I. INTRODUCTION:
NATURAL PHILOSOPHY
AND DIVINE PROVIDENCE

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The implications of scientific advance for Christian theology are often reduced to a plausible but simplistic formula: as natural phenomena, formerly explained by the will of a deity, were increasingly understood in mechanistic terms, increasingly brought within the domain of natural laws, so the belief in an active, caring Providence was eroded until the God of Abraham, Isaac, and Jacob became nothing more than a remote clockmaker. On this view, the relationship between Enlightenment philosophy and the so-called "scientific revolution" of the seventeenth century is straightforward. Eighteenth-century freethinkers simply drew out the implications of Newtonian science, rejoicing in what human reason had achieved, celebrating the power of new empirical methods, questioning (in the spirit of John Locke) whether there was any privileged route to knowledge either through intuition or revelation. It is a view often substantiated by reference to Voltaire, as keen to popularize Newton's science as he was to denounce the "priestcraft" of the Catholic clergy. And Voltaire was certainly not alone in preferring the rational deity of the Newtonian universe to the whimsical, interfering deity of the Old Testament who, on Voltaire's satirical reading, was so bereft of moral sensibility that he had commanded the prophet Ezekiel to eat his barley bread cooked with shit.¹

That there are continuities between seventeenth-century science and the rationalist philosophies of the Enlightenment no one could deny. Scholars of the calibre of Ernst Cassirer² and Peter Gay³ have detected a new tone of thought, new and more stringent criteria for making truth claims, reflecting the great achievements of Galileo and Newton in the physical sciences and the rationalist epistemology of Descartes. I shall, however, begin with some conclusions from recent scholarship that point to richer, more complex sets of relations between what one might be tempted to call a scientific mentality and attitudes towards religious belief. High on any list would be the growing recognition that the concept of a "scientific revolution" in seventeenth-century Europe cannot properly capture the enormous diversification of scientific practice that can be detected during the period that separated Newton from Copernicus.⁴
A discussion of science and religion in the contemporary period could justifiably present a historical narrative of the major scientific advancements and theological movements in the twentieth century along with the key developments in the rapidly growing specialization of religion and science. This approach would illumine the origins of the specialization as well as the events that have shaped it—and surely the emergence of a systematic, international dialogue among scientists, philosophers, and theologians is the biggest story of the twentieth century as far as religion and science is concerned.

Another approach is to examine the relationship between the contemporary study of science and religion, and its Western cultural environment. Historical narrative is less important in this approach, while interpretation and argument are more prominent. However, such an analysis promises desirable insights into the potential importance of the specialization of religion and science. This is the approach taken in this essay.

Presenting the relationship between the contemporary study of science and religion and its Western milieu inevitably involves a certain amount of cultural analysis. There are dangers in all attempts to characterize such an amorphous reality as a culture, some obvious, and others less so. Yet the significance of the interaction between science and religion is broadly rooted in the contemporary situation, and this point can be conveyed only by accepting the confusions and perils of cultural analysis and venturing some general judgments about the Western cultural context.

Accordingly, the first part of this paper offers a sweeping glance at those features of contemporary Western culture that are most pertinent to the emergence and modification of what can be called its "critical spirit." The second part aims to relate science, religion, and the study of their interaction to this cultural analysis, in a bidirectional way. On the one hand, a broad cultural perspective illuminates the significance of the relationship between science and religion, and so confirms the importance of its systematic study. On the other, the relationship between science and religion is richly informative about contemporary Western culture.

The relationship between science and religion is fascinating partly because it compactly expresses a kind of schizophrenic anxiety within the contemporary West
generally: How can we think and act scientifically and theologically, critically and worshipfully, technologically and ethically at the same time? This phenomenon has been noticed and discussed many times. I am not especially attached to the term “schizophrenia” for describing it, but the analogy has some advantages. In clinical psychology, schizophrenia tends to mean dissociation from reality. In its popular sense, however, it suggests a split personality, in which the dissociation is internal rather than external—what psychologists might call multiple personality disorder. The two are not completely independent, since dissociation from reality is often the result of an attempt to avoid awareness of an internal tension or split, and vice versa. I will use “schizophrenia” as an analogy drawing on both meanings. Analogized by an internal personality split is the tension commonly experienced in the West between critical and spiritual impulses within human life. The image of dissociation from reality corresponds in the analogy to the failure to perceive accurately the nature of human life that follows from discomfort with its simultaneously present spiritual and critical moments. This failure of perception is expressed, for instance, in anthropologies and metaphysics that fail (or refuse) to build both these moments into their explication of human nature and of the world in which it has arisen.

A concrete, homey illustration of this tension might be helpful. It is well expressed at several points in the movie The Last of His Tribe, produced in 1992 by Home Box Office Entertainment. The following exchange from that film succeeded in conveying the relative spiritual numbness cultivated in at least some minds given over to criticism and systematic observation. The person lacking spiritual mobility and resourcefulness in the encounter is an otherwise generous and thoughtful anthropologist, but the same tendency can be found in theologians and natural scientists, and perhaps even the general way of being of the West. Alfred Kroeber, the anthropologist, convinces the last of the Yahi tribe—dubbed Ishi by Kroeber—to lead him and some colleagues to the lands of the Yahi. There, before his old hut, Ishi recalls the wiping out of his people, and tries to reach his awkward, disengaged companion:

**ISHI**: Put your hands on the earth. (Uncomfortably, anxious to take this moment with due seriousness, Kroeber joins Ishi on his knees in the dirt.)

**ISHI**: Do you feel her breathing?

**KROEBER (embarrassed, uncertain)**: Ah... yes... .

**ISHI**: Do you hear her singing?

**KROEBER**: I... I don't know... I think so... .

**ISHI**: What does she sing? (Kroeber is silent.)

**ISHI (suddenly)**: Sing it.

**KROEBER (unable to maintain his cooperative facade)**: I... ah... I can't.

**ISHI (louder)**: Sing it!

**KROEBER (now totally out of his depth)**: Ishi, I can't.

**ISHI (after a pause, with heartbreaking energy)**: Ishi, last Yahi. (Ishi grasps the soil in tightly clenched fists, weeps, and begins to sing mournfully.)
Contemporary Western culture's uneasiness with combining the critical and spiritual aspects of life is Kroeber's discomfort writ large. It is an awkwardness deeply connected with the historical origins and working assumptions of that culture.

The primary argument to be made here is that the interaction between science and religion within the modern West exhibits the same awkward tension that strains the culture as a whole. The science-religion relationship is by no means the only manifestation of this awkward cultural confusion. There are signs of it whenever religious or ethical or artistic impulses collide with critical or analytical or controlling ones. As a result, the systematic study of science and religion is not unique in its importance. Exploiting the analogy again, every schizophrenic symptom is a window of understanding onto the underlying tension, and in many cases also an opportunity for easing it. The interaction of science and religion, however, presents the tension between the religious and critical tendencies of human life with interesting directness, because of the contrast between the spiritual and critical tendencies of human rationality immediately evident there.

I. THE CONTEMPORARY SITUATION

The Soul of the Modern West: Criticism

Modernity happened to Western civilization. It is one name given to the series of spectacular transformations of life that are the very stuff of any interpretation of our contemporary situation: from feudal economic systems, to free-market, industrialized economies; from political power concentrated in the hands of a few, to vast democratic institutions that encourage wide distribution of information and responsibility; from natural science as primarily classification and description, to an internationally coordinated quest for progressive, experimentally supported theories that enable prediction and control; from candles and ox-drawn plows, to a panoply of technological marvels that have transformed the average standard of living and the way we relate to the world around us; from widespread superstition and credulity that lent itself to exploitation by a few and preserved ignorance of social and psychological realities, to an equally widespread spirit of criticism that has given birth to free speech and the free press, to social and political institutions with a rudimentary capacity to criticize and correct themselves, and to the systematic study of human psychology, religion, and social life.

Modernity, however, has proved to be both boon and bane. These transformations are so powerful and pervasive that it is scarcely possible to escape their influence, no matter where in the world one lives; the modern West seems to sweep all before it, or under it, capturing or breaking the imagination of many people in other cultures, and transforming life for better or worse. To many non-Western cultures less geared to expansion and consumption, this is a matter of great concern, for they find themselves changing rapidly under the influence of the West, but with little internal capacity to assess, assimilate, control, or resist what is happening.
The ambivalence of modernity is also evident from an internal Western point of view. For instance, in spite of the collapse of the Soviet Union’s centrally planned economy, the future of capitalistic, free-market economies is far from secure: they are stubbornly geared into practices that are undermining the moral and natural resources necessary to their own continuation, and they threaten as a result to contribute to the decline of many Western societies into turmoil and the whole planet into an ecological catastrophe. Likewise, Western democratic political institutions are too often struggling in vain to offer needed leadership to their constituents because, in the final analysis, they are failing to cultivate and protect social institutions such as family, education, and religion that are essential to maintaining the healthy tone of political life.

These more objective, institutional signs of ambivalence are accompanied by more vague and subjective ones in the conceptual life of Western culture. Perhaps most important among these is widespread overreliance on our analytical and controlling expertise, to the point that our feeling for nature, for community, for history, and for spirituality has been dramatically weakened. Most of us in the West no longer confuse myth and history, but neither do we know how to reappropriate our demythologized stories. We seem to know a great deal about how we human beings and the world work, but we are often at a loss to know how to affirm meaning for our existence in that supposedly “well-understood” world, unless it is by means of regression to that naïveté so seductively packaged in religious fundamentalism and political fanaticism of the right and left.

Modernity is in some respects the prodigal child of the West, an increasingly uncontrollable nexus of forces that is threatening to fly free from its creative source. The grave question is unanswered as to whether this Western cultural prodigal will return home. Finding a positive answer to that question is one of the most urgent global challenges, not withstanding its Western provenance. Most major social, economic, and political concerns feed into it, and the continuation of much life on the planet depends upon solving it.

This is the threatening practical context within which science and religion interact with each other. Both science and religion, in their distinctive ways, must come to terms with this clutch of crises, and they must find ways of attacking them together. A promising starting point for such common work is the awareness that the root cause of the problematic character of modern Western culture is a profound confusion, a schizophrenic uncertainty, about how to be in the world.

The Heart of the Contemporary West: Self-Criticism

As modern optimism has increasingly given way to dismay at the darker side of modernity tragically evident in the twentieth century, so modernity’s critical spirit has been directed inward in a more sustained, penetrating way. That has made possible a more balanced view of the changes in Western life that distinguish the modern era from previous times: they have a creative, brilliant aspect, and a darker, perhaps suicidal one.

In everyday social life, this heightened self-critical mood has occasionally led to the angry or despairing rejection of everything Western and modern, as embodied in some
of the more extreme Western religious sects and cults. It is also present to some extent in the support being found for non-Western religions among Westerners, in the flower-
ing of environmentalist movements, and in the self-mortifying grief for, and roman-
ticization of, cultures overwhelmed by Western expansion. Fundamentalist Christianity, which turns its back on criticism altogether, can be understood partly as a repudiation of the modern confidence in autonomous criticism, and so as an extreme and unstable form of self-critical correction. This spirit of cultural self-criticism appears in less grand ways, too, such as the increasingly popular quest for a simpler, more self-sustaining lifestyle. More generally, the news media report high levels of dissatisfaction with the disintegrating moral fabric of modern Western societies, and a widespread frustration about the apparent absence of practical solutions.

Moving from social context to the recent intellectual life of the culture, the turn of modernity's critical spirit against its own principles and achievements has found expression in equally diverse ways. The emergence of the deconstructionist “method” is one of the most notable of these. Echoing tendencies toward fragmentation and abstention from recognizable structures evident in twentieth century art and literature, deconstructionist philosophers renounced social and philosophical construction and turned their analytical skills to the task of uncovering the hidden agendas and structures of power in ideas, institutions, and cultural practices. The culture at large has also expressed widespread suspicion—verging on cynicism—about the possibility of social and intellectual creation that can be open to criticism and ready to discover its own negative social consequences.

A second intellectual expression of modernity's self-critical spirit is a penetrating reassessment of modern Western institutions, such as family, education, politics, and religion. In Western economics, the mood of reassessment is represented most recently by Daly's and Cobb's For the Common Good. While there have always been relatively ineffective external critiques of capitalism, For the Common Good is an instance of the increasingly powerful breed of internal critiques, advocating a capitalistic free market and the profit motive, at the same time as arguing for a transformation of the free market in the direction of sustainability. The novelty of Cobb's and Daly's argument turns on the observation that the capitalist market has a tendency to erode the very foundations upon which it stands. For instance, the market does not allow very effectively for inherent limitations in both natural resources and the ecosystem on which life depends. And the individualistic self-interest that drives the market tends to dis-

The recognition of the dependence of capitalistic economies upon both the ecosphere and community institutions is alive and well in other areas. For example, sociological works such as The Good Society, by Robert Bellah and his colleagues, lead the way in
analyzing the deterioration of vital Western institutions, and in urging greater discussion of these issues as the first step to reversing the alarming consequences. Noam Chomsky's *Necessary Illusions* is a recent representative of an emerging criticism of democracy itself—one of the recent criticisms from within to complement the long-standing critiques of it from without.

If these forms of Western social and political self-criticism are in search of a more comprehensively unified and harmonious view of society, they are also determined not to continue the pattern of artificially securing such harmony by propounding theories that are overly abstracted from the concrete circumstances and organic interrelatedness of life. We cannot do good economics without taking account of the ecosphere and social institutions, and we cannot revitalize politics without also working on family, religion, and education.

In and through all of these examples, in both academia and the wider society, modernity expresses the willingness to criticize itself, to recognize the self-destructiveness of its consumptive and expansionist tendencies, and in turn to face the partial failure of its economic, social, political, and religious institutions—along with enjoying their imperfect success. This shift is encouraging, and the hopefulness for the future that it engenders shows up in lots of ways. Not surprisingly, the changing relationship between science and religion attests to it. If the unrestrained critical mood of early modernity made inconceivable anything except conflict between science and religion, or their rigid separation, the later, more self-critical phase of modernity has discovered a richer, more ambiguous relation between the two. In this new stage, there seems to be the possibility of reuniting the vast critical capacity of modernity with the habitually marginalized spiritual side of human life.

"Postmodernity" is the common catch phrase for this restructuring of the mentality of the West. As the name itself suggests, these changes are intimately related to modernity. This implies that postmodernity may best be understood as an essentially modern, self-critical rebound of modernity against itself, a necessary step toward a more consistent appropriation of the Enlightenment principle of independent criticism. Some writers prefer to interpret the widespread changes as indications of a new era, in much the same way that modernity is thought to be marked off from medieval European culture by the transformations mentioned earlier. In any event, since the social and ecological problems confronting humanity grow more severe with alarming rapidity, it can only be hoped that a "postmodern outlook" will be effective in helping the West to ease them.

There is a sense in which the willingness of the modern West to engage in this sort of penetrating self-criticism is disappointingly late in coming. Is it a sign that modernity, and with it the ancient stream of Western culture, is embracing greater maturity, albeit a maturity forced by the negative consequences of its own uncontrolled brilliance, its careless treatment of other cultures, its reckless careening into an untenable future? Or is it merely an enactment of the fact that the drive to survive is stronger than the drive to consume? If these mounting crises were to abate, would signs of the
modern West’s newfound maturity prove to have staying power? Though I lean toward discerning a tentative maturation in and through this self-criticism in the last century or so, the most basic observation of human nature—religiously expressed, for example, in the Jewish myth of the Garden of Eden, the Christian doctrine of original sin, and the Buddhist teaching about the universality of dukkha (suffering)—insists that such maturity is a fragile thing at best. Like all intangible cultural phenomena, its survival depends upon being institutionally embodied, and even then there can be no guarantees. Our families, religious communities, schools, economies, and the scientific and technological traditions must each in their own way build self-critical insights into their ordinary modes of operation. Religious insight has customarily been marginalized in this process. However, in the light of an adequate appraisal of the interconnectedness of human life—one less skewed by modernity’s infatuation with objectivity and critical rationality—it is indispensable.

II. SCIENCE AND RELIGION

This is one description of a few important features of the contemporary Western world, and doubtless each reader would adjust what I have said at a number of points. This interpretation has emphasized the modern spirit of criticism—and its unsteady enhancement in the twentieth century as cultural self-criticism—as the driving force behind the social, economic, political, and religious motifs of the modern Western way of being in the world. With more space, I would want to comment on several other prominent strands of our contemporary cultural tapestry, including attitudes about the natural environment, a range of human justice issues, the rise of psychological and social sciences, and astonishing advances in the physical sciences. I would also discuss the prominence of historical relativism and cultural and religious pluralism.

No matter how complete the picture, however, the West clearly has developed a highly distinctive way of viewing the world. It is not set in concrete, and will change and change again. As Heidegger has reminded us, we human beings are the creatures who are always trying to understand ourselves, and whose self-understanding is constantly in a state of metamorphosis. This way of being in the world is therefore not the only way, and certainly not necessarily the best or most advanced. Nevertheless it is our thought-world, the world we actually inhabit, and consequently the arena for the interaction of science and religion. When we consider the science-religion relationship in this rich and problematic context, two lines of thought suggest themselves, and I gather my thoughts under two headings accordingly: this interaction is informative, and the systematic study of it is important.

The Interaction between Science and Religion is Informative

The contemporary form of the interaction between science and religion is informative about all of the modern West in one way. The nature of this interaction in the recent
past, in conjunction with the way our culture has been inclined to represent this history to itself, is enlightening in a different way. I will start by looking to the past, and return to the current situation later.

The story of the conflict between science and Christian theology is a popular tale, told and retold even now in both schools and the media. A few strident intellectuals keep the embers of plausibility glowing beneath the story by urging the rational weakness of religious faith or of church theology. Though actual instances of explicit conflict are rare, there are enough contemporary examples—such as religious creationists, educators, and scientists having it out on daytime television talk shows—to sustain a popular confidence in the story’s veracity. And what narrative unfolds in this popular, widely believed story? A tale about how Christian theologians have duped the West to protect their own sacred narratives: first, theology insisted that certain things were true of the world; next, science discovered that these beliefs were false; and then, theology resisted this new knowledge, until finally it was forced to give up its false claims about the world, one by one. The keys to this triumph of science over the pretensions of religion, so the story goes, are its impartial method and the corresponding certainty of its results. What chance did religion have? The dubious assertions of faith, stubbornly based on misinterpretations of beautiful biblical myths and legends, eventually had to bow to the objective and reliable assertions of the natural sciences.

It is quite a story. In many ways, however, it is dissociated from reality. In it, a profound tension within human rationality as this has developed in the West is grossly distorted by cartoonlike caricatures, to the point that the story conveys little useful information about anything that really happened. Instead, like the good legend it is, every ritual retelling of it merely expatiates the underlying tension.

The signs of this dissociation are abundant. Most obviously, many ordinary religious people, nowadays as a century ago, while intimidated by what the story portends for their faith in a general way, tend to be confused as to what the fuss is all about, since they personally have little trouble reconciling to their satisfaction most specific scientific discoveries with their faith. Of course, the practice of petitionary prayer is discernibly affected by suggestions from science about the world that make, for example, God’s action in it harder to imagine. Moreover, it is not theologically adequate to deflect these suggestions—as many religious people do—by saying merely that “God creates through evolution,” as if that settled the deeper issues of providence or divine action. But the fact that this response was and is so obvious to many indicates that the story of warfare is exaggerated. Most people simply did not and do not experience the impact of scientific discoveries upon religious belief as a conflict in which science vanquishes their faith.

Having said this, it is important to emphasize that there were real conflicts from time to time. However, another sign of dissociation is that examples of hostility are just not as abundant or as protracted as the story implies they ought to be. For instance, in the second half of the nineteenth century, the mutual antagonism was
supposed to be at its height because of the publication of Charles Darwin's *Origin of Species* (1859). However, Claude Welch has pointed out, in his *Protestant Thought in the Nineteenth Century,* the relative ease with which scientific discoveries were assimilated during this period. In the warfare story, the theological assumptions that God providentially directs the universe, that the Hebrew myths of creation describe actual events, and that human life is the pinnacle of creation, are presented as held with straightforward definiteness by theologians and religious believers alike, and then challenged with unexpected directness by discoveries in geology and biology, leading to protracted controversies. In reality, there has never been that much unanimity about anything in Christian, Jewish, or Muslim theology, let alone in religious groups. Moreover, a considerable readiness for a new way of seeing nature and history was in place because of the impact of historical criticism, Schelling's and Hegel's transformation of the philosophy of history, and work in natural history such as Charles Lyell's *Principles of Geology* (1830–1833) and Robert Chambers' *The Natural History of Creation* (1844), all of which prepared the way for the public and academic reception of such creative contributions as Darwin's.

There was controversy, of course, over Lyell and Darwin, as well as Hegel, Strauss, Feuerbach, Marx, Durkheim, and Freud. There ought to have been, since theological issues of great importance were at stake. But most folk merely observe controversy, and participate in it only on street corners or over the dinner table, where solutions are unsought, or easy to come by. Even in theological circles, any particular controversy was short-lived, and the scientific discoveries were assimilated with only slightly more difficulty than in casual amateur discussions. It is strange, and telling, that, in spite of little actual resistance from mainstream theology to those scientific discoveries, so much fuss is made about it now. Shakespeare comes to mind: "much ado about nothing," or "the lady doth protest too much, methinks." The *symbolic value* of the story is the reason it was and is so infamous, rather than its *fidelity to facts.*

This conclusion can be corroborated by noticing a third sign of dissociation. What were the big changes in theology that made the ready assimilation of scientific discoveries by theology possible? What were the new understandings of providence, anthropology, salvation, the church, and creation that resulted? Shockingly—though this is old news to students of the history of the relations between science and religion—there were hardly any large changes at the time. Eventually, of course, substantial theological changes occurred, but only in some areas, and there only partially. Many of the sharpest problems are still the subject of vast amounts of energy and time; some have barely been touched. It follows that the rapidity of assimilation itself was *not due to the discovery of substantially new theological solutions* to the challenges posed for theology. In fact, from that point of view, the fractiousness between science and religion in the nineteenth century and on into the twentieth should have been greater than it was. Shakespeare comes to mind again here, but in the guise of lines he never wrote: "the lady doth protest too little, methinks," or "hardly any ado about a
whole lot." This facile assimilation is confirmation of the presence of a deeper, unresolved perplexity, the same profound problem that drives the exaggerations in the overhearty celebration of the warfare story, one whose arousal needs to be quieted as quickly as possible, even though there are no adequate theological solutions ready to hand.

The wrenching tension in our modern Western way of being in the world may be expressed in a variety of ways: in terms of rationality, we do not know how to think consistently about our world; in terms of ethics, we do not know how to act for the best; and in terms of the religious life—what used to be called piety—we do not know where our spiritual allegiance lies, or what we can finally trust. This tension is signified in the immensely sharpened form that modernity has brought to of all the classical theological problems: the problems of God and nature, faith and history, grace and freedom, eternity and time. The modern versions of some classical philosophical conundrums express it too: the problems of body and mind, freedom and determinism, absolute and relative, substance and process, society and individual.

Of course, thinking about these problems has been a pasttime of many different societies, so they appear to be deeply embedded in a human quest for understanding that is cross-cultural to some extent. In this sense, there is nothing novel about them. What is new in the modern West is the unsettling of older, Western solutions and the reframing of the problems in more definite terms, thanks to a habit of criticism, of organized curiosity. For centuries the West has been turning the tentative answers of both theology and philosophy over and over, examining and criticizing, searching and probing. In the Enlightenment, however, this curiosity exploded, and one after another of the most firmly established answers fell.

For constructive theology, three important examples of reigning solutions that lost their grip—though they are still not completely destroyed, even today—were a comfortable understanding of divine action, uncomplicated access to the historical person of Jesus of Nazareth; and an unquestioned acceptance of the preeminent status of human beings in the natural order. In every case, the curious, critical spirit of the Enlightenment marked a turning point.

(1) Newtonian mechanics, complemented by Voltaire’s, Hume’s, and other deistic philosophical attacks on miracle, forever changed the Christian doctrine of God. Quantum mechanics alters the details, but the comfortable solution of a God who miraculously intervenes in spite of the course of nature no longer seems possible.

(2) The rise of modern history, and with it literary and biblical criticism, permanently muddied the waters into which one formerly could gaze confidently, envisioning (partly through the convenience of reflection) the life and personality of Jesus. The internationally coordinated, interdisciplinary quest for the historical Jesus is but a refinement of the biblical-critical toolbox; inherent limitations in the presently available sources ensure that the Jesus of history will remain an enigma.
(3) The realization that our sun was one of uncountably many stars in an immense universe, together with the recognition of the universe's age and its chancy, evolutionary production of humanity, put an end to the possibility of an anthropocentric interpretation of creation. Once again, the anthropic principle changes the details in a fascinating way, but not the dislodging of the human species from center stage in the universe.

In all three cases, the formalizable edge of our critical curiosity—the natural sciences, historical criticism, and lately even the human sciences—has thrown down the gauntlet to the intangible, religious aspect of our natures: "Are you real? What is your status? Should you perish? Do you matter?" This challenge is deeply disturbing, and the history of science and religion in the modern era suggests an anxious West casting about for assurance that "everything is alright." Supposing that we hear nothing but the echo of our own voices in the newly demystified universe, we feel bereft, and so turn to, and become overly dependent on, our abilities to control and criticize. In the process, we have vastly overreached our capacity to take care of ourselves and our world, and are in imminent danger of destroying both human cultures and those other streams of life with which we share our planetary home. The challenge has become to rediscover how to feel at home in the universe now that we have become relatively good at interrogating and controlling it. This is a fundamentally religious problem and, as long as our modern self-understanding remains one-sidedly fixated upon our ability to control and criticize, the schizophrenia that grips us will continue to set the limits on our future options.

It is misleading to think of the natural sciences as causing these existential crises and their theological and philosophical correlates. Likewise, it is unhelpful to imagine that the historical or social sciences are to blame. That would be as absurd as supposing that there were a clear cut division between scientific and religious kinds of rational apparatus. This fantastic scenario posits the "critical, scientific" mentality rising independently from out of nowhere to challenge the "existential, religious" mentality, without harm to itself. But this is obviously unrealistic. Human rationality is united with every other aspect of human life in a biological, emotional, spiritual, practical unity. Scientific and theological modes of reflection are both aspects of the rich and finally unfathomable reality that is human rationality. This rational unity is in tension with itself, and it is this—rather than any projected, external conflict—which gives rise to the crises within the psyche of the modern West, and to the attendant misreading of reality and of human nature. The many modern theologies and natural sciences are all the production of the modern West's strained spirit, and the story of their exciting, conflicted relationship is an unusually telling symptom of this deeper tension.

If there were such a thing as cultural psychotherapy—and sociologists sometimes tend toward this in approaching their subject matter—the obviousness of the dissociation from reality on which the story of the warfare between science and religion trades
would attract instant and intense attention. The same goes for the phenomenon of over-rapid assimilation. They are dead giveaways, simpleminded, half-sincere cover-ups of a deeply painful wound in the contemporary Western psyche, a wound that shows itself in many different ways having little to do with science and religion. From a "cultural-psychotherapeutic" viewpoint, three fascinating questions about this characterization of the modern Western mind suggest themselves, all reminiscent of Friedrich Nietzsche’s concerns: How did this inner tension arise within the West? What does the possibility of its emergence mean about the nature of reality? Can we reasonably expect this situation to develop into a more unified, peaceful way of being in the world? Passing over the first two questions, we can assess the possibility of an optimistic prognosis by considering what is disclosed about the contemporary West in and through the currently flourishing study of the interaction between science and religion.

The study of science and religion has, by now, passed beyond simple characterizations like “warfare” and “conflict.” Facile assimilation, too, is seen for the pointless avoidance tactic that it is. So what does the current state of the relationship between science and religion disclose about the brilliant and dangerous schizophrenia of the modern West? Is the contemporary interaction between science and religion continuing to broadcast the confusion and anxiety of the modern West? With an important qualification, to which we will come presently, I think the answer is “yes.”

There have been fairly dramatic advances in understanding the relationship between science and religion in the last couple of decades, thanks primarily to the emergence of a specialization devoted to the systematic study of this relationship. We are now conversant with consonance as well as dissonance between theological and scientific ideas. We have learned that religious convictions can and do play a role in the discovery, development, and judgment of scientific theories, even as religious theorizing is conditioned in related ways by natural science. We have discovered important similarities—unsurprising in view of the organic unity of human rational processes—in the way scientific theories and theological doctrines are constructed, the result of a richer appreciation of the complexities of scientific method, and of the rationality of theological construction. We have noticed that theology and science interact not only by means of metaphysical and philosophical suggestions—perhaps “buffering” propositions is an apt description—but by means of ethical, aesthetic, and religious ones too.

In numerous ways, therefore, our understanding of the interaction between science and religion has broadened and deepened, to the point that we wonder how anyone could ever have been satisfied with calling it “warfare.” At least within the area of its study—though how far beyond its borders this insight extends is debatable—little need is felt to distort the fascinating story of science and religion into a symbolic scapegoat for our modern anxieties. It is what it is: the noble and ignoble mixed up together, scientists and theologians working side by side, sometimes rigidly and overcautiously, at other times with overconfident hubris. This signals a major improvement over the
discussion of science and religion in earlier years, as well as over that discussion as it is carried on in many quarters outside the science-religion specialization even now.

It can be agreed, then, that the academic study of science and religion—I will strain normal usage and call it a “discipline”—is no longer trumpeting the modern crisis of spirit by means of promulgating a view of the interaction between the two that is dissociated from reality. However, this cultural crisis is still present. The difference from earlier years is that the discipline of science and religion tends to deal with it more openly, though involvement in details doubtless obscures awareness of this at times. For instance, building methodological bridges between science and theology amounts to trying to figure out how it can be that the same human beings, using the same rational capacity in the same existential context, can engage in activities that, on the face of things, appear to be so different. It is an attempt to understand the unity of our own rationality. Again, trying to understand how science interacts with individual theological loci is equivalent to grappling with our cultural schizophrenia under relatively controlled conditions, and trying to unify the disparate tendencies of our thought under a single, adequate, rational perspective. It follows that the contemporary discipline of science and religion still yields valuable information about the schizophrenic state of the modern Western mind, albeit in a more direct and hopefully healthy way than was the case formerly.

Now we come to the promised qualification, which may be a happy one. Religion is less apt these days to tremble at every new instance of a scientific discovery that sits awkwardly with theological ideas. Indeed, theology appears more resilient in the face of secular assertiveness generally. The cause of this change has superficial and more profound components. On the surface level, it is due in part to the fact that the material content of the natural sciences is in general significantly more amenable to theological concepts than seemed to be the case a century ago. We live in a more interesting, less rigid, more vague world than we once thought. Chaos theory, quantum mechanics and the reevaluation of causality it sparks, the cosmological anthropic principle, and the ever-deepening understanding of the role of chance in biological systems are but four outstanding developments of recent years. They suggest both consonance and dissonance with the religious dimension of our self-understanding, to be sure, but more importantly, they confirm the hope that religion does not need to panic whenever there seems to be a conflict between its beliefs and the provisional results of science. The scientific context for theologizing presumably will change in the future as it has changed in the past, and disciplined, creative minds can fruitfully relate religion and science in almost any circumstance. Unchecked pessimism in the science-religion relationship is as inappropriate as unrelieved optimism.6

But this is an unstable justification for religious self-confidence. At a deeper level, this growing confidence confirms what was discussed earlier: the modern West is self-critically beginning to tire of tormenting itself with its own acuity, and is starting to take its needs for meaning, happiness, and justice more seriously. It is more conceivable
today than ever before that scientifically responsible theology might be willing to take a stand on something that seems to fly in the face of scientific consensus—on the basis, say, of recognizing the validity of human religious experience—and to wait to see what science turns up. This is the cash value of taking the emotional and spiritual aspects of human life more seriously. The often vague references to postmodernism are angling in at this transformation in character, which amounts to a shift toward having greater courage to seek out wholeness of life and thought. It seems, then, that interaction between science and religion remains informative about the conflicted nature of much of modern Western self-understanding, but that the beginnings of a new and potentially happier message are discernible.

The Discipline of Science and Religion is Important

The irony of this growing religious assertiveness is that it is building in the absence of major theological breakthroughs. This also applies to the relations between religious thought and both historical criticism and the human sciences. To make this point, I shall briefly summarize one issue in need of a breakthrough—the problem of divine action—arguing that very little of major significance has changed in the shape of this problem. I will conclude that the unprecedented level of systematic, interdisciplinary attention paid to such problems by the discipline of science and religion is of the utmost importance.

The idea of God as a causal agent in the world like any other has never been an acceptable understanding of divine action, for it fails to respect the transcendence of God. Something like it, however, proved itself workable from early medieval times. This traditional solution recognized the possibility of two means of divine agency: primary causation, understood by analogy with ordinary human causal agency, which means that God acts independently of any other causal agents; and secondary causation, understood by analogy with a monarch who acts through an officer of the crown, which means that God acts in and through human beings and nature. The idea of nature as regulated by laws did raise problems for this general view of divine action, as medieval contention over “first cause” arguments for the existence of God shows. But primary divine causation remained plausible, because the conception of “law of nature” was not strong enough either to make miracles seem problematic or to make identifying the causal nexus of God’s interaction with nature a pressing issue. Even the person constitutionally predisposed to doubt reports of miracles could still affirm primary divine causation by means of a mystery-shrouded causal joint—the point at which God’s action impacts the world. Such a skeptical person could also continue to think of divine action as a secondary cause, imagining that human causal agency is used to achieve divine purposes, for this does not require imagining that a divine act breaks the causal chain of events.

The traditional solution was sufficiently compelling to hold off its three major competitors, each with deep roots in the West, though other traditions show signs of them, too.
(1) The deistic account of divine action—presupposing a God who is responsible for the orderliness of the natural world but who does not act in it—is evident in early Greek philosophy, and preeminently in Aristotle.

(2) The pantheistic account can be traced back in the West to the Pythagoreans, who held that the world was infused with mathematical-musical harmonies—that it was, to use language not available to them, divine in and through its magnificent, mystical naturalness.

(3) The other major competitor to the traditional account can be traced to its embryonic Western beginnings in the legendary tension between Socrates and Protagoras the Sophist. Socrates’ confidence in reason and suspicion of appearances was opposed by Protagoras, who was wary of the pretensions of reason and preferred the world of appearances. This classic expression of uncertainty about the extent to which reason or appearances can be trusted gave rise to the agnostic view that neither human freedom nor divine action in the world can finally be affirmed with certainty.

Deism, pantheism, and agnosticism, in these incipient forms or in their later developments, do not rule out the possibility of special divine action, which was needed by the major Western religions to make sense of special revelation, redemption, and petitionary prayer. Thus the traditional solution remained persuasive for a long time.

This satisfactory view of divine action became unmanageable with the simultaneous rise of naturalistic, historical consciousness and Newtonian mechanics, with its correspondingly rigid “laws of nature” such as universal causality. Universal causality made divine primary causation of all kinds problematic, and naturalistic, historical sensibilities were on average disinclined to believe in divine action through natural-law-suspending miracles. The apparent loss of a viable understanding of God as a primary causal agent—and the awkwardly heavy dependence on divine acts as secondary causes that resulted—led to the powerful resurgence of the traditional alternatives.

(1) The most obvious response—though problematic for traditional Jewish, Christian, and Muslim theology—was that of the Enlightenment Deists, who revived the argument from design on the basis of a world set in motion by a loving, clockmaker God who was forever after a patient observer. The modern Deists thus denied both primary and secondary causation, after the act of creation.

(2) Spinoza, Schelling, and Hegel were famous sophisticated representatives of ancient pantheism, and they made a massive virtue of secondary causation, with God acting in and through everything, but the possibility of envisaging divine intentions was seriously obscured.

(3) Kant took the traditional agnostic solution to its radically hopeful terminus: being the creatures we are, we have no option but to perceive the world as a closed causal network, yet our knowledge is only of experience caused by things in a world presumed to be out there, and not of the things in themselves, of which we have neither experience
nor theoretical knowledge. This wedge so forcefully driven between experience and reality allowed Kant to affirm simultaneously rigid causality (as our own inevitable contribution to experience), and the freedom of human will and the activity of God (as hypotheses necessary to account for our moral life and our ability to act at all).

Each of these three modern expressions of the classical alternative solutions was variously attacked or conditionally affirmed by theologians, in a rather messy process of trying to figure out what to say about divine action now that the traditional solution had lost much of its plausibility. But none of the theological appropriations of these alternatives was particularly amenable to the traditional Western idea of a transcendent-immanent God. This left mainstream theology at best in an awkward holding pattern. Of course, secondary divine causation in principle cannot be ruled out by any scientific discovery, but partly because of that, it is a desperately weak thesis when thought to exhaust divine action. Thus mainstream theology tended to deal with the problem of divine action by positing a mechanism for divine primary causation that either permanently transcended human understanding or awaited clearer articulation. This strategy may have been convenient and common, but it was really just avoiding the problem in its sharpest form, presumably in the hope that a persuasive, more traditional account of the action of God would be forthcoming. The consequences for spirituality of this lack of clarity are well known. Prayer remains meaningful to most, but often because the ancient, theologically deficient, anthropomorphic, mythical view of God's action lives on. Rare is the Jew, Christian, or Muslim who has felt the problem of divine action and does not thereafter pray with shaken confidence in God's responsiveness to their concerns.

Now we must ask whether anything has changed in this story of competition among the four basic Western accounts of divine action, besides the partial collapse of the traditional view. Have philosophical analyses like those of Austin Farrer and others achieved a new view of divine action? Far from it; they are simply clear about the problem, as when Farrer argues that the subjective discernment of divine acts does not illuminate the mode of divine action, which necessarily remains shrouded. Has anything been added by the interpretation of divine action as a subjective discernment of ordinary events as "special," within the constant field of providential divine activity? On the contrary, not only does it leave unclear the mode of God's everyday sustaining action, this subjectivizing view has given away any sense of positive, special, divine action independent of human recognition of it, making a confused virtue of collapsing divine action into secondary causes. Have theologies using Alfred North Whitehead's philosophy of organism advanced the problem? By no means, for process theology purchases a solution to the pantheistic problem of not being able to speak concretely about divine intentions at the cost of supposing that God and the universe are coeternally locked in a process of mutual co-determination. This is an intriguing theological strategy, but it baptizes as a Christian (Jewish, Muslim) view what formerly was
considered a competitor, so it must be thought of not as a breakthrough, but as a revolutionary correction. Like the other views, it also has its own conceptual problems.

Process metaphysics (the modern representative of the pantheistic approach), deism in its post-Enlightenment form (common among contemporary religious scientists), and the ingenious Kantian development of traditional agnosticism (common among modern theologians) together constitute the three partially viable, partially problematic modern competitors to the traditional theistic account of divine action. After all this time, therefore, though many of the details have changed, the theological problem of divine action retains much the same shape and sharpness as it has had for 2,500 years, except that the most audacious account of all—the traditional Jewish-Christian-Muslim insistence that God acts in history and nature—has become quite obscure. The same is true for most other theological problems newly framed by scientific discoveries.

The recognition of the notable failure of modern religious thought to produce compelling and widely accepted explications of many of its classical affirmations is the first reason why the discipline of science and religion is important. This is the area in which fertile discussions occur that are beginning to overcome the widespread neglect of the natural sciences by religious thinkers. For example, it is in the sphere of science and religion that process philosophers, classical theists from several religions, philosophers of action, quantum physicists, chaos theorists, and philosophers of science struggle together to figure out whether there is anything helpful in the changing details of the problem of divine action. It is there that process philosophers, deists, and Kantian agnostics press their claims to be the most adequate inheritors of the traditional theological understanding of divine action. And it is the specialization of science and religion that has produced and criticized the major reconstructions of the traditional solutions, including John Polkinghorne’s use of chaos theory, Robert Russell’s nuanced construal of quantum indeterminacy as the epistemically impenetrable locus of divine primary causation, and Arthur Peacocke’s modeling of divine primary causation after the human mind’s top-down control over the body. All of these views face serious problems, but each promises to revive the traditional account, and only in the discipline of science and religion do resources exist to explore them with the scientific and theological thoroughness required.

Producing tolerably acceptable solutions to theological problems matters, and believability hinges on taking what we know about the world as seriously as we can. Only by paying attention to the natural sciences with the same degree of care that is brought to scriptures, the history of religious teaching, or the nature of religious experience can persuasive, realistic, durable solutions be generated. Of course, this same requirement applies to aspects of modern self-understanding besides the natural sciences, especially historical criticism, social psychology, literature and the arts, comparative religions, and cultural anthropology. Understandably, but tragically, much contemporary religious thought is in a “divide-and-survive” mode, effectively disguising its intellectual inadequacy beneath a horde of relatively self-contained, narrowly
focused, and individually important special interests. Work at the interface of science and religion is one way in which religious thought can become less defensive and more adequate. It is not the only way, but it is a relatively effective one.

This leads to the second way in which the discipline of science and religion is important: it is a good way to educate ourselves about ourselves. There can be no question that deeper self-knowledge is needed. Without a clearer understanding of contemporary Western culture, we probably cannot achieve a markedly greater sense of personal and social integration. Western religious institutions will continue to have little of transforming relevance to say to their contexts, and we certainly cannot seriously hope to avert the catastrophes relentlessly pressing in upon our societies and ecosystem. This statement does not imply that every Westerner must gain a sophisticated appreciation of the contemporary situation if these benefits are to be attained. Nor does it imply that the discipline of science and religion is indispensable. It does mean, however, that a critical mass of people must break through to clearer insights and to consensus on key issues. The discipline of science and religion is an important long-term factor in cultivating this kind of consensus. Its special contribution is to join forces with other intellectual and educational efforts in helping people to understand that religious and spiritual interests are complementary to critical, scientific ones, and not contradictory. To be sure, such intellectual and educational work is of limited value, for practical problems are best solved by action. However, effective, stable action requires hard-won clarity of thought and educational strategies with a vision to match. The impact on practical issues of education in the discipline of theology and science is indirect, to be sure, but powerful in the long term.

There are three educational tasks for the discipline of theology and science. First, the academic community needs a clear appreciation of the richness of human rationality and its fundamental unity in spite of the powerful tension that rakes it. The muting of religious, affective dimensions of human life in the name of the critical, scientific dimensions is absurd. Though it is less common than it once was, this attitude is still far too prevalent among academics. The discipline of science and religion is in a good position to offer a correction to this extreme tendency. Similarly, the discipline is well equipped to bring about some reforms in mainstream academic theology, by easing it over its discomfort with and withdrawal from natural science. Other reforming forces must continue to do the same for other fields of human knowledge.

The second educational task involves religious groups and the schools that train their leadership. Religious believers need to understand why prayer seems more pointless than it did to their great-grandparents, why eternal life is more difficult to affirm, and why it feels harder and perhaps irresponsible to trust the future of the earth to divine providence. These are three of the many signs that ordinary believers are deeply affected by the schizophrenic tendencies of their modern Western context. Indeed, as I noted above, an argument can be made that the rise of fundamentalism in the West (and maybe elsewhere, too) owes something to a generalized awareness of the conflicted
character of Western life and thought. The discipline of science and religion has much to offer at this point, both by making its results intelligible to religious believers, and by cultivating an awareness of science and religion in religious educational settings. Once again, other forces must achieve parallel goals for other aspects of contemporary knowledge.

Without such an educational effort in seminaries and other venues for the training of religious leaders, how can graduated priests and rabbis possibly give an account of their personal faith—a faith historically responsible, in spite of the existential reality for some of their parishioners that the modern, scientific view of the world makes the traditional stories about Moses, Jesus, and the Qur'an seem like fairy tales; a faith hopeful, in spite of the difficulty of believing in life everlasting when consciousness is biological in origin; a faith relevant, in spite of the comic implausibility of traditionally absolute conceptions of redemption and revelation in the light of the vast stretches of time and space that envelop us; a faith scripturally rooted, in spite of the fact that the supernaturalism of the Bible and the Qur'an clashes with our scientific view of the world as a closed causal network with no room for miracle? How can such under-equipped leaders possibly help their scientist followers who feel driven to separate their faith from their scientific research, because they can find no natural way to relate the two? How can they hope to bring the richness of scientific wonder and discovery to bear in their preaching and teaching, without gross ignorance or ridiculous naiveté? The sad fact is that religious leaders simply will not be able to do this, unless they voluntarily seek the training they lack. Thankfully, some are slightly better equipped to deal with the theological aporias induced by other aspects of the contemporary thought-world. But a theologically informed response to the scientific nature of our era lags behind.

The third educational task is less specific. The general public needs to be encouraged to take their religious impulses seriously, instead of cultivating insensitivity toward them. Of course, religious experience and interest have not declined significantly as secularization has grown. But mainline church and synagogue attendance, which involves intellectual assent through participation in a theologically self-conscious community, has with variations dropped sharply throughout the West. At this point, the discipline of science and religion joins numerous other forces and groups with the same goal. Educational strategies are hard to develop in this context, and the effects of any concrete attempt tend to be diffuse and difficult to assess. The effort is important, however, for it is one way in which the mood of a culture—or at least an interested subculture—is changed, hopefully to the point that organized religion can recover a more significant, positive role in the maintenance and transformation of our social and political institutions.

This in turn leads to the final sense in which the discipline of science and religion is important: exploration of this area can actually help to bring about reconciliation of the underlying tension to which it attests. We are no longer speaking here merely of
education of religious believers or the general public, nor of some reforms in the academic community, but of assuaging one of the fundamental intellectual and practical crises of our era. It is in this sense that the contemporary science-religion specialization is a quest for harmony, for a unified, consistent understanding of human nature and the world in which it has arisen.

At first sight, this appears to be an inappropriately grandiose goal. However, while decidedly grandiose, it is far from being unrealistic. Though the schizophrenia of the modern West is ubiquitous in its intellectual and practical life, there are few areas as well equipped to explore the possibilities of reconciliation as the systematic study of science and religion. As I have tried to show, this fitness is due in large part to the inescapable lucidity with which this interaction discloses the simultaneously fractured and exciting character of the modern Western world. Successes in this area readily feed back into easing the uncomfortable, driving tension that gnaws beneath the surface of modern Western life. To be sure, major successes have been rare. But we live in dangerous times, now that the future of Western civilization and the fate of the planet lie in human hands. Intellectual adventures are not the only way forward, but there is a handful of academic enterprises, each of which is indispensable to the quest for harmony in human self-understanding, and vital for negotiating a daunting future. I have argued that the specialization of science and religion is one of them.

NOTES

1. The “Joint Appeal by Religion and Science for the Environment” (Washington, May, 1992) and other similar events are the results of a solid consensus among religious leaders and scientists about the need to avert looming ecological catastrophes. A recent article in Parade (an insert in many weekend U.S. newspapers, including the Oakland Tribune) of March 1, 1992, pp. 10 ff, by Carl Sagan, entitled “To Avert a Common Danger: Religion and Science, Old Antagonists, Forge a New Alliance,” gives an account of this cooperative approach.


6. For an interesting example of balancing the promise of consonance and the threat of dissonance, see Robert John Russell’s essay in Part III of this volume.