

THE RELIGION OF A SCIENTIST:  
EXPLORATIONS INTO REALITY  
(*RELIGIO PHILOSOPHI NATURALIS*)

by *Arthur Peacocke*

*Abstract.* Sir Thomas Browne's reflection on the synthesis between his Christian religion and his practice as a medical doctor, made over three centuries ago, leads into reflections on the present relation between religion and science in the personal experience of the writer. An account is given of how the actual practice of scientific investigation led the author to theistic inferences and how the study of DNA provoked questions concerning reductionism and emergence. This evoked the need for a map of knowledge, and an attempt is presented in a figure which also serves to clarify what kind of realistic reference is involved in both scientific and humanistic contexts—especially with respect to personal language. Theological investigations thereby receive at least provisional legitimization and, with this encouragement, the article pursues the questions of the nature of the divine Source ("God") of the world's being and becoming, of God's interaction and communication with the world, especially with human beings in that world. The penultimate section outlines why the writer considers an explicit communication from God to humanity in Jesus of Nazareth is coherent with the foregoing and what this implies for human fulfillment, individually and corporately. The article concludes with a plea for humility before God and nature in our inquiries in the spirit both of Sir Thomas Browne and of the arch "agnostic" T. H. Huxley.

*Keywords:* brain; communication; critical realism; DNA; emergence; existence; God; humility; information; Jesus; map of knowledge; mind; natural philosophy; person; personal agency; reductionism; religion; sacraments; science; structure; theology; top-down causation.

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*The wisdom of God receives small honour from those vulgar heads, that rudely stare about, and with a grosse rusticity admire his workes; those highly magnifie him whose judicious enquiry into his acts, and deliberate research into his creatures, returne the duty of a devout and learned admiration.*

—Sir Thomas Browne, *Religio Medici* (1643)

INTRODUCTION: SIR THOMAS BROWNE AND HIS  
*RELIGIO MEDICI*

In 1671, King Charles II on his visit to the city of Norwich, in Norfolk, East Anglia, with his usual largesse decided to confer a knighthood on the city's mayor but, the latter declining (for reasons unknown), he then bestowed it on the local doctor, one Thomas Browne, who had then lived there for more than half of his life. Adventitious as this event was, the royal visitor could scarcely have given this honor more judiciously. For Sir Thomas Browne, as we must now call him, was not only a physician—with the best degrees of his time from Oxford and Leyden and a former student at Montpellier and Padua—but he was also a man of prodigious and catholic learning in at least nine languages, natural philosophy (the sciences we would call them), literature, practical arts, and much, much more. His various tracts are concerned with more than twenty-seven different fields of study.

Above all, he was a devout and informed Christian, curious in his faith, irenical, tolerant, and (we would say) ecumenical in his disposition in times when such attitudes were rare in a land only recently torn by civil war and revolution over religious as well as political ideologies. He himself was, as he tells us in his most important work, the *Religio Medici*, of the “reformed, new-cast Religion, wherein I dislike nothing but the name [of Protestant], of the same belief our Saviour taught, the Apostles disseminated, the Fathers authorised, and the Martyrs confirmed” (Browne [1643] 1977, 61). For, he tells us later, referring to Roman Catholics, “we have reformed from them, not against them” (p. 62) and goes on to express his broad tolerance of those practices and beliefs of theirs which he preferred not to adopt.

But what he is most remembered for is his rhythmic and subtle prose writings which remain a jewel in the crown that is rightly conferred on the English language of his century—he was, for example, enthusiastically adopted as a model by Herman Melville in *Moby Dick*. His most influential work is the one already mentioned, *Religio Medici*, the “Religion of a Doctor.” In that work, he stands at the watershed between medieval perceptions of nature, humanity, and God and

those of the new “natural philosophy,” the program—as we might say—of that Royal Society of London founded during his lifetime.

Many of us today intuit that we too in the last decade of this century are also traversing, indeed have already traversed, a watershed not dissimilar from the one he was crossing, that between a culture in which religion is at least taken seriously to one in which science alone is listened to. So the title of my essay unashamedly echoes that of his major work (though my prose will not stand comparison!) and could have well been entitled “*Religio philosophi naturalis*.” It is worth looking a little more closely at Sir Thomas Browne’s all-inclusive vista, for it has features we can recognize as germane to ourselves.

For him, there were vertical and horizontal dimensions to existence which he combined in a cosmic and transcendent unity through the use of reason in the form of a “‘Divine Sagacity’ . . . the dynamic power of the mind to encompass ‘the close connexion and cohesion’ of the diverse aspects of the universe” (Patrides 1977, 26). The vertical dimension in his thought was the Scale of Nature, which he described thus: “. . . there is in this Universe a Staire, or manifest Scale of creatures, rising not disorderly, or in confusion, but with a comely method and proportion” (Browne [1643] 1977, 101). This hierarchy—one he shared with his contemporaries—of levels of existence was a system of analogies and correspondences from the least plant to the very angels. Ours, we shall see, is rather one of structures, entities, and processes; of methodologies and of concepts. Furthermore, we could perhaps also well enrich our discourse by use of two of his favorite metaphors. One is that of music, which, he says, “strikes in mee a deepe fit of devotion, and a profound contemplation of the first Composer, there is something in it of Divinity more than the eare discovers . . . it is a sensible fit of that Harmony, which intellectually sounds in the eares of God” (Browne [1643] 1977, 149–50). The other is that of the circle as symbolic of the omnipresence of God “whose center is every where, and circumference no where” (Browne [1716] 1977, 450).

Browne also discerned cosmic unity in the horizontal dimension of historical process which he identified, like his contemporaries, with the broadly biblical, Judeo-Christian view of history as expressing the divine purpose from the Creation to the Last Judgment. For him, “the created World is but a small *Parenthesis* in Eternity” ([1716] 1977, 471), and there was for him a profound contrast between the processes of time, which we can hope to understand, and that of the divine Eternal Present, which we cannot. It must be noted that our culture, even when it does not share that perspective, also has its

horizontal dimension in our perception of cosmic and biological evolution.

So presented, through the prejudiced and distorting lens of my own undoubted attraction to the man and his thought, perhaps the reader can agree that Sir Thomas Browne develops themes which might perhaps find at least an echo in the religion of a late-twentieth-century scientist, a *religio philosophi naturalis* for today. But the waters of three centuries of natural philosophy, of the natural and human sciences, have gone under the bridge since his day and we now face new challenges—not least those also coming from historical criticism of the Bible and of other sources of authority for earlier times. These have removed many of the pillars from which his world, and even that of the previous century, have been constructed. Browne wrote from his position as a lifelong Christian believer, reflecting on the world he knew, not least as a doctor, and relying—though not totally uncritically—on ancient authorities.

#### A SCIENTIST ENCOUNTERS NATURE AND IS LED TO THEISTIC INFERENCES

My own experience as a *scientist* of the Christian religion<sup>1</sup> has to begin with the time when I first began actually to *do* science. This occurred only when I was, after a lengthy apprenticeship, actually posing questions to “Nature” by putting it, as it were, to the test of experiments of my own devising and execution. By that time I had become skeptical and agnostic about the beliefs of that same English-reformed, catholic Christianity to which Browne had adhered, no longer “new-cast” as it appeared freshly to him and thereby, no doubt, less appealing three centuries later to someone also in their twenties as I then was (only a little younger than when Browne wrote the *Religio Medici*).

Doing research as a graduate student, questions kept pressing on me. How *could* one explain and account for what every scientific advance unveiled and reinforced, namely the inherent, if hidden, intelligibility and rationality of the natural world? As Albert Einstein famously expressed it: “The eternal mystery of the world is its comprehensibility” (1970, 61). Both the *fact* of its existence (the question: Why is there anything at all?) and its manifest rationality seemed to demand some kind of theistic affirmation to make any coherent sense of it all—and asking Why? and making sense of a wide range of data was just what my training and research experience were making my habitual practice.

That there is anything at all implies the existence of some ground

of being and becoming other than the world, and its inherent rationality suggests further that such a ground must be suprarational in the sense of being able to give existence to a world embodying rationality. There have been many names for this ground in different religions, but in English that name was and is “God,” as long as we recognize that *ex hypothesi* we can never in principle know the nature of God in God’s own self and we will always have to refer to God by analogy, metaphor, and model. So this was but the beginning of my pilgrimage as a scientist seeking to make coherent sense of the world in all of its aspects.

I have described elsewhere some of my steps along that way and the various signposts other than the sciences which pointed me along it (Peacocke 1991, 477–93). I shall continue here mainly with the scientific considerations that I found relevant to my own religious quest.

#### AN INITIAL ENCOUNTER, VIA DNA, WITH EMERGENCE AND WITH REDUCTIONISM

As it happened, when I had completed my apprenticeship and was pursuing research entirely of my own devising, in my first university post, it was mainly centered on what we now call DNA. In the late 1940s and early 1950s, DNA had been identified as the principle carrier of the genes, but it was still not certain even that it was a large molecule—and, of course, although it was known to contain nucleotides linked together in chains of uncertain length, its double-helical structure was unknown. I forbear here from regaling you with my own personal recollections and anecdotes of the complex choreography executed by the principle characters involved in the unveiling of that double-helical structure. Suffice to say that it revolutionized biology and has now become part of the public awareness of the world. What gradually especially impressed itself on me—and it is a clue to many important issues in the epistemology and relationships of the sciences—is that for the first time we were witnessing the existence of a complex macromolecule the *chemical structure* of which had the ability to convey *information*, the genetic instructions to the next generation to be like its parent(s). Now the *concept* of “information,” originating in the mathematical theory of communication (Shannon and Weaver 1949), had never been part of the organic chemistry of nucleotides, even of polynucleotides. Hence in DNA we were witnessing a notable example of what many reflecting on the evolutionary process have called “emergence”—the entirely *neutral* name for that general feature of natural processes wherein complex structures, especially in

living organisms, develop distinctively new capabilities and functions at levels of greater complexity.<sup>2</sup> Such emergence is an undoubted, observed feature of the evolutionary process, especially of the biological. It eventually goaded me to wider reflections: first, epistemological, on the relations among the bodies of knowledge which different sciences provide; and, second, ontological, on the nature of the realities which the sciences putatively claim to disclose.

Francis Crick, one of the discoverers of the DNA structure, for which he shared the Nobel Prize with another Englishman, Maurice Wilkins, and an American, James Watson, early threw down the gauntlet in these matters by declaring that “the ultimate aim of the modern movement in biology is in fact to explain *all* biology in terms of physics and chemistry” (Crick 1966, 10). Such a challenge can be mounted at many other interfaces between the sciences other than that between biology and physics/chemistry. We have all witnessed the attempted takeover bids, for example, of psychology by neurophysiology and of anthropology and sociology by biology. The game is that of “reductionism” or, more colloquially, “nothing-buttery”—“discipline X [usually meaning yours] is really *nothing but* discipline Y [which happens to be mine].” (So that is the direction the grants should go too?)

#### REDUCTIONISM AGAIN: THE MAP OF KNOWLEDGE— SCIENTIFIC AND HUMANISTIC

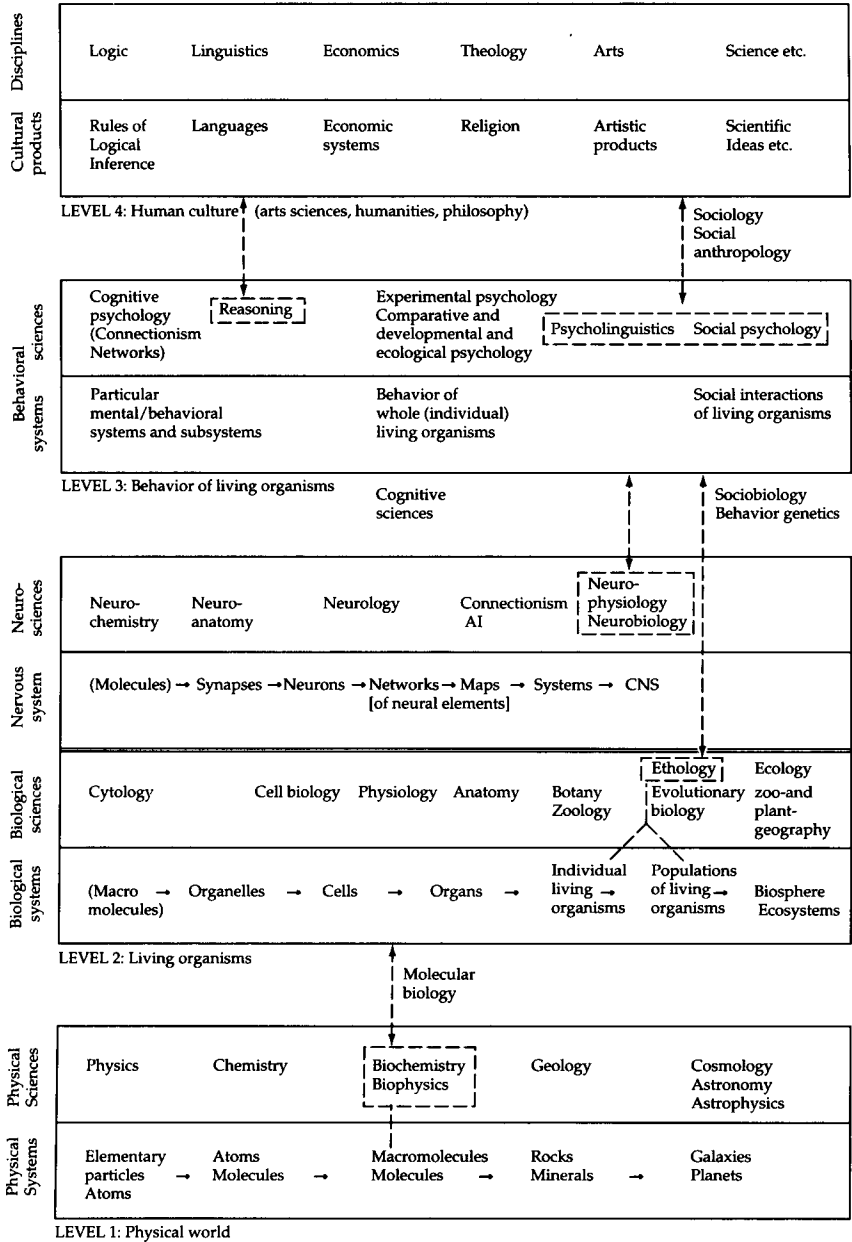
It became clear to me over the years that the issues involved in such reductionist claims are significant not only in relation to infighting between the sciences, or rather between scientists, but for our apprehension of the whole map of knowledge, including the status of the humanities and of theology, the intellectual articulation of religious experience and traditions. Just to clarify what I am referring to, let us look at figure 1, which represents the relation between the different focal levels of interest and of analysis of the various sciences, especially as they pertain to human beings, rather like the different levels of resolution of a microscope.

The scheme represented is an epistemological one concerned with the foci of interest, and so of analysis, that naturally arise from the, quite properly, *methodologically* reductionist techniques of the sciences—the necessary breaking down of complex wholes into their smaller units for investigation. The figure illustrates “part-whole” hierarchies of complexity in which the sciences focusing on the more complex “wholes” are distinct from those focusing on the parts that constitute them. Such relations occur both horizontally, within the

four broad categories of the boxes, and vertically, though the latter are of most concern to us now. As one goes up the figure, one finds the need to deploy distinctively new concepts and theories containing new referential terms in order to represent the observed capacities and functions and to describe accurately the structures, entities, and processes which occur at those more complex levels (inevitably higher on the printed page).

Such considerations led me to go into the subtle, and sometimes raging, debate concerning reductionism, provoked first among biologists by Crick's remarks and later among anthropologists by the sociobiologist E. O. Wilson. Briefly stated, I concluded that in many important instances the concepts and theories that constitute the content of the sciences focusing on the more complex levels are often (not always) logically not reducible to those operative in the sciences that focus on their components. Sometimes a variety of independent derivation, identification, or measurement procedures directed at a particular complex level find an invariance in the concepts and referential terms of the theories needed to account for the phenomena associated with them. W. C. Wimsatt of the University of Chicago has called these "robust," for what is yielded by the procedures appropriate to each level of investigation can then be said to be real, if only in the pragmatic sense that we cannot avoid taking account of them in our dealings and interactions with them (Wimsatt 1981). In such instances, there is a *prima facie* case that the concepts and referential terms of the theories deployed in relation to the more complex levels actually refer to new realities distinctively emerging at those levels of complexity. There is then an emergence which could be said to be ontological were it not that this might mislead some into thinking that some actual entity has been *added* to the more complex system.<sup>3</sup> There is no justification for making such assertions (as, for example, in the discredited vitalist postulate). We have already seen one example in the case of DNA, in conjunction with its coevolved cytoplasm, when there emerges a genuine capacity to convey information not present in individual nucleotides. Others occur at many different levels in figure 1, usually known best to the practitioners of the corresponding fields of study.

Thus we have here a contemporary version of Sir Thomas Browne's vertical Scale of Nature, except it now has a fascinating convergence with his horizontal one of history, at least insofar as it concerns the nonhuman. For the kind of hierarchy of increasing complexities which constitutes the world as it now *is* corresponds very closely to its *past* development in time in cosmic and terrestrial biological evolution, in which the more complex can only emerge from



**Fig. 1: A Hierarchy of Disciplines**

*Legend:* Levels correspond to foci of interest and so of analysis. Level 4 is meant to give only an indication of the content of human culture.

Solid horizontal arrows represent part-to-whole hierarchies of structural and/or functional organization (N.B., molecules and macromolecules in level 1 are the lowest “parts” of the “wholes” in level 2).



the less so. Whether or not *human* history has the directional character in which Browne believed is, of course, still one of the religious affirmations at issue.

#### CRITICAL REALISM: A CONTEMPORARY "SCALE" OF BEING AND BECOMING AND THE REALITY OF THE PERSONAL

The foregoing interpretations of the relations between the sciences and the realities of the natural world presuppose that the scientific studies denoted in figure 1 (and all of the others not shown there), whether or not humanity is their field of interest, actually *can* refer in their concepts and the terms of their theories (but do not *necessarily* do so) to what is distinctively real in that upon which they focus. That is, these studies *aim*, at least, to depict reality and can do so through the use of revisable metaphors and models deployed within the context of a continuous linguistic community. This stance, often now called that of "critical realism," commends itself to me as the appropriate description of both the scientific and theological enterprises, though the latter would take a separate justification. Suffice it to say that it certainly seems to be the working philosophy of most practicing scientists and most practicing religious believers. In their intellectual accounts, both, for me, involve inference to the best explanation based on the normal criteria of reasonableness (fit with the data, internal coherence, comprehensiveness, fruitfulness, and general cogency).

Such considerations, it gradually dawned on me, now allow us to infer from the new map of knowledge a new "scale" (to use Sir Thomas's word) of being and becoming. Science has shown that the natural world is a hierarchy of levels of complexity, each operating

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Dashed boxes represent subdisciplines in particular levels that can be coordinated with studies at the next higher level (the connections are indicated by vertical, dashed, double-headed arrows).

In each of the levels 1-3, examples are given of the *systems* studied which can be classified as being within these levels and also of their corresponding scientific disciplines. Level 2 elaborates additionally the part-whole hierarchy of levels of organization in the nervous system (after figure 1 of Churchland and Sejnowski 1988).

In level 2, the science of genetics has relevance to the whole range of the part-whole hierarchy of living systems and so, if included, would have to be written so as to extend across its entire width.

CNS = central nervous system.

*Source:* Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming—Natural, Divine, and Human*, 2d expanded ed. (London: SCM Press, and Minneapolis: Fortress Press, 1993), p. 217. The figure is an elaboration of figure 8.1 of W.A. Bechtel and A. Abrahamsen in *Connectionism and the Mind* (Oxford and Cambridge, Mass.: Blackwell, 1991).

at its own level, and each requiring its own methods of inquiry and developing its own conceptual framework, in which at least some of the terms can refer to new nonreducible realities distinctive of the level in question. In a nutshell, atoms and molecules are not *more* real than cells, or living organisms, or ecosystems. Moreover, there are *social* and *personal* realities, too. This recognition of the possibility of the emergence of new realities in the natural world, as one moves up figure 1, gives a recognizable location within the map of knowledge for the emergence of the distinctively human, all that is signaled by the use of the word *person*. The language of personal experience, especially that of personal relations, thereby acquires a new legitimacy as referring to realities which could be emergent in humanity and which are not prematurely to be reduced to the concepts applicable to the constituents of the evolved human body. They must be accorded a *prima facie* status of referring to realities until they have unequivocally been shown to be reducible totally to the sciences of the lower levels, and this has not happened. It is notable that even philosophers who take a nondualist view of the mind/body problem often recognize the inherent nonreducibility of mentalistic language to that of the brain and cognitive sciences. The total, complex brain states of consciousness can thus still be regarded as realities known from within and expressed *faute de mieux* in the ordinary language of personal experiences and relations—and not only *ordinary* language. Is it not time that those of us who have been educated predominantly in the sciences recognize frankly, indeed gratefully, that the most accurate and sensitive means for expressing states of human consciousness and personal relations are to be found not in the language of the sciences—especially not in those of artificial intelligence or of connectionism—but in those of the arts (verbal, musical, physical, and visual) and even of religion? In this perspective, personhood is an emergent reality in biological evolution and history, and any account of personal life has a distinctive core which is *sui generis* and not reducible to the concepts and referential terms of the theories of the sciences that focus upon the less complex levels of human being (all those in levels 1–3 of figure 1)—although, of course, it depends on the proper operation of processes at those levels.

#### THE LEGITIMACY OF THEOLOGY AND THE QUESTIONS TO WHICH IT RESPONDS

These reflections led me to perceive how theology (talk about God: theo-logy) might be given at least a provisional justification by locating it on this map of knowledge. God, we have postulated,

transcends while giving existence to all-that-is, as Source of all being and becoming. God cannot then be in any sense an “emergent” reality, for God is the ultimate Reality that relates to all that is created, which is everything other than Godself. Hence, at the top-most limit of the scale of complex relations in any schema, one cannot but place the relation of God to the world and to human persons in the world (possessing as they do the most complex piece of matter in that world, the human brain). This leads us to expect, from the map we have been outlining, that the language needed to articulate these relationships should be distinctive and *sui generis*, God and the world both being real on this understanding. Thus theology can find a legitimate location on such a map and its concepts and the terms in its theories (usually called “doctrines”) can refer to realities and are not prematurely to be reduced to those of, say, psychology, anthropology, or sociology. It will be a matter of investigation to see how far that is possible at all. But there is a particular reason why we can expect that such reduction of theology will never be totally exhaustive, for its “object,” its focus of interest, is “God,” that which, the One who, *by definition*, is other than all-that-is. Therefore this focus of study, God, is not, *ex hypothesi*, describable by anything in the world and reference to God can be *only* by inherently inadequate analogy, explicated in metaphor and model.

The map of knowledge and the scale of being and becoming I have been sketching also reinforces another question with theological import which relentlessly impressed itself upon me as a scientist. It was: What kind of explanation of the existence of this universe is plausible and most consistent with all of the data, when we take account of the now well-established fact that the original quantum fluctuation<sup>4</sup> has by the operation of its own inherent processes, as unraveled by the sciences, given rise to the emergence of free, self-conscious persons, capable of thought, prayer, creativity, and of adherence to (and repudiation of) values of truth, beauty, and goodness—and of instantiating them in the lives and work of a Newton, a Mozart, a Jesus of Nazareth?

It seemed and still seems to me that the edge of this question has been immeasurably sharpened by the evolutionary vista that the sciences of the last century and a half have unveiled to us. It demands, more insistently than ever was possible in the days of the fallible argument from design, to be most coherently responded to by postulating that the One, rational Source of Being and Becoming that we call God is also working out what we can only call a “purpose,” utilizing the most potent language we can command, that which also pertains to where the process has so far been going—

namely, the language of the personal. So we have to insist that God is *at least* personal; that personal language, necessarily analogical and metaphorical as it is, is the least misleading way of referring to this unique and ultimate reality; that God may then be said to be rational and purposive in the eliciting of persons through the processes of the created world which the sciences discover.

At once a paradox arises. We have postulated that this "God" transcends all-that-is in giving it being and becoming; yet, by creating through its very processes, it is also immanent in all-that-is. This paradox is implicit in many of the major religious traditions, which cope with it in various ways. The Christian faith embraces the paradox and adds a *tertium quid*, God as *Logos*, the self-expressive outreach of God in the very forms of the created order, as the transcendence of the Immanent and the immanence of the Transcendent. A provisional model of this last, it always seemed to me, is the kind of transcendence-in-immanence/immanence-in-transcendence which we humans experience in the relation of our self-conscious intentions and purposes to the bodies which implement them and which *are* also our own selves in action. So Christians have traditionally affirmed three modalities of the way in which the *one* God relates to the world—whether or not they constitute the ultimate mystery of God's own being and becoming continues to be a matter of, to me, obscure but obviously profound debate.

#### SCIENCE AND THE POSSIBILITY OF GOD INTERACTING AND COMMUNICATING WITH THE WORLD

I have spoken of God's relation to the world in general terms, but how are we to conceive of God's action in or, as many contributors to the discussion prefer to put it, God's interaction with the world? This is a crucial question for our times and especially challenges the religion of a scientist who has to take seriously the ever-expanding ability of the sciences to unravel the causal nexus of the first three levels in figure 1. The option of conceiving of God as a kind of *deus ex machina* who disrupts the very regularities Godself has created hardly seems worthy of the purposive, suprarational Creator God who gives existence to this subtly rational and beautifully articulated world, whose existence and character must form the very basis for a scientist (*qua* scientist) of believing in the existence of such a creative God in the first place. In what follows I can but offer my own perspective in my personal *religio philosophi naturalis*.

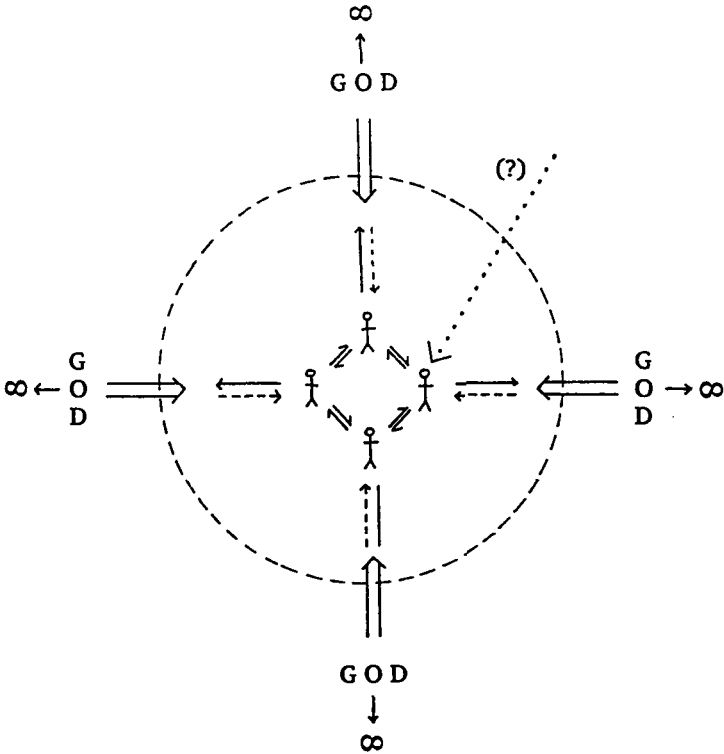
The monotheistic religions all recognize that God is the source of the existence of the world (all-that-is other than God) and continues,

in our (created) time, to give it existence as each moment succeeds another. But how can we regard God as interacting with the world in such a way as actually to make a difference to events and so to patterns of events? Let me depict the situation in figure 2.

Figure 2 attempts to represent, rather like a Venn diagram, both the world being "in God," namely, that God is immanent in the world and present to it all, and God being more than the world, that is, God transcends the world. There is more to God than the world, which possesses a different kind of existence altogether than God (so figure 2 is pan-*en*-theistic and not pantheistic). Human beings are emergent within nature and so lie fully within the circle denoting the "world." Within that circle all is "natural," that is, fundamentally intelligible to the disciplines of the natural and human sciences, taking account of their due limitations already discussed, and are therefore subsumable under certain rubrics of regularity, however putative (commonly called the "laws of nature," though this term hardly seems appropriate to the human sciences and even has drawbacks in the physical sciences). The only lacunae in the nexus of causes and effects, saving that of human free will, are those at the level of quantum events, predictable in their outcomes only probabilistically; and the macroscopic, so-called chaotic states of nonlinear dynamical systems which now transpire to be extremely sensitive to initial conditions that we can never know with sufficient accuracy to predict their future sequence of states over an indefinite period. Some argue that God's action in the world is best located in one or the other of these lacunae, the unclosable gaps in our knowledge. Macroscopic events could then possibly be altered by God without infringing the regularities science reports.

I am unhappy with these suggestions for a number of reasons, which include the following. Briefly, in the case of a divine quantum "intervention," there is the problem of *God's* knowledge of the outcome of individual quantum events if there are no hidden variables; in the case of chaotic systems, there is the doubt that it can scarcely be an *argument* for God's altering those macroscopic states that we can never, in principle, know *whether or not* God has acted to change them.

So, we continue to ask, how can we conceive of God's interacting to influence patterns of events in the world when all seems subsumable under the regularities of the sciences? This question persists as a thorn in the flesh of a scientist seeking a believable religion. I offer therefore a sketch of my own path through this jungle. I have been under contribution from three areas which have helped me to model how God might interact with the world to change patterns of events consistently with my scientific perceptions. They are as follows.



**Figure 2: Spatial Diagram Representing the Interaction between God and the World, including Humanity.**

G O D is represented by the whole surface of the page, imagined to extend to infinity (∞) in all directions

○ The WORLD, all-that-is: created and other than God and including—  
 人 HUMANITY

⇒ God's interaction with and influence on the world and its events—both general and particular

---> Effects of the nonhuman world on humanity

→ Human agency in the nonhuman world

⇌ Personal interactions, both individual and social, between human beings

...> Direct communication from God to humanity?

Source: Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming—Natural, Divine, and Human*, 2d, expanded ed. (London: SCM Press, and Minneapolis: Fortress Press, 1993), p. 195.

(1) *The Existence of Top-Down Causation or Whole-Part Constraints.* In many complex systems (whose complexity can be structural and/or functional and/or temporal), the macroscopic state and character of the system as whole is a constraint upon, effectively like a cause of, what happens to the units of which it is constituted, so that these latter behave in ways other than they would have done were they not part of that system.

(2) *The Concept of Information Transfer.* Information has overlapping and connected meanings (as classified by John Puddefoot): (a) counting-information in communication theory, concerned with the probability of outcomes or cases when there are multiple possibilities; (b) shaping-information, the process of giving form to something (cf. Latin *informare*: to give shape to); (c) meaning-information in the ordinary sense of knowledge. Puddefoot points out that information (a) must inform our brains/minds in sense (b) to convey information in sense (c) (Puddefoot 1992, 15). This whole process—(a), (b) and (c)—I shall henceforth refer to as an input, or communication, of information to our brains/minds. Note that the process begins with (a), which is conceptually distinct from the transfer of energy with which it is invariably linked in our observed world.

(3) *Recent Interpretations of the Mind-Brain Interaction and So of Personal Agency.* The way the brain acts on the body through the operation of the central nervous system is best conceived of, according to the brain scientist Roger Sperry, as an instance of such top-down causation of whole-part constraint.<sup>5</sup> The total state of the human brain-as-a-whole, a state self-consciously describable to ourselves only in mentalistic language, is a constraint upon, and so causally effective on, the firing of individual neurones, or groups of neurones, in such a way as to trigger and actually be the specific action intended in the consciousness that was that brain state. This amounts to a contemporary analysis of what is involved in personal agency.

These considerations, taken together, have led me to envisage that the best model for God's interaction with the world is that of God as "informing," influencing through an input of information (in the sense expounded above), and so shaping and influencing, the whole state of all-that-is over all space and all times.<sup>6</sup> Thereby God exerts a top-down causative constraint so that particular patterns of events at lower levels within that whole can, if God so wills, be different from what they would otherwise have been if God had not so willed; and if God had left the interplay of law and chance to continue to operate in the general processes of the world, as God's general will

continuously prescribes. But in being different from what they might otherwise have been, apart from this specific intention of God, these events do not in any way deviate from any of the regularities (“laws”) which pertain to their particular level in the world (levels 1–4 in figure 1) any more than do the constituents of systems (physical, biological, social, etc.) which exert top-down causation, or whole-part constraint, on their lower levels (see point 1 above). God alone has the all-embracing comprehensive knowledge of and presence to all-that-is through all time and space, so such an interaction must be unique to God alone. It is analogous to personal agency, as expounded in point 3 above, and also to what the biblical tradition affirms. The ultimate “how” question in this model (and remember it is *only* a model) is how God can input information without an input of energy. This is unanswerable and one can only resort to saying that this is a “direct action” of God, for *all* theories of God’s interaction with the world eventually run into the problem of the “ontological gap at the causal joint” (Farrer 1967, *passim*)—the recognition that there will always be a gap in our understanding because there is an unbridgeable ontological gulf between what God is in God’s own self and all created entities, that is, everything other than God (which is what *creatio ex nihilo* is about). My proposal is simply one concerning the location in relation to the world of this ontological gap across which God, as it were, acts directly. The suggestion is therefore that there is one *continuing* act of God on the whole that can manifest itself in patterns of events which constitute meaning for those creatures, namely ourselves, who have the capacity to discern them. Thus does God communicate Godself to free self-conscious persons whose existence God has purposed and elicited through the natural, creative processes to which God continues to give existence. Thus these patterns or events can thereby constitute meanings for us which God intends to convey: here we are close to the idea of God’s self-expressive Word (the *Logos*) as manifest in and imprinted upon the whole created order and process.

#### COMMUNICATION BETWEEN GOD AND HUMANITY

The idea that patterns of events can constitute meaning for human beings and so be a means of self-communication from God to humanity is a characteristically *personal* mode of interaction. For, when we as persons interact with each other, we do so through interpretable patterns in electromagnetic waves of light (sight), vibrations in the air (sound), molecules (taste and smell), and physical pressure (touch)—all of which are irreducibly physical as means without



derogating from the subtleties of interpersonal interaction. So, it is not surprising that God should use the same means of interpretable patterns of events in the natural (including human) world to communicate with us. Of course, as human beings we have to learn how to read the signals others, individually and corporately, send to us in those complex patterns in time and space we call language (written, verbal, bodily), music, art, etc. Subtle as human communication is, its means are irreducibly physical, even though the content of the messages are personal and can be the most profound of which we are capable. Thus, God's signals, if they *are* there, have to be read and interpreted, no less than the writing on the wall in Belshazzar's feast. Sir Thomas Browne is worth recalling at this point: "The Hand of Providence writes often by Abbreviatures, Hieroglyphics or short Characters . . . which are not to be made out but by a Hint or Key from that Spirit which indited them" (Browne [1716] 1977, 428).

Sir Thomas's remark should serve to give us pause. For

- if God is anything like what I have been depicting,
- if God has created and continues to create a world in which free persons have emerged and flourish, and
- if God is least misleadingly described as personal and implements the divine purposes by eliciting the emergence of a humanity that seeks God as its Source and Ground,

then, might not that same humanity have grounds for hoping that God's own self is perennially initiating communication to that very same humanity, alone in all creation capable of responding freely and consciously to God's signals? Surely the human search for God must therefore be matched by, indeed transcended by, God's own communication to humanity in what we can then only call "revelation"?

Thus it is that the scientist can find himself or herself, in spite of the inherited prejudice of the tribe, having seriously to consider the content of those major religions that make claims to conserve revelations of God to humanity in the past and to continue to be channels of experience of God today. That barrier of prejudice is, of course, enormous after a century of the trumpeting of the supposed warfare between religion and science and the official alienation of the respective communities. But now that the autonomy of science from interference by religious bodies is secure, surely it is time for scientists to grow out of that period of rebellious adolescence and consider maturely the challenge of the most profound thinking about human existence to which the existence of the phenomenon of religion has testified ever since the Neanderthals buried their dead with ritual? All of us, scientists included, have a major inquiry to undertake into the well-winnowed wisdom of the religions of the world

concerning God's communication and relation to humanity—in spite of the horrific deeds done to human beings in the name of intolerant religion. For the corruption of the best is still the worst and science, too, has its corruptions: none of us can afford to be “holier than thou.”

#### A SCIENTIST EXPLORES THE CHRISTIAN RELIGION

I can only indicate briefly where my thinking and experience have led me in the context of the post-Christian society in which I have lived. My own quest was influenced by the need, instilled in me by my scientific training, to ask Why?, to ask What is the evidence? when I confront any particular proposals or positions in religion, as in science, and not to accept uncritically any claimed authorities, for such assertions are almost invariably circular in the validation of their presumed authority.

If, as I have argued, it is reasonable to expect that God communicates through patterns of events in the world, the claim that the history of the ancient people of Israel is such a revelation is *prima facie* worthy of investigation. I have indeed found that the record of this revelation in their scriptures has enriched my understanding of God, provided they are studied in the light of historical, critical scholarship and with the recognition that there is much dross among the gold—inevitably since those scriptures are simply a selected library of a culture extending over a thousand years.

The same considerations concerning the possibility of God's self-communication also render it possible that a human being might emerge who so freely responds to God that he or she is able to be “informed,” and thus shaped, by God so as to be a unique vehicle for God's self-expression in the world and so to be able both to convey God's own meanings for human existence to all of us and to be a window into the divine life itself. In Jesus of Nazareth, I believe we have grounds for saying that this has happened within the matrix of the revelation of God through the ancient people of Israel—that is, that Jesus was the God-informed person *par excellence* and therefore identifiable as a self-expression of God in human form. As traditionally affirmed, he was the Word, *Logos*, of God “made flesh.” I regard this capacity that he demonstrated to be, in principle, a possibility for all humanity in an inclusive understanding of what is technically known as the Incarnation. But I also affirm it actually occurred in and to him and that we have evidence that his life was taken up into that of God's own self. In his human life of suffering, self-sacrificial love for his fellow human beings, we have then a

revelation of both what humanity is intended to be and to become in the purposes of God and what God perennially *is*. Thus he came to be called the “Christ,” the Anointed One to fulfill this mission.

During that life, he initiated a new human community whose very *raison d’être* was and is the instantiation of a new possibility for human life—that of openness to God in self-offering love. I also think that, among much else, Jesus also initiated a repeating pattern of events in which that community might realize specifically the personal presence of God that had been manifest in him. I refer to the sacraments of the Church, in which created matter—natural and/or “the work of human hands” (bread, wine, oil, water)—is incorporated into an authorized act of the community Jesus initiated in such a way that God can be present effectively and cognitively, as surely as we encounter human persons through patterns of physical signs, as already proposed. This sacramental character of at least the Christian religion has been central to me in my own particular pilgrimage, for the sacraments are an explicit and repeatedly manifest sign of what the scientist perceives as going on in cosmic and biological evolution—namely, the very stuff of the world becoming the vehicle of personhood. I have indicated how the sacraments fit into my account of God’s general relation to the world. In the often, and unnecessarily, controversial interpretations of the meaning of, in particular, the Eucharist or Holy Communion, I prefer the affirmative reticence of Queen Elizabeth the First:

’Twas God the word that spake it,  
He took the Bread and brake it;  
And what the word did make it;  
That I believe, and take it.<sup>7</sup>

#### HUMILITY BEFORE GOD AND NATURE

I have come a long way in this essay—perhaps too far for some—and this quotation brings us full circle to that culture with which I began this sketch of how a twentieth-century scientist can begin to take seriously the revelation of God in certain strands in human history. It was and is no intention of mine to foreclose on the possibility that God has spoken at “sundry times and in diverse manners” (Hebrews 1:1) to other people of other cultures. But science, as we know it, is now the independent offspring of a Christian culture, so it is not surprising that this scientist, at least, should find his spiritual home in that tradition, however critically appropriated.

Once one has decided *that* God is, one has taken the first step on a long journey that will last a lifetime, into eternity in my view, and will need all of the sources of spiritual discipline that the experience

and wisdom of the community of followers of this Way can provide (prayer, worship, meditation, the sacraments). But not that community alone, for being a lover as well as a student of *nature*, one of my greatest joys is walking in the English countryside—at its best a cocreation of God and humanity—and in the Scottish mountains—wild and untouched, as God made them. Then, occasionally, with Wordsworth at Tintern Abbey on the Wye:

I have felt  
A presence that disturbs me with the joy  
Of elevated thoughts; a sense sublime  
Of something far more deeply interfused,  
Whose dwelling is the light of setting suns,  
And the round ocean and the living air,  
And the blue sky, and in the mind of man.

—Wordsworth 1798<sup>8</sup>

In all of these spiritual experiences of a natural scientist, my *religio philosophi naturalis*, there is one precondition that all explorers into realities, natural and divine, must fulfill. It was the attitude expressed in a prayer of that devout man with whom I began, Sir Thomas Browne:

Teach my endeavours so thy workes to read,  
That learning them, in thee I may proceed.

—Browne [1643] 1977, 76

This need for humility, has never been better expressed than by that arch-hammer of ecclesiastics and Darwin's "bull-dog," Thomas H. Huxley, who wrote in a letter to Charles Kingsley, the author and Evangelical clergyman,

Science seems to me to teach in the highest and stongest manner the great truth which is embodied in the Christian conception of entire surrender to the will of God. Sit down before fact as a little child, be prepared to give up every preconceived notion, follow humbly wherever and to whatever abysses Nature leads, or you shall learn nothing. I have only begun to learn content and peace of mind since I resolved at all risks to do this.

—Huxley 1913, 235

## NOTES

1. I am afraid I can speak firsthand of no other, though what I have to say will, I hope, be relevant to other forms of theism.

2. This term need not (*should* not) be taken to imply the operation of any influences, either external in the form of an "entelechy" or "life force" or internal in the sense "top-down" causative influences. It is, in my usage, a purely descriptive term for the observed phenomenon of the appearance of new capabilities, functions, etc., at greater levels of complexity.

3. This emergence of new kinds of realities is distinct from what could be called "epistemological emergence," when the concepts and theories are not logically reducible

to those pertaining to the constituents of the system. A related concept is that of "ontological reduction" which is not usually in dispute when it is taken to refer only to the fact that the complex wholes are actually made up of units which, in isolation, have their own distinctive properties—for example, all living organisms are, in this sense, ontologically reducible to atoms and molecules.

4. Or whatever it was on our time scale which, "15 billion years ago," initiated the expansion of our universe.

5. For example, see his *Science and Moral Priority* (Oxford: Blackwell, 1983), chap. 6, and subsequent writings.

6. John Polkinghorne has also used the notions of input of information and the idea of top-down causation from God into the world in his account, which has some differences in balance and emphasis from my own, of God's interaction with the world (Polkinghorne 1989, *passim*).

7. Her answer on being asked her opinion of Christ's presence in the sacrament of the Eucharist (S. Clarke, *Marrow of Ecclesiastical History*, pt. ii, Life of Queen Elizabeth, ed. 1675).

8. "Lines Composed a Few Miles above Tintern Abbey," lines 93–99. E.g. in *The Literature of England* (Chicago: Scott, Foresman, 1953), p. 664.

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