

METAPHYSICS AS MEDIATOR BETWEEN REVELATION AND THE NATURAL SCIENCES

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“The most basic and indispensable mediator between the realm of revealed knowledge, grasped by faith, and that of all other natural knowledge, in particular the natural sciences, is *metaphysics*.”



The aim of this issue of *Communio*, following the invitation of Pope John Paul II in his Encyclical *Fides et Ratio*, is to explore the integration of the various modes of knowing into a fully mature Christian wisdom. The fundamental integration is between faith, which gives us access to the truths of divine revelation, concerning the inner life of God and his special plans for human salvation, which we could not otherwise know by our own unaided reason, and reason, which gives us access to truths about our universe capable of being known by our own natural powers of reason. This basic division of the sources of Christian wisdom is given graphic expression by the favorite medieval image of the “two books” God has given us to read: the *Book of Nature* and the *Book of Revelation*. Both are by the same author, hence in principle cannot contradict each other, although they may sometimes appear to do so in our ongoing process of trying to understand them more fully. They are rather complementary, and both need to be read, St. Thomas warns, if we are to know adequately what God wants us to know about himself and our human destiny. This process can also be described by another

eloquent traditional formula, coming down to us through Augustine, Anselm, etc.: “faith seeking understanding (*fides quaerens intellectum*).”

Such an integrated Christian wisdom cannot be the work of any one particular discipline, whether based on faith or natural reason. It must be done by the whole Christian person, integrating the truths provided by both books with the story of his or her own life. Still, this cannot be done unless there is some intrinsic integration possible between the different modes of knowing available to the whole person. This is where our assigned task in this common project comes in. One of the special problems that arise with respect to integrated wisdom in our contemporary culture is the apparently unbridgeable gap between the knowledge coming from faith, expressed in Christian revelation and theology, and the knowledge coming from the natural sciences, with their spectacular growth and prestige, which have developed in the last few centuries, together with the vast influence they have exercised over our lives through their applications to technology.

Because of the strict, self-imposed limitations of the scientific way of knowing, built into it by its methodology of empirical testing and quantitative measurement, expressed mathematically, science itself cannot relate itself to the realms of faith and religious knowledge in general, or in fact to any mode of knowledge with a broader horizon of content and method, such as philosophy, and metaphysics in particular. Philosophy, because it has, or should have, the broadest horizon of content and method among our human modes of knowing, stands out, then, as the most promising place to look for mediation between these two poles of human knowing, faith and the natural sciences. But within philosophy itself the discipline that explicitly takes the broadest or ultimate horizon of subject matter, i.e., being itself as such, together with the fundamental properties and laws governing the interrelationships of all real beings, is *metaphysics* (at least in its classical systematic sense). Hence the claim that we are putting forth here is that the most basic and indispensable mediator between the realm of revealed knowledge, grasped by faith, and that of all other natural knowledge, in particular the natural sciences, is *metaphysics*—practiced in the classical way of a unified science, dealing with real being as such, not, as so often understood today, merely as a grab bag of all kinds of diverse philosophical problems which cannot be solved by other methods. To flesh this out, and see what such a mediatorship could be like and what it can actually achieve in this role in our own day, is the burden of the rest of this article.

I shall distinguish two main roles of metaphysics in this mediation:

I. Metaphysics as monitor of the statements of scientists about their findings.

II. Metaphysics as positively drawing from the results of science to illuminate the truths of Christian revelation, as a contribution to integral Christian wisdom.

I. Metaphysics as Monitor of the Statements of Scientists

The first role of metaphysics as regards the sciences is a negative one of monitoring the conclusions proposed by scientists as purportedly arising from their scientific work. The problem here is that scientists, forgetting the built-in limits of their scientific discipline, sometimes draw generalized conclusions from their work which do not in fact follow from it and block any integration with higher Christian wisdom, or actually contradict some already established truth of the latter. For example:

A. Incautious Assertions

A few years ago physicists, in order to explain some data of the subatomic quantum world, postulated a “high energy vacuum field” beyond all determinate particles, from which subatomic particles spontaneously popped out, apparently at random, and into which they were reabsorbed again, in a kind of “dance out of nothing into something and back again.” Some physicists began reporting to the popular media, who reprinted it without further qualification, that these particles originated “out of nothing.” The media immediately started reporting that the latest science showed that the universe had emerged out of nothing by random chance, with no need of a creator or other cause.

In fact, all that the scientists were really trying to say—or were justified in saying—was that these particles originated from an energy field beyond all *determinate* particles or forms, a “no-thing” in this sense. But this is by no means the same as pure non-being or nothingness in the absolute metaphysical sense; this high-energy vacuum field is by no means nothing but a very real and powerful force in some not yet specifiable sense. The scientists themselves all too often did not correct

the media for thus distorting their more modest conclusions; or perhaps their qualifications were ignored. Hence it is up to metaphysics, as the discipline whose explicit focus is the properties and laws of reality as such—being as being—to correct those speaking from the point of view of the more particular sciences when they assert what sound like metaphysical conclusions beyond the scope of their own discipline.

Thus it is a very important role of metaphysics, speaking from its broader point of view, to remind us that efficient causality, as understood in the physical sciences, has been narrowed down (under the influence of Hume) to mean, not the active production of some new reality, but in effect nothing more than *predictability according to law* (either deterministic or statistical). Since the appearance of these particles is not predictable by us according to any known law, a scientist is justified in saying that in this restricted meaning of causality their appearance “has no cause.” But this says nothing about the absence of causality in the stronger ontological meaning of actively productive causality—“that which is responsible by its action for the being of another, in whole or in part,” whether or not the connection is predictable by us. It is obvious that to allow such a causeless origination of any real being out of sheer nothingness would directly contradict one of the fundamental beliefs of any Christian wisdom, namely, the creation of the whole universe by God out of nothing preexisting, and that only God can thus create out of nothing. This entails a responsibility on the part of the Christian philosopher to keep up with the general development of science, especially its new breakthroughs, and monitor the interpretations given to them by scientists.

B. Scientific Assertions Which Positively Contradict Christian Wisdom

There is a second monitoring role of metaphysics that concerns not just incautious language in expressing authentic findings of science, but positive assertions by scientists that deny or challenge some tenet of Christian belief. Easy examples are straight-out declarations of materialism or atheism by scientists, which in principle will not allow the existence of anything transcending this material world and the properties of matter. These have been around for a long time. But such positions do not derive their authority from science. They clearly violate the built-in limitations placed on their scientific claims in virtue of their own methodology. Just because one cannot do empirical testing through quantitative measurement on entities that transcend the

properties of matter, it does not follow that these do not or cannot exist, but only that, if they do exist, they are outside the scope of this particular science and can neither be affirmed nor denied by it. Metaphysics certainly has an important role in refuting such ideological positions as atheism and materialism, but we will not delay here on such obvious examples of the need of monitoring by the broader discipline of metaphysics, which has long been practice by both Christian and other philosophical thinkers.

More pertinent to our special interests here—and requiring more careful reflection—are the varied challenges of a modified reductive materialism now being brought forward in the area of the biological sciences dealing with human beings, such as evolutionary biology, neuroscience, etc. Physicists, especially theoretical ones, are now more open than they used to be to the “hypothesis” of God as cosmic designer, and even to a spiritual dimension in humans. But it is in the biological sciences, such as evolutionary biology and especially neuroscience, that reductive materialism and resistance to any spiritual dimension in the human person beyond the reach of science still tenaciously persist. The challenges here concern the very nature of what it means to be human, the relationship of the higher intellectual activities of the mind to the body, whether there is an irreducible spiritual element in us (traditionally called the soul) which, as transcending the material body and the properties of matter, is immaterial and immediately created by God; or whether all these so-called higher activities, with the source from which they flow, are ultimately reducible to nothing more than brain states, highly complex webs of interacting neuron loops, with no dualism of any kind between material (biological) and immaterial dimensions of our human nature. This is where metaphysics must work hardest today, to keep these sciences from closing themselves off from any higher level of human living such as the interpersonal, the moral, the religious, and hence from any integration with Christian wisdom as a whole.

The comparatively new science of evolutionary biology is also proving to be a center of strong resistance to the presence of any distinctively spiritual element in human nature that would constitute a radical qualitative break with the animal ancestors of man and thus remove him from the one great evolutionary process that defines our world for scientists today. This position, beginning to spread more widely now even among Christian thinkers, threatens the uniquely spiritual dimension of the human which sets it off as different in kind from the animals and makes us apt for a direct union with God beyond

this life. It also eliminates (in most forms) any kind of radical intervention of God in the natural evolutionary process by direct creation of the human spiritual and immortal soul out of nothing preexisting—which is actually (although unknown to many) an explicit tenet of Catholic belief, often enough stated in papal Encyclicals but in fact never formally defined.¹ Strong resistance to any notion of an immediate creation of the human soul by God, rather than emergence out of the universal evolutionary process, even with the help of God, is surprisingly widespread today, even among Christian thinkers.

What makes this task of metaphysics today particularly difficult—and urgent—is that we are seeing a new chapter unfold within Christian thought itself on the relation between body and mind, matter and spirit. The whole basic traditional distinction between matter and spirit, long accepted by all branches of Christianity, is now eroding, with Christian thinkers themselves speaking of going beyond “the outmoded distinction between matter and spirit.” This movement is occurring principally among Protestant thinkers (predominantly so far among the academic elite of seminary and university), but with

¹*Denzinger's Enchiridion* (the standard repository of official Church teaching from all sources) cites at least two clear texts: (1) Pope Leo IX, in a “Profession of Faith” imposed for a particular occasion in 1074, stated: “That the soul is not a part of God, but created out of nothing (*ex nihilo creatam*) I believe and teach” (*Denzinger*, n. 685). (2) Pope Pius XII, in his Encyclical *Humani Generis* of 1950, declared: “The Magisterium of the Church does not prohibit the development of the doctrine of ‘evolution’ insofar as it investigates the origin of the human body as arising from already existing and living matter—for the Catholic faith orders us to retain the doctrine that souls are immediately created by God . . .” (*Denzinger*, n. 3896). (3) The present Pope John Paul II has repeated the same teaching in the same words in his remarkable recent *Letter on Evolution*, where he urges Catholic thinkers no longer to resist the general theory of evolution but to integrate it into an enriched vision of how God created the material world, guided it through billions of years of development, and finally brought forth humanity as the crown of the whole process. But he makes explicit exception for the immediate creation of the human soul by God, as a traditional doctrine of faith (“Message to the Pontifical Academy of Sciences,” Oct. 22, 1996; *Origins*, Dec. 5, 1996).

However, none of these documents constitutes a formal explicit definition of the teaching as a doctrine of faith to be believed by all under pain of heresy—Encyclicals do not have this authority unless they explicitly declare it, which is not the case here. They are merely taking it for granted and reaffirming it as a traditional doctrine of Catholic faith. Hence Catholics who deny it are not formally heretics. But it remains clear that for many centuries, even before the medieval period, it has been taken for granted and explicitly asserted as being part of the legacy of Catholic faith.

some Catholics now joining in. Because this movement is taking place within Christian thought itself, and because it concerns such a crucial point of Christian wisdom, I would like to focus on this recent development as a striking example of the kind of monitoring service that metaphysics can give to Christian wisdom today.

Non-Reductive Physicalism

The most challenging and certainly the most articulate school that is now emerging along this major fault line of matter and spirit describes itself as “Non-Reductive Physicalism.” They have recently published a manifesto, whose signers include theologians, philosophers, scripture scholars, neuroscientists, psychologists, etc., entitled *Whatever Happened to the Soul?*² What is meant by this title? It means the belief that the basic subject or agent at work in all the activities of the human being is a purely physical one, i.e., the human body, concentrated in the brain. This physical subject, however, possesses a set of *higher properties*, in the order of self-consciousness, intellectual, interpersonal, moral, and religious activities, which are not reducible to the lower level biological activities of the same physical subject, hence not—at least not yet—explainable by our present-day science. In a word, there is here no *dualism of subjects, or substances* (natures), such as a spiritual soul and a material body-with-brain. Instead, there is a *dualism of properties* within a single underlying physical subject or substance. They describe the appearance of these new higher properties in a lower-level

²*Whatever Happened to the Soul?* Warren Brown, Nancey Murphy, H. Newton Malony, eds. (Minneapolis: Fortress Press, 1998). A second rich source book for both sides of the question is the “Proceedings of the Vatican Observatory Symposium”, *Neuroscience and the Person*, Robert John Russell et al., eds. (Berkeley: Center for Theology and the Natural Sciences; distributed by the Univ. of Notre Dame Press, 1999). Even in the latter book, sponsored though it is by the Vatican, a slight majority of the contributors seem to favor the Non-Reductive Physicalism position. The leading philosophers of the group are Nancey Murphy (Fuller Evangelical Seminary, CA) and Philip Clayton (Philosophy Dept., California State University at Sonoma). Both have important articles in the *Neuroscience* volume; the best seems to me to be that of Clayton, “Neuroscience, the Person, and God,” 181–214 (also in *Zygon*, 35, 2000, 613–52). Although some of the authors in this Symposium hold out for the strict spirituality of the soul, few, if any, including Catholics, are sympathetic to the idea of the immediate creation of the human soul by God, traditional doctrine though it may be.

subject as a product of “emergence” (“emergentism”) from within the evolutionary process of nature, resulting in the “supervenience” of the new properties on the old. Most of them even hold that there is a “top-down” holistic causal influence of this higher set of properties affecting the behavior on the lower biological levels.

It must always be remembered, however, that the one subject or agent of all these operations, on whatever level, is still the same physical subject. What has happened to the spiritual and hence immortal soul of tradition? Nancey Murphy, one of the philosophical leaders of the group, was quite up front about it in a lecture of hers I heard in California: “What has happened to the spiritual soul? It’s gone!” The distinct spiritual and immortal soul, she maintains, is a holdover from Greek metaphysics and should be purified out of authentic biblical Christian belief.

What then happens at death? Since the one operating subject is a physical one, when this goes we are totally dead, totally gone, with nothing surviving. And since the subject performing them is gone, all the properties, higher and lower, are gone too. What then of the traditional Christian doctrine of the resurrection at the last day? Their response is a “re-creation” theory: that God “re-creates” us at the appropriate time, either by putting together again the same biological pattern we had during life, or re-creating us out of nothing if need be. How? God is omnipotent; he can do what he wants. We must have recourse here to our Christian faith, and no scientific or philosophical objections are relevant. Biblical faith requires us to believe in the resurrection of the person, not in any intermediary surviving spiritual soul as a bond of continuity. The members of this school are proud of this set of positions as a paradigm example of the new positive dialogue between theology and science: it does justice both to neuroscience and to authentic biblical Christian faith, they maintain.

Metaphysical Response

1) The notion of a purely physical subject possessing higher level properties—intellectual, moral, religious—that are irreducible to the lower level biological properties of the same physical subject is an incoherent one. These higher level properties are not mere linguistic predicates that can be moved around and attached to any subject one wants; they are dynamic activities proceeding from an abiding center of action, i.e., a *nature*, and expressive of it. Hence this nature as source

of these actions must be at least on the same level of ontological perfection as the actions that proceed from it. Otherwise the fundamental metaphysical principle will be violated that the effect cannot be greater than its cause. The surplus of ontological perfection in the effect over that of the cause would then come from nothing, and have no sufficient reason—which does not make philosophical sense. If the properties of the higher level mental activities in question transcend the properties of the lower level biological activities that can be studied by science, then what is needed is a new higher level *nature* at least on the same level as the activities that proceed from it and express it. Thus it follows that whenever a new irreducible set of properties emerges in the course of evolution, it is really a new nature, that is, a new kind of being, that has emerged on the spectrum of reality. That is how one defines a being, by its characteristic activities. So if the human being performs immaterial operations that transcend the spatial-material properties of the body and the brain, then this being must have a nature (or part of its nature) that is similarly immaterial, in order to be the agent producing them. That is why St. Thomas's first step in analyzing the relationship of the human soul and body is always to pin down the spirituality of the higher intellectual operations of the human being and thus establish the spirituality of the human soul as their abiding source.

In the current discussions on the mind-body problem in the analytic school of philosophy—on which Nancey Murphy is clearly dependent—many of the philosophers involved (perhaps most) are equally unwilling to accept the notion of a spiritual soul distinct from the body, and have recourse to the above notion of the *supervenience* of higher level irreducible properties on a lower level agent-subject. A state of supervenience is obtained when the same lower level subject has two sets of properties, one lower and one higher, such that the higher is irreducible to the lower, yet is always correlated in some way with the lower, so that it cannot be present without the lower and is ontologically dependent on it. The higher level of properties, usually emerging later in the course of evolution, is said to “supervene” on the lower. But, as many critics have pointed out, this term really turns out to be little more than a restatement in technical terms of what one has taken to be the facts, not an explanation of how they can be so. In fact, Jaegwon Kim, one of the leading participators in this debate, in his illuminating survey of 40 years of development of the problem, makes the same basic point, and then goes on to add, with refreshing honesty, that most of those involved in the discussion, including himself, come

to it with an a priori commitment to physicalism, and then they try every way they can to introduce higher level irreducible properties by techniques such as supervenience, without having to abandon their basic physicalism, to which they are committed on principle by their respect for science. But this is hardly the most objective way of proceeding in trying to solve a philosophical problem!³

To sum up: To attribute spiritual operations to a purely physical or bodily subject violates the fundamental metaphysical law of the proportion of nature to the operations which proceed from it and express it.

2) The second part of Non-Reductive Physicalism's theory, its explanation of death and resurrection, is equally flawed philosophically. According to it, when we die we die totally, and since the physical subject of all the higher properties is gone, the properties disappear also. There is no bond of continuity of my identity between death and resurrection. At the appropriate time for the latter, God simply "re-creates" the identical me again, out of the existing materials in the world, or, if need be, out of nothing. But it is a metaphysical impossibility even for God to reproduce the identical person again once it is gone. The new one might be similar, like a clone, but could not be the identical "I", because, for one thing, the new "I" would not have the same *story*, of struggle, conversion, achievement, etc., as the original. The identity of any person (or being) is inseparable from its existential story. Some defenders of the position will reply that God has the exact pattern of my arrangements of atoms and molecules as before in his mind, and has merely to reproduce it again. But a pattern is not a unique existing individual. It is impossible in principle ever to reproduce the uniqueness of anything. And if God can reproduce the same pattern of myself once, then there is no reason he could not reproduce it twice, three, or a dozen times—a dozen identical I's—absurdity, chaos in heaven! Even God cannot perform contradictions. Furthermore, there would be real trouble when it came to the Last Judgment: when the new me was called to account for its past misdeeds, it could well protest, "That was not me; it was the other one

³Cf. Jaegwon Kim, "The Mind-Body Problem: Taking Stock after 40 Years," in *Philosophical Perspectives II: Mind, Causation, and the World*, ed. J. Tomberlin (London: Blackwell, 1997), 185–209. He frankly concedes that he doesn't think much progress has been made over this period that the new technical term "supervenience" seems to him more like a new verbal affirmation of the conclusion desired than a satisfactory philosophical explanation. I agree.

before me!” Chaos again at the Last Judgment! Uniqueness is the one thing in the universe that is not reproducible; a pattern is not a person. That is why the Greek Fathers and the whole Catholic tradition insisted so strongly on the need of a spiritual immortal soul to constitute the bond of continuity between the death of my body and its resurrection again.

Thus, purely on metaphysical grounds (easily graspable by common sense too), without recourse to scriptural argument, the Christian Non-Reductive Physicalism movement is fatally flawed. One cannot really be a consistent Christian without believing in a spiritual soul surviving death. Yet it seems as though a strange kind of blackout or forgetfulness of the whole notion of a spiritual world distinct from the material—what the spiritual could even mean—is becoming more and more widespread in contemporary philosophical thought, even among Christian academic thinkers. One of the key roles of metaphysics, therefore, in the preservation and development of an integral Christian wisdom in our day seems to me to be the maintaining of a clear understanding of the irreducible difference between matter and spirit and the appreciation of the world of spirit in which we humans share by the possession of a spiritual soul, immediately created by God, as a synthesis of the two worlds of matter and spirit. Thus of the two definitions of man that St. Thomas uses, “rational animal” and “embodied spirit,” many Thomists, including myself, think the latter is the more profound.

Fear of Dualism

It must be admitted, however, that one of the principal considerations that has scared off the above group—and many other contemporary philosophers—from being open to accepting anything like a spiritual soul is the spectre of body-soul dualism, haunting them from Plato and Descartes. The only dualism they seem familiar with is the *substance-dualism* of body and soul as two substances of entirely different natures somehow connected together. They either seem surprisingly unaware of the distinctive position of St. Thomas, or lay it aside as “too complex and controversial for us to consider here.” For this they substitute the *property-dualism* of higher and lower properties

in the same bodily nature.⁴ But St. Thomas's position is not a dualism of substances at all. He insists, against Plato and all such dualists, that the human being, body and soul, is not *two substances* but a *single nature*, an embodied spirit, with a dualism of two irreducible *levels of activity* within the one nature: "Body and soul are not two actually existing substances; instead, one actually existing substance arises from both" (*Sum. c. Gent. II, c. 69*).

But whereas for the physicalists, as we have seen above, the unity of nature which grounded its dualism of higher and lower properties was a lower level purely physical nature—the higher grounded on the lower—St. Thomas did the opposite, grounding its lower-level operations in a higher nature, whose very nature empowered it to operate on both levels. Thus the human soul, for St. Thomas, because it possesses its own spiritual act of existence, which it lends to the body, operates as both form of the body, carrying on the operations of the body, and also as spirit, with a surplus of spiritual power to carry on higher spiritual operations beyond the mediation of any sense organ—in a word, a single two-level nature that is an *embodied spirit*. Most modern philosophers, it seems, after rightly rejecting the only dualism they know, the two-substance dualism of Plato and Descartes, seem to be unaware of, or not to understand clearly, St. Thomas's rich, but complex and sophisticated dualism of levels of activity within a single substance (nature), that of an embodied spirit. It is this alone that allows us humans to be the unique synthesis that we are of the two great worlds of spirit and matter: "man the microcosm," as the Greek Fathers delighted to call us. This seminal notion is indispensable to an integrated Christian wisdom, it seems to me.

So much for one key example of the role of metaphysics in monitoring negative attacks or challenges against the faith-content of

⁴A representative example of the widespread antipathy among Protestant academic thinkers today is the article of Lynn Baker, "Must a Christian Be a Mind-Body Dualist?" *Faith and Philosophy*, 12 (1995), 489–505. Her answer is "No, and if you don't have to be, you should not be." Sympathy for this position, with special opposition to the need for an immediate creation of the human soul by God, is also shown by the well known Catholic philosopher of science, Ernan McMullin, "Evolution and Special Creation," *Zygon*, 28 (1993), 299–306; and "Biology and the Theology of Human Nature," in *Controlling Our Destinies: Perspectives on the Human Genome Project*, ed. P. Sloan (Univ. of Notre Dame Press, 1998).

Christian wisdom coming from the natural sciences—as interpreted by so many contemporary scientists, and philosophers. Now let us turn to its more positive role of creative assimilation of the authentic results of the natural sciences into integral Christian wisdom.

II. Metaphysics as Positive Mediator between Science and Revelation

Let us distinguish two main roles: one general, one particular. The first is:

A. Knowledge of Science as Integral to Our Human Role as Mediator between the Material World and God

This basic role is concerned with the place of scientific knowledge in general in the return of the material universe to God through the mediation of man, as part of that great integrating medieval vision of the universe, called “The Great Circle of Being”—a vision dear to St. Thomas and other medieval thinkers, but one which seems to have dropped out of the consciousness of most Christian thinkers today. Let us recall briefly this vision, founded on the archetypal image of the “universe as journey.” The whole universe was conceived as a journey with two great phases: (1) the journey of the Many (creatures) out from the One (God) in creation, called the *exitus*, or the “road out,” away from Home, in which creatures emanate from God in all their rich diversity, to unfold their diverse potentialities; and (2) the *reditus*, or “road back,” the return back Home to union with their Source. The first part of the journey corresponds, in metaphysical terms, to the exercise of efficient causality by God, as he projects all creatures out into real existence, each with its own dynamic nature. The second part corresponds to the exercise of final causality by God; no sooner has he “thrown” all creatures out into existence than he begins to pull them back toward himself by the pull of the good, each to its own proper fulfillment as a nature. But since all finite goods are such, St. Thomas argues, only by participation in the Infinite Good that is their ultimate Source, each finite being therefore tends implicitly towards participating as much as possible in this Infinite Good, that is, returning Home again as much as it can, to the Ultimate Fullness of the Good from which it came.

But there is a problem in the actualization of this deep implicit longing of the universe to return back to God. Rational beings, endowed with a spiritual intellect and will, such as pure finite spirits (angels) and finite embodied spirits, such as we humans, can be directly united with God by knowledge and love, with the help of God. But the material world, sunk in the darkness of unconsciousness, has no way on its own to be united directly to God. This is where the special role of us human beings, as embodied spirits, comes in. We alone can be the mediators between this material world and God its Source, because we alone contain within our very being both matter and spirit, as the unique synthesis of the spiritual world and the material world into a single being—a *microcosm*, as the Greek Fathers described us, reflecting in ourselves all the levels of being of the universe from the lowest particle of matter to its Infinite Spiritual Source.⁵

Since we have our roots deeply in matter through our bodies, as embodied spirits, we alone (or other embodied spirits similar to us) can speak in the name of the material universe, which has no voice of its own. Angels cannot do this, having no part in matter. We can perform this role of mediation precisely by taking up the world of matter in which we are immersed into explicit consciousness—making it self-conscious in us, so to speak—and then referring it back to its Source; recognizing that it is on a journey, and offering it back again to its Source with gratitude and love, as a gift to us for our own journey. Thus we fulfill the very meaning of the material world by raising it into the light of spiritual self-consciousness, where alone its meaning can come out of darkness into the light of knowledge and love. And in the final fulfillment of our own journey, in the resurrection of our bodies, we will actually take the material world, glorified and transformed by being totally penetrated by spirit, but still material, into our immediate personal union with the divine Source of both the material world and ourselves.

But we cannot possibly speak for the material cosmos unless we know and understand it to some significant extent—and the better we know it, the more aptly we can speak for it. This is precisely the full meaning—and dignity—of the natural sciences in

⁵Cf. my article, “Living on the Edge: The Human Person as Frontier Being and Microcosm,” *International Philosophical Quarterly*, 36 (1996): 183–99.

this great journey of the universe back Home to its Source. They are the only way we can come to know in any detail just what this material cosmos is really like, how God has made it. After all, when we get to know the basic laws of nature and the story of the origin and development of our cosmos, as revealed by contemporary science, are we not trying as best we can to rethink the thoughts of God himself by which he created it, and to acknowledge his gift with wonder and gratitude, speaking for the material world that cannot speak for itself? There is no way we can attain an integral Christian wisdom, fulfilling our role in the Great Circle of Being, it seems to me, except by assimilating as fully as we can the authentic conclusions of the sciences.

Every Christian need not do this in detail; but the Christian community as a whole must do it as carefully as it can, and communicate the large lines of this by education to all its members. The Dalai Lama himself, with his typical profound insight, has said in a recent talk: “The universe has no voice. But the universe needs a voice. *We* are the voice of the universe.”

What a magnificent destiny and dignity of us humans, especially as Christians—not just to save our own human souls, but to enable our whole vast material cosmos, through our mediation, to fulfill its own meaning and return home again to its Source and complete the Great Circle of Being! And how wondrously enriched this great vision of the universe as journey becomes when we integrate it with our Christian faith and recognize that God himself, in the Person of his son, has come to take on our bodily human nature and walk this journey with us, and to act as the supreme and ultimate Mediator between the world of creation and its Creator and thus complete in a stunning new way the Great Circle of being on its way Home.

St. Thomas sums up in his typical terse way this whole vision of emanation and return: “In the emergence of creatures from their first source is revealed a kind of circular movement (*circulatio*), in which all things return, as to their end, back to the place from which they had their origin in the first place.”⁶ The same schema of emanation and return is also the basic structure of his entire *Summa Theologiae*, the first Part describing the emanation, the other three the return to God through the mediation of human beings and Jesus, the

⁶ Thomas Aquinas, *In I Sent.*, d. 14, q. 2, a. 2.

God-man. The unique role of human beings, however, in mediating the return of the material world, especially by raising it into self-consciousness in us, is only hinted at. Its explicit development as I have done above had to wait for our own time, with the flowering of modern science. But to incorporate this magnificent vision now seems to me to be an imperative for any integral Christian wisdom.

Now let us look at some of the particular discoveries of the natural sciences that seem to me apt to shed further light on the content of Christian revelation.

B. The “Big Bang” Origin of Our Material Universe

First proposed some 60 years ago, this then-startling hypothesis has now built up a mass of corroborative evidence over the years, especially the recent discovery of the faint background radio echoes of the original explosion still coming in to us from all directions in space, which match exactly what would be expected mathematically if such an event had occurred. As a result there is now pretty universal scientific agreement that this is the only plausible explanation of the data. But this is an astonishing bit of new information, unknown to any of our ancestors before 60 years ago, and throws a brilliant new light on just how God went about creating our universe. We had long known, of course, *that* God created this universe out of the sheer creativity of his divine wisdom. But we had no further clue, Christian thinkers or anybody else, as to the details of just *how* God went about executing his plan. For example, it was commonly agreed that while the human race, at least for Jews and Christians, had a special history, with a beginning and expected end, this took place in the context of an unchanging cosmos, with timeless unchanging laws—an historical humanity unfolding within an a-historical physical cosmos. Now we know that the entire physical cosmos itself is through and through historical, is itself a single great story, with a beginning and still evolving toward an as yet unknown conclusion, a story of which we humans are an integral part and in fact are the cutting edge of creativity, with our intelligence and creative imagination, so that we are gradually taking an increasing role in the very way the process itself unfolds—at least with respect to our own little planet earth at present, and who knows how much further in the future? Humans and the cosmos itself are now part of a single great unified story, integral pieces in

the same divine plan for an evolving and hence not yet finished universe, of which a small part is the evolution of life on our own little earth. The conclusion follows from all this, which no ancient, early Christian, or medieval person could have known or suspected: we humans must now look on ourselves, in the fullness of now available Christian wisdom, as *created co-creators, with God, of a not yet finished universe*. A new vision indeed of our place as embodied spirits within the total divine plan for our universe!—a vision that we can look to no one of our great thinkers in the past to explicate for us. It is a new responsibility resting squarely on our shoulders as 21st century Christians.

There are also other aspects of the universe as a story evolving from a single tiny beginning point like the Big Bang that seem to me to shed significant light on how God seems to have gone about his project of creation. The extremely fine tuning, recently deciphered, of the fundamental initial forces of the universe, down to the most infinitesimal detail of precision, any slight change in which would have made it impossible for higher life like ourselves to develop in the universe, points to the extraordinary subtlety, ingenuity, and unpredictable creativity of the divine plan of creation, and to what seems to me the special signature of the divine hand, discernable in many different ways, that is, that the tiniest, apparently most insignificant beginnings of things turn out to have the most enormous, far-reaching effects over time. Thus the whole vast complexity and diversity of our present universe developed out of the tiniest, most inconspicuous initial starting point, and the tiniest, hardly measurable differences in the fine tuning of the small number of original basic forces of nature would have resulted in enormous later differences in the development and present structure of our unimaginably vast universe. Is there not something similar in the way God seems to like to deal with humans in their development—from the humblest, most unobtrusive beginnings to the most splendid later unfolding, e.g., the coming to earth of God himself taking on our human nature by being born inconspicuously in a stable; and the birth of his Church from a small contingent of undistinguished ordinary people to its present vast expansion into roughly one third of the total six billion population of the whole earth? That seems to be God's mysterious preferred way of doing important things! Thus we reach the remarkable conclusion that the present discoveries of science pointing to how God went about forming our universe give us a strong hint as to one aspect of God's

unique and unpredictable “style” of dealing with his creatures: the humblest beginnings flower into the most far-reaching results.

C. Complexity or “Chaos” Theory: Order out of Chaos

This fascinating new theory seems to me another example of an increasingly well-established scientific hypothesis that provides us with a significant hint as to the way God prefers to proceed in planning his creation. For our purposes we can distinguish two main parts to it. The first is that in very large unstable systems, with unstable equilibrium, such as the weather, large water systems such as the oceans, etc., once the system passes beyond a certain threshold of disequilibrium and turbulence, what seems like chaos begins to produce new and unpredictable—often beautiful—new higher forms of order, new forms of self-organization, order out of apparent chaos. The facts are well enough established. But a satisfactory explanation so far eludes us, it seems. So I will leave you to your own reflections on this intriguing phenomenon. It is telling us something, but just what is not yet clear, save the unpredictable creativity infused within nature itself by its Author. The possible implications for shedding light on the process of evolution, and other puzzles, are now under discussion by scientists.⁷

The second part of the theory seems to me to be another striking example of the divine way of planning the development of nature so that the tiniest, most inconspicuous initial events, or early interventions, end up by triggering off enormous later consequences. It has been discovered that in these large unstable systems the injection of a very tiny change in the system from the outside, at or near the beginning, can trigger a domino effect of larger and larger effects ending in vast later consequences, as parts of the system already balanced precariously on the edge of equilibrium are pushed

⁷Cf. J. Gleick, *Chaos* (London; Heinemann, 1988); I. M. Stewart, *Does God Play Dice?* (London: Blackwell, 1989); I. Prigogine & I. Stengers, *Order out of Chaos* (London: Heinemann, 1984); and the fine chapter of John Polkinghorne, “Does God Act in the World?” in his *Belief in God in an Age of Science* (New Haven: Yale Univ., 1998). For him, God acts on the unfolding world process by a “top-down causality” operating by “information causality,” not “energy causality,” i.e., by infusion of new *information*, not new energy, as does our own soul, analogously, in acting on our body.

over the edge into a new state, thus precipitating one by one larger and larger breakdowns of equilibrium, out of which new unpredictable forms of order emerge. Thus scientists say it is literally possible that someone could sneeze at the edge of the Gulf of Mexico and a month later a snow storm be precipitated in Montana. Here is the same law of tiny unnoticeable beginnings ending in huge unpredictable consequences.

It follows from this that, since any number of such tiny interventions can occur in any such large unstable system, and are neither predictable or even noticeable by us human observers, it is in principle impossible to predict accurately in detail the future development of any such large system containing unstable states of equilibrium, such as the weather. This means that an element of unpredictability and chance is built into the very structure of the unfolding of our material universe through time. And is not a similar law at work in human communities? Do we not see small initial decisions, made by a small number or even a single individual, gradually spreading, like the ripples of a stone dropped in the water, and ending up with vast new social, economic, political, spiritual movements, or changes of consciousness, in the history of our world?

Along the same lines of unpredictable creativity in nature, we might call attention to current studies of what seems to be a general tendency in living organisms—maybe even below that—to a kind of spontaneous, unpredictable, self-organizing activity, producing creative adaptation to changes in their environment that is not just the result of random chance mutations from without, but from some inner principle of creativity. This has given rise to generalized theories of what is being called *autopoiesis*, or “self-making, self-organizing” as one of the built-in potentialities in all of nature—at least in the realm of living organisms. Such, for example, is the theory being proposed by Niels Henrik Gregersen in “The Idea of Creation and the Theory of Autopoietic Processes,”⁸ in *Zygon*. His theory is critically discussed by other scientists in the March 1999 issue.⁹ This is clearly a case for careful metaphysical discernment of

⁸ Niels Henrik Gregersen, “The Idea of Creation and the Theory of Autopoietic Processes.” *Zygon*, 33 (1998): 333–67.

⁹ Cf. also Erich Jantsch, *The Self-Organizing Universe: The Scientific and Human Implications of the New Paradigm of Evolution* (New York: Pergamon, 1988).

the philosophical issues involved, such as the principle of sufficient reason.

God's Mode of Action in the World

What is the relevance for integral Christian wisdom of such scientific discoveries and hypotheses along this line of the unpredictable creativity that seems to run like a thread through all of nature? Christians believe, both for philosophical and theological reasons, that God's creation is somehow an *image* of God's own being, and hence mode of action, and this must include to some extent even the natural material cosmos. It seems plausible then, even to be expected, that this recurring theme of unpredictable creativity in nature, with all its surprises to us, should reflect in some imperfect way the infinitely free, unpredictable creativity of God himself, its Creator. Inspired by this same theme, a number of Christian theologian-scientists today are reflecting on just what seems to be God's characteristic mode of action in and on our world, in the light of contemporary science. Their general consensus seems to be that reflection on the history of our material universe reveals that God exercises his providence over it, not according to some totally preordained script, but rather by a creative interplay—whose rationale is hidden from us at present—of *real chance and law-like order*, analogous to the interplay, in his providence over human history, of genuine freedom and intended divine goals. It seems to me, therefore, that this recent scientific uncovering in nature of a certain power of unpredictable creativity, matched with the unpredictable creativity of God's own mode of acting in our world, willing to weave together both chance and order, highlights in a significant new way a distinctive aspect of God as ongoing Creator that we might not have paid enough attention to before, in our perhaps undue preoccupation to ensure God's total control of his creation. It certainly has done so for me, I can testify.¹⁰

The Interconnectedness of All Things in the Material Cosmos

¹⁰Cf., for example, Elizabeth Johnson, "The Cosmos: An Astonishing Image of God," *Origins*, 26 (Sept. 12, 1996): 206–26.

One of the most striking lessons we learn from contemporary science is the extraordinary close and tightly woven interaction and interconnectedness of all entities in our material world. It starts with the fine tuning and tight interdependence of the four great forces and initial constants of the cosmos, the smallest changes in which would have radically altered the present state and structure of our evolving universe: gravity, electromagnetism, the strong force that holds together the nucleus of the atom, Planck's constant, the rate of expansion from the Big Bang, etc. But then in terms of these, of the fields of force emanating from these, all the entities in the cosmic system interact in some way with each other. It is literally true, scientists tell us, that if I wiggle my finger, I move a distant star, every star, though to an infinitesimal and unmeasurable degree. In the domain of living organisms, both within each cell and within the organism as a whole, there is a stunning complexity of interactions and co-dependency between the huge number of elements involved, balanced in fragile equilibrium. Then there is the complex web of mutual relations between members of the same species, and of these in turn with the whole delicately balanced environmental ecosphere, so that if one element in the web is removed or significantly changed, the whole equilibrium can begin to unravel with large unforeseen and unpredictable consequences, more often harmful than helpful. Touch one part of the web, and the repercussions will ripple through the entire web.

The mutual influence of mind on body and vice versa is now more and more recognized in medicine. States of mind and emotion can affect states of health, and states of body can affect states of mind, in quite significant, often dramatic ways. And elusive psychic fields seem to hold sway among societies both of animals and humans. Strong psychic emotive fields are well known to exist among human beings in close social relation, within families, crowds, large cultural groups. All living beings are wondrously intertwined with each other, both within and across species, and with the ecological environment in which they are embedded. Another astonishing example, well below the level of life, is the behavior of subatomic particles at the quantum dimension, which, according to Bell's theorem, once joined ("entangled") at some point, then maintain a mysterious instantaneous connection with each other no matter how far separated thereafter in space—called the "non-locality" of matter at the quantum level.

There is also the unique relationship, unknown before quantum physics, between the human observer and the quantum world he is trying to observe, according to which the very act by which the scientific observer observes his quantum object significantly modifies the very object of his observation, often triggering the change from a partially indeterminate state of the quantum phenomenon to a determinate one. Thus the electrons when unobserved within an atom are present as energy waves pulsing all around the nucleus at once; but when observed in the lab (the observer must send in a light ray to do so) the “wave packet collapses,” as they say, and the electron shows up as a determinate single particle with a determinate location, size, weight, etc. It is as though the subatomic world were somehow incomplete, not fully actualized by itself, and is waiting for us human observers to complete it, actualize it more fully, by the very fact of coming to know it. Thus the age-old, taken for granted principle of the independence of the object known from its supposedly detached, “objective” knower has suddenly collapsed or been significantly modified, at least in the subatomic quantum world. Now the very knower himself and what he tries to know have become inextricably intertwined in a kind of unified field.

In sum, there seems to be a general law pervading the whole material world, never recognized so explicitly in previous ages: that of the profound universal interconnectedness of all things, so that every part of the same vast web resonates in harmony with every other, like a musical composition. This can shed considerable light on the nature of the universe, as a distant image of God, and of the human community that we are in our journey toward the ultimate “togetherness” of heaven.¹¹

Conclusion

I have sketched out what seem to me the main lines of the role of metaphysics as mediator between the modern natural sciences and the content of Christian revelation as held by faith. This role is

¹¹This interconnectedness of all things is eloquently brought out in the remarkable book of George Schroeder, *The Hidden Face of God: How Science Reveals the Ultimate Truth* (New York: Free Press, 2001).

double: (1) a negative role of monitoring the statements of scientists which would exclude integration into an integral Christian wisdom, either as incautious interpretations of authentic scientific findings or as explicit contradictions of something already in the legacy of revelation; (2) a positive role of discerning the implications of authentic scientific findings for shedding new light on the content already in place in the treasury of Christian wisdom. We have outlined what seemed to us several key examples, among others possible. But we must warn our readers that in this interface between metaphysics and science the rigor of argumentation proper to metaphysics by itself is not to be expected.. This is not the realm of necessary truths. The conclusions must always partake of the order of the contingent and the in-principle revisable that is proper to the epistemological status of modern science with its experimental method.

In fact, I suggest that this comparatively new project of exploring the interface between modern science, metaphysics, and the content of Christian revelation calls for a new level of metaphysics itself. The aim of traditional metaphysics was to discover the necessary fundamental properties, governing principles, and laws proper to any universe of finite, changing beings, no matter what its particular structure. That still holds true. But there is another possible, more contingent level of what can also be called “applied metaphysics”: that is, to draw out and interpret the general governing principles at work in our particular universe that emerge from the conclusions of the various natural sciences and that could have been otherwise, leaving intact the necessary laws of traditional pure metaphysics. Some distinguished metaphysicians are already working in precisely this field, such as Errol Harris in his numerous works. This is also precisely what we have been doing in the second part of this article. I suggest that such an area of reflection should now be added to the ongoing project of an integral Christian wisdom—an exciting and challenging project indeed! Such a project, we maintain, can only be carried out through the mediation of an alert metaphysics, used by a Christian theologian (in the widest, non-professional sense), at the service of an integral Christian wisdom,

where the two wings of faith and reason fly together in a creative harmony.¹² □

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¹²For one of the best guides to discern what the future of this already lively dialogue between religion and science can and should be, I strongly recommend the insightful recent work of John Polkinghorne, *Belief in God in an Age of Science* (New Haven: Yale Univ. Press, 1998), Ch. 4: The Continuing Dialogue between Science and Religion. One of the best places to keep up on this ongoing dialogue, at least in English, seems to be at present the journal *Zygon*. Christian thinkers interested in this project would be wise to monitor it. I also recommend, as a remarkably insightful, illuminating—and inspiring—example of the same work I have been trying to do here, the very recent book of George Schroeder, the well-known Jewish scientist-religious believer, entitled *The Hidden Face of God: How Science Reveals the Ultimate Truth* (see n. 9), showing how contemporary science points to a transcendent, all-pervasive, unifying Wisdom that underlies the whole material cosmos and all the laws of nature.

