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Discourse on Method

In a withering critique of the "evolutionary mysticism" of P. Teilhard de Chardin, the eminent zoologist George Gaylord Simpson lambasted the French Jesuit's pretense to scientific legitimacy on grounds that all of "Teilhard's major premises are in fact religious, and…his conclusions about evolution derive from those premises and not from scientific premises" (1964: 348). Consequently, and in apparent contrast to premises of the sciences, Simpson alleges that Teilhard discovers nothing in evolution that he has not already presupposed.

I note this episode at the outset of this book not because I hold any brief for Teilhard or any other version of "evolutionary theology"; indeed I take the very category to be hopelessly confused for reasons which will eventually become clear. Rather, I recall Simpson's diatribe because it reflects a naïve view of the nature of science and its relation to metaphysics and theology from whose standpoint this book—which necessarily presupposes its own metaphysics in the course of advancing them—is likely to be deeply opposed and even more deeply misunderstood. In this chapter, I shall offer a formal and metaphysical argument, chiefly with respect to the *act* of scientific knowledge, that this view is false in principle. Thus, this chapter stands somewhat apart and strikes something of a different tone from the rest of the book and may appear metaphysically abstruse to readers of a more scientific and less philosophical bent. Its purpose is to show *that* there is an irreducibly metaphysical and theological dimension to scientific inquiry that is not obviated by retreat to the putative neutrality of scientific method, to explain the metaphysical reasons *why* this is the case, and to show *how* a putatively neutral method conceals a questionable metaphysics and theology. Once we have established this relation, the question of the relationship between science and theology, creation and evolution, becomes not so much *whether* theology but *which*. We will adjudicate this question historically and speculatively in Parts II and III. Nevertheless, in order to avoid misunderstanding and to avoid being accused of a "fault," which is really only ontological necessity equally

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binding on the likely opponents of my argument, I wish to depart in advance from the material task of this book to state briefly what I take to be the formal parameters of the relationship of science to metaphysics and theology and some of the implications which follow from it. This exercise is somewhat artificial since my argument actually militates against any final separation of method and substance or form and content. But when thought must begin without any pure starting points, which is to say whenever thought begins, we do what we must.

Simpson's criticism of Teilhard exemplifies what I will call an "extrinsicist" view of the relation between science, metaphysics, and theology. In its most extreme form, the one Simpson appears to hold, the essential difference between scientific and metaphysical or theological premises consists in the former's indifference to, and thus, independence from the latter. At the root of this is a positivism which takes the world as unproblematically—and uninterestingly—given, a standpoint no less metaphysical than the metaphysics it deplores. We will consider the implications of this positivism in subsequent chapters. A milder form of this view would acknowledge that there are metaphysical and perhaps even *de facto* theological assumptions at the logical and historical origins of scientific inquiry, but that these, being essentially external to science, can be safely "bracketed out" from the strictly scientific work of testing hypotheses through empirical or experimental methods. The difference between these two positions is minimal, however, for they share in the more basic assumption that, whatever other methodological peculiarities may be proper to its "essence," science is science not least because its "essence" excludes metaphysics and theology.[1] In other words, it is here at the point of their mutual exclusivity that the distinction, which is really a wall of separation, is to be drawn between science on the one hand, and metaphysics or theology on the other.

Inherent in this assumption are two others. The first is that scientific premises are ultimately self-justifying, if only *a posteriori*. This is to say then that scientific inquiry does not depend upon any form of rationality "higher" than itself but is rather the final basis upon which other forms of rationality, including one's initial metaphysical assumptions, may ultimately be justified.[2] Natural science, in brief, is first philosophy which ultimately pulls itself up from the "empirically given" by its own intellectual bootstraps.[3] This is the root of Simpson's complaint as well as the whole contemporary movement, exemplified by Dennett (1995) and others, in which evolutionary biology and pragmatic philosophy collaborate in the "Darwinization of everything" without need of submitting the Darwinian "algorithm" of natural selection to anything more comprehensive or fundamental than itself.[4] In the most extreme forms of Darwinian absolutism, natural selection is not so much an event within the history of thought, but rather all historical theories are episodes within the sovereign activity of natural selection, a notion which finally severs any link between thought and truth.[5] Perhaps this is why the "debate" between Darwinians and their religious opponents is so perpetually unedifying and why thinking and sloganeering, education and ignorance are often so readily and willingly confused.

Even in the more benign forms of extrinsicism, metaphysics, to the extent that its presence is acknowledged, is reduced to the status of a hypothesis or a system to be verified or rejected through subsequent scientific analysis which, *qua* scientific, is essentially free of metaphysics.[6] (As we shall see, this is an inadequate understanding

of the metaphysical relation of the creature to God.)[7] Science is thought to be capable of grounding itself and justifying its own metaphysical hypotheses on the basis of the second assumption, namely, that the empirical and experimental methods of scientific analysis are ontologically neutral precisely as *method*, and thus stand essentially *outside* of metaphysics and theology. This same assumption then allows one to eschew "scientism" and excessive "reductionism" and to regard these as philosophical contaminations extrinsic to "pure" science.[8] And it even permits one to propose a *rapprochement* of sorts between science and metaphysics or theology, not by entertaining the possibility of integrating the sciences into a theological view of reality or by supposing that theological truth might qualify scientific knowledge without loss to its scientific character—the extrinsicist view dogmatically prohibits this *a priori*—but by urging each, as it were, to "mind its own business."[9] There are of course important distinctions to be maintained between science, metaphysics, and theology—distinctions mandated by the doctrine of creation itself. So the notion that philosophy, theology, and science should each stick to its own proper business does indeed contain an important truth. But it is not the whole truth, or rather it is a truth that cannot be adequately comprehended without a good idea of what that business is. There is no question that the sciences enjoy a legitimate autonomy with respect to metaphysics and theology; the question is the meaning and nature of this autonomy. This is ultimately an ontological question.

Talk of "a" normative relation between theology and science is of course fraught with complications. The word "science" conceals a vast array of different and highly specialized theoretical and experimental activities, both within the ever-increasing number of scientific sub-specialties and between them. Those taking an empirical or "sociology of knowledge" approach to the so-called "science–religion dialogue" have therefore developed "models of interaction" based upon the different ways that the science–religion relationship is empirically shown to be operative among the different sciences and in relatively more theoretical and practical applications. This approach entails its own unacknowledged ontological commitments and begs too many ontological questions to be philosophically satisfying, but it is helpful in calling attention to the different complex levels at which the question applies and the concrete obstacles to answering it.[10] Training in the sciences is now so specialized that the vast majority of researchers are isolated from the theoretical genesis of their own disciplines, a problem compounded by the fusion of the scientific and technological revolutions and the ostensible parting of ways between a science now largely equated with technological prowess and what was once known as "natural philosophy." As a result, there are many biologists who have never really studied Darwin, physicists with little firsthand acquaintance with Newton, and economists who are unfamiliar with Adam Smith. Where these great architects of modern thought are read, it is largely a matter of mere historical interest, or in the case of Darwinism, of occasionally rubbing the forehead of the talisman for the sake of legitimizing oneself in the eyes of the tribe.[11] Yet, each of the sciences gets philosophical as it nears its theoretical source—where it did once regard itself as *natural philosophy*—because each at its source and in its most comprehensive theoretical articulation embodies an aspiration to ultimacy or universality that is simultaneously obscured in the mundane work of the specialist and operative within it. The closer one gets to these original sources, the closer one gets to

indispensible assumptions about the meaning of nature, place, body, causation, motion, life, explanation, and truth. In short, one gets closer to the indispensible assumptions about being *qua* being and therefore being in relation to God that remain axiomatic within science in its more mundane practice at the experimental level. The average researcher in applied physics does not have to think about what an entity, a body, truth, or place is, not because these are irrelevant to his work but because he can take them for granted. That ground will have already been plowed by others.

It is not my intention in this chapter to try to provide an exhaustive account of what the normative relation to metaphysics and theology should look like "in the laboratory," as it were. Indeed it follows from my theological thesis about the meaning and nature of creation, as well as from my formal account of this relation, that this normative relation can only be discovered from *within* each of the sciences in question. This is an aspect of their *legitima autonomia* (*Gaudium et Spes*, 36). This relation is a function of the intrinsic truth of the world and the way this truth impresses itself on the structure of thought and its objects, not the *de jure* imposition of extrinsic theological authority which has all but ceased to exist anyway. However, if my formal account of this relation and my material evaluations of its various historical forms are correct and science's relation to metaphysics and theology is not merely a sociological accident or a heuristic "model" that can be discarded or altered at will but a constitutive, ontological relation, then two consequences follow for any attempt from within the sciences to adequately address this question or to realize this relation.

First, though this relationship will be most visible and its implications will be felt most strongly at the programmatic level where the sciences strive for universality and thus are most philosophical, this ambition to universality can be present at both ends of inquiry, in what Stenmark calls the initial "problem-stating" phase or later in the "application phase" (2004: 217–219). And as with any sort of action, the formulation of problems and ends determines the shape of intermediate steps in the solving or testing of those problems. So to insist that the sciences take philosophical inventory of their theoretical origins is not to say that science's relationship to metaphysics and theology will be practically irrelevant in the work of abstraction and experimentation, for example. Nor is it to deny that this relationship might "show up" (under other descriptions of course) in the laboratory, for instance, in the intractability of certain phenomena and their resistance to reduction, in ways that may force a rethinking of a discipline's material ontological commitments. It is only to say that the practical relevance of this relation will be determined largely by how the broader theoretical context mediates the ontological commitments of the discipline in question.

Second, properly recognizing this relationship will mean recognizing its formal and constitutive character, which means that it is always already given and operative and that there is no ontologically neutral ground from which to step outside this relation in order to survey it. In other words, there is no metaphysically neutral starting point from which science can lift itself up by its own intellectual bootstraps. The question, then, is not how the sciences can be "brought into relation" or "reintegrated" with metaphysics and theology, but rather how science's relation to metaphysics and theology is *already present* within scientific theory and method, and this in two senses: first, how the truth of being *qua* being is already operative, imposing itself upon the scientific act perhaps in spite of whatever theories we may have about that act, and,

second, whether the way that any given science cognizes this relationship, which is materially a matter of historical contingency, is scientifically, metaphysically, and theologically coherent.[12] It is the burden of this chapter to argue that science's relationship to metaphysics and theology does obtain of necessity, to outline the true form of that relationship, and to criticize the tacit formulation of this relationship in the extrinsicist view. Accepting these arguments will mean, finally, not that professional scientists must become professional theologians—*this* is effectively what happens when the relation between science and theology is *not* properly understood and maintained—but that they become better scientists *qua* physics or *qua* biology and so on by allowing their objects to be and to present themselves. To achieve this, science must "return to the sources" to reappraise the metaphysics and theology latent in its own founding assumptions, to assess how these are axiomatic within scientific practice, and to determine the extent to which these falsify science and its objects by making the world inherently less than our elementary experience of it and less than it is in itself.

One might argue that this assessment is already taking place. Since Simpson's brief essay, developments in the history and philosophy of science have vastly complicated our understanding of the nature of science as a historical enterprise and have given us a more complex picture of the role that philosophy and theology—as well as other extra-scientific factors like politics, economics, or racial and cultural prejudice—have played in the course of the actual development of the sciences.[13] One need not look far within the guild of evolutionary biologists, or sympathetic historians and philosophers, to find the sometimes reluctant admission that there is a metaphysical component inherent in biology and that this component is sometimes even called upon to do significant scientific work.[14] Even so, while these developments may have ameliorated the ostensible naiveté of Simpson's position, they are conducted within the purview of the ontology and ultimately the malign theology latent in his extrinsicist assumptions. To see this fully we must understand that "atheism" too is a form of theology—even a form of *Christian* theology, historically speaking—inasmuch as it requires a determinate conception of God to reject.[15] (As it happens, Darwinism's official atheism is distinctly Protestant: Latitudinarian Anglicanism, to be precise.)[16] Nietzsche was partly correct, then, that Christianity itself bears responsibility for the death of God, something of which the Fathers of the Second Vatican Council were very aware.[17] There seems to be little awareness of this among atheists and naturalists, however, and thus little evidence that the acknowledgment of science's metaphysical and theological dimensions has appreciably altered the nature of its metaphysical and theological assumptions.[18] The pervasiveness of this "theology" within science and the philosophy of science is a crucial reason why this chapter is necessary at the outset of this book. Some may not find these arguments compelling, but they will not even be intelligible from the vantage afforded by the latent theology of modern biology, and taking for granted the meaning of words used in common such as "God" and "creation" will only serve to conceal this theology from our eyes.

We will not get very far in answering the question of the relation between metaphysics, theology, and science if we do not understand what sort of question it is. The relation of science to metaphysics and theology is not *fundamentally* a scientific question, nor is it fundamentally an empirical, historical, sociological, or even philosophical question, though of course it is all of these. Rather it is *fundamentally* a theological question,

logically consequent upon the question of the relation between God and the world. This is because any attempt to answer it will invariably presuppose, project, and enforce some understanding of this most basic relation. Science cannot determine for itself its relation to theology, in other words, without effectively *doing* theology, without saying, explicitly or implicitly where to draw the line, or how to characterize the difference between God and the world (a line, historically speaking, that is drawn in dramatically different fashion after the Incarnation of Christ and drawn differently again from the seventeenth century onward).[19] In fact, the very extrinsicism governing contemporary thinking about the relation between science and theology is premised upon a more basic extrinsicism governing thought about the relation between nature and God, such that "natural" and "supernatural" are taken to denote juxtaposed and mutually exclusive orders of reality and forms of explanation.[20] "Nature" is natural precisely in the fact that it excludes God and vice versa.[21] It is because this is such bad theology, annulling the very difference between God and the world protected by the doctrine of "creation," that what passes for discussion and debate between so-called creationists and evolutionary biologists never attains to a discussion of creation at all and why most parties seem blindly content to assume that "creation" is a self-evident notion that means whatever Richard Dawkins or Daniel Dennett take it to mean.

The effects of these unavoidable theological judgments are not limited to the "theological" side of the relation. Corresponding to these theological predecisions—and often prior to them in the order in which we articulate things—are judgments regarding what Aristotle called being *qua* being or Aquinas called *esse commune*, the understanding of "being in general" presupposed by and operative within any notion of nature. For example, the decision to regard "being" (*esse*) as synonymous with brute facticity, which is the metaphysical correlate to an extrinsicist understanding of "creation," exercises a profound influence upon what will be regarded as relevant content in the empirical analysis of "nature" and what inherent features of our being in the world are to be regarded as nonevidentiary, giving ontological precedence to analytically separated parts, for instance, over formal and integrated wholes. Metaphysical judgments are inherent in what counts as empirical evidence, and these judgments mediate between science and theology proper.[22]

As obvious as it may seem, we need to be (continually) reminded that all science is undertaken *by* human beings from *within* the world.[23] Because all science is commenced by us from within the world that encompasses us, no science really commences, as our intractable Cartesianism would have it, in "an Archimedean freedom outside nature" (Grant 1969: 32). This is why Aristotle judged that no science established its own subject matter and no science was ultimately self-generating or capable of establishing its own first principles. It receives the former from the world—there could be no biology without living things, for example—and it receives the latter on loan, as it were, from a more fundamental or comprehensive science: with the "laws of biology," in modern parlance, being irreducible to but dependent upon the laws of physics, and so on.[24]

Precisely because this Archimedean point is an illusion, because there is no *outside* nature, the entire edifice is *groundless* in the sense that the first principles (the source) of demonstration—ultimately being itself—are not themselves demonstrable on the basis of anything more basic. This is why Aristotle makes the remarkable "concession" that the indemonstrable first principles of being *qua* being which are at the *ontological*

root of every science command faith (πιστειν, *pistein*). This "faith" is understood not as a "decision to believe" this untestable hypothesis rather than another—indeed he claims that in the "interior discourse within the soul," the truth of axioms (as distinct from hypotheses or postulates) cannot be disbelieved—but in the sense of the "yes" implicit in our reception of the world as it "communicates itself" immediately to our understanding (*nous*) (Aristotle, *Topica*, I, 100b20; *Post. An.*, I, 2, 72a30ff, 76ba21ff, 99b15–100b18).[25] Aristotelian *pistis* is a kind of trust, a willingness to receive the world on its own terms that is constitutive of cognition as such. It is analogous to the relation between perception and the *lebenswelt* in phenomenology, prior to the "phenomenological attitude" or to its subsequent objectification by science.[26] To discover a "decision to believe" is to have arrived too late. It is rather like the faith praised by God in *The Portal of the Mystery of Hope*, the masterpiece by the French poet Charles Péguy. "Faith" in this sense is "easy," and disbelieving is hard. It follows naturally from a creation so resplendent that God declares, "in order really not to see me these poor people would have to be blind" (Péguy 1996: 6). Thus,

> Faith is obvious. Faith can walk on its own. To believe you just have to let yourself go, you need to look around. In order not to believe, you would have to do violence to yourself, frustrate yourself. Harden yourself. Run yourself backwards, turn yourself inside-out, thwart yourself…
>
> In order not to believe, my child, you would have to shut your eyes and plug your ears. In order not to see, not to believe (1996: 9).

Descartes does precisely this, of course, at the origins of modern science, in an act of intellectual self-mutilation so violent that the unbridgeable chasm which it forges between thought and world, matter and meaning, and ultimately, his essence as sheer will and his body as extended malleable "stuff" will be felt down the centuries.[27]

> I will now shut up my eyes, stop my ears, and will withdraw all my senses, I will eliminate from my thoughts all images and bodily things, or rather, *since this is hardly possible*, I will regard all such images as vacuous, false, and worthless (Descartes 1985a: 24).[28]

Descartes' violent attempt at refusing the truth of the world is an act of sheer obstinacy which by his own admission can only be half successful. Because in the *actual* world we are flesh and blood persons always already in the world, and because the world has always already taken up residence in the immediacy and intelligibility of our understanding, Aristotle concludes that the indemonstrable first principles "are the *cause* of our knowledge—i.e. our *conviction* (πιστενειν, *pistenein*)" (*Post. An.*, I, 72a30). Because we are encompassed by the world, and because the truth of the world therefore precedes (and exceeds) our knowledge of it, all science thus ultimately originates in preexistent, prescientific knowledge, in truth given to experience as an intelligible unity. This unity *in* experience is not *just* a unity *of* experience on Aristotle's terms, but the metaphysical unity of being-as-*act* binding an efficient cause (the world) and its effect (our experience) into a "single actuality" or event, a notion evident, for example, throughout his account of sense experience in *De Anima*.[29] I see this tree, for instance, because it has already taken up residence in me, so to speak, and while it is possible to imagine my

sight and the tree separately (viewed as potencies)—and while it is certainly possible to make subsequent erroneous judgments about the tree—my see*ing* it coincides with its tak*ing* up residence. "The activity of the sensible object and that of the percipient sense is one and the same activity, and yet the distinction between their being remains" (*De Anima*, III, 425b26). The sciences then proceed from this unity, abstracting "parts of being" from this actual whole and returning to this whole by way of synthesis.[30]

This unity all but disappeared from view with the demise of the act–potency distinction and the subsequent transformation of efficient causality into a (strictly unintelligible) relation between two events. This is why causality is now reduced to regularity of occurrence.

Yet unlike modern science, which commences in what Galileo approvingly called the "rape committed on [the] senses" in order to get to the "real world" lurking objectively behind their deceptive deliverances, there is a sense in which ordinary sense experience of the world does serve as a kind of rational criterion for Aristotle. This is why he can claim that the indemonstrable first principles of demonstration are better known than the conclusions (*Post. An.*, I, 72a25ff).[31] (We will take up this point in detail in the final chapter.) Aristotelian experience is not a criterion of rationality, of course, in the critical Kantian (or Fichtean) sense that obliterates the world in itself and reduces it to an object for a subject by converting time and space into *a priori* intuitions for possible sense experience and the predicaments of being into *a priori* categories of understanding.[32] Nor is it a criterion in the sense of a "naïve realism" sometimes attributed to him by his seventeenth-century detractors, that all our initial judgments about sense experience are correct and that things are always simply as they appear to be—as if the sun were really no bigger than a coin or a straight stick miraculously bent when one end is stuck in water.

Rather, because I always already *belong* to the world—because the world and I are distinct poles of a single actuality—there is no "subjective experience" of myself that does not already include the prior objective order of the world, and there is thus no real possibility of separating my subjectivity from this order. The Cartesian *epoché* can only be a willful act of self-mutilation that, even then, is no more than half successful. Moreover, this experience in its very intelligibility has to be included in any account of the truth of the world since it is manifestly a part of the world. Joe Sachs put it very well in his commentary on the *De Anima*. An alternative to the modern attempt to reduce the actual world to the parameters of a mechanistic ontology is to "realize that the world must be so constituted in the first place that the soul and the activities of life are genuine possibilities within it" (Sachs 2004: 8). Thus for Aristotle, both analysis and synthesis attempt, in a sense, to "catch up" to the elementary experience of the world as it impresses itself upon us in the single actuality that is our being in it and immediately receiving it. Analysis and synthesis are attempts to "unpack" the truth of being impressed upon this immediate understanding. Since truth is not exhausted in appearance it needs to be unpacked, not because the truth lurks obscurely "behind" appearances (where it can never logically be reached), but because it *overwhelms* appearances, as the light of the sun overwhelms the eye of the owl (Aristotle, *Metaph.*, II, 933b10).[33]

The crucial points are these: being precedes knowledge, and a certain *understanding* of the whole or being as such (*esse commune*) permeates scientific inquiry and lies, albeit

differently, at both its origin and end. This is not to say that an articulated metaphysical *system* serves as the deductive basis of subsequent science—indeed in Aristotle's scheme the science of being *qua* being is *chronologically* last in the order in which the sciences are articulated—rather, it is to say that the truth of being *qua* being (what is) is *ontologically* first and thus lies at the origin and source of all inquiry, imposing itself upon thought in its very structure even if this is inadequately recognized. And since what is true of the whole is by definition true of all its parts, metaphysics, as a matter of ontological and epistemic necessity, is in some sense operative throughout the endeavor of thought. To put the matter in Aristotelian terms, the orders of being and knowledge, while not separate, are distinct and inversely related: what is last in the order that we come to know is first in the order of being, as it must be if knowledge of the world is to be knowledge *of the world* and not simply a tracing around the structures of logic or the finite categories of our understanding. While metaphysics may therefore come chronologically *after* physics, its truths as truths of being and therefore as the condition of possibility for knowledge are ontologically first and thus operative formally in thought as such, even though these truths may be distorted by subsequent, second-order reflection. Because scientific knowledge is both responsive to reality and assumes an understanding of reality in general that is more than it can ever say for itself, and because any such account implies a relation to God in the manner already discussed, all sciences tacitly partake in that *theologia naturalis* which Aquinas said is proper to metaphysics (*In Boeth. de Trin*, q.5, a.4). For all deal with "divine things," at least implicitly, as an ineradicable aspect of their treatment of the world, as Aristotle himself does in the 12th book of the *Metaphysics*.[34] That other sciences differently conceived do so tacitly or unawares or that they fill their metaphysics with content materially different from Aristotle does not obviate this formal point. Precisely because these are judgments about reality *in general*, that is, about the *whole*, they are axiomatic within those sciences such as biology, chemistry, astronomy, and their sub-specialties which ostensibly deal only with a part. Indeed, as I shall argue, these sciences deal with the whole through the attention they give to a part.[35] Irreducibly metaphysical judgments as to the nature of being, form, time, space, matter, cause, truth, knowledge, explanation, wholes, parts, and the like are the starting point of science, not its conclusions. Because they are apropos of being *qua* being, these judgments are not merely *presupposed* at the origins of scientific inquiry where they may thereafter be bracketed out. Since what is true of the whole is by definition true of every part, they permeate the entire enterprise and are operative inside of every subsequent judgment.

A Most Basic Distinction

To put the point positively, science is constitutively and therefore inexorably related to metaphysics and theology. To say that this science is intrinsically constituted in relation to metaphysics and theology is to say that science is not simply distinguished from metaphysics and theology merely by a difference of method (experimental, empirical, or mathematical) that would demarcate them *externally*, though this is not to deny that there is a methodological difference. Nor are they simply distinguished in virtue of their end or the fact that science typically trades in what can be observed, or measured, or

predicted, or manipulated. The question of precisely *what* the empirical sciences observe is a complicated matter, since empirical experience is already a highly "stylized" experience.[36] And it is not always the case, in astronomy, for example, or in certain branches of physics, or even in reconstructing certain features of a hypothetical evolutionary past, that the objects of science can be observed or manipulated. Where it is the case, the very fact that empirical experience is "stylized" is an indication that there is no such thing as empirical observation that is not philosophically mediated. To say, then, that science is intrinsically constituted in relation to metaphysics and theology is to say, first, that it remains dependent upon a tacit metaphysics and theology in the very act by which it distinguishes itself from them, and, second, that science is constituted as such in distinction from philosophy and theology *by the manner* in which it relates itself to them (precisely *by* distinguishing itself from them), as a way of attending to "the whole" through its perspectival attention toward a part. To say that this relation is inexorable is to say that it cannot be willed away. It can be forgotten, neglected, suppressed, or materially distorted, but never escaped. The more vehemently a Dawkins or a Dennett asserts his atheism, for example, the more definitive and grotesque his theology becomes.

Before explaining further the meaning and implications of this claim, it is first important to specify just what sort of claim it is. It is actually three claims which cannot be deduced or inferred from one another as a matter of positive theological principle. Though they form a comprehensive whole when taken together, illuminating and deepening each other, each stands on its own without reference to the other two, and they could thus be articulated in any order. The first sense of the claim is theological. Science's constitutive and inexorable relation to theology is but the cognitive expression of being's constitutive and inexorable relation to God. It follows, in other words, from a proper understanding of creation understood (in its passive sense) precisely *as a relation*, a notion we will specify a bit more fully later (Aquinas, *ST*, I.45.3). Inasmuch as relation to God intrinsically constitutes the creature in its very distinction from God, this most basic relation is implicated in all subsequent relations of the creature, including thought.[37] There can be no "outside" of relation to God because it is through this relation itself—real on the side of creatures, rational on the side of God—that the being of all that is mysteriously not God is constituted. This is why Aquinas can say not only that all things tend to God and that God is sought in every end, but also that "all cognitive beings also know God implicitly in any object of knowledge" (*De ver.*, III.22.3). If this is true, then there will be in the cognitive order something analogous to the classical understanding in the moral order of sin as a *privatio boni*, where sin is understood as the privation of a more basic goodness which continues to be reflected in and through the privation.[38] If relation to God is *ontologically* constitutive, then a defective realization of this relationship in the cognitive order cannot vitiate that relationship utterly. Objectively speaking, this means that this relation, since it is really *in* the creature, must remain phenomenologically "visible," as it were, even though we try, like Hazel Motes, to turn a blind eye to it.[39] "Ever since the creation of the world, his eternal power and divine nature, invisible though they are, have been seen and understood through the things he has made" (Romans 1: 20).

The second sense of the claim, and the principal argument of this chapter, is philosophical. This sense of the claim is not deduced from creation and should certainly not be mistaken for an argument in "proof" of God's existence. In this sense, this is a

claim about reason's own intrinsic necessities *qua* reason, and, consequently, about the nature of science or "natural philosophy." It is argued not from the top down, so to speak, but from the ground up.[40] Though I maintain that no one can escape what is finally a theological standpoint, and though I hold that the theological standpoint revealed in Christianity purifies and deepens philosophy and does not negate it, this philosophical argument does not require one to assent to Christian faith or the doctrine of creation *ex nihilo* in order to recognize its force. We have already encountered this argument in its most basic form. The notion of a "pure" science free from metaphysical and theological contamination is a fiction and therefore *already* the expression of a theology. This is because every account of scientific knowledge necessarily presupposes something of the object of that knowledge, namely, nature, and this in turn presupposes an account of being *qua* being that mediates both the content of science and the relation to theology. More simply, science is intrinsically related to theology because one cannot identify the object of scientific inquiry—namely, nature—without simultaneously distinguishing it from that which is not nature—namely, God—and without giving tacit specification to the character of this "not." This is confirmed by a fact which we have already noted and which we will see repeated frequently as our argument unfolds over the course of this book: conceptions of nature determine in advance what sort of God is allowed to appear to thought and, consequently, the range of meanings that can be intelligibly attached to "creation."

We have not yet stated the point in its full depth, however. If the distinction between God and the world is the most primitive of distinctions, if it is inherent in the very idea of the world even where "God" is thought not to exist (i.e., in much of the modern West), then this distinction will inhere in all subsequent distinctions and in the notion of "distinction" itself. How one understands the very nature of "distinguishing" will therefore also give tacit expression to an ontology and ultimately a theology, which is to say that there is no retreat to an ontologically neutral "methodological" standpoint in order to escape this relation. We will have to make good on this claim, of course; suffice it for now to note the obvious point that we are here discussing the objective *logic* of theorizing and the fact that the *act* of distinguishing God and the world is an irreducibly *theological* act. We are not mandating that one who thinks about nature be *thinking about* God, much less articulating an explicit theology. This is why Aquinas says that we have an *implicit* knowledge of God in the knowledge of everything else. Sincerity of belief, in other words, is not the issue. I have little doubt that Richard Dawkins sincerely *believes* he is an atheist, just as Aristotle reports that there are some who attribute disbelief in the principle of noncontradiction to Heraclitus (Aristotle, *Metaph.*, IV, 1005b25). But Dawkins is a very bad atheist, preserving in his thought at every turn the traces of the theology he purports to reject, much as those purported to disbelieve "the most certain principle of being" affirm it in the very act of denying it. In both cases, professed belief is betrayed by the act of thought itself (1005b20–1006a13). Aristotle suggests that such men, suffering a want of education, do not know themselves.[41] I leave it to the reader's discretion to judge whether he is right.

The third sense of the claim is historical, and indeed what is true in principle in the orders of being and thought we should expect to see enacted in history. Because science cannot do without judgments of an irreducibly metaphysical and theological nature, modern science in general and modern biology in particular have never in fact

done without them. Each in the course of its actual development has both presupposed and enforced particular metaphysical and theological outlooks which are beyond their own scope to adjudicate, outlooks at once parasitic and destructive of the orthodox tradition of Christian theology. One might say that the modern conception of nature, insofar as it is possible to identify the essence of such a thing from among its many articulations, depends upon an unthinking of traditional doctrines of God and creation that is no less theological for being malign. As a result, substitute doctrines of God and creation that make no theological sense have come to be widely accepted only for the purpose of being rejected, while ignorance and an enforced lack of interest about such fundamental human questions are confused with education. Consequently, many contemporary atheists lack the theological literacy to recognize that what they disbelieve in is not in fact God or the incentive to discover otherwise.

One might object that my claim to be making a philosophical argument refutes itself. If there is finally no "outside theology," as I am arguing, then it would seem that my argument *for* theology cannot be outside theology either. So it appears we are trapped in a vicious circle, which returns us to our starting point in Simpson's original accusation: that the problem of science's relationship to theology is not properly "discovered," but formulated presupposing its own theological solution. But not all circles are vicious—indeed circles were once thought perfect before they became vicious—and the impossibility of finally *separating* the form of a problem from its material content does not preclude the possibility of *distinguishing* the form from the content and from pursuing the problem in formal terms for quite a long way before the content necessarily comes into view. Such a possibility is inherent in the inverse relation between the orders of being and thought which follows in turn from reality's superiority to all our theories about it. Without this excess of being to thought, the very notion of truth disintegrates into mere logical coherence. To deny the legitimacy of knowing the form of a problem by an abstraction from its material content is to deny the possibility of science, which is also a form of abstraction, for one would have to know the whole of everything in order to know anything whatsoever. As it happens, while I wish to maintain the strongest possible *distinction* between theology and philosophy, and thus a distinction between the formal, philosophical character of this relation and the theological content which ultimately makes sense of it, I do not for a minute wish to *separate* philosophy from theology. To separate the formal problem from its material solution would already be to pronounce theologically upon that solution. The same holds true for the relation between theology and science. While I would wish to make the strongest possible distinction between science and theology, there is no "outside theology" for science either. The distinction between science and theology, in other words, is finally a theological distinction undertaken from within a theological purview.

It turns out, then, that maintaining the rightful and necessary distinction between science, metaphysics, and theology is something of a paradoxical affair. And this paradox is mandated, albeit in distinctly different ways, both by our being in the world and by a doctrine of God that does not annul the difference between God and the world. The necessity of presupposing more of being than one could ever say derives from our being in the world and from the impossibility of demonstrating the principles of being, which would be tantamount to justifying the world on the basis of some

Archimedean point outside it. The impossibility of ever fully justifying that presupposition or getting to the bottom of it derives from the very distinction between God and the world, which forbids us the continuity of being implied in either a deductive or inductive metaphysics and finally prevents the universe from fully explaining itself. It seems that being itself leaves us in the curious position of formally requiring and indeed having thought permeated by a metaphysics that is, by turns, equally necessary and equally impossible. Precisely because this situation prevents us from deducing the world from a metaphysical starting point, there is a distinction (but not a separation) between the order of discovery, that is, the order of reason, and the order of being that is the source of that discovery: having an inkling in advance of what we can never know and cannot help but know, we must nevertheless approach it from the ground up. This permits the philosophical discovery of a formal problematic whose paradoxical structure is only revealed in the end, and by approach from the opposite direction, to be the expression of Christian theological content. This content "resolves" the problematic precisely by disclosing its paradoxical character and thereby smashing any illusion that this necessary metaphysics can ever coherently take the form of a "system" encompassing *or* discretely separating God and the world. And so while the material content of Christian "metaphysics" is alone in "satisfying" the formal problem of metaphysics as such, we avoid vice in this circular conclusion by setting out in opposite directions, and traversing its circumference in two directions at once.

The Impossible Necessity of Metaphysics

In order to understand more deeply just why and how a metaphysics and *theologia naturalis* are intrinsic to the sciences even while remaining distinct from them, we must explore this paradox further.[42] It is an obscure problem, and to address it, I want to draw upon insights from an obscure text, at least from the point of view of contemporary philosophy of science, the 1932 masterpiece by Erich Przywara, *Analogia Entis*.[43] Przywara helps us to see that the "impossible necessity" of this metaphysics is not simply a function of reason's limitations, as if these could be determined once and for all by a critical philosophy tacitly exceeding those limits, but ultimately from our paradoxical status as *creatures*, which transforms and enriches the very meaning of limit in a way that has a direct bearing on the distinction between theology and the sciences.

To admit, from outside of the "metaphysics of creation," that science is never without its metaphysics and theology is to recognize that the necessity of metaphysics and its inherent relation to theology are *formal* problems, formally binding on the very structure of thought, "prior to the *theologia naturalis* advanced by any particular metaphysics" (Przywara: 48). This is why, for Aristotle, the "most certain principle of being" the indemonstrable first truth of metaphysics imbibed through the unity of understanding (*nous*) in our elementary experience of the world could *not* be a "hypothesis": because any such hypothesis could only be stated in terms already presupposing this principle (*Metaph.*, IV, 1005a18–1005b34; *Post. An.*, II, 100a9–100b18).[44] This, further, is why metaphysics is not merely presupposed at the origins of a science where it can be safely bracketed out from the conduct of "pure" science and why it is not merely a "hypothesis" subject to subsequent verification by an ontologically neutral method.

To say that metaphysics and its attendant *theologia naturalis* present a formal problem in advance of any particular solution is to say that they present a problem of structure, but is it the structure of thought or the structure of being? The many historical attempts to resolve this question decisively in favor of one or the other side of the polarity immediately reveal an aporetic dilemma. With respect to the first form of metaphysics—the metaphysics of act, knowledge, or consciousness which Erich Przywara called a *metanoetics*—not only does the attempt to get critically "behind thought" through thought involve a certain infinite regress, but also "no account can be given at all that is not cast in the form of certain ontological categories" (4).[45] The second form, which Przywara calls *metaontics*, aspires to an adequation of thought and being so complete that knowledge itself can be understood as the self-expression of being.

The obvious problem in this instance is that a *metanoetic* point of departure is inherent within this aspiration: even if we find thought *about being* in the heart of thought itself, it nevertheless remains irreducibly *thought* about being. (This is one reason why Aristotle says that "the soul is *in a way* all things"—*quadammodo omnia*. This means there is also an important way in which it is *not*, in which thought and being stand in excess to each other (*De Anima*, III, 431b20).) What is crucial from our point of view is that while it is necessary to maintain a distinction between these two forms of metaphysics—the distinction between truth and appearance depends upon it—the line of demarcation between them, like that distinguishing metaphysics from *theologia naturalis*, is not an external limit. Rather, each is internally pervaded from the start with the other; each is always already implicated in the other such that "clearly the final problem of metaphysics must be just this mutual belonging" (Przywara: 6).[46]

It is partly this mutual implication of being and thought, reflected in our earlier comments about Aristotelian "experience," that led Aquinas and the scholastics to insist that the first object of the intellect is *being* (*ens*) (Aquinas, *De ver.*, XXI, 4, ad.4). That is, the structure of human thought is "theoretical" or "contemplative" in the traditional sense before it is active. Inherently entailed in its most fundamental operation, that is, in the *act* of consciousness, are a receptivity toward and affirmation of *what is* and of what thus transcends—and therefore *precedes*—the temporal flux of becoming precisely insofar as it is.[47] An important consequence follows. While we may grant a *methodological* priority to the *metanoetic* (a relative priority granted to the order of thought that allows us to imagine metaphysics as a formal question in advance of metaphysical content), the *metaontic* within the *metanoetic* is that which objectively (i.e., ontologically) precedes it by virtue of the transcendence of its object.[48] In other words, the truth of being imposes itself on the *act* of thought prior to our material judgments regarding this truth. The primacy of the *metaontic* is reflected in the priority that Aristotle and Aquinas accorded to *nous/intuitus* not just at the end of discursive reasoning in the goal of a contemplative unity of thought and being, but at the *origin*.[49]

The implications of this, both for the formal structure of metaphysics and for the particular metaphysical assumptions embodied in modern science, are too numerous and momentous for us to give them more than a passing mention at this stage. I would note first that the inherent implication of being in thought immediately provokes questions about what are traditionally referred to as the transcendental attributes of

being—unity, truth, goodness, and beauty—and their convertibility. This issue can be focused by posing the questions: "What makes truth compelling? What is the force of reason?" To answer that reason and truth are compelling in their own right—that they claim and move us by nothing more basic than themselves and that they cannot therefore be defended—is immediately to enter upon a Platonic reflection upon the ontological (and thus causal) priority of the good. To defend reason and truth for their usefulness, by contrast, is already to have abandoned them.[50] The implications for the sciences are immediate. If reason is structurally contemplative, if the question "what is?" ontologically precedes—or rather, is already entailed within—all questions of "how?" then the claims of pragmatic science to have dispensed with such questions will have the character of a self-inflicted wound and indeed a self-deception. Such claims do not vindicate reason as much as abandon it in service of the Baconian *dictum* equating knowledge and power. And yet, this will be *only* a wound. For inasmuch as reason is structurally—that is, *ontologically*—contemplative, it will be impossible to avoid both posing and answering the ontological question in practice, albeit in an inherently reductive way.[51]

We must postpone further reflection on this point until subsequent chapters. At present, I wish to indicate two points that are more immediately relevant. The first is that the structurally contemplative character of reason further deepens the necessity of metaphysics, making it not just a "system requirement" for any given theory but a constitutive if inchoate feature of the act of thought. The second is that the tension between what Przywara calls the *metaontic* and *metanoetic* starting point for a metaphysics at once necessary and impossible is indicative of a deeper and more comprehensive tension between an *a priori* metaphysics that aspires, in its perfected form, to "deduce the world from its idea" and an *a posteriori*, inductive metaphysics that proceeds from particulars to universals and effects to causes.[52] Each can be regarded *metaontically* or *metanoetically*, that is, from the side of the object or the side of the act, which unveils yet another tension internal to thought between historical existence (*esse*) and suprahistorical "essence" (though we see in Part III that there is also a "suprahistorical" dimension to *esse* and a historical dimension to *essentia*). Our point here is not to duplicate all of the details of Przywara's profound and subtle analysis. Rather, the point is simply to open a window onto science's relation to metaphysics and theology. Inasmuch as reason's act is structurally metaphysical *before* it is scientific and remains metaphysical while it is scientific, it is necessary to determine, as far as possible, the exigencies of this act. Przywara's formulation helps us to see the paradoxical structure of these exigencies. We have seen, on the one hand, that the strict impossibility of either a pure *metaontic* or *metanoetic* metaphysics coincides with the strict necessity of both, and the same is true of an *a priori* or an *a posteriori* metaphysics conceived in *metaontic* or *metanoetic* terms. This means that the relationship between these two forms of metaphysics is not an extrinsic relation of mutual exclusion but an intrinsic relation of polarity: "Polarity means that the poles, even as they are in tension, exist strictly through the other" (Balthasar 2000: 105).

> A pure *a priori* metaphysics, whether of the object or the act, would be *a priori* not only in the sense of "*priori*"—an immediate grasp of the first principle—but also and precisely in the sense of the "*a*"—seeing *from* the vantage of the first principle. (Przywara: 17)

This is manifestly not the position occupied by any would-be metaphysician; he remains within and a part of an order of being that precedes and determines him. It was this which first led Aristotle, the exemplar of *a posteriori* metaphysics, to declare the first principles of metaphysics indemonstrable. The philosopher has no recourse to a starting point "outside" or "above" the order of being but instead always commences his deliberations from within that order. And if we are allowed to follow Aristotle's own account of the senses or the diverse reflections of Husserl, Wittgenstein, Hans Jonas, and Michael Polanyi on the *lebenswelt* and its bodily mediation, they commence from more deeply within that order than the philosopher is ever capable of realizing, certainly more deeply than Descartes' disjunction of *res cogitans* and *res extensa*, perennially repeated in all reductionist science, would ever lead us to believe. Were it even possible to attain to such heights, the world thus derived from its idea, whether conceived in mathematical terms, or in the terms of Platonic *eidos* and Aristotelian *morphē*, would never reduce entirely to that idea.[53] Existentially, that is, with respect to what *is*, it would always be bedeviled by an irreducible historical remainder—not merely man, or even *this* man, but "Socrates."

This seems to militate in favor of an *a posteriori* metaphysics. Yet, a pure *a posteriori* starting point proves just as elusive. Most mundanely,

> even the most extreme of empirically experimental metaphysics cannot avoid a theoretical point of departure for its experiments…and every "it is assumed that" already implies an antecedent theory which affects the order of the experiment and thus constitutes at least a negative *a priori*.[54] (Przywara: 23)

A positive *a priori*, moreover, a universal that transcends its particular, contingent instances, remains the formal object of an *a posteriori* metaphysics, so it appears that an *a posteriori* metaphysics has the *a priori* as both its origin and end. And so with respect to the cognitive act, we see the inverse of the earlier problematic with the *a priori* metaphysical form. Just as from the deductive vantage there was an irreducible existential (historical) remainder in the explication of what *is*, so there is an irreducibly essential (suprahistorical) remainder in grasping of *what* is, something in the apprehension of the "what" (precisely insofar as it is) which presents itself as transcendent and to that extent (ontologically) prior to its singular instantiation.[55] Przywara uses the formula "essence *in and beyond* existence" to designate this.

These paradoxical necessities do not compel explicit assent to this antique philosophical lexicon, of course, much less to an ontological doctrine of substantial forms or essences as principles of being. I am well aware that such a position is regarded as far from self-evident in the Babel that is contemporary philosophy and is even more despised in the philosophy of science or biology where it will earn you an *anathema sit* as a variation on "typological thinking."[56] Positivists like Martin Mahner and Mario Bunge, subscribing to a nominalist position, would no doubt dismiss this in advance as yet another "unintelligible discourse about Being, Nothingness, Dasein, deconstruction and the like" (1997: 3). I privilege this language as belonging to philosophy proper not on grounds that it is the only one possible, but on grounds that it expresses something basic, at least so far as the order of knowledge can be abstracted and inversely related to the order of reality: the formal problem of philosophical experience in advance of any particular philosophical content.

One may choose not to subscribe to these terms. Yet inasmuch as our elementary experience is necessarily intelligible, inasmuch as being is a formal object constitutive of thought and intelligible only through form, and inasmuch as form is therefore necessarily affirmed in the *act* of thinking, we may reasonably ask to what extent it is possible finally to *disbelieve* in them—"For what a man says, he does not necessarily believe" (Aristotle, *Metaph.*, IV, 1005b25). Balthasar maintains that there are no real idealists on similar grounds.[57] One should think it tiring work in any event.[58] This is why D.C. Schindler (2008) is absolutely correct to say that it is much easier simply to ignore such basic contradictions, as Descartes was forced to do, than to try and overcome them.[59] Just as hypocrisy is said to be the tribute vice pays to virtue, so pain at contradiction is the residual tribute reason pays to the claim of being as truth. For the most part, the tribute is not exacting, but when it is, one can avoid it simply by remaining numb to the contradiction and subordinating the claim of a comprehensive truth (and the prospect of an integrated, coherent life) to the criterion of efficiency. So just as one can subjectively live contradictory lives at home, at church, and at the office, one can always respond to this formal problematic with an assertion of nominalism—as indeed modern science has done—and then simply ignore the fact that this carries its own metaphysical implications which are no more self-evident, but much less coherent.[60] Nevertheless, just as an "essentialist" ontology, whether Platonic or Aristotelian, reflects this formal problematic and attempts to conceive of a universe large enough to include what is experientially basic in it, so nominalism is a second-order stance taken in *response* to what is experientially basic. It is a material response to this formal problem that does not refute the problem but affirms it.

Thus, both *a priori* and *a posteriori* metaphysics turn out to be equally necessary and equally impossible. They are necessary because together they mutually constitute the very form of thought. They are impossible, not because they are mutually exclusive alternatives demarcated by an external limit, but first, because of the "intrinsic reciprocity" that obtains between them, and second, because this reciprocity denotes the philosopher's self-transcending location within an order of being to which there is no "outside." Let us take these points in turn. Przywara's formula "essence in and beyond existence" expresses the paradoxical fact that each necessary form of metaphysics is irreducible to the other, and this necessitates a distinction between them. And yet this distinction is *not* a separation. For we have found something of the *a priori* (corresponding to essence) operative at the heart of the *a posteriori*, and conversely we have found something of the *a posteriori* (corresponding to concrete historical existence) at the heart of the *a priori*. While each form is distinct from the other, each exists only in and through the other and so cannot properly be itself without it. The two forms of metaphysics structuring the act of thought constitute a polarity in Balthasar's sense. This leaves the would-be metaphysician in what Przywara calls the "suspended middle," oscillating between two poles without ever leaving either behind, in a mutual unity incapable of accounting fully for itself and thus suspended, as it were, from nothing.

This "suspended middle" is crucial for several reasons, although the first is of more remote interest for the time being. Internal to the various tensions we have seen thus far, and indeed to each pole of these tensions, is a movement between the relative and the absolute, the *a priori* moving from the "top-down" as it were from an eidetic source and the *a posteriori* taking the reverse movement from below to above, toward that which transcends its fleeting instantiation in the particular and simply *is*—whatever

that is taken to be. Insofar as both movements press toward a comprehension of the whole, and insofar as the whole is not self-explanatory and the less so the more that each pole of approach reveals its dependence upon the other, "the pure formal problem of metaphysics as such leads to the *question of the relation between God and creature*" (Przywara: 45). In reality this question was already implicit from the beginning, formally inherent in the problem of metaphysics *per se*, inasmuch as no metaphysics can avoid giving some sort of "bottom-up" answer to it. But is this the same question as those we have been considering, or is it a question of a different order?

At the risk of abusing the notion of "paradox," I must point out a certain, shall we say, curiosity with respect to this question. The paradoxical "limits" within which the philosophical act commences make it impossible for philosophy to specify *a priori* and with precision just what reason's limits *are* in its pursuit of God. For, in order to specify these limits absolutely, one would already have to see beyond them, and it is precisely this that is denied by the philosopher's paradoxical position. Balthasar put it very well.

> The positive definition of grace can only be given through grace itself. God must himself reveal what he is within himself. The creature cannot delimit itself in relation to this Unknown reality. Nor can the creature, as a theologically understood "pure" nature, ever know wherein it is specifically different from God. (Balthasar 1992: 279)

Historically speaking, it is surely telling in this regard that the Greeks, who were able to anticipate a great many conclusions which would find their fulfillment in Christianity, knew no distinction between theology and philosophy. The distinction only comes about as a consequence of the revelation, in Christ, of a transcendence and immanence beyond even the Greek imagination that institutes a hiatus within their ontological monism. I would therefore take exception to the manner in which some contemporary Thomists draw the distinction between philosophy and theology, or rather perhaps, since I take the view articulated here to be more or less Thomistic, I take exception to their understanding of what they are actually *doing* when they draw the distinction. And I do so neither to devalue natural reason nor to limit the autonomy of philosophy, but because by attempting to valorize reason and secure the autonomy of philosophy in juxtaposition to revelation, they *limit* reason prematurely and misconstrue the nature of this autonomy.[61] And they do so on what are fundamentally theological and not philosophical grounds.

Philosophy in its aspiration to ultimacy is inherently open to theology.[62] Because this aspiration commences from within this "suspended middle," we cannot completely specify philosophy's limits vis-à-vis theology from *within* philosophy, and I would be reluctant to place any *a priori philosophical* restrictions—if such an *a priori* even exists after revelation—on philosophy's capacity for God. And yet, if we do *not* regard this question as in some sense beyond the reach of earlier questions, we run into a different and distinctly *theological* problem: we annul the infinite difference between God and the world, effectively rendering "God as creature" or "creature as God" not simply by effectively equating God with "the all" but also by appropriating through our *scientia* a vantage that only God could possess. This makes philosophy into a theology, albeit one typically emptied of theological content. We will see this repeatedly when we examine the metaphysics of modern biology. This is brought about by collapsing the

constitutive tension of the "suspended middle" through "rounding upon being" in one of two directions: either by attempting to reduce the *a priori* to the *a posteriori* or by reducing the *a posteriori* to the *a priori*.[63] Since the paradoxical form is disclosed not simply through the concept of being but through the *act* which implicates being in thought, this annulment of the difference between God and being and this reduction of one pole of the metaphysical form to the other brings about a concomitant reduction of the *world*: reducing "existence" to "essence" conceived now as brute facticity, or reducing "essence" to "existence" now conceived as the history of accidental becoming, that is, as mere artifact of the historical process.

The implication here is that the formula "essence in and beyond existence," which expresses the primal form of metaphysics, has implicit within it the formula "God beyond and in the creature" and must pass over into this form, not to collapse philosophy into theology, but in order to preserve the distinction between them, the metaphysical form itself, and the fullness of thought and being. Both philosophy's intrinsic openness to theology and its distinction from theology are crucial to the integrity of both philosophy and the world. But the distinction itself is *theologically* granted. Because God infinitely transcends the world, the relationship between God and the world cannot be encompassed or systematized within a higher, metaphysical vantage. Being, as Aquinas would say, is not a genus and does not include God and the world (*Contra Gent.*, 1.25.6; *ST*, I, q.3, a.5). Theology premised upon God's infinite otherness from the world thus preserves the noetic order precisely in virtue of its *discontinuity* with that order and the subsequent irreducibility of that order to *a priori* or *a posteriori* thought.[64] Proceeding thus from what is first in the order of knowledge, we arrive late at what is first in the order of being, where we find that the metaphysical *content* of Catholic theology thus turns out to be the key to sustaining the metaphysical *form* of our engagement with the world, and the ability of being to "appear" within that engagement. The result is once again paradoxical. Only by acknowledging the metaphysical substance of Catholic theology can metaphysics—and science insofar as it is metaphysical—sustain both its formal difference from theology *and* the full rein of its aspiration to ultimacy. Thus, to deny theology its place above and within the noetic order on grounds that it does not submit to scientific verification represents not a rugged adherence to the limits of reason but a misunderstanding of "limit" and a totalitarian closure upon it that refuses to follow reason until that limit is reached.

The relation between theology and metaphysics is no more extrinsic than the forms internal to metaphysics itself. Their distinction, in other words, is not a separation. Thus, to distinguish theology and metaphysics is "not to say that philosophy would thus have God as its negative limit concept, and theology the creature" (Przywara: 52). Rather, just as we found the *metanoetic in* the heart of the *metaontic*, the *a priori in* the heart of the *a posteriori*, the *superhistorical in* the historical and *vice versa*, so we find a metaphysics internal to theology and a theology internal to metaphysics not in spite of but *because of* their abiding difference. They do not inhabit different, mutually exclusive domains but inhabit the same creaturely domain differently. Theology thus comes not to abolish philosophy but to fulfill it—*gratia non destruit sed perficit naturam*. That is why Christianity was able to fulfill the ambitions of Greek philosophy better than the Greeks, we shall argue. And it is why it is perfectly legitimate to consider Aquinas an Aristotelian philosopher, not because he slavishly follows Aristotle and then tacks

theology onto Aristotle's breaking point, but because the revelation of the world as creation allows him to be a better Aristotelian than Aristotle himself was, to see the gratuitous gift of *esse* in the heart of *philosophy* and thus make deeper sense of Aristotle's concern for the mysterious irreducibility and commonality in every "this-something."

The difference between theology and philosophy consists partly in where each "takes its stand": theology in the transcendent God who as such presides independently over his own self-disclosure, philosophy, in the act and being whose own formal structure cannot be explicated without at least implicit reference to the absolute.[65] Each then tends to go forth from itself without ever departing from itself, finding itself already in the heart of the other. To paraphrase Aquinas, theology, whose principles are in God and revealed in the Incarnation, thus treats the world as an inexorable aspect of its treatment of God (since it can only know God by way of the world). While that "theology belonging to metaphysics" treats of God as an inexorable aspect of its treatment of the world, regarding God not as he is revealed to be in Christ but as a principle from which the world takes its departure precisely as world. (This remains formally the case even when being "from God" assumes only a negative form, as when naturalism attempts to define nature in opposition to God.)[66] Each subsists within the other. Philosophy resides in the heart of theology because God, presiding over his own appearance, can only appear to us from within the world in which theology is conducted. Theology resides in the heart of philosophy because an intuition of the whole inheres in the apprehension of a part, because it harbors a legitimate aspiration to ultimacy, and because some form of the God–world relation is inherent in however it understands its subject.[67] Each occupies its common ground with the other differently in virtue of their respective stands and the distinct way in which each is necessarily inadequate to its object: theology remains constitutively incapable of exhausting the God–world relationship from God's side, while philosophy remains incapable of exhausting it from the side of the world.

This is why Aquinas and the tradition have insisted that philosophy's approach to God is fundamentally negative. It proceeds by negating all finite characteristics to distinguish what God is *not* and insists that any stated similarity between creatures and God is surpassed by an ever-greater dissimilarity. This is easily misunderstood, however. It would be a mistake, for example, to distinguish philosophy from theology as if one were negative and the other positive, as if theology were not called upon to take this unspeakable difference between God and the world even *more seriously* than philosophy. It would also be a mistake to read this *apophatic* approach as an indication of philosophy's breaking point, as if it did not betoken true *philo-sophia*, the restless unwillingness to stop short of God, and as if it did not denote philosophy's *positive* capacity to distinguish a relatively coherent sense of God's difference from the world.[68] All of which is to say that the *via negativa* attests once again to an *intrinsic* conception of limit and the different way that theology and philosophy each copes with this infinite difference.

Moreover, if "God in and beyond the creature" is arrived at *through the creature*, through the formal structure of "essence in and beyond existence," then this *via negativa* extends not only to the infinite distance *between* created and uncreated being but also analogously—by virtue of the relation between them—*within* the truth of created being itself. In the dynamic interplay between essence and existence, there is a certain bottomless depth, a certain infinity *within* the being of the creature itself,

that is phenomenologically and analogically visible, as it were.[69] This will become crucial in Part III of this book, once we have explicated the doctrine of creation in its metaphysical meaning. This negative *apophatic* dimension is not eliminated in theology proper any more than the positive *kataphatic* dimension is eliminated in philosophy, but the manner of their presence tends to differ in each case. Whereas philosophy may of its own accord recognize these negations as the reverse side of a more basic affirmation of superabundance, the full meaning of that superabundance as love so transcendently other as to be capable of encompassing its own denial and rejection is only revealed in the theology occasioned by God's surprising historical self-disclosure in the Incarnation. Whereas philosophy may recognize this distinction-in-unity as the formal structure of metaphysics, only theology—or philosophy conducted within the ambit of the Incarnation—can properly recognize this as an *analogia trinitatis*. Whereas philosophy attending to its own formal structure may see the mutual irreducibility of "essence" and "existence" negatively as limit—for example, as the incomprehensibility of Socrates *qua* Socrates—or perhaps even positively as the beauty of Socrates *qua* Socrates, theology proper sees in the very incomprehensibility of Socrates the reverse side of a depth, a gratuitous "excess" of being, proper to every concrete act of being as such. Once theology has given this gift of creation to philosophy, or once philosophy receptive to theology comes to discover it, philosophy itself is all the richer, all the more philosophical.

Let us descend from these speculative heights and return to our original concerns: the relation between science, metaphysics, and theology. I began by voicing a general opposition to what I have called an "extrinsicist" view of the relation between science and theology. Whether in the naïve form which denies science's *de facto* dependence upon metaphysics and theology or in the more sophisticated form that admits it, the extrinsicist view conceives of science on the one hand and metaphysics and theology on the other as fundamentally external and therefore exclusive of one another in their inmost "essence." This then leads the extrinsicist to view metaphysics and theology (the latter, typically, without rational foundation) as systems or hypotheses—"regional ontologies" in the jargon of Mahner and Bunge—subject to verification by empirical or experimental methods which, precisely as method exclusive of metaphysical or theological content, are ontologically neutral.

We began to cast doubt on this viewpoint by showing that the seemingly innocent methodological assumptions of the extrinsicist are founded on an extrinsicist conception of the God–world relation and thus on a definite, if implicit *theologia naturalis*. We then suggested that some such theology is implicit in any and every science, the more noticeably so the more that science approaches its own metaphysical core. The analysis of this section has shown why that is the case and why as a consequence metaphysics and its implicit *theologia naturalis* cannot in the first instance be a system, a hypothesis, or a "regional ontology": because there is for us no "outside" of the order of being and because from inside it, metaphysics and *theologia naturalis* are formally constitutive and thus ineradicable features of our elementary experience in advance of any subsequent metaphysical and theological commitments, whether in the affirmative or the negative. They are thus implicit within any and every science which can never fully shake that experience and never completely succeed at "committing rape on the senses," which would only be a secondary metaphysical and theological stance in any

event. Contrary to Mayr, natural theology does not begin with the Greeks and Egyptians and end with the *Bridgewater Treatises* (1991: 52–53). It begins with thought and does not end.

We have therefore claimed that science is constitutively and inexorably related to metaphysics and theology; that as such metaphysics and theology are internal to science even as they are distinct from it; and that this relation to metaphysics and theology cannot be willed away. By allowing for a true theology, which is nothing less than allowing for the real difference between God and the world instead of theologically annulling it, the sciences are permitted *to be* and to be science, not least by being "other than theology." But their being "other than theology" is not *external* to theology any more than science is external to itself, or any more than their objects—I speak now in a theological voice—are external to the gift of *esse* in creation. Inasmuch as science cannot escape its own constitutive metaphysical and theological basis, it is incapable of grounding itself as first philosophy, incapable of being its own law (*autonomos*) in such a way as to be its own queen. Scientific autonomy, then, is not to be found in some illusory freedom from and indifference to metaphysical and theological assumptions. To the contrary, the freedom of metaphysics and the sciences not to be theology is itself *theologically* granted, not, of course, in a juridical sense by theologians and ecclesiastics but by the metaphysical and theological truth of science's own creaturely constitution. If, then, science is dependent upon a metaphysics and theology which it forever presupposes and toward which it inevitably tends, it stands to reason that it ought to depend upon *good* metaphysics and theology, true to its own formal structure, and that where it does not natural science will suffer deleterious consequences precisely *as* natural and *as* scientific.

If thought is *formally* metaphysical and theological, then there can be no vantage from which to evaluate the metaphysical and theological content of one's claims about the world that is not itself equally metaphysical and theological, and no recourse to a methodological, empirical, or experimental vantage that is ontologically indifferent. To deny this is to fail (or to refuse) to know oneself and thus to fail (or to refuse) to know the formal structure of one's own thought or the material metaphysical and theological presuppositions that secretly guide one's own thinking. As we shall see in the following section, the very notion of methodological or empirical neutrality will already be the expression of an ontology and a *theologia naturalis*, and the refusal to acknowledge this is a failure of self-knowledge. If thought is formally metaphysical and theological, the ultimate question to put to such an ideal is whether the particular metaphysics and theology instantiated in it are adequate to the content implicated in that form, or alternatively, whether a science now wedded to pragmatism still finds reason and truth sufficiently compelling enough to care whether it is adequate or not.

Theology and Science Within and Without Limits

The "extrinsicist view" of the relation between science, metaphysics, and theology runs contrary to the exigencies imposed upon thought by the structure of being. There are nevertheless several variations on this extrinsicist theme. The first, of which we took G.G. Simpson to be a representative, regards science, metaphysics, and

theology as so utterly separate that it disowns any necessary relation whatsoever. A second and more subtle alternative acknowledges a necessary relation between science and metaphysics but nevertheless distinguishes what is "scientific" in science by its exclusion of what is metaphysical in it. This mutually exclusive relation is then treated as a relationship of abstraction, with metaphysics either extrapolating to the general from the particular or functioning as a prior hypothesis, for which the empirical and experimental sciences working in the concrete provide *a posteriori* justification. This understanding of the relation already contains within it the assumption that method itself is prior to ontology and is thus ontologically neutral, and so it begs the question posed here.[70] Still, these assumptions make it possible to conceive of a reconciliation of sorts between metaphysics and science. They even make it possible to imagine an architectonic of knowledge bearing superficial resemblance to the traditional notion of subalternation, in which fundamental sciences such as physics provide the basis for subsequent sciences, such as biology, dealing with emergent phenomena that are not simply reducible to physics.[71] In this conception of order, however, the empirical and experimental sciences occupy the position of first philosophy; metaphysics, if its necessity is admitted at all, is but a handmaid.

Yet, these assumptions are not ontologically innocent. This equation of abstraction with the movement from the particular to the general reflects the deep-seated mechanistic assumption that the "parts" of reality are ontologically prior to the whole of it, with the latter being merely the aggregation of the former and the result of their history of interaction. This view presupposes, in turn, the demise of the Aristotelian conception of act and the elevation of counterfactual orders to ontological primacy over the actual world that presents itself to experience. But in the *actual* world, the existence of each thing is already characterized by a near infinity of relations which help to constitute it. When the primacy is accorded to the actual world and to these constitutive relations, as in Aristotle and Thomas, "abstraction" has almost an inverse sense (Aquinas, *In Boeth. de Trin.*, q.5, a.3).[72] To abstract—literally to take or pull from—is to distinguish or isolate in thought what actually belongs together in reality: form and matter, parts and wholes, a thing and the context which is the presupposition of its flourishing.[73] Experimentation, in which one attempts to "vary or dissociate phenomena by a kind of analysis" typically by producing "a disturbance of the phenomena," is a form of abstraction in this sense (Bernard 1957: 9).[74] Thus for Aristotle, it is the particular sciences which are abstract because, whereas metaphysics treats of "being *qua* being" they each "cut off a part of being" from the whole to which it actually belongs (*Metaph.*, IV, 1003b25).

Now it should be said from the outset that this is both necessary and legitimate and that there is indeed a correct intuition in the extrinsicist's assumption about the relation of science to metaphysics. While certainly whatever is true of being *qua* being is analogously true of every "part," and while this means that the truths of metaphysics are tacitly operative within all the sciences, it is manifestly not the case that what is true of each thing—being a rhinoceros, for instance—is true of being as such. So while the sciences are intrinsically related to and indeed tacitly permeated by metaphysics, they are not "branches" of metaphysics which could be either deduced from it or reduced to it. The particular sciences do represent a genuine novelty "over and above" metaphysics, and Aristotle is much more insistent than the architects of

modern science upon an irreducible distinction between the various sciences. It is not in Aristotle but rather in the seventeenth century that "the ideal of a system of our entire knowledge founded on one method was born" (Funkenstein 1986: 6). For Aristotle, to attempt demonstration across *genera* or to translate methods from one science to another would be to fall into the sin of *metabasis* (*Post. An.*, I, 75a38–75b20).[75] Yet, this novelty "over and above" metaphysics is not *outside* metaphysics; rather it exemplifies the very form of metaphysics unveiled in the previous section.

So there is obviously a basic truth in the notion that the sciences are distinguished from metaphysics by their detailed attention to a (relatively) concrete part of reality abstracted from the broader whole, and it is not just different objects within the world but the formal perspectives that each bring to the same objects within the one world which distinguishes the sciences from one another as physics, chemistry, biology, and so on (Aquinas, *ST*, I.1, a.3, resp.). And it goes without saying that scientific abstraction and experimentation are both perfectly legitimate: metaphysically because of the rightful irreducibility of the sciences to philosophy; theologically because the legitimate autonomy of the sciences is warranted by a proper understanding of God and creation and the irreducibility of created to divine being; and pragmatically because the sciences have obviously proven spectacularly successful in realizing the ends which they have set for themselves.

Nevertheless, there is latent within even the most subtle form of the extrinsicist view an implicit understanding of abstraction within science and a concomitant notion of "limit" which are not finally tenable. This understanding exemplifies the formal problematic of metaphysics and science's own intrinsic relation to metaphysics by giving expression to a quite particular ontology that determines in advance the limits of what science can "see."[76] Already we have supplied one very general corrective to this understanding. Abstraction is as much if not more a matter of deriving the particular from the general as deriving the general from the particular. It is therefore a misunderstanding to think that metaphysics deals very generally with the whole (or theology with God) while the sciences deal "regionally" with an abstracted part which bears no (relevant) relation to that whole (or to God). This notion forever prevents the reintegration of science into a comprehensive order of reason, much less a coherent theological outlook, and transforms this reintegration into a matter of extrinsic "addition." The sciences rather deal with the whole, namely, the one actual world whose parts are intrinsically related to one another and to God, in and through their detailed attention to the abstracted part and according to their particular modalities as physics, chemistry, biology, and so on. To acknowledge this is to alter what the sciences in principle should be able to "see," though only if it also alters what they are *willing* to see, without requiring them to alter the particular modality—physics, chemistry, biology, and so on—so as to become metaphysics and theology.

To better understand the ontology latent in the extrinsicist notion of "method," we must delve further into the nature of abstraction. As D.L. Schindler puts it,

> Abstractions and distinctions, which involve separating an entity or pulling it out or excluding it from the web of relations that characterize its concrete existence at any moment, necessarily evoke the notion of limit: of a boundary that sets the object off from its environs (2011: 386).

It goes without saying once again that such abstractions are not only perfectly legitimate but also perfectly unavoidable. The act of attention itself is an act of abstraction in this sense, indeed doubly so. Any discrete object of attention is already thus "abstracted" to a certain degree. It moves to the foreground as this infinite "web of relations" imperceptibly recedes into the background, if not into complete invisibility.[77] This involves a correlative abstraction on the side of the subject. As the subject "loses himself" in the object of attention, "the immediacy of inwardness and outwardness in one" (Jonas 2001b) that characterizes embodied existence in place, the unfathomable depth of learning and conditioning this body must undergo to perform the most basic task, and the "stage-setting done in the language" necessary simply to recognize and name the objects of his attention, are all momentarily forgotten.[78] An observer forgetting himself in the phenomenon becomes as the eye taking in the world, which sees everything except itself. Yet, all of these things are intrinsic to the most basic acts of cognition, and no one could rightly think that they cease to belong together in reality. So the question is not whether scientific abstraction is legitimate. Rather the question, ultimately, has to do with what is actually occurring when we abstract, whether our understanding of this activity is adequate to its reality, and what it costs, not only with regard to our understanding of the God–world and science–theology relations but to our understanding of the natural world *per se*, when this activity is misunderstood. We will address all these questions in more depth in the final chapter; our present concern is different. Having shown thus far that the sciences harbor a metaphysics and a *theologia naturalis* within themselves, our present concern is to begin to show in formal terms just what sort of metaphysics and theology are entailed in the extrinsicist notion of methodological neutrality, though this too should be clearer after our historical exposition.

It is crucial to recognize that any operative notion of limit contains *both* a tacit conception of what lies on either side of it *and* a tacit conception of how they are related, whether the *relata* be finite wholes such as an organism and an experimentally isolated part or God and the world considered in abstraction from its relation to him. To see this is to see the self-contradiction inherent in extrinsicism and its notion of a preontological limit. Some such view of the *relata* and the relation between them is already intrinsic, albeit tacitly, in the notion of the neutral limit itself, just as each of the various poles of the formal problem of metaphysics contained its opposite in its very distinction from it. So extrinsicism not only falsely accounts for the relation between *relata*, it falsely accounts for itself, displaying its intrinsically metaphysical character in this very fact. If then the assumption that science is extrinsic to metaphysics and theology betrays itself and expresses a distinct metaphysics and theology, what is the distinct ontological and theological content that lies within this extrinsicism and its notions of a metaphysically neutral method and limit?

Implicit in the notion of a methodological purity that precedes any ontology is a conception of "distinction" that is essentially Cartesian, in which the limit's function is analogous to Descartes' conception of a line. Geometry provides Descartes with his much sought after clarity because of the "essential" properties of a line, the "purely abstract *externality*," which divides as essentially *external to and thus separate from each other* whatever falls on either side of it (D.L. Schindler 2011: 396–397).[79] This notion of limit thus makes it possible to treat entities separated through analysis as if

they were ontologically indifferent to the original wholes from which they were abstracted. *Distinction between* two entities thus becomes *the separation of* those entities, and the original relation between them becomes an extrinsic and thus accidental qualification of each entity's original, "internal" indifference.[80]

Method and abstraction thus understood are not preontological. Rather they are themselves the expression of an *a priori* mechanistic ontology which is "predicated upon the possibility of an exhaustive intelligibility of things" achieved through analysis, even if the advent of statistical dynamics and quantum physics and the demise of Laplacean determinism have placed this ideal permanently beyond reach (D.L. Schindler 2011: 395). The ideal remains precisely insofar as science continues to *equate* intelligibility with control (predictive or manipulative) and thus to emphasize "the primacy of controlling power in its quest for the intelligibility of the object" (2011: 395). As we shall see in Chapter 3, this is precisely what the Baconian equation of knowing and making *is*: knowing not simply for the sake of control but *by means of control*, knowing *by* controlling which accords epistemic and ontological priority to parts separated through analysis.[81]

This ontology not only imposes *a priori* determination on the shape of the God–world relationship, but it determines in advance both what is admissible as a "thing" so far as science is concerned and what thereby counts for knowledge of it. This mechanistically conceived limit projects its extrinsicism not only onto the relation between science and theology but also onto the relation between God and the world, now understood as indifferent to any relation to God. This incoherently makes God into a finite object and provides the theological foundation for regarding divine and natural agency as mutually exclusive alternatives in the order of being and "natural" and "supernatural" as mutually exclusive forms of explanation in the order of knowledge. However, since the relation between science and theology is *not* in fact extrinsic, as extrinsicism's own self-contradiction shows, this conception of the God–world relation has a corresponding effect on the notions of nature and natural knowledge latent in this understanding, determining in advance what counts as the relevant content of empirical observation. We shall see in later chapters that this metaphysical and theological extrinsicism evacuates creatures of the unity, intelligibility, and interiority inherent in our elementary experience of them. This erases the difference heretofore distinguishing things "existing by nature" from artifacts, as the objects of science are reimagined as sometimes highly organized aggregations of externally related parts (Aristotle, *Physica*, II, 192b1).[82] Whatever cannot be accounted for in terms of these mechanical relations between indifferent parts, such as their phenomenal appearance to us, is either regarded as epiphenomenal and thus ultimately unreal, or in what amounts to the same thing, its explanation is endlessly deferred on the assumption that this intelligibility can be reached additively by compounding the abstracted parts "each of which, or indeed all of which as summed, remains exhaustively intelligible in principle" (D.L. Schindler 2011: 397).

We can see that the problems with this metaphysics and this malign theology are not merely metaphysical and theological. Rooted in an empiricism impervious to experience, mechanistic metaphysics will inject a dose of antirealism into the heart of modern science. We will consider its deleterious effects in subsequent chapters. The point at present is that one cannot coherently attempt to distinguish science from

metaphysics and theology or to insist that they keep to discrete disciplinary limits by circumventing science's constitutive and inexorable relation to metaphysics and theology. To attempt to do so by appeal to an empiricism or a method outside metaphysics as a neutral arbiter of metaphysical and theological content is not only to beg the crucial question, it is to substitute one set of theological judgments for another. There is simply no such thing as a methodological naturalism that is not also an ontological naturalism. And ontological naturalism is, at bottom, a bad theology that does not know itself.

Nevertheless, it has become axiomatic that science in its essence is substantially indifferent to theology, except where theology has the temerity to trespass into science's domain—that is, into the universe. We have now shown, in formal terms at least, that this viewpoint is in error. Modern naturalism is not simply an alternative *to* theology, as proponents like Simpson would have it, but an alternative theology that determines in advance both what sort of God can appear to thought and what sort of "nature" may manifest itself. We have yet to specify in its full depth just what this alternative theology is, why it is theologically wanting, and why, for this very reason, it falls short in its understanding of nature *as natural*. These are all matters for subsequent chapters. Our purpose presently is simply to bring the fact of these metaphysical and theological suppositions to light, so that they might not interfere with understanding the argument to follow.

This axiomatic extrinsicism makes misunderstanding all but inevitable. Transforming the meaning of "God" and "creation" beyond all discernible theological sense, it determines in advance what these terms can mean to contemporary minds, to the point that the contemporary debate, insofar as there is one, hardly touches upon God and creation at all. Once God ceases to be the fully transcendent and thus the fully immanent source *of* being and becomes instead a finite object *within* being extrinsically juxtaposed to the world, once being is reduced from "the inner *act* of existence" at once common to all things and proper to each thing, through which they participate in the immutable being of God, then the question of creation ceases to be about creation in its proper sense and becomes instead a question of *manufacture* (Clarke in Anderson 1997: xv). Creation is no longer understood as a question of ontological constitution but is rather misinterpreted as a question of temporal origins in a series of causes and effects which culminate in the manufactured artifact. The possibility of "verifying creation" becomes a nonsensical matter of isolating this process of manufacture as one might experimentally isolate a natural process. The suggestion that science might open itself to creation without harm to its scientific character is regarded as nonsensical and interpreted as the requirement for science to denature itself and to become a kind of *theologia naturalis* by discovering this "process." When this absurd demand cannot be met, the question of creation degenerates into a matter of calculating probabilities. Creation is then relegated to some hypothetical "time" before the big bang, where the absurd notion of a multiverse is invoked to reduce to zero the improbability of this world arising by accident.[83]

Within Darwinian biology, the *act* of creation thus comes to be understood as a rival "mechanism" to natural selection while the *doctrine* of creation is regarded as an alternative explanation for the diversity of species. Thus, "creation" is either reduced to a harmless, untestable hypothesis beyond the bounds of reason where it makes no

claim on our understanding of nature and where it can be easily dispensed with by changing the mathematical presuppositions of the hypothesis, or it is regarded as an irrational infringement on both the integrity of nature and the autonomy of science. And to claim, as I have done, that one must critically engage the totalizing claims of Darwinian biology in order to make creation intelligible—or worse that there might be inherent defects in Darwinism's explanatory power—only reinforces these assumptions, making it seem as if creation and Darwinian evolution were strict rivals. The entire question of creation is thus misunderstood—what it means and what is at stake in it—because God himself is misunderstood. And if conceptions of God and nature are indeed correlative, as we have argued here and will show throughout this book, then we cannot do such violence to our understanding of God without simultaneously doing violence to our understanding of nature and ourselves.

These, at any rate, are the claims that I shall unfold in the chapters to follow: that the universe, historically and theoretically, is an irreducibly metaphysical and theological idea; that because creation is what the world *is*, the doctrine of creation is essential to an understanding of the universe that is both comprehensive and nonreductive; and that the scientific and Darwinian revolutions, for all their stunning success in increasing our knowledge of the universe, have left us with a universe so reduced and fractured that it threatens to undermine the rationality and intelligibility of their own achievement. In short, without God there is no science, because ultimately without God there is no world. Such strong claims will no doubt stretch the bounds of credulity for many readers, particularly those of a scientific bent. But if the arguments of this chapter are substantially correct, then science—least of all evolutionary biology, that most theological of sciences—is never without its God already, in which case the obstacles to understanding and believing the arguments of this book may not be so great as they initially seem. For the first and most crucial step for recovering a true understanding of creation and for effecting reconciliation between creation and the sciences is for the sciences to suspend belief in the tenets of their own theology.

Notes

1 I will delineate the distinction and relation between metaphysics and theology in advancing this argument.

2 For an example which misstates the nature of this relationship but inadvertently corroborates my argument by displaying its own extra-scientific commitment to a nominalism which cannot be scientifically justified, see Mahner and Bunge (1997), pp. 2–4.

> If ontology is general science, then the specific factual sciences, or sciences of reality, are special metaphysics or regional ontologies. In our view, both science and ontology inquire into the nature of things, but whereas science does it in detail and thus produces theories open to empirical scrutiny, ontology is extremely general and can be checked solely by its coherence with science.

3 In his attack on scholasticism, Francis Bacon expressed resentment that "natural philosophy," the true "queen of the sciences" in his estimation, had been relegated to the status of a "handmaid." It was a situation he set out to rectify. See Bacon (2000), p. 65.

4 See Dennett (1995), pp. 52–60. For a critique of "evolution as algorithm" from within the contemporary philosophy of science, see Mahner and Bunge (1997), pp. 361–362.

5 Clark (1999) recognizes this. "Believing that we have believed things only so that the beliefs are spread, we have already stopped believing."

6 There is a half-truth here that I am thus half-willing to concede. There is a necessary distinction to be made between science and metaphysics and an obvious sense in which scientific analysis of the world does have a priority over metaphysics and theology and does set limits to metaphysical and theological claims. The question is whether "distinction" must mean total "separation," and I am arguing that it does not. And I wish to claim as a consequence that the priority of the sciences over metaphysics and theology is a relative priority occurring within the absolute priority of theology over the sciences: even the scientific qualification of theological claims occurs as a consequence of its inherent relation to theology and so occurs within a theological frame. I owe this terminology, as well as a great deal of my understanding on this point, to D.L. Schindler.

7 This relation, typically characterized as the "analogy of being," in which any similarity of the creature to God is transcended by an ever-greater difference from God, prevents our hardening of this relation into a "system" composed of two objects which can be surveyed from outside. The analogy of being, properly understood, is thus tantamount to the "destruction of every system" (Balthasar 1992: 255).

8 Carlo Lancellotti (November 10, 2006), a physicist at CUNY, takes this position while defending a nonreductive conception of science in a paper entitled "Science, Contemplation, and Ideology."

9 One of the most banal and self-contradictory of these proposals is offered by Stephen Jay Gould in his proposal of NOMA—nonoverlapping magisteria—between science and religion. There is a basic truth here, namely, that there is a distinction to be maintained and areas of inquiry proper to each, but Gould's proposal amounts to little more than a warmed—over representation of the "fact–value" distinction. More importantly, he unwittingly bears witness to the true nature of the relation between theology and science by violating his own proposal and trespassing into theological doctrine in the very act of articulating it. See Gould (1999), pp. 3–96.

10 The work of Mikael Stenmark, an attempt to improve upon the groundbreaking work of Ian Barbour, is helpful in focusing our attention on the complex ways in which science as practiced "interacts" in its various phases with "religion." Stenmark maintains that this "interaction" differs depending upon whether science is in its "problem-stating phase," its "development phase," its "justification phase," or its "application phase." Although this should be borne in mind in any material engagement with science, Stenmark's project nevertheless falls short in my estimation even when it recognizes the implicit metaphysical commitments of modern naturalism because it regards the question of the relation between science and religion as a (neutral) methodological question rather than a metaphysical one, thus betraying a metaphysics of its own which negatively prejudices the project in advance. See Stenmark (2004), pp. 209–250.

11 See, e.g., the *apologia pro vita sua* in Gould (2002), pp. 24–48.

12 I shall argue that any historically contingent defective form of this relation will be parasitic upon the ontologically true form of this relation constituting both being and thought. This means that the defective form of the relationship cannot fully vitiate the true form, which continues to "show up" in and through the defects. We shall see how this is true in the case of Darwinism.

13 See, e.g., Hull (1989), pp. 62–75, 162–178, 181–204. Hull does a great deal to deepen our appreciation of the historical nature of science generally and Darwinism in particular, and most of what he means by "metaphysics," of which there is precious little in his book, follows from that historicism. Because of this historicism, he does not appear to grasp the formal and *a priori* nature of the problem, but his own *a priori* commitment to historicism

and to a Darwinian account of theory itself unwittingly exemplifies the problem by giving expression to the metaphysics implicitly held prior to his historical investigations.

14 See, e.g., Depew and Weber (1997):

> As readers of this book will by now be aware, it is just because metaphors play roles in explanations that one is not entitled simply to say, "Oh, that's just my way of putting it." Even when they perform little or no explanatory work, moreover, metaphors carry a good deal of metaphysical and epistemological freight. Indeed, wherever there is a deficit between theoretical reach and empirical support the difference is usually made up by invoking ontology to do the missing work. Similarly, epistemological or methodological ideals are sometimes used to intimate on highly general grounds that the theory in question must be true (374).

15 See, e.g., Ratzinger (2004):

> Moreover, we have already noted that atheism's dismissal of the subject of God is only apparent, that in reality it represents a form of man's concern with the question of God, a form that can express a particular passion about this question and not infrequently does (104).

Retreat to "agnosticism" does not circumvent this dilemma; it merely redefines the God–world relationship as one of indifference, a move which presupposes a world of metaphysical and theological predecision.

16 George Grant, following George Santayana, observes that there is generally a difference between Catholic and Protestant atheism, and so too, a difference between (continental) European and Anglo-American nihilism, the latter of which is more optimistic and cheerful because of its roots in a pragmatic, rather than a contemplative tradition. See Grant (1969), pp. 25–40.

17 The fact that "atheism has its roots in the Western world, not in Asia or Africa: in other words, that it has sprung up precisely where Christianity has been preached for 2,000 years" (Ratzinger 1969: 147) is both evidence of this thesis and cause for reflection upon the varieties of atheism and upon the nature of Christian responsibility in bringing it about. For an excellent theological explanation of this responsibility and of how Nietzsche is both correct and incorrect, see Hart (2003).

18 As evidence, see the excerpts from Hull (1989) and from Mahner and Bunge (1997) cited earlier.

19 See, e.g., Balthasar (1992), p. 279.

20 Consider the fairly standard definition of "naturalism" given by Depew and Weber (1997):

> We take the term naturalism to mean not only that supernatural and immaterial entities cannot explain events and processes but that the purely natural processes and laws that do explain them do not point to anything beyond themselves (147).

There are (at least) three interesting features of this definition: first, that the "purely natural" excludes the "supernatural and immaterial" by definition; second, that this definition determines in advance that God must be *an* "entity"; and, third, that this understanding becomes an *a priori* warrant for refusing to consider nature in alternative terms. For a more nuanced understanding denying that "naturalism," whether metaphysical, epistemological, or methodological, can be a substantive philosophical position without self-contradiction, see Rea (2002), pp. 50–73. Rea concludes that "naturalism is a research program which treats the methods of science alone as basic sources of evidence." Inasmuch as this is true, it suggests another reason why naturalism is not a substantive philosophical position: it epitomizes the very abandonment of reason as the search for truth, subordinating this search to the interests of power.

21 There is of course a nuanced sense in which this is true. Any coherent, much less orthodox doctrine of God insists upon the absolute difference between God and the world, in both directions, as it were: God cannot be *a* being, and thus not an "item" in the universe, but

neither can he be *the* being of the universe (pantheism). An error in either direction collapses the difference and thus subordinates God to a higher term (e.g., being, becoming), which would then effectively be God. But this insistence upon the absolute difference between God and the world does not make their agency mutually exclusive or make divine agency essentially violent with respect to the creature as this extrinsicism would require. We will address this point in more depth in subsequent chapters.

22 I take the terminology of "metaphysics as mediator" from W. Norris Clarke, S.J., although I differ somewhat from Clarke on the question of what this mediation consists in. See Clarke (2001), pp. 464–487.

23 For two very different takes on the consequences of forgetting this, see Jonas (2001b), pp. 26–37 and Lewontin (1992), pp. 3–26.

24 There is actually a faint echo of this understanding in Richard Dawkins' brief account of the relation between physics and biology. See Dawkins (1996), pp. 11–18.

25 Despite significant differences, St. Augustine had a similar understanding in defining the act of faith as "thinking with assent" (*assenione cum cogitare*). See Augustine, *De Praed. Sanct.*, II.5; *De Spiritu et Lit.*, XXXI.54.

26 See Husserl (1970), pp. 5–7, 48–53, 103–114, 121–123, 137–148, 172–174. In making this comparison and suggesting a basic sympathy with Husserl's analysis, I do not mean to suggest that Aristotle therefore represents the "natural attitude" which Husserl contrasts with the phenomenological (1970: 145). Nor do I wish to enter into the long-standing debate between "idealists" and "metaphysicians" over the meaning of the phenomenological epoché and its difference from the Cartesian epoché (on this, see Sokolowski 2000: 198–227). Suffice it to say that I think Aristotle himself would resist the distinction (and thus the characterization) because his metaphysics, while it requires a distinction between the orders of being and knowledge, precludes a strictly phenomenological epoché and because I do not think there can be a phenomenology and thus a phenomenological reduction that is not already metaphysical in principle. The reasons for this should become clear later.

27 On *res volens* as the true meaning of Descartes' *res cogitans*, see Hanby (2003), pp. 134–177.

28 Emphasis mine.

29 We will have a great deal more to say about the significance of all this in coming chapters. For now, see Aristotle, *Physica*, II, 202a15–202a20; *De Anima*, III, 425b26–426a26; Lear (1988), pp. 26–42; and Owens (1978), pp. 403–409.

30 Hence Aquinas says that

> rational [synthetic/discursive] thinking ends in intellectual thinking [understanding], following the process of analysis, in which reason gathers one simple truth from many things. And again, intellectual thinking is the beginning of rational thinking, following from the process of synthesis, in which the intellect comprehends a multiplicity in unity. (*In Boeth. de Trin.*, q.6, a.1)

31 See the venerable Salusbury translation of Galilei (1953).

> I cannot find any bounds for my admiration how reason was able in Aristarchus and Copernicus to commit such a rape upon their senses as, in despite thereof, to make herself mistress to their belief. (Galilei 1953: 341)

The Stillman Drake translation reissued in the *Modern Library Science* series edited by Gould (2001) renders the offending phrase, "*tanta violenza al senso*" as making "reason so conquer sense that, in defiance of the latter, the former became mistress of their belief" (381). Although this is certainly legitimate and may be more technically correct, the metaphor of sense as an "unwilling mistress" of reason loses some of its rhetorical force and something of its philosophical importance as well.

32 J.G. Fichte was well aware of this reduction, counseling Kant to abolish the fiction of the *ding an sich* in virtue of the fact that his idealist philosophy had in fact already abolished it. See Fichte (1994), pp. 12–16, 54–55, 65–76, 90–99.

33 Hence this does not succumb to the charge of naïve realism, for at least two reasons. First, while Aristotle denies that *nous* and sense can ever be mistaken, nothing prevents mistakes in the judgments we make about them—this is why truth is at once easy and hard. Second, to put it in Balthasarian terms, the presence of this objective order in experience is not simply the presence of this order as *object* but rather as *subject* not exhausted in its appearance.

34 This is in contrast to that theology disclosed in the person of Christ himself, which treats of the world as a gratuitous aspect of the revelation of God.

35 For Aristotle, the cosmos is not an aggregation of externally and accidentally related items. Rather it forms a real unity-in-distinction insofar (a crucial qualification) as the things comprising it are *in act*. For this reason, it is the particular sciences and not metaphysics which are abstract, for they deal with a "part" of being in distinction from its relation to the whole in which it always actually exists, though again, "distinction" should not be equated with "separation" insofar as what is said of the whole applies analogously to all the parts. See Aristotle, *Metaph.*, IV, 1003b25.

36 The term is Adrian Walker's.

37 For Aquinas, the creature is intrinsically related to God, and God intimately present to the creature through his granting of *esse*, without which no other qualification of the creature is. See Aquinas, *ST*, I.8.1. We will discuss this crucial understanding in much more detail in subsequent chapters.

38 For a classic, first-person expression of this understanding, see Augustine, *Conf.*, II.6.

39 Hazel Motes is the primary character in Flannery O'Connor's *Wise Blood*. He founds the Church without Christ and intentionally blinds himself, possibly in an attempt to craft his own redemption, or possibly in an attempt to deny he needs any.

40 I do not wish to give the mistaken impression that determining the inner necessities of reason *qua* reason, i.e., epistemology, is first philosophy. I take these necessities to be determined by the necessities of being *qua* being. Thus, every epistemology is already a metaphysics and vice versa.

41 For an extended discussion of this point, see Lear (1988), pp. 99, 249–255.

42 This rather dense section attempts to explicate the metaphysical paradoxes embedded in the structure of philosophical thinking, which bear directly on the relation between science, metaphysics, and theology. Readers who are not inclined toward such metaphysical speculations may wish to continue ahead to the final section.

43 Przywara's text is being translated from its nearly impenetrable German by David Bentley Hart and John Betz and is to be published by Eerdmans. I am grateful to Hart and Betz for allowing me an advance look at the manuscript; any citations of Przywara's work will be from this manuscript.

44 I take the so-called principle of noncontradiction to be an ontological and not merely logical principle that presupposes the primacy of act and which only reduces to the empty formula A = A if one has already reduced the act of being A to mere brute facticity.

45 Przywara continues:

> This is most conspicuous in the very term "act of knowledge": for "act" implies "potency", and "act" and "potency" are ontology's most general categories. Indeed, moreover, this is what proves strangely inevitable in general for all talk—even if it concern only method—of a so-called "pure consciousness." Not only does the comprehension belonging to consciousness (whether in comprehending itself or in comprehending what is other than itself) occur by way of objects (at the very least, in the inevitability with which the "I" rings out, and then in the

> intricate intertwinings of the I in "things" and "fellow I's"), but even the inner form of this comprehension has itself the character of an object. Even Kant's pure categories of judgment bear the form of ontological categories: quality, quantity, modality, etc. Even Hegel's retreat to the inner and most formal species of judgment runs up against an expression proper to ontology: identity and opposition. Even the most formal comportment of consciousness as such—relation (that between act and object)—has an ontological shape. And even what is most proper to "pure consciousness" (in the sense given this phrase by objective idealism) succumbs to this reality: in the permanence of "validity" there rings out the "there"—"*Da*"—of a *Dasein* (existence); in the ideality of "validity", the "thus"—"*So*"—of *Sosein* (essence) (4).

46 This is why Balthasar (2000) insists that "self-knowledge and the disclosure of the world are not just simultaneous but intrinsically inseparable" (46).

47 To see this, it helps to have recourse to Aristotle's distinction between first actuality (which is also a kind of potency) and second actuality, exemplified in the distinction between a man who hears and one who is actively listening to a musical performance. The first sort of actuality can be imagined in separation from its objects, the man who hears, e.g., and the performance (or the musicians who perform). But a man listening to this Mozart concerto is part of a single event with the musicians who are performing it. The power in act and its object belong to what Aristotle calls a single actuality of both alike—hence the claim for an intrinsic correlation between the act of knowledge or consciousness and its objects. This distinction will take on added importance as we proceed through subsequent chapters. See Aristotle, *Physica*, III, 200b25–202b29; *De Anima*, 425b26–426a27.

48 Precisely because the *metaontic* is implicated in the *metanoetic* as that which precedes it by virtue of the transcendence of its object, Przywara restates the Aristotelian–Thomist inversion of the orders of being and knowledge, insisting that the *metaontic* is the objectively prior and comprehensive category, even though the *metanoetic* enjoys a certain methodological priority.

49 Aquinas' reflections are fascinating in this regard.

> Now reason differs from intellect as multitude differs from unity. Thus Boethius says that reasoning is related to understanding as time to eternity and as a circle to its center. For it is distinctive of reason to disperse itself in the consideration of many things, and then to gather one simple truth from them…Conversely, intellect first contemplates a truth one and undivided and in that truth comprehends a whole multitude, as God, by knowing his essence, knows all things…It is clear then, that rational thinking ends in intellectual thinking, following the process of analysis, in which reason gathers one simple truth from many things. And again, intellectual thinking is the beginning of rational thinking, following the process of synthesis, in which the intellect comprehends a multiplicity in unity. (*In Boeth. de Trin.*, VI.3)

50 For a much more profound reflection on these points than I can offer here, see D.C. Schindler (2008), pp. 1–84, 226–282.

51 See, e.g., Veatch (1969) and de Koninck (1960).

52 Przywara actually delineates a third tension between a "*metaontic* transcendentalism," which regards truth, goodness, and beauty as a determination of the ontic, and a *metanoetic* transcendentalism, which regards them principally as a determination of the inner form of the noetic.

53 As we shall see in subsequent chapters, the doctrine of creation itself must affirm this.

54 > A Kantianism of "pure method" (furthermore) signifies, by this very phrase, simply that the steps of its research are guided at the outset by this limit concept of "pure method." Determination by this limit concept thus precedes every initial step, and is intrinsically prior to it. (Przywara: 23)

55 I do not intend to equate existence (*esse*) with history simply. To the contrary, in Part III I will spell out what I mean by *esse* and argue simultaneously *against* the equation of being

and history and *for* an intensified historical concreteness beyond anything which Darwinian theory can accommodate, precisely as a function of this distinction between the ontological and historical orders which will call the meaning of history itself into question.

56 This scornful term was coined by Ernst Mayr. It is to be contrasted with the "population thinking" of orthodox neo-Darwinism. See Mayr (1991), pp. 40–42.

57 Rather, they adjudge external existence and value to the things that they know inside of themselves, and no argument in the world can convince them that this affirmation is a merely practical one that could be superseded from a higher speculative standpoint. In a word, they affirm the intentionality of intellectual cognition, whose primary direction is out of the subject…. (Balthasar 2000: 54)

58 We could do worse for a working definition of "elementary experience" than the one supplied by Luigi Giussani: that experience which one cannot sanely deny (1997: 7).

59 Misology, as we characterize it, appears most perfectly not in the person who rejects reason altogether, but in the person who accepts it…most of the time. He will be happy to make assertions, perhaps even with great conviction, but will be just as happy to abandon them when, for example, in a moment of crisis they commit him to some further claim beyond what he is ready to admit…A skeptic in the usual sense feels some obligation to the "truth" of skepticism, an obligation that requires the kind of passion and even ascetical devotion that we associate with profound faith. A radical skeptic, or misologist in our sense of the term, by contrast, is ready to deny even the truth of skepticism whenever he has "good reason" to do so. As people often say, the real opposite of love is not hatred, but indifference; the real opposite of the philologue is the misologist who has simply grown numb to the claim of reason (D.C. Schindler 2008: 12).

60 Thus, it is completely beside the point to invoke the likes of Francis Collins, Kenneth Miller, Theodosius Dobzhansky, or R.A. Fisher as figures subjectively capable of reconciling personal piety and orthodox biological commitments, as if the possibility of living a contradiction were a sign of *rapprochement* between science and theology. This is not to deny the possibility of such *rapprochement* by declaring this synthesis a contradiction, nor is it a comment upon the subjective sincerity or even personal holiness of any of these men, about whose lives I know little. It is only to remark on the possibility of maintaining a personal pietism and a theoretical rationalism at odds with any coherent theology. In both historical and theoretical terms, pietism and rationalism are not mutually exclusive alternatives but often mutually inclusive complements.

61 For two somewhat different examples, see McInerny (2006) and White (2009).

62 It is fraught with problems *simply* to say on the hypothesis of a "pure nature" that "natural reason" can tell us *that* God is (as first cause, etc.) but that only grace eventually gives essential knowledge of *what* God is. There is first the fact that this is itself a theological claim and not a philosophical one, on which basis a counterfactual "pure nature" is abstracted from the one graced theological order and made the basis of the actual order. Quite apart from this, it is doubly problematic to say that the existence of God communicates nothing of the essence of God, not even in an *apophatic* or negative mode or that the *via negativa* conveys nothing positive. First, it presupposes a problematic conception of knowledge (D.C. Schindler 2004b). Second, and even more seriously, if God's existence, which is identical with his essence, communicates nothing of that essence, then being as such must be essentially empty, or in Thomas Joseph White's words, banal (2009: 123). This, I would suggest, is the first step toward making Aristotle and Thomas into nominalists, hardly a novel charge in the history of philosophy. Of course, one can retrieve this Thomistic axiom by saying, as we have, that philosophy cannot reveal God as disclosed by Christ, and that this surprising knowledge is different in kind from knowledge outside of faith, but this would mean allowing that Christ and the historical order are capable of revealing something of the divine essence in a way that many Thomists would disallow.

63 The phrase "round upon being" is derived from Milbank (1990: 63). His critique of transcendental philosophy and the possibility of distinguishing once and for all between a "necessary finite knowledge and a superfluous and pretended transcendent knowledge" are applicable to the possibility of securing a merely positive empirical knowledge against transcendence.

64 > It should now be clear that our question can be posed only from the perspective of a "creaturely" metaphysics, and not from that of the absolute of a purely *a priori* or a purely *a posteriori* metaphysics. Theology, as clearly distinct from philosophy, is possible only on the basis of "God beyond the creature", understood as the fundamental relation between God and the creature. "God as creature"—inasmuch as this is the formal ground of the fundamental relation between God and creature within the *absoluta* of a purely *a priori* and purely *a posteriori* metaphysics—excludes any independent theology, because here philosophy as such is already theology. (Przywara: 53)

65 I owe this image of "taking a stand" to an unpublished essay by D.C. Schindler.

66 That is to say, one need not concede that the world originates causally in God in order tacitly to acknowledge God's role as a "principle" of the world. Modern naturalism preserves this idea in negative form precisely by defining nature as that which excludes God by definition. In this sense God's role as principle is preserved in that nature which by definition takes its leave of God.

67 See Balthasar (1982), p. 145.

68 Again, this is what makes it possible for Christian theology to assume and transform both Neoplatonism and Aristotelianism. Still, I say "relatively coherent" because I shall argue that neither Aristotle nor Neoplatonism finally succeeded in adequately distinguishing God and the world, a distinction only fully revealed through the Incarnation.

69 We will return to this point in later chapters. Meanwhile, see Balthasar (2000), pp. 131–225.

70 See, e.g., Mahner and Bunge (1997), pp. 3–4.

71 Although he makes no allowance for metaphysics, much less theology, there is something like this operative in Dawkins (1996), pp. 11–18.

72 This is one of the reasons, though not the only one, that Aristotelianism–Thomism was slow in giving rise to a fully experimental science. See Oliver (2005), pp. 45–83 and Funkenstein (1986), pp. 152–178.

73 For this reason Thomas would have regarded the absolute singular thing, arrived at by Ockham and later nominalists through the "principle of annihilation" and the imaginary destruction of all supporting contexts, as a violation of the principle of noncontradiction. A thing deprived of all the relations constituting it could not be a thing in any meaningful sense. See Funkenstein (1986), pp. 129–145.

74 Claude Bernard cites the remark by Cuvier, which echoes Francis Bacon: "The observer listens to nature; the experimenter questions and forces her to unveil herself" (Bernard 1957: 6).

75 See also Funkenstein (1986), pp. 36–37.

76 Funkenstein's description of seventeenth-century sciences remains applicable. "The very notion of things was made to fit the mathematical relations governing them, even while conceding that the latter are, in a sense, contingent." Funkenstein (1986), p. 151. See also Veatch (1969), pp. 126–144.

77 The physicist Bohm (1957), p. 134, and Michael Polanyi each make similar observations. We shall revisit this point in the final chapter.

78 These remarks loosely paraphrase what Michael Polanyi meant by "indwelling," "focal awareness," and by "tacit knowing." See Polanyi (1969), pp. 123–157. There are some affinities between this and the notion of "stage-setting" explored by Wittgenstein (1958), §257.

79 On the nature of lines and the pure externality of matter, whose essential property is its capacity for "occupying space," see Descartes' "The World" (1985d), pp. 90–94;

"Discourse on the Method" (1985b), p. 121; and "Meditations" (1985c), p. 54. "Externality" is likewise the defining feature of Newtonian body *qua* body, defined simply as "determined quantities of extension." See Newton (1962), p. 140.

80 In order to avoid the distortions which ensue from taking abstracted parts as ontologically prior to the wholes in which they actually exist and from which they derive their meaning as parts, Aquinas carefully distinguished between abstraction and separation, correlating them to two distinct intellectual operations. The former operation, the "understanding of indivisibles," corresponds to essences and abstracts what can be known separately but actually belong together in reality—form/matter, wholes/parts, and so on—the latter operation forms positive and negative judgments with respect to existence. The first sort of operation is legitimate precisely because it is able to abstract form from the existents in which it inheres or parts from wholes without losing sight of the actual (i.e., real) priority of the whole. "It is correctly called abstraction, but only when the objects, one of which is known without the other, are one in reality." In separation, by contrast, the intellect composes and divides, distinguishing "one thing from another by understanding that the one does not exist in the other" (Aquinas, *In Boeth. de Trin*., q.5, a.3).

> Now since the truth of the intellect results from its conformity with reality, it is clear that in this second operation the intellect cannot truthfully abstract what is united in reality, because the abstraction would signify a separation with regard to the very being of the thing (q.5, a.3).

These distinctions presuppose that the cosmos is a unity insofar as it *is*, that is, insofar as the things comprising it participate (through *ens commune*) in the act of being by virtue of which they are "structured in a mutually supporting order (*ordo ad invicem*)" and "are ordained toward each other (*ad alia ordinantur*)" (Funkenstein 1986: 136). We will distinguish between "ordination" in terms of being and the "external teleology" presupposed and rejected by Darwin in later chapters. We will also consider how the epistemic priority of analysis and the ontological priority of parts over wholes are correlated to the reduction of being from act to brute facticity.

81 We will be developing our own analysis of this ontology and its equation of knowledge and power in subsequent chapters. In the meantime one may consult, in addition to the essay from D.L. Schindler, Jonas (2001a) "Is God a Mathematician? The Meaning of Metabolism" and "The Practical Uses of Theory." See also "Seventeenth Century and After: The Meaning of the Scientific and Technological Revolution" (Jonas 1974).

82 David Bohm observes that externality, in addition to a reduction to basic elements, is one of the defining characteristics of mechanistic ontology.

> These elements are basically external to each other, not only in being separate in space, but more important, in the sense that the fundamental nature of each is independent of that of the other. Thus, the elements do not grow organically as parts of a whole, but rather…they may be compared to parts of a machine, whose forms are determined externally to the structure of the machine in which they are working…Also…the elements interact mechanically, and are thus related only by influencing each other externally, e.g., by forces of interaction that do not deeply affect their inner nature. (Bohm 1986: 15)

This is because once nature is conflated with artifice, things no longer have an inner nature determining the meaning of the parts as parts of a *per se* (rather than merely aggregated) unity. Rather interiority is reimagined in terms of exteriority, as the interaction of externally related parts whose unity is the end result of its piece-by-piece assembly.

83 I judge the multiverse to be nonsensical not because I deny the possibility that the universe is in fact infinitely immense or that it contains infinitely more items or possibilities than we know, but because inasmuch as other "universes" are or were, they would belong to the one order of being (and causality) and thus would not truly be alternative universes,

but simply heretofore unknown parts of the one universe. If they did not so belong, there could be no possibility of ever knowing about them.

References

Anderson, J.F. (trans. and ed.) (1997) *An Introduction to the Metaphysics of St. Thomas Aquinas*. Washington, DC: Regnery Publishing, Int.

Bacon, F. (2000) *The New Organon*, edited by L. Jardine and M. Silverthorne. Cambridge: Cambridge University Press.

von Balthasar, H.U. (1982) *The Glory of the Lord I: Seeing the Form*, translated by E. Leiva-Marikakis. San Francisco: Ignatius Press.

von Balthasar, H.U. (1992) *The Theology of Karl Barth*, translated by E.T. Oakes San Francisco: Ignatius Press.

von Balthasar, H.U. (2000) *Theo-Logic I: Truth of the World*, translated by A.J. Walker. San Francisco: Ignatius Press.

Bernard, C. (1957) *An Introduction to the Study of Experimental Medicine*, translated by H.C. Greene New York: Dover.

Bohm, D. (1957) *Causality and Chance in Modern Physics*. London: Kegan Paul.

Bohm, D. (1986) "The Implicate Order: A New Approach to the Nature of Reality," in D.L. Schindler (ed.), *Beyond Mechanism: The Universe in Recent Physics and Catholic Thought*. Lanham: University Press of America.

Clark, S.R.L. (March 4, 1999) Deconstructing Darwin. Alan Richardson Lecture. University of Durham.

Clarke, W.N. (2001) Metaphysics as Mediator: Between Revelation and the Natural Sciences. *Communio* 28, pp. 464–487.

Clarke, W.N. (1997) "Introduction," in J.F. Anderson (trans. and ed.), *An Introduction to the Metaphysics of St. Thomas Aquinas*. Washington, DC: Regnery Publishing, Int.

Dawkins, R. (1996) *The Blind Watchmaker: Why the Evidence of Evolution Reveals a Universe Without Design*. New York: W.W. Norton.

Dennett, D. (1995) *Darwin's Dangerous Idea: Evolution and the Meanings of Life*. New York: Simon & Schuster.

Depew, D.J. and Weber, B.H. (1997) *Darwinism Evolving: Systems Dynamics and the Genealogy of Natural Selection*. Cambridge: MIT Press.

Descartes, R. (1985a) "Meditations on First Philosophy," in J. Cottingham, R. Stoothoff, and D. Murdoch (trans.), *The Philosophical Writings of Descartes*, vol. 2. Cambridge: Cambridge University Press.

Descartes, R. (1985b) "Discourse on the Method," in J. Cottingham, R. Stoothoff, and D. Murdoch (trans.), *The Philosophical Writings of Descartes*, vol. 2. Cambridge: Cambridge University Press.

Descartes, R. (1985c) "Meditations," in J. Cottingham, R. Stoothoff, and D. Murdoch (trans.), *The Philosophical Writings of Descartes*, vol. 2. Cambridge: Cambridge University Press.

Descartes, R. (1985d) "The World," in J. Cottingham, R. Stoothoff, and D. Murdoch (trans.), *The Philosophical Writings of Descartes*, vol. 1. Cambridge: Cambridge University Press.

Fichte, J.G. (1994) *Introductions to the Wissenschaftslehre and Other Writings*, translated by D. Breazeale. Indianapolis: Hackett.

Funkenstein, A. (1986) *Theology and the Scientific Imagination: From the Middle Ages to the Seventeenth Century*. Princeton: Princeton University Press.

Galilei, G. (1953) *Dialogue on the Great World Systems*, edited by Giorgio de Santillana. Chicago: University of Chicago Press.

Gould, S.J. (1999) *Rock of Ages: Science and Religion in the Fullness of Life*. New York: Ballantine Books.

Gould, S.J. (2002) *The Structure of Evolutionary Theory*. Cambridge: Belknap/Harvard.

Grant, G. (1969) "In Defense of North America," in *Technology and Empire*. Toronto: House of Anansi, pp. 15–40.

Giussani, L. (1997) *The Religious Sense*. Montreal: McGill Queen's University Press.

Hanby, M. (2003) *Augustine and Modernity*. London: Routledge.

Hart, D.B. (October 2003) Christ and Nothing. First Things. http://www.firstthings.com/article/2007/12/christ-and-nothing-28. Accessed on November 20, 2012.

Hull, D.L. (1989) *The Metaphysics of Evolution*. Albany: State University of New York Press.

Husserl, E. (1970) *The Crisis of European Sciences and Transcendental Phenomenology. An Introduction to Phenomenological Philosophy*, translated by D. Carr. Evanston: Northwestern University Press.

Jonas, H. (1974) "Seventeenth Century and After: The Meaning of the Scientific and Technological Revolution," in *Philosophical Essays: From Ancient Creed to Technological Man*. Englewood Cliffs: Prentice-Hall, pp. 45–80.

Jonas, H. (2001a) "Is God a Mathematician? The Meaning of Metabolism," in *The Phenomenon of Life: Toward a Philosophy of Biology*. Evanston: Northwestern University Press, pp. 64–98.

Jonas, H. (2001b) "Life, Death, and the Body in the Theory of Being," in *The Phenomenon of Life: Toward a Philosophy of Biology*. Evanston: Northwestern University Press.

de Koninck, C. (1960) *The Hollow Universe*. London: Oxford University Press.

Lancellotti, C. (November 10, 2006) "Science, Contemplation, and Ideology." Lily Fellows Program National Research Conference: The World and Christian Imagination. Baylor University.

Lear, J. (1988) *Aristotle: The Desire to Understand*. Cambridge: Cambridge University Press.

Lewontin, R.C. (1992) *Biology as Ideology: The Doctrine of DNA*. San Francisco: Harper.

Mahner, M. and Bunge, M. (1997) *Foundations of Biophilosophy*. Berlin: Springer-Verlag.

Mayr, E. (1991) *One Long Argument: Charles Darwin and the Creation of Modern Evolutionary Thought*. Cambridge: Harvard University Press.

McInerny, R. (2006) *Praeambula Fidei: Thomism and the God of the Philosophers*. Washington, DC: The Catholic University of America Press.

Milbank, J. (1990) *Theology and Social Theory: Beyond Secular Reason*. Oxford: Blackwell.

Newton, I. (1962) "De Gravitatione et Aequipondio Fluidorum," in A.P. Hall and M.B. Hall (eds.), *Unpublished Scientific Papers of Isaac Newton*. Cambridge: Cambridge University Press.

Oliver, S. (2005) *Philosophy, God and Motion*. London: Routledge.

Owens, J. (1978) *The Doctrine of Being in the Aristotelian Metaphysics*. Toronto: Pontifical Institute of Mediaeval Studies.

Péguy, C. (1996) *The Portal of the Mystery of Hope*, translated by D.C. Schindler. Grand Rapids: Eerdmans.

Polanyi, M. (1969) *Knowing and Being*. Chicago: University of Chicago Press.

Przywara, E. (forthcoming) *Analogia Entis*, translated by D.B. Hart and J. Betz. Grand Rapids: Eerdmans.

Ratzinger, J. (1969) "Introductory Article and Chapter 1: The Dignity of the Human Person," in H. Vorgrimler (ed.), *Commentary on the Documents of Vatican II*. New York: Herder & Herder.

Ratzinger, J.C. (2004) *Introduction to Christianity*, translated by J.R. Foster. San Francisco: Ignatius Press.

Rea, M.C. (2002) *World Without Design: The Ontological Consequences of Naturalism*. Oxford: Oxford University Press.

Sachs, J. (2004) *Aristotle's on the Soul and on Memory and Recollection*. Santa Fe: Green Lion Press.
Schindler, D.C. (2004) Surprised by Truth: The Drama of Reason in Fundamental Theology. *Communio* 31, pp. 587–611.
Schindler, D.C. (2008) *Plato's Critique of Impure Reason: On Goodness and Truth in the Republic*. Washington, DC: The Catholic University of America Press.
Schindler, D.L. (2011) *Ordering Love: Liberal Societies and the Memory of God*. Grand Rapids: Eerdmans.
Simpson, G.G. (1964) "Evolutionary Theology: The New Mysticism," in P. Appleman (ed.) *(1979) Darwin: A Norton Critical Edition*, 2nd edn. New York: W.W. Norton.
Sokolowski, R. (2000) *Introduction to Phenomenology*. Cambridge: Cambridge University Press.
Stenmark, M. (2004) *How to Relate Science and Religion: A Multidimensional Model*. Grand Rapids: Eerdmans.
Veatch, H.B. (1969) *Two Logics: The Conflict Between Classical and Neo-Analytic Philosophy*. Evanston: Northwestern.
White, T.J. (2009) *Wisdom in the Face of Modernity: A Study in Thomistic Natural Theology*. Ave Maria: Sapientia Press of Ave Maria University.
Wittgenstein, L. (1958) *Philosophical Investigations*, 3rd edn., translated by G.E.M. Anscombe. Oxford: Basil Blackwell.

Further Reading

von Balthasar, H.U. (1987) *Epilogue*, translated by E.T. Oakes San Francisco: Ignatius Press.
Bieler, M. (2011) "Analogia Entis as an Expression of Love According to Ferdinand Ulrich," in T.J. White (ed.), *Analogia Entis*. Grand Rapids: Eerdmans.
Chesterton, G.K. (1994) *What's Wrong with the World*. San Francisco: Ignatius Press.
Dewey, J. (1979) "The Influence of Darwin on Philosophy," in P. Appleman (ed.), *Darwin: A Norton Critical Edition*. New York: W.W. Norton, pp. 305–314.
Galilei, G. (2001) "Dialogue Concerning the Two Chief World Systems" (Drake trans.), in S.J. Gould (ed.), *Modern Library Science*. New York: The Modern Library.
Hanby, M. (Summer 2005) These Three Abide: Augustine and the Eschatological Non-obsolescence of Faith. *Pro Ecclesia* XIV.3, pp. 340–360.
Hanby, M. (2008) "A Few Words on Balthasar's First Word," in R.A. Howsare and L.S. Chapp (eds.), *How Balthasar Changed My Mind*. New York: Crossroad, pp. 74–90.
Kant, I. (1929) *Critique of Pure Reason*, translated by N.K. Smith. New York: St. Martin's.
Kass, L. (2002) "The Permanent Limitations of Biology," in *Life, Liberty, and the Defense of Dignity*. San Francisco: Encounter Books, pp. 277–297.
Loeb, J. (1912) *The Mechanistic Conception of Life: Biological Essays*. Chicago: University of Chicago Press.
de Lubac, H. (1998) *The Mystery of the Supernatural*, translated by R. Sheed. New York: Crossroad Herder.
MacIntyre, A. (1988) *Whose Justice? Which Rationality?* Notre Dame: Notre Dame Press.
Pauly, P.J. (1987) *Controlling Life: Jacques Loeb and the Engineering Ideal in Biology*. Oxford: Oxford University Press.
Ratzinger, J.C. (1995) *'In the Beginning…' A Catholic Understanding of the Story of Creation and the Fall*, translated by B. Ramsey. Grand Rapids: Eerdmans.

Schindler, D.C. (Fall 2005) What's the Difference?: The Metaphysics of Participation in a Christian Context. *St. Anselm Journal* 3(1), pp. 1–27.

Stock, G. (2002) *Redesigning Humans: Our Inevitable Genetic Future*. Boston: Houghton Mifflin.

Walker, A.J. (Fall 2004) Personal Singularity and The *Communio Personarum*: A Creative Development of Thomas Aquinas' Doctrine of *Esse Commune*. *Communio* 31, pp. 457–475.

Whitehead, A.N. (1920) "Theories of the Bifurcation of Nature," in *The Concept of Nature: Tarner Lectures Delivered in Trinity College*. Cambridge: Cambridge University Press.