scientific knowledge to elicit or encourage or give a kind of *imprimatur* to secularism; but for Heaven's sake, the secular world has always been 'there' or 'here'" (Coles 1999, 40).

Coles's meditations are in response to the dramatic event of Freudianism's replacing religion in the understanding and treatment of individuals suffering from mental distress. As a psychiatrist and a man of religious sensibility, Coles might well be expected to put the issue of contemporary secularism in the context of the stresses attached to personal religious belief. The circumstances of his writing his book, however, belie his understanding of doubt as a constant twin of religious faith, because what he is describing is the displacement of religious concepts by those of science. As Day points out, there was secularism before there was science, but now secularism has become a social movement defended by philosophers, scientists, politicians, and writers. It is therefore not enough to see secularism as another name for doubt and as the inevitable complement of religious faith, for this subtle psychotheological observation does not explain the roaring reality of rampant secularism seen in the present day and of science in the form of technological application as its chief agent.

Science changed from a form of praise of God's creation by such early giants as Galileo and Newton into an aggressive competitor of religious faith through a long process. Influential American philosopher William James provided an illustration of how this transformation took place, and not as an unintended consequence but deliberately. In 1902 he published his Gifford Lectures, *The Varieties of Religious Experience*. The republication of the book nearly one hundred years later by the Modern Library (James [1902] 1999) reflects its importance as a cultural event. Its initial publication marked a transition point from a science whose purpose was to reflect the glory of God to a science whose intent is to replace religion with the glorification of the human intellect. *Varieties* has been influential just because it is not an example of blatant atheism but proceeds more subtly and more powerfully as a phenomenology of religious experience, examining religious belief not in doctrinal or historical terms but by means of the then newly developing science of empirical psychology. The book consists largely of reports of religious experiences, internal states that the

subjects connect with divine or other external spiritual entities, which James analyzes in terms of his pragmatic theory of truth. His conclusion is that such experiences do not validate any particular religious tradition and especially not the Calvinist Protestant one. James's case against the Protestantism of his day as a form of psychological strain and excess is easy to make, because he defines all religious experiences in psychopathological terms and applies a pragmatic, practical, businesslike criterion of meaning to them ([1902] 1999, 9, 11, 29). On the other hand, his phenomenology of religious experience tends against a reductive point of view, for he takes reports of religious experience at face value and thereby eliminates the intellectual possibility of scientific materialism. Metaphysically James reached the conclusion that the variety of religious experience was best explained by seeing reality not as a duality of mind and matter, that is, as a competition between religion and secularism, but as a monism that combines both elements of mind and matter and could in effect support either religion or secularism. Such an approach may seem expansive or contradictory or even two-faced, leaving James's readers to wonder which side he is really on. As a practical matter, however, given a choice between the opportunity to make good in a time of burgeoning industry and commerce or to observe the stringent demands of Calvinist ethics, who would embrace the latter?

What James accomplished socially was to provide a scientific rationale for displacing evangelical Protestantism with a variety of free thought among the elites of American society. His philosophy of religion made possible for them indulgence in new kinds of religious experiences including spiritualism, seances, reincarnation, theosophy, and Eastern mysticism without the traditional Christian elements of judgment and hellfire. In this way James was the prophet of current self-affirming "new age" religion. It was a time when technology and industry were transforming American life, and the glorification of business and greed seen in the gospel of Herbert Spencer's philosophical evolutionism was destined to come into conflict with the rigorous ethics of the Calvinist Christian gospel, which counseled humility, doing good for others, and subservience of self—ethical ideals that hardly suit the exploitation of business opportunities. James prepares the way for a secular outlook by applying his famous pragmatic theory of meaning to religious beliefs in which their practical effects are their warrant for validity and value. An example is his harsh criticism of Theresa of Avila, whose extraordinary mystical experiences had, he says, only a "paltry" practical effect (James [1902] 1999, 379–80). Actually, Theresa was the most practical of mystics, and her works had great practical effect, but for James the reform of the convent system in Renaissance Spain and the enhancement of the spiritual life of Christians through her writings are not practical enough. Frequently in *Varieties* James uses the term "cash value" as a metaphor for the pragmatic theory of meaning, but

in time the reader begins to realize that "cash value" is not a metaphor but designates the real thing, the real sense of what James believes the value of meanings and beliefs to be.[3]

I have presented James's *Varieties* as if it were an ideology, that is, less the product of the independent thought of a philosopher than a reflection of the change in the technological structures of production, to use a Marxist turn of phrase. This is justified, I believe, because the practical effect of their writing and thought is the criterion James employs in judging others, and the cash value of his *Varieties* is that it gave leave to the elites of American society to disregard the stringent ethics of Calvinistic Protestantism and invent an ersatz spiritual life for their own comfort. The business ethic was thereby able to overcome the Protestant ethic, and technology succeeded in displacing religion to give secularism a social reality it had never before had in American thought and life. By emphasizing the cash value of religion James had in effect turned it into a technology, a means of production. The technologization of our culture has had the same effect on science itself.

The Magical Quality of Techno-secularism

In our day, technology-based secularism threatens to displace religion entirely from the national consensus. The success of secularism is based on the effects of technological advance rather than on the victory of scientific ideas in the conflict with religious beliefs. How this happened can be gleaned from a remark by science-fiction writer Arthur C. Clarke, who stated that "any sufficiently advanced technology is indistinguishable from magic."[4] It would be impossible to describe technology's effects on contemporary life in a few words, because technology is ubiquitous and its manifestations manifold. However, one point of recent technological development is worth making in general terms, namely, how technology itself is evolving from its nineteenth-century mechanical phase to a twenty-first century phase that Clarke called "magical." That the difference is qualitative and not merely quantitative can be imaged by reference to the steam engine and the personal computer.

In Victorian times steam power was the main force used for technological advance, most obviously the steam train engines that even today have not lost their evocative power. The point of the nostalgia is that every aspect of the technology of a steam engine was open and available for inspection: fire box, water pipes, smoke stack, steam valves, reciprocating rods, driving wheels. The immense force of steam power pulling tons of iron and steel was understandable just through observation; there was romance but no mystery. The most typical example of twenty-first-century technology is not the steam engine but the computer, whose product is not motion and force but organized information. The appearance of words on

a computer screen can, of course, be connected to the keys we hit on a keyboard, but we cannot see the causal links from the keyboard to the screen, for the keystrokes are transmitted by an electronic and not a mechanical process, unlike the typewriter in which the keys are connected to push rods with a character for each letter that strike the paper on the platen. Further, if we take apart the computer we see its components—electric motor, fan, transformer, cables and wires, boards and chips—but these do not directly convey how the process of computerization takes place, because the calculations and the sortings and arrangings of data are done within the chip, which has no moving parts. How the computer works thus remains a mystery even after inspection of its innards. It is a "black box" whose inner logic and workings are a mystery to most of us. Unknowable, it is often unrepairable by its users, and, as with many appliances today, usually cheaper and more efficient to replace than to repair. We have retreated from mechanical explanations in terms of Victorian forces—explicit, competent, and muscular—to a postmodern realm of magical effects whose causes cannot be explained: mysterious, astonishing, the province of experts who may regard mere users with disdain.

The transformation of technology from a mechanical to a magical phase indicates its enormously enhanced power and influence. Steam-powered trains provided a visible replacement for horses and walking, but information processing is so prevalent that, even if we do not own a personal computer, we are still beholden to computerization in appliances, television sets, weaponry, and libraries. Technology has become so ubiquitous in manipulating and transforming our world that it has in a way overcome theoretical science, for by "science" the general public now perceives not an empirical or mathematical explanation of physical phenomena but the power to change our lives, to make them more comfortable by making our personal environments more responsive to our wishes. According to one qualified observer, we "like science and technology but are happy enough not knowing very much about it. . . . We can blame the state of public education for this, but there is something willful in it" (Mowbray 2004, 6). Applying James's terminology, it has been said that technology is the cash value of science, and, as in the case of religion, the reduction to cash value empties out the true value of the scientific enterprise, which is to increase humankind's knowledge (Roy 2002). In this way science is reduced to its technological expression and the scientist perceived less as a discoverer than as a magician. Our personal environments have become so much the result of technological manipulation that when we reflect on them we perceive the creative power of human scientists, whereas in earlier times when we reflected upon nature we could see the creative power of God. Technological effects have acquired a life of their own, achieving a qualitative level of change so that now technology has its own ethics, theology, and unanticipated consequences. The displacement of religion from

civic life is more the effect of technological ubiquity and power than the result of direct cultural and intellectual causes, a phenomenon that I call *techno-secularism*.

One particularly important result of technological ubiquity is the degree to which it has sustained and extended the power of the state over our lives. The increase in the amount of data and reports required of corporations, colleges, businesses, and nonprofit institutions could not have taken place without new developments in technology. In turn, the increased sophistication of technology has empowered an exponential increase in the amount and particularity of regulations imposed on individuals and institutions in civil society. Thus, the recent electronic revolution has only intensified the impulse to bureaucratize power that followed upon such technological advances as air mail delivery, carbon paper, telephones, skyscrapers for office space, mechanically powered transportation, typewriters, and, not least, automatic weapons. Computerization and the ability to electronically replicate, organize, and transmit data over the Internet have made possible a massive expansion of federal and state control over our lives. In fact, the technologically amplified power of the bureaucratic state has made the state the chief object of concern and worry for its citizens, because its permission and benefits are required to conduct virtually every aspect of the daily business of contemporary life.

THE ETHICS OF TECHNO-SECULARISM

I emphasize here techno-secularism's ethical and religious dimensions, which are mediated through its implicit concepts as well as its practical effects. The implicit ethical theory of techno-secularism is instrumental, accepting that what technology can provide should be used for the betterment of the human condition without consideration of prescriptive ethical rules and humane traditions. It is utilitarian, opting for the greatest good for the greatest number, with the "good" being understood in relentlessly material terms—that is, terms amenable to technological control. The ethic is eudaimonian rather than hedonistic, concerned with bodily well-being rather than the maximization of pleasure. The techno-secular ethic is diet conscious, encourages the drinking of light wines rather than beer or whiskey, is anti-smoking, promotes safe sex practices, and is mightily concerned with attaining a long, fulfilled, healthful life. It is nonetheless a materialistic ethic with a "horizon" that ends with death, and so encourages a fearful rather than an heroic lifestyle, justifying abortion and euthanasia because of the demands that children and the aged make: disfiguring women's bodies, taking up precious time (the one commodity that technology cannot provide in abundance), and stultifying the careers and personal goals of both men and women. Techno-secularism is fearful even before the point of death, fearing the incompetence and dependence of old age and sequestering the dying, unseen, to hospital rooms and the ministration of experts

on death and dying. It emphasizes extending the period of healthful living for as long as possible, putting forth the possibilities of extending youthfulness by medical technology and of technologically sustained immortality in the form of cryogenics and cloning. Avoiding the inevitability of death, techno-secularism refuses to deal with the issue of what comes after, if anything, and its ethics is formed without reference to God and religion, because these are possibilities that extend beyond its horizon.

With regard to religion, techno-secularism attempts to empty out the doctrinal teaching from religious belief in order to co-opt religion's ability to change lives and to generate major social movements that are, in James's terms, religion's cash value. Techno-secularism has a fear of religion's ability to motivate people and social events effectively and occasionally attempts to refocus religious belief from religious ends to those in line with the aims of the bureaucratic state. For religion to "work," however, the religious believer must actually think that the objects of his or her beliefs are real and that the doctrines of his or her religion are true. Techno-secularism hits the fatal shoals on this point, for it cannot provide a doctrine that it believes itself and yet will motivate others in a religious way.[5] Unable to divorce cause from effect, that is, the content of religious belief from its effectiveness as a personal motivator and social force, techno-secularism relies on the smooth and unnoticed transition from faith-based explanations to scientific causes, as a result not of logical arguments but of the ubiquity of technology in our daily lives. Thus has magic made a revival as the unseen scientific causes of technology are appealed to for the improvement of our lives while true religion is trivialized and marginalized seemingly without effort.

Must magic prevail? Modern science and revealed religion are united on the point that "magic" in the ancient sense, by which incantation and commerce with spirits could influence fate, is a superstition unworthy of acceptance by educated people, and in modern times "magic" has come to describe a form of entertainment in which a magician performs tricks and illusions on stage. The doves do not appear magically from the wave of a colorful kerchief but were already in the magician's sleeve; the woman does not really float in the air but is is suspended on thin wires hidden by the darkened stage. The magic that prevails in the dominance of technology in contemporary life is also a form of fakery, for its effects depend on the highly trained intelligence and hard, sustained work of armies of scientists, researchers, technicians, and planners, all of whom work on materials already provided in nature. Tertullian, who was quoted at the beginning of this essay, also said, in a controversy about Creation, "If I give you a rose, will you disdain its creator?" The technologist would reply that the rose is fabricated, first by selective breeding and subsequently by genetic engineering; but first there was the rose itself, the rose as a natural phenomenon, the rose that is a symbol of mystical intuition of Creation.

NOTES

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1. The terms *orthodox Darwinism* and *central dogma* are frequently, and revealingly, used by evolutionary scientists to describe the core tenets of the contemporary theory of evolution. Gould is not seen as someone who subscribed to the orthodox view.
2. The text of the debate is available at *http://www.ditext.com/russell/debate.html*.
3. James's appreciation for the cash value of ideas reflects the fact that the family had been left well-to-do by the financial success of his grandfather, which enabled William, his brother Henry, and their father Henry Sr. to pursue lives of study and writing.
4. Quotation is found at *http://www.quotationspage.com/quotes/Arthur_C._Clarke*.
5. Dianetics, the movement founded by science-fiction writer L. Ron Hubbard, is an explicit attempt to organize a religion on a technological basis that has not been notably successful except among those in the entertainment community.

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