Evolving creation: Exploring contemporary theologies of evolution

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EVOLVING CREATION

Exploring Contemporary Theologies of Evolution

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Introduction

Framing the Problem

In his monumental essay *Theology in a Secular Age*, Charles Taylor explains how, at least in Western societies, life takes place within a constructed social place that precludes *transcendence*. This is what Charles Taylor calls the *immanent frame*. "This frame," Taylor explains, "constitutes a 'natural' order, to be contrasted to a 'supernatural' one, an 'immanent' world, over against a possible 'transcendent' one."[1] Rather than being a set of beliefs, the immanent frame is the common context in which we develop our beliefs, which can be *open* or *closed* to some form of transcendence. In other words, although we all inhabit the *immanent frame*, openness to some type of transcendence is still possible. The default position is, however, a kind of implicit *naturalism* that prevents God's existence to be taken for granted. There are, as I was saying, two ways of inhabiting the *immanent frame*: one can be either *open* or *closed* to some form of transcendence, and be so with or without recognition of the contestability of one's position and of the viability of the alternative position. To the "overly confident" posture that cannot grant plausibility to the alternative Taylor calls "spin." To the posture that remains open to appreciate the viability of other positions Taylor calls "take."[2] In his discussion, Taylor pays special attention to the "closed spin," which, according to him, is hegemonic in the Academy. The "closed spin" is supported by what Taylor calls "closed world structures," which are nothing but ways of preventing one from recognizing the hidden presuppositions that sustain our "spin," thus

[1] Charles Taylor, *A Secular Age* (Cambridge, MA and London: The Belknap Press of Harvard University Press, 2007), p. 542. For an accessible and insightful introduction to Taylor's *A Secular Age*, see: James Smith, *How (Not) to be Secular: Reading Charles Taylor* (Grand Rapids, Michigan/Cambridge, U.K.: William B. Eerdmans Publishing Company, 2014).

[2] "What I am calling 'spin,'" Taylor explains, "is a way of convincing oneself that one's reading is obvious, compelling, allowing of no cavil or demurral…. It implies that one's thinking is clouded or cramped by a powerful picture which prevents one seeing important aspects of reality" (Taylor, *A Secular Age*, p. 551).

reinforcing one's "spun" position.[3] In his discussion, Taylor undertakes the arduous task of attempting at undermining the self-confidence or "naturalness" of the "closed spin." One of Taylor's strategies is simply to tell the story of how the closed spin came to be, and point out sociological, historical and religious factors that tend to be underestimated, or even neglected, in conventional accounts ("subtraction stories") of the process of secularization. The other strategy is the attempt to instill in those who are "spun" a sense of being *cross-pressured*, i.e. of becoming aware of the perhaps unexpected and disconcerting appeal of the "open take."

My thesis is not about Charles Taylor. And yet, this very brief review of some of Taylor's illuminating ideas and vocabulary will allow me to explain with greater clarity the goal that I want to achieve, which can be seen as a humble contribution, focused on the dialogue with natural sciences, and in particular the contemporary evolutionary paradigm, to Taylor's attempt to put pressure on the "closed spin" and question its viability. For a considerable number of scientists and philosophers, evolution reinforces the conviction that the belief in God is simply dispensable or even untenable. This conviction is at the core of a naturalist worldview and contributes significantly to a reinforcement of the "closed spin." In this context, and put in simple terms, the goal of my thesis is not to unequivocally prove that God does exist or is compatible with evolutionary science, but, more modestly, to put "pressure" on the naturalistic worldview, and so undermine the "closed spin." In other words, it is the goal of my thesis to make scientific naturalists experience a kind of healthy health *cross-pressure* that will hopefully invite them to re-consider the viability of the "open take." In order to accomplish this goal, I will pursue three main strategies. It is interesting to note, at this respect, that to a certain extent I will be following the three steps of what we could call "Taylor's apologetics," which Smith describes in the following way: "first, level the play-ground (for example, by pointing out that both exclusive

[3] Ibid., p. 549.

humanism and Christianity face dilemmas); second, show some of the inadequacy of purely 'immanentist' accounts, opening space for a Christian account to receive a hearing; and then, third, sketch how a Christian 'take' which might offer a more nuanced or more comprehensive account of our experience (a phenomenological strategy)."[4] So, the first strategy, which I will undertake in the first chapter, will be to argue that a purely naturalistic interpretation of reality should be regarded more as *worldview* than as a logical consequence of scientific data. This worldview is, we will see, sustained by metaphysical, epistemological and methodological premises whose justification transcends the methods proper to the natural sciences. It will be my goal to bring these premises to light.

The second line of argumentation will engage directly the data of evolutionary science, and take seriously the way it challenges a theistic interpretation of the world, thus reinforcing the "closed spin," and contributing for the *fragilization* of the believer's commitment to Christian faith. The evolutionary paradigm that dominates contemporary science has definitely set aside the static paradigm that underscored the development of Christian doctrine.[5] We are now aware that the universe as we know it has undergone a long evolutionary process in which higher levels of complexity – the structures of the cosmos, life, the diversity of species, and even consciousness – appear to have developed from lower levels of complexity. It seems more difficult to maintain, today, that it was God who directly formed the Sun, the moon, the starts, the astonishing variety of plant and animal species, and even the human being. Science has certainly not disclosed all the mysteries of our universe. But we should not underestimate its accomplishments, either. In

[4] Smith, *How (Not) to be Secular,* p. 120. Smith notes that this sort of strategy is akin to the school of thought known as "reformed epistemology," which is associated with Alvin Plantinga and Nicholas Wolterstorff. It is interesting to note, as well, that according to Augustine, whom Aquinas quotes in the *Summa theologica*, "science begets faith in us, and nourishes, defends and strengthens it" (*S. th.*, I, q.6, a.1, *obj.*1).

[5] Throughout the thesis, I will be using the term "evolution" in two different ways. The term "evolution" applies, in the first place, to the dynamic character of the universe, and in this sense it opposes the term "static." The term evolution will be used to name "biological evolution," the process of diversification of species. The context will make it clear, I hope, the way I will be using the term.

science, theories are never definitive. And yet, what we already know about the formation of stars and galaxies, about the origins of life, and the exuberant branching of the tree of life is quite remarkable. Our universe does evolve. Higher levels of complexity emerge out of lower levels of complexity, and, even more amazingly, we have quite good explanations – although certainly not complete – for how these processes unfold. Although the role of science in the process of secularization appears not to be, at least according to Taylor, as important as one might think, it is still true that scientific developments, in particular evolutionary data, are seen by many as being incompatible with a theistic interpretation of reality. We can identify three main challenges posed by the evolutionary paradigm to the belief in the creator God. First, given the astonishing success of science, its ability to describe the emergence of everything that we see around us – the earth under our feet, the sky above our heads, and the life that animates our bodies – we should not be surprised that many came to see God as an old-fashioned entity we can do away with. If the universe can, by itself, give rise to everything that exists, why do we still need God? And, even if there are other reasons why we think God is still necessary, can we maintain that this God is the creator God Scriptures tell us about? Second, according to the scientific discoveries in the area of both physics and biology, chance appears to be an intrinsic element to the evolutionary process: in place of determinism, there is a complex combination of law and chance. This means that the present and future state of the universe cannot be deduced from the past, either in principle or in practice. How is this compatible with the idea that God creates according to a pre-determined plan? Finally, the same evolutionary process that has given rise to an exuberant diversity of living creatures is also tainted by pain, death, and waste. How is such a massive presence of suffering compatible with a provident and omnipotent God who cares about God's creation?

It will be an important part of this thesis to address each one of these three challenges to the belief that the world is the creation of a provident and benevolent God. We will do so in the

three first sections of the second chapter. It will be my goal to suggest that contemporary scientific data actually leave the door open to a theist interpretation. I will show, in particular, how the recent retrieval of *emergentism*, while remaining within the confines of scientific naturalism, provides a powerful challenge to scientific materialism, and invites a much deeper appreciation for the different levels of reality, including the human. It will also become clear, I hope, that chance is perfectly compatible with an over-all sense of purpose for the universe, even if our understanding of purpose might have to be re-worked. In the second half of the chapter, I will undertake a metaphysical discussion of evolution, which, without being absolutely conclusive, will hopefully stimulate the reader's "metaphysical imagination," and raise critical questions concerning the viability of the naturalistic project.

The third and final line of argumentation will invite theists and naturalists alike to appreciate the cogency of the theistic interpretation of evolution by engaging two different theological approaches to evolution. The first "take," which was pursued by authors like Karl Rahner, Elizabeth Johnson and Dennis Edwards, and which we will be discussing in the third chapter, consists on contemporary retrieval of the scholastic distinction between primary and secondary causality. The second approach, which takes its inspiration from *process theology*, is John Haught's theology of evolution, and will be discussed in the fourth and last chapter. We will have the chance to appreciate the way these two theological "takes" portray the "God of evolution," and also their understanding divine action and the doctrine of creation. We will also discuss their strengths and weaknesses. The main goal, however, will be to invite the reader, even if he or she is not a believer, to contemplate the evolving universe from the perspective of theology and appreciate its consistency. If after reading this thesis the reader feels just a little bit *cross-pressured*, I will have accomplished my goal.

Chapter 1

Hidden Cards: Scientific Naturalism as a Worldview

> *What is absolutely certain is that the naturalistic view of things is … just a picture of the world, not a truth about the world that we can know, nor even a conviction that rests upon a secure rational foundation.*
>
> David Bentley Hart[1]

Drawing together the effort of several generations of scientists, modern science has built an impressive account of the history of our universe. While many pieces of the puzzle are still missing, natural science can describe with remarkable accuracy the overarching process that leads from the emergence of matter and the formation of the macrostructures of the universe, to the emergence of life, and the explosive diversification of species. This fascinating journey culminates in the emergence of conscious beings endowed with the capacity to grasp the depths not only of their own interiority, but also of the abyss of time that prepares their arrival.

Although incomplete, the scientific account of this astounding journey is not only rigorous, detailed and based on clear evidence, but also able to make new predictions that can be tested by the scientific community. What is proper to the natural sciences is the attempt to explain natural phenomena in terms of immanent causes alone. In other words, science uncovers the causal links, insofar as they are accessible to empirical and rational inquiry, that unite different phenomena, without ever stepping outside the natural world. Once the regularity of these causal links is disclosed, they are classified and organized in terms of what we call scientific laws. The question that naturally arises is whether every natural phenomenon, and in particular the

[1] David Bentley Hart, *The experience of God: Being, Consciousness, Bliss* (New Haven and London: Yale University Press, 2013), p. 82.

emergence of new levels of complexity, can be explained in terms of immanent causes alone. For example, evolutionary biology provides a convincing account of the diversification of species. Some scientists will even claim that even the human phenomenon in all its dimensions – consciousness, morality, culture, and even religion – can be accounted for by some adaptation of Darwinian evolution.

The remarkable explicative power of natural sciences, along with the pervasive presence of chance and suffering throughout the evolutionary process, has led many scientists – and also many lay people in scientific matters – to decree the idea of a creator and provident God as superfluous, even unacceptable. This is understandable. We are well aware of a panoply of myths and religious narratives that "explain" natural phenomena in terms of some type of divine action. In the Jewish Scriptures, for example, the creation of the world and everything therein is attributed to the direct intervention of God. Things exist because God calls them to exist. Given the disparity between this narratives and the scientific account of natural history, it is understandable that one feels pressured to choose between religious narratives and science. And if one knows a little bit of science and has witnessed to its explicative power, it is perhaps difficult not to lean towards science and give up religion, or at least dismiss it as a mere source of meaning and personal consolation.

This description of the apparent tension between the religious and scientific accounts of natural history is somehow simplistic, I must admit. And yet, I believe that it reflects accurately the conviction, upheld by a non-negligible number of prominent intellectuals, in particular scientists, that everything that exists within our universe can be totally explained in terms of immanent causes. Although many links in the chain are still missing, the story goes, through their persistent effort, scientists will eventually arrive at a complete explanation of the universe and its structures, thus rendering superfluous, even contradictory, the belief in a creator God. John

Haught, who will be a dialogue partner throughout this thesis, frames the question in a sharp way: "does the idea of divine action have any legitimacy at all in view of the strong claims by naturalists that science is enough to explain all phenomena satisfactorily by itself? […] Science has now replaced the idea of divine providence as the most plausible way to explain all the features of living organisms. Consequently, one must choose between science and theology, and there is no question as to which option the naturalist will embrace."[2] In short, for many scientists, and other intellectuals alike, "nature is enough." In other words, nature's climb in the ladder of complexity – the formation of the structures of the universe, the emergence of life, the diversification of species, and even the arrival of the human phenomenon – can be fully explained by immanent causes alone. And it is the role of the scientific method to uncover the natural causes that govern the natural world.

But is that so? Is science really able to explain everything that exists without any recourse to a transcendent cause, i.e. a cause that cannot be counted among natural causes, and is, rather, the cause that sustains all the other causes? Does the explanatory power of natural sciences rule out the existence of a creator and provident God? The goal of the first two chapters of this thesis is to justify a negative answer to both these questions. In the first part of the argument, it will be my goal to challenge the idea that naturalism is the unavoidable consequence of science, or even a properly scientific conclusion at all. I will suggest that naturalism should be rather understood as a "worldview" sustained by metaphysical, epistemological and methodological premises whose justification transcends the methods proper to the natural sciences. Adopting the terminology of John Haught, I will name this worldview "scientific naturalism." In short, in the first part of my argument, I will try to level the field by uncovering the tacit (and non-scientific)

[2] John Haught, *Is Nature Enough: Meaning and Truth in the Age of Science* (Cambridge: Cambridge University Press: 2006), p. 59.

premises of scientific naturalism, and denounce the illegitimate attempt to force a necessary link between science and a naturalistic interpretation of the world. Only in a second moment – this will be the goal of the second chapter – will I suggest that the theistic worldview is actually more plausible than the naturalistic worldview, which is not free of its own difficulties and riddles.

In this first chapter, then, I will begin my discussion by naming the core assertions of scientific naturalism. In the second section, I will suggest that these assertions are underpinned by a threefold reductionism – methodological, epistemological, and metaphysical – that cannot be justified by science itself. I will conclude with some critical remarks.

The Core Assertions of Scientific Naturalism

I have been suggesting that the claim according to which science excludes both a transcendent cause and a transcendent goal for the universe reflects a worldview, which I have named "scientific naturalism," sustained by methodological, epistemological and metaphysical premises or assumptions. It is the goal of this chapter to uncover some of these premises. Before embracing this task, thought, it is important to briefly describe the core assertions of scientific naturalism.

The expression *naturalism* refers to the conviction that there is no reality that transcends nature either as its cause or as its goal. In the words of John Haught, "naturalism denies the existence of any realities distinct from the natural world, an unimaginably immense and resourceful realm of being that includes humans and their cultural creations."[3] Not surprisingly, naturalism is tantamount to the rejection, or at least suspension, of the belief in God as the transcendent source and final goal of everything that exists. Throughout the history of beliefs and ideas, naturalism took many different shapes and was supported by a variety of religious and philosophical commitments. Here, I am mostly interested in the naturalistic worldview that grew

[3] Haught, *Is Nature Enough*, p. 2.

alongside modern science, and which I call scientific naturalism. What is particular about this type of naturalism is its close association with science. To be more clear, scientific naturalism assumes not only that nature is all there is, but also that this conclusion is a rational extrapolation of the developments of modern science, which is affirmed as the only reliable way of understanding nature. Scientific naturalism is, in this sense, intimately connected with what is commonly called "scientism," i.e. the claim according to which science is the only way of getting to know reality: "scientism, the epistemic soul of scientific naturalism, claims that the experimental method that came to prominence in the modern period is sufficient to tell us everything factual about the universe. It is convinced that all religious visions of nature and humanity are now superseded by a superior way of understanding."[4]

But what are, then, the key claims of this worldview? Although scientific naturalism is not completely uniform, I believe that most of its adherents would subscribe to five basic assertions.[5] First, nature is everything there is. There is no God. There are no angels. There is no soul. Second, everything that exists, including the human phenomenon in all its dimensions, can be explained in terms of immanent causes that can be disclosed by the natural sciences. In other words, scientific materialism claims that science can account for the emergence of every level of complexity we can observe in the universe: the structures of the universe, life, the diversity of

[4] Ibid., p. 5.

[5] My description of the basic claims of scientific naturalism is an adaptation of John Haught's account of the teachings of scientific naturalism in terms of seven propositions, which I reproduce here (idem, p. 9):

1. "Outside nature, which includes humans and their cultural creations, there is nothing.
2. It follows from #1 that nature is self-originating.
3. Since there is nothing beyond nature, there can be no overarching purpose or transcendent goal that would give any last meaning to the universe.
4. There is no such a thing as the "soul," and no reasonable prospect of conscious human survival beyond death.
5. The emergence of life and mind in evolution was accidental and unintended.

What I am calling "scientific naturalism" [Haught continues] accepts these five tenets, but adds two more:

6. Every natural event is itself the product of other natural events. Since there is no divine cause, all causes must be purely natural causes, in principle accessible to scientific comprehension.
7. All the various features of living beings, including humans, can be explained ultimately in evolutionary, specifically Darwinian, terms. I shall often refer to this belief as "evolutionary naturalism."

species, human beings, culture, morality, and even religion. Third, the emergence of the different levels of complexity was accidental and unintended, and not the result of an intelligent designer. This assertion appears to be justified by the pervasive presence of chance both at the quantum level and throughout the process of biological evolution. Fourth, there is no transcendent goal or purpose for human beings or for the universe as a whole. We can say, in this sense, that no final meaning to the universe can be discerned. Fifth, nature is evolving and emergent, i.e. the universe has a history, and throughout this history higher levels of complexity emerge out of lower levels of complexity by virtue of its own intrinsic capacities, not by virtue of some extrinsic cause.

There is, finally, a sixth assertion that is not consensual among those who dwell the naturalistic worldview: the claim that matter is all there is. When this claim is added to the five we have just described, we get what John Haught calls "hard naturalism," or "scientific materialism." For those who embrace this view, higher levels of complexity are nothing but mere *epiphenomena*. Consciousness, morality, freedom are nothing but a manifestation of the properties of matter. Everything will eventually be explained in terms of elementary constituents of matter animated by fundamental and overarching laws yet to be discovered. This means that chemistry, biology, and all the human sciences will eventually be subsumed under physics as the most fundamental science. Hard naturalism is in contrast with "soft naturalism," which "proposes that nature consists of complex systems and organic wholes that cannot be accounted for exclusively in terms of their physical antecedents or atomic components."[6] In other words, according to "soft naturalism," higher levels of complexity are endowed with laws that cannot be reduced to the laws operative at lower levels of complexity.

Needless to say, that the naturalist worldview is particularly hostile to the belief in a personal God who would be both the source and the ultimate goal of the universe: claiming to be

[6] Ibid., p. 8.

able to explain every aspect of reality in terms of immanent causes, and having purged nature of any sense of purpose, scientific naturalism more often than not entails the explicit rejection of a personal God.

The Hidden Premises of Scientific Naturalism

Scientific naturalism is often regarded as the inevitable corollary of modern science. In other words, if one accepts the developments of science – and there are certainly very good reasons to do so – then one would also have to subscribe to the tenets of scientific naturalism, as if they were a logical derivation of science. As I have stated, the goal of this first chapter is precisely to expose the fragility of this link between science and scientific naturalism.[7] It is not my intention to devalue the achievements of modern science. On the contrary, as a physicist by training, I have the utmost respect for science and the way it has allowed us to learn about the universe we inhabit and grasp the mystery of our own existence. What I cannot accept is the clumsy and hasty connection between science and a naturalistic worldview that, at least in its more radical versions, not only decrees the non-existence of God, as it reduces to mere epiphenomena vast areas of human experience.[8] I have good reasons to believe scientific naturalism, and its claim that nature is self-explanatory and deprived of any transcendent meaning and purpose, to be problematic. For the moment, however, my goal is simply to bring to light the hidden premises of the naturalistic worldview, thus loosening the (apparently inevitable) connection between science and naturalism.

[7] It is worth noting that the naturalist worldview is actually the result of a complex historical and sociological process that progressively undermined the theistic worldview. Although science is often regarded as the major factor involved in this process, there are many other factors involved of religious, metaphysical, and sociological nature. For insightful accounts of what can be called the process of secularization, see: Charles Taylor, *A Secular Age* (Cambridge, MA and London: The Belknap Press of Harvard University Press, 2007); John Milbank, *Theology and Social Theory: Beyond Secular Reason*, 2nd ed. (Oxford, UK/Malden, MA: Blackwell, 2006); Michael Buckley, S.J., *At the Origins of Modern Atheism* (New Haven and London: Yale University Press, 1987).

[8] It is important to clarify that not every naturalistic approach treats consciousness and human experience in general as epiphenomenal. As we will see in the next chapter, there are naturalistic approaches that reject materialistic interpretations of reality. In short, we should keep in mind the distinction between scientific naturalism and scientific materialism.

To use Haught's words, "scientific naturalism is not by any means the same thing as science. Science is a fruitful but self-limiting way of learning some things about the world, whereas scientific naturalism is a worldview that goes far beyond verifiable knowledge by insisting on the explanatory adequacy of scientific method."[9]

As I see it, the heart of scientific naturalism lies in a series of reductionisms of *methodological*, *epistemological*, and *metaphysical* nature.[10] Let me explain. By methodological reductionism I mean the conviction, espoused by the adherents of scientific naturalism, that only by applying the methods proper to the natural sciences will we arrive at an accurate description of reality. Closely related to methodological reductionism is the idea that no true knowledge can be attained to unless the rational and empirical standards of science are strictly respected, thus excluding any other ways of being getting in touch with reality. Building upon the methodological and epistemological reductionisms, metaphysical reductionism declares inexistent anything that cannot be seen through the lenses of science. Particularly important, in this respect, is the tendency, initially motivated by methodological assumptions, to reduce the scope of causality to a narrow understanding of efficient causality. While initially it was essentially a methodological assumption, the exclusive focus on a narrow understanding of efficient causality soon became an ontological assertion about the nature of causality: every phenomenon in the world fits into a deterministic and mechanical chain of efficient causality that cannot be violated. Equally significant, and equally unjustified, is the claim that the totality is

[9] Haught, *Is Nature Enough*, p. 7. Along the same lines, Hart observes that "the materialistic metaphysics that emerged from the mechanical philosophy has endured and prevailed not because it is a necessary support of scientific research, or because the sciences somehow corroborate its tenets, but simply because it determines in advance which problems of interpretation we can safely avoid confronting" (*The Experience of God*, p. 65).

[10] The term *reductionism* is often used, as we will see in the next section, as a technical word that designates the tendency to "reduce" higher levels of complexity to its constituent parts. Understood in this way, *reductionism* is opposed to *emergentism*. In this chapter, however, the term *reductionism* will be given a broader meaning, as it will soon become clear.

equal to the sum of its parts. But let me now explore in greater depth each of these three types of reductionism.

Methodological Reductionism

Method is fundamentally a research strategy. Given the complexity of nature, the scientist has to focus his attention on certain aspects of reality. The idea is to parcel out a big problem in order to make it more manageable. In Hart's words, "a method, at least in the sciences, is a systematic set of limitations and constraints voluntarily assumed by a researcher in order to concentrate his or her investigations upon a strictly defined aspect of or approach to a clearly delineated object."[11] The whole explanatory power of science lies in its method. It would be a mistake, however, to think that by applying the scientific method we will eventually attain to a complete description of reality. The essence of method is precisely to simplify, to ask manageable questions, to focus on what can be empirically tested and measured. By doing so, however, science inevitably leaves out fundamental questions, and is basically incompetent to contemplate reality as a whole. But let us look more closely to some of the key operative principles of the methods proper to science.

First, science tends to focus its attention on what is empirically testable, measurable, repeatable, and ultimately capable, at least ideally, of being described in terms of mathematical models and laws. It is certainly true that this ideal is more easily fulfilled by more fundamental sciences, like physics and chemistry, but, to a certain extent, it remains as the goal of any scientific discipline. While being particularly fruitful, this approach suffers from unsurpassable limitations. To begin with, not every phenomenon is repeatable or capable of being described mathematically. Focusing on what is common to different objects, science classifies, organizes, and builds testable laws. But in doing so, it ignores what is unique to each thing. Science can accurately explain, for example, the succession of nights and days, but it cannot capture the

[11] Hart, *The Experience of God*, p. 70.

unique beauty of today's sunrise or sunset. Needless to say, that this is especially true at the level of human experience: the dearest things to us are often unrepeatable, unclassifiable, even impossible to verify empirically and yet we know them to be absolutely real. As Hart puts it, "most of the things we know to be true, often quite indubitably, do not fall within the realm of what can be tested by empirical methods; they are by their nature episodic, experiential, local, personal, intuitive, or purely logical."[12] It is important to understand that the scientific method always entails simplification. This brings to my mind, for example, the kinetic theory of gases. In a first approach, one imagines that the gas molecules are punctual particles interacting elastically. With these assumptions in mind, one can easily arrive at a simple equation – the "fundamental equation for the ideal gas" – which can successfully explain some of the basic properties of gases. In certain conditions, however, the predictions of this fundamental equation do not match reality. And the reason for this is easy to grasp: molecules do not behave as the idealized particles we started with. Real gas molecules have dimensions, i.e. they are not punctual, and the way they interact is much more complicated than the collision of billiard balls. The lesson we can learn from this example is quite straightforward: because it operates under simplifying hypothesis, science cannot capture reality in its whole complexity and subtlety.

Second, a common, and certainly very useful, research strategy is the breaking up of complex wholes in more manageable component units. This is, once again, a strategy of simplification. The problem with this approach is that the whole is not necessarily equal to the sum of its parts. This has become particularly evident in quantum mechanics, for example. The system formed by two electrons behaves differently than the two separate electrons. I remember that when I was a child I loved to disassemble my toys. More often than not, I was not able to bring them back to their original shape. The same happens with science. In order to explore

[12] Ibid., p. 71.

complex wholes, scientists break them up in more manageable units: organisms are divided into organs, organs into tissues, tissues into cells, cells into cellular components, the components of the cell into organic molecules, organic molecules into atoms, atoms into electrons and nucleons, and nucleons into quarks. What we do not know is how to put these pieces together again and reconstruct the original whole. As I will discuss further down, this methodological strategy is often translated into a metaphysical claim, namely that higher levels of complexity can be explained by the laws operative at lower levels of complexity. For example, the behavior of animals would be totally explained by their genes. Some scientists dream of a final theory that, operating at the most fundamental level of reality, would provide an all-encompassing explanation of the universe. This hope, which ends up reducing to mere epiphenomena extensive areas of human experience, is obviously supported by the assumption that the whole is equal to the sum of its parts. Such a questionable assumption is nothing but the metaphysical translation of the methodological strategy we have just described.

The third methodological strategy of science is the exclusive focus on efficient causality. Once again, I am not saying that this strategy is in itself illegitimate or misguided. It is important however, to be aware that our methodological assumptions operate as a kind of filter that leaves out important aspects of reality. In other words, the questions we ask limit the answers we get. So, given that science, in consonance with its methodological assumptions, limits the scope of its inquiry to efficient causality, it should not be surprising, for example, that no trace of purpose will be found in scientific theories.[13] Likewise, if scientific method concentrates, from the beginning, on impersonal and empirical data alone, thus excluding personal data of consciousness, then it is not surprising that the universe will be claimed to be impersonal. This does not rule out

[13] I am not trying to downplay or ignore the role of chance in biological evolution, which, as we will see, is rightly regarded as a major objection against a teleological approach to reality. The reason why I do not discuss this important question at this point is because the issue of chance will be treated in depth in the next chapter.

the possibility of an overarching purpose in nature. It simply means that science is not competent, due to its methodological constraints, to address this question: "teleology is not its concern."[14] As Hart puts it, and this is a crucial point, "to bracket form and finality out of one's investigations as far as reason allows is a matter of method, but to deny their reality altogether is a matter of metaphysics."[15] The transposition of methodological assumptions into metaphysical claims is, in this sense, *tautological*: we see only what our method allows us to see. "If we look exclusively for material and efficient processes," Hart asserts, "then indeed we find them, precisely where everyone, or nearly any metaphysical persuasion, expects them to be found."[16]

To sum up, it belongs to the nature of the scientific method to focus on certain kinds of questions and to find strategies to simplify the problems it faces. In itself, this approach to reality is totally legitimate. The problem begins – and this is what I have called methodological reductionism – when the methods proper to the natural sciences are thought to be the only legitimate way to learn about reality, and reality itself is narrowed down to what one can "see" through the methodological constraints of science. In short, one should not confuse method with truth: "when one forgets the distinction between method and truth, one becomes foolishly prone to respond to any question that cannot be answered from the vantage point of one's particular methodological perch by dismissing it as nonsensical, or by issuing a promissory note guaranteeing a solution to the problem at some juncture in the remote future, or simply by distorting the question into one that looks like the kind one really can answer after all."[17]

[14] Haught, *Is Nature Enough*, p. 101.
[15] Hart, *The Experience of God*, p. 70.
[16] Ibid., p. 69.
[17] Ibid., p. 71.

Epistemology Reductionism

Science constitutes a very successful "road to the real." As I have been repeating, the remarkable developments of the natural sciences have provided us with a quite detailed map of nature. At the same time, it is important to say that science is not the only way of getting to know reality. Moreover, there are whole realms of reality which science is simply not able to grasp. In this sense, if one interacts with the world exclusively through the lens of science, there are many things one will not be able to "see." Let me give a simple example. The microscope is a very useful device that allows scientists to explore the microscopic world. At the same time, the microscope is totally inadequate when it comes to exploring things of our own size, for example. The same could be said about a telescope or an accelerator of particles. "A microscope," Hart jokes, "may conduct the eye into the mysteries of a single cell, but it will not alert one to a collapsing roof overhead; happily we have more senses than one. We may even have spiritual senses, however much we are discouraged from trusting in them at present."[18] It is important to realize, then, that science cannot give access to every aspect of reality: "since the world has many aspects it requires different avenues of approach."[19] Haught explores five different roads to the real, "five fields of meaning through which the desire to know must travel if it is to encounter the rich texture of the world's being."[20] These avenues are: affectivity, intersubjectivity, narrativity, beauty and theory. Let me briefly dwell in each one of these "fields of meaning."

First, affectivity. Science is associated with objectivity, neutrality, and even affective detachment. And yet, affectivity, feeling, intuition are important ways of accessing other types of truth. "To approach the entire range of my experiences with the same suspension of desire that I practice in the laboratory," Haught warns, "would be not only pathological but also

[18] Ibid., p. 76.
[19] Haught, *Is Nature Enough*, p. 42.
[20] Ibid.

epistemologically crippling."[21] Affectivity is, of course, very important for religion, which is colored with a whole range of feelings: joy, sorrow, remorse, dependency, fascination, excitement, anxiety, love, hope, confidence, reverence, and so on. In fact, only the claim, yet to be confirmed, that existence is at its core impersonal would justify the kind of affective detachment that tends to characterize the scientific practice, at least ideally. I say ideally, because in fact feeling plays a role even in the practice of science: intuition, passion, humility, trust, for example, are important aspects of scientific activity.

Second, intersubjectivity. Scientific inquiry works under the assumption of an opposition between subject and object. The subject, i.e. the scientist, treats everything else as "objectifiable," and essentially deprived of personal quality. Once again, this is a legitimate way of grasping reality. It is far from being the only legitimate way, though. Even outside the human world, things are endowed with different levels of interiority, and in order to disclose this "insidness" of things one needs to adopt a kind of empathy that goes beyond objectification. In Haught's words, "an acknowledgement of the world of subjects is not explicitly operative in scientific knowing, although it is tacitly so even there. But in nonscientific cognition the desire to know must suspend the sterilizing approach it rightly employs in the field of science or theory. Instead it must adopt a posture of receptive openness to the unobjectifiable world of the other."[22] In short, the assumption that only impersonal knowledge can disclose truth amounts to an assumption that is not in itself scientific.

Another important way of searching for truth is story telling: "for human subjects the world is not experienced, at least in a rich or interesting way, apart from stories…. There is a narrative quality to all of our experience, and it is from stories, whether mythic or historical, that

[21] Ibid., p. 43.
[22] Ibid., p. 45.

we acquire any sense of reality at all."[23] Story-telling is, again, very important in religion. In Christianity, for example, the biblical narrative constitutes, along with tradition, which by the way is also inherently narrative, the fundamental witness to divine revelation. We can say, in this sense, that the Christian revelation has a narrative character. The adherents of the naturalistic worldview will unsurprisingly object that stories are simply human fabrications. While they certainly constitute a source of consolation and meaning, stories cannot approach reality, which can only be accessed through the impersonal and objective methods of science. And yet, the rejection of narrative of an epistemic mode is itself a narrative. "Close examination will show," Haught remarks, "that the naturalistic dismissal of the cognitive (as distinctive from emotive) function of story, a denial that undergirds much contemporary academic life, is itself born aloft in the wings of a firmly established cultural narrative of its own. It is empowered by the myth that trustworthy consciousness came into the world only with the birth of objectifying scientific method during the sixteenth and seventeenth Centuries."[24]

For medieval philosophers, beauty and truth were inseparable: beauty was regarded as the "splendor of truth." With the advent of Modernity, this relationship was severed, and beauty came to be relegated to the subjective realm: instead of objective and intrinsically related to truth, beauty is a product of human creativity. "Beneath its apparent aesthetical appeal, the fundamental layer of all being is the dead world of primary qualities, the scientifically knowable quantitative stuff that we overlay with the secondary qualities of our five senses."[25] Despite Modernity's dissociation between beauty and truth, aesthetics remains as an important element even for scientific research. Elegance and simplicity have been, in many occasions, the underlying (and often tacit) criteria guiding scientific research. Physicists, for example, look for equations that are

[23] Ibid., p. 46.
[24] Ibid., p. 47.
[25] Ibid., p. 48.

both simple and elegant. When a theory becomes clumsy and overburdened with additional hypothesis, it usually means that it better to pursue a different direction.

To the scientific naturalist, the four previous ways of grasping reality – affectivity, intersubjectivity, narrativity, beauty – are so personal and subjective that they are more likely to conceal reality than reveal it: "scientific naturalism is inclined to think of all pre-theoretic modes of involvement in the world as cognitionally suspect since the lack the objective detachment practiced by science. The primal field of meaning can give us mere illusions, it would seem, whereas only science can deliver the *real* world to us."[26] Theory, impersonal knowledge, would be, then, the only legitimate way of accessing reality. This is what I mean by epistemological reductionism. To be sure, although science is certainly underpinned by epistemological assumptions that are not in themselves empirically testable (even if most scientific naturalists would not admit it), theory remains science's proper way of approaching reality. And this is totally legitimate. What is more debatable is whether detached and empirical knowledge is the only way of accessing reality, especially if one accepts that the other "fields of meaning" have an important role to play in science itself. "Ironically," Haught observes, "the exclusivist preference for theory may itself be a consequence not so much of the pure desire to know as of other cravings."[27] "It is questionable … whether impersonal, subject-object detachment can put us in touch with everything the desire to know intends. Clearly there are kinds of knowing, for example in the area of intersubjective or aesthetic involvements, in which a calculated suppression of feeling would interfere with our contacting reality. There is a deep sense in which the desire to know must always remain pure. But purity does not mean affective deadness."[28]

[26] Ibid., p. 49.
[27] Ibid., p. 50.
[28] Ibid., p. 51.

Against the "epistemic narrowness" of scientific naturalism, then, we should remain open to an epistemic pluralism that acknowledges different and complementary ways of accessing reality. Because science cannot grasp every aspect of reality, we need what Haught calls a *richer empiricism*: "science is not empirical enough to capture the most important things that are going on in evolution and the universe."[29] For example, in order to discern the presence of purpose in the evolutionary process, one needs other ways of "seeing" other than those made available to science. "In fact, because science deliberately leaves out any concern with value, meaning, importance, subjectivity, intentionality or purpose, it cannot even in principle tell us whether or not these are features of the real world."[30] In other words, naturalism decrees from the outset that the universe is purposeless, and in this sense it remains blind to any vestige of teleology. "The world that naturalism takes to be fundamentally or concretely real turns out to be itself a construct built from the bottom up on a kind of faith and not observation alone. Naturalism *assumes* that a kind of cognition that suppresses personal knowing, common sense and teleological considerations can be trusted to put us in touch what is really real. It believes that the *primal* ways of knowing must take a back seat to the theoretic."[31]

It is important to stress that insofar as it parcels out reality, science lacks the capacity to read the meaning of reality as a whole. At this respect, Michael Polanyi, who was a scientist and philosopher, distinguished between two types of knowledge.[32] The first one pays attention to the constituents of reality. The second one focuses on the meaning of the whole formed by these constituents. For example, when reading the pages of a book, one reads each character separately – this is one level of knowledge – but also the meaning they are trying to convey. If one focuses

[29] Ibid., p. 120.
[30] Ibid., p. 120.
[31] Ibid., p. 121.
[32] Michael Polanyi, *Personal Knowledge: Towards a Pot-Critical Philosophy*, corrected edition, (Chicago: The University of Chicago Press, 1962).

the attention in each character or world separately, the general meaning is inevitably lost. In this sense, Haught explains,

> in order to apprehend what I am saying you have to relax your focus on the particular words, sentences and paragraphs, suspending any inclination to focus *on* them, in order to integrate them into an explicit or focal knowledge of this page's content. Likewise, if you are going to be able to see any meaning in nature you would have to learn to relax your attention to its separate parts. In fact, the more you focus on atoms, molecules, cells or other units, the less you will be able to discern any overarching meaning in their togetherness in the universe."[33]

To sum up, scientific naturalism is underpinned by an epistemological reductionism that does not find justification in science itself. There are many "roads" to reality, and we need all of them in order to be able to explore reality in all its integrity and depth. In fact, science is simply not capacitated to explore reality in all its depth. In the words of John Haught, "if there is a 'more-than-nature,' it could never be grasped cognitionally in the same way that things in nature are mastered by science. Transcendent reality would come first to our awareness in primal regions of knowing – affective, intersubjective, narrative and aesthetic – rather than in the theoretic or objectifying field."[34]

It is interesting to note, finally, that a careful analysis of the "human desire to know" can provide a convincing argument against the claims of scientific naturalism. The core of the argument, which John Haught explores in *Is Nature Enough?*, resides in the observation that a naturalistic interpretation of the world ends up frustrating human desire to know.[35] In other words, scientific naturalism cannot meet the human mind's best standards of understanding. Paraphrasing John Haught, the essentially mindless, purposeless, self-originating, self-enclosed universe of scientific naturalism is not enough to house our own critical intelligence. Scientific

[33] Haught, *Is Nature Enough*, p. 123.
[34] Ibid., p. 54.
[35] See: Ibid., p. 36.

naturalism is simply too narrow to accommodate human desire to know. In face of this, we have only two options: either to commit "cognitional suicide," or to acknowledge the bankruptcy of scientific naturalism, and open ourselves to theism as a viable possibility.[36] In the end, the question that we really have to ask ourselves is: "which worldview gives the better account of the anticipatory thrust of our desire to know? Naturalism, with its reduction of mind to the earlier-and-simpler, and its prediction of eventual obliteration of subjectivity and truth? Or a theological worldview in which the mind's anticipation is aroused by an infinite fullness of truth and goodness that grasps hold of each of us here and now, luring our minds, and hearts, to enter more completely into it?"[37] Due to limitations in space, I will pursue this line of argumentation elsewhere.

Metaphysical Reductionism

If the methodological and epistemological reductionisms that ground scientific naturalism constrict our access to reality, metaphysical reductionism constricts reality itself. Or, to be more precise, scientific naturalism offers a constricted view of reality that suffers from important distortions and oversights. Metaphysical reductionism is intrinsically related to methodological and epistemological reductionism, and all three are supported by tacit assumptions that I have been trying to uncover. On the one hand, the way one conceives reality determines the way to know it. For example, if one thinks that reality is utterly impersonal, then the objective methods of science are certainly the only legitimate means to investigate it. On the other hand, if we start with a narrow epistemology, we will inevitably be blind to important aspects of reality, which we then portray in a constricted way.

[36] See: Conor Cunningham, *Darwin's Pious Idea: Why the Ultra-Darwinists and Creationist Both Get It Wrong* (Grand rapids, Michigan, Cambridge, U.K.: William B. Eerdmans Publishing Company, 2010), p. 336.
[37] Haught, *Is Nature Enough*, p. 215.

In the discussion above, we have implicitly mentioned two key forms of metaphysical reductionism that tend to characterizes scientific naturalism. The first one is the claim that the whole is equal to the sum of its parts, in such a way that everything that exists can ultimately be explained in terms of elementary particles animated by fundamental laws. As I have already mentioned, this claim has been contested by science itself. It is, indeed, a matter of controversy whether the scientific laws that govern higher levels of complexity can be subsumed in the laws operative at lower levels of complexity. We will discuss this question in the next chapter. In any case, if one subscribes to this materialistic interpretation of the world, then the higher levels of complexity, including the human phenomenon and its various dimensions, end up reduced to mere epiphenomena without ontological consistency. This is what Haught calls "ontology of death." In its core, reality is essentially dead, i.e. totally deprived of any personal qualities: "lifelessness seems more real than life."[38] "Having exorcised the cosmos of life and mind" the author continues, "the modern ontology of death has bequeathed to science the logically impossible assignment of explaining life and mind in terms of what naturalists take to be an essentially lifeless and mindless universe."[39]

A question that arises at this point is whether and how subjectivity can emerge out of a material substrate that is completely devoid of subjectivity. According to John Haught, who in this point agrees with Alfred North Whitehead, there is no such a thing as completely "mindless" matter. All things are endowed with at least rudimentary levels of "interiority." During evolution "subjectivity" intensifies and eventually self-conscious beings emerge. We can talk, in this sense, of a kind of "panexperientialism."[40] Haught's view is far from being consensual, though.[41]

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[38] Ibid., p. 61.
[39] Ibid., p. 63.
[40] See: John Haught, *God After Darwin: A Theology of Evolution* (Boulder, Colorado: Westview Press, 2000), pp. 165-84.
[41] See, for example: Hart, *The Experience of God*, pp. 215-216.

The second type of metaphysical reductionism that typically characterizes scientific naturalism is the constricted understanding of causality that attempts at explaining natural phenomena in terms of efficient causes alone. Focusing its attention on causes that are quantifiable and susceptible of empirical observation, modern science abandoned every type of causality that was beyond the reach of experiment. This was the case of formal and final causes. On the other hand, while the notion of matter was kept, its meaning was changed. Instead of being associated with "pure potentiality," matter was simply thought of as the fundamental "stuff" of the universe. In short, "of the four causes, only efficient causality remained since it alone could be expressed mathematically, observed empirically, and controlled experimentally."[42] Even the understanding of efficient causality was progressively "contracted" and understood in terms of physical interactions only. While initially it was essentially a methodological assumption, the exclusive focus on a narrow understanding of efficient causality soon became an ontological assertion about the nature of causality: every phenomenon in the world fits into a deterministic and mechanical chain of efficient causality that cannot be violated. In other words, causality became a univocal concept: "the term 'causality' was no longer an analogous notion, applicable to a range of causes, but a univocal idea applied to the one unique type of causality to be found in the cosmos: the efficient causality of the energy that moves the atoms."[43]

It is important to stress that the exclusive focus on efficient causes stems from metaphysical and methodological assumptions that are not in themselves scientific. In other words, the fact that scientific materialism excludes any type of causality other than efficient causality does not necessarily rule out that possibility of nature being endowed with a much richer conception of causality. Science is particularly apt to disclose the chains of efficient

[42] Michael J. Dodds, *Unlocking Divine Action: Contemporary Science and Thomas Aquinas* (Washington, D.C.: The Catholic University of America, 2012), p. 49.
[43] Idem.

causality underlying natural phenomena. At the same time, given its methodological assumptions, science seems to be blind to other types of causality, which, if they exist, do not have to be understood as being in competition with efficient causality. As Hart reminds us, different kinds of causality do not compete with one another:

> In the older metaphysics it was impossible for one kind of causality to exclude another, not simply because each occupied a unique logical space but because all forms of causality were seen as thoroughly and integrally complementary to one another…. We should then, at any rate, ignore the oft-repeated claim that the success of the modern sciences has somehow proved the nonexistence or conceptual emptiness of 'higher' forms of causality.[44]

To the narrow understanding of causality embraced by scientific naturalists I would contrapose, following John Haught, a kind of layered explanation that acknowledges the different kinds of causality operative in nature. "Adequate explanation," Haught pointedly observes, "runs endlessly deep and involves many levels. No one science, or even the whole set of sciences, can ever comprehend the rich totality of causal ingredients that underlie each cosmic event…. In fact, individual sciences can reach toward exactness only by abstracting from most of nature's causal depth."[45] John Haught offers an insightful example that illustrates the meaning of "layered explanation."[46] Suppose that someone asks me to explain why a pot of water is boiling on my stove. On a first level, I could simply say that water is boiling in my stove because a transition of phase from a liquid to a gaseous state is taking place as a result of heat transference from the stove to the water that excites the H_2O molecules. On a second level, however, I could explain that the water is boiling because I turned the gas burner on. This second explanation is, I guess

[44] Hart, *The Experience of God*, pp. 68-69. "Even if we should ever succeed at tracking back the entire physical narrative of reality to its origin from 'matter' [the author continues] (…) and to a set of physical immutable laws (like the law of gravity) describable by mathematics, we shall still not have dispensed with forms of finality" (ibid., p. 69). Along the same lines, Haught reminds us that, "in Aristotelian terms, final causes are not rivals to efficient or material causes" (Haught, *Is Nature Enough?*, p. 75).
[45] Ibid., p. 18.
[46] Ibid., p. 69.

everyone would agree, as reasonable as the first one. However, we can yet think of a third level of explanation: the water is boiling because I want to prepare a tea.

> Here we have three different levels of explanation. All are correct and relevant, but they cannot be reduced to or mapped onto one another. Each adds something important to an understanding of why the water is boiling, and it does so without conflicting or competing with others. Of course, the persistent materialist will still try to reduce all levels to atomic movement, but logically speaking the third-person language of physics and chemistry is not reducible to the first-person, subjective perspective of the 'I want tea' that leads me to boil the water.[47]

It is not difficult to see how this simple example can be analogously applied to some other, perhaps more vital, questions, as for example: "how did life appear in the universe," or "how did consciousness emerge?" As in the example of water boiling on the stove, science has an important role in addressing these questions. At the same time, plenty of space is still left for approaches that go beyond the natural sciences, namely theological explanations. For example, "without contradicting or competing with elaborate physical and chemical explanations theology may be justified in claiming that life exists ultimately because of the infinite generosity and attractive power of God."[48] I am of course referring to the classical distinction between primary and secondary causation, which we will have the chance to explore in greater depth in the following chapters.

A third question, which we will have to deal with in greater depth, is related to the concept of "emergence." Contemporary science tends to claim, as I have already noticed, that higher levels of complexity emerge out of lower levels of complexity without the need of any transcendent cause. A pressing question one has to ask, however, is: where has this *surplus* of complexity (or being) come from? As Haught rightly asks, "naturalism has been satisfied to

[47] Ibid., p. 70.
[48] Ibid., p. 71.

explain the more in terms of the less, and the later in terms of the earlier, but can it avoid a virtual appeal to magic in doing so? Where does the more come from?"[49] Simply because one is able to describe the historical development natural process, this does not necessarily mean that one has disclosed all the causes at work. Presuming so would mean to fall in a kind of genetic fallacy: the mistake of thinking that to have described a thing's material history or physical origin is to have explained the thing exhaustively. "We tend to presume," Hart warns, "that one can discover the temporally prior physical causes of some object – the world, an organism, a behavior, a religion, a mental event, an experience, or anything else – one has thereby eliminated all other possible causal explanations of the object. But this is a principle that is true only if materialism is true, and materialism is true only if this principle is true, and logical rules should not set the rule for our thinking."[50] These brief remarks should be enough for one to understand what is at stake with the concept of emergence. Since this problem turns out to be one of the key questions of this thesis, a whole section will be dedicate to it in the next chapter.

Concluding Remarks

Let us now pull together all the loose threads. In order to do so, it is important not to lose sight of the question that guides the first two chapters of this thesis: given the claim that immanent causes alone can explain the emergence of higher levels of complexity from lower ones, in a process that appears to be pervaded by chance, does it still make sense to cling to a theistic worldview? In other words, is the belief in a creator and providential God still tenable? The goal of this first chapter was to suggest that a purely naturalistic interpretation of reality should be regarded more

[49] Ibid., p. 82. "Scientific accounts," Haught continues, "are limited to explain such captivating emergent as life and mind in terms of what is lifeless and mindless. However, since any abrupt transition from deadness to aliveness in natural history would appear magical, naturalists are obliged by their creed to look for ways to make the transition seem perfectly smooth and completely specifiable in physical and chemical terms. One way of doing so is to make lifelessness the pervasive natural state of being and deny that life has any distinct reality at all" (ibid., p. 84).
[50] Hart, *The Experience of God*, p. 68.

as worldview than as a logical consequence of scientific developments. I named this view "scientific naturalism," and tried to uncover the non-scientific assumptions that underpin its central claims. The core of scientific naturalism is a threefold reductionism – methodological, epistemological, and metaphysical – that ignores from the outset legitimate questions about the world as a whole, and cannot grasp reality in all its depth. In other words, the answers one gets necessarily correspond to the questions one asks. And science is simply not well-equipped to ask and answer certain types of questions, like for example the questions about the origin and final purpose of the universe. This does not mean that there is something wrong with science: science is doing its job when it applies a method that is inevitably "reductive." But the fact that science cannot address these questions does not necessarily mean that they are unanswerable or nonsensical. It simply means that in order to engage these questions, we have to make use of other different forms of knowledge. In the words of Hart,

> The whole power, beauty, and (and for the want of a better word) piety of the science lies in that fruitful narrowness of focus that I mentioned above, that austere abdication of metaphysical pretensions that permits them their potentially interminable inductive and theoretical odyssey through the physical order. It is the purity of this vocation to the particular that is the special glory of science. This means that sciences are, by their very nature, commendably fragmentary and, in regard to many real and important questions about existence, utterly inconsequential. Not only can they not provide knowledge of everything; they cannot provide complete knowledge of anything.[51]

The whole purpose of this chapter was to "level the field," and suggest that scientific naturalism, no less than the theistic worldview, is underpinned by tacit assumptions, some of which we have tried to bring to light. It will be the goal of the next chapter to defend the "viability," and even superiority, of the "theistic worldview." In order to do so, we will have to embrace the epistemological and methodological pluralism I have alluded to in this chapter.

[51] Hart, *The Experience of God*, pp. 75-76.

Chapter 2

Towards a Theistic Interpretation of Evolution

> *Materialism is among the most problematic of philosophical standpoints, the most impoverished in its explanatory range, and among the most willful and (for want of a better word) magical in its logic, even if it has been in fashion for a couple of centuries or more.*
>
> David Bentley Hart[1]

One of the most popular myths of our times is the idea that science, and in particular the theory of evolution, rules out God's existence. Scientific naturalism would be, in this sense, a logical consequence of the discoveries of contemporary science. It was the goal of the previous chapter to challenge this claim. While science does make a very important contribution to our understanding of the universe, one that challenges theologians to re-think divine action and the meaning of Creation, the connection between science and scientific naturalism is only made possible by non-scientific assumptions – *hidden cards* – which we have been trying to uncover. Supposing that our discussion was persuasive enough, the field is now leveled: scientific naturalism is no less a worldview than theism. In other words, despite its "scientific aura," scientific naturalism is deeply indebted to epistemological and metaphysical presuppositions that cannot be justified by science itself. Of course, this, by itself, does not say much about the plausibility of the two worldviews.

The question that I now want to address pertains, then, to the relative coherence and plausibility of the naturalist and theistic worldviews. If we grant that scientific naturalism is no more objective than theism, in the sense that it is not the unavoidable consequence of the empirical sciences, is there a way of assessing which worldview is more consistent? In short,

[1] David Bentley Hart, *The experience of God: Being, Consciousness, Bliss* (New Haven and London: Yale University Press, 2013), p. 48.

which worldview makes more sense: scientific naturalism or theism? It will be the goal of this chapter to explain why I think that theism is actually more apt than scientific naturalism to make sense of emergent evolution, and in this sense closer to the truth.

Science, I have been trying to argue, does not necessarily disprove God's existence. This does not mean, of course, that we should expect to find in science alone enough evidence to unequivocally affirm God's existence. Science is "methodologically agnostic," and that is the way it should be. It would be a mistake, in this sense, to attempt at defending the truth of the theistic worldview within the strict confines of science. At the same time, science does raise important challenges to the theist worldview, challenges that no serious discussion can ignore. The first challenge consists in the claim that nature is able, by itself, to generate everything that exists: the structures of the universe, inorganic matter, life, the diversity of species, and human beings. Supposing this indeed true, what sense does it make, then, to say that God is Creator? What does God create if not the universe and things therein? Moreover, if every natural phenomenon can be totally explained within the confined of science, how can God interact with creatures without disrupting the integrity of the immanent order? The next challenge we have to deal with is the pervasive presence of chance not only throughout the process of evolution, but also at the quantum level. Given the apparent tentativeness of the process of evolution, its many dead ends, and the uselessness of many organic structures, how can we maintain that the world is the creation of a provident God? How is chance compatible with purpose? Finally, the Darwinian account of the process of biological evolution is tainted by the shadow of pain, death and extinction. As Elizabeth Johnson writes, "life evolves at a terrible cost in pain and death. The natural world of living organisms is not just the beautiful dwelling place of the Creator Spirit whose love empowers creation to evolve according to its own free, rigorous, process. It is also a place of

agony insofar as these processes exact at high price."[2] The question that naturally arises is: can we honestly say that the process of evolution, shadowed as it is by suffering, death and an "incredible waste," is created and sustained by an all-powerful and loving God? How is such a massive presence of suffering compatible with a provident and omnipotent God who cares about creation?

Three challenges, three sets of questions that apparently make untenable three core claims of classical theism: that God is all-powerful, provident (i.e. God creates and governs the world according to a pre-existing plan) and loving. The first task of this chapter will be precisely to analyze each one of these three challenges. Without meaning to evade the seriousness they pose to the theistic worldview, I will suggest that scientific data actually leave the door open to a theistic interpretation of the reality. However, if we want to offer a more convincing defense of theism, we will have to go beyond the confines of science and plunge into the metaphysical realm. In my argumentation, I will submit emergent evolution to the scrutiny of the principle of sufficient reason (or principle of causality), according to which "no effect can be greater than its cause."[3] If one assumes, as some recent scientific developments appear to suggest, that higher levels of complexity cannot be reduced to the lower levels, i.e. that more complexity really means *more* being, we will have to explain where does the *more* come from. I will be asking whether scientific materialism and scientific naturalism can offer a consistent response to this question. The fact that science is able to describe the evolutionary process of the universe does not necessarily mean, indeed, that we have an adequate metaphysical explanation of the causes at play. Although I will not be able, within the limited space of this thesis, to propose a consistent metaphysics of evolution, I hope I will at least be able to raise some challenging questions that will hopefully arouse some "metaphysical discomfort." Along the same lines, the sheer fact of chance begs for a

[2] Elizabeth Johnson, *Ask the Beasts. Darwin and the God of Love* (London: Bloomsbury, 2014), p. 181.
[3] Norris Clark, *The One and the Many: A Contemporary Thomistic Metaphysics* (Notre Dame, Indiana: University of Notre Dame Press, 2001), p. 247.

metaphysical interpretation. I will suggest that what appears to be mere lack of purpose might well be the condition of possibility for the emergence of autonomy and freedom. We could say, in this sense, that chance has a "constructive" side to it. I will close the section with what, in my opinion, turns out be the most pressing challenge against scientific naturalism: why is there something rather nothing? How did anything come to exist? As astrophysicist Martin Rees remarks, "theorists may, some day, be able to write down fundamental equations governing physical reality. But physics can never explain what 'breathes fire' into the equations, and actualizes them is a real cosmos."[4]

The Emergent Universe

Paraphrasing Bernard Lonergan, Neil Ormerod claims that "you cannot prove the existence of God to a materialist without first converting the materialist away from materialism."[5] We have seen, in the first chapter, how scientific materialism disregards vast domains of reality as mere epiphenomena without ontological consistency. Unsurprisingly, such a narrow interpretation of reality cannot hold a place for God. The good news is that contemporary scientists and philosophers of science seem to be moving away, even if parsimoniously, from reductionist interpretations of nature and the human phenomena.

During the 20th century, the great majority of scientists and philosophers of science subscribed to some form of reductionism. It became the dream of many physicists to explaining everything that exists in terms of elementary particles and fundamental laws. Towards the end of the 20th century, however, the reductionist project begun exhibiting some cracks, which led a considerable number of philosophers of science to retrieve the long time abandoned idea of

[4] Martin Rees, *Just Six Numbers: The Deep Forces that Shape the Universe* (New York: Basic Books, 2000), p. 131.
[5] Ormerod, *A Public God: Natural Theology Reconsidered* (Minneapolis: Fortress Press, 2015), p. 71. Lonergan's original affirmation is: "one cannot prove the existence of God to a Kantian without first breaking his allegiance to Kant. One cannot prove the existence of God to a positivist without first converting him from positivism."

emergence.[6] In fact, the *re-emergence* of *emergence* theories presupposes the failure of the once-popular project of complete explanatory reduction.[7] In the words of Paul Davies, "there is a growing band of scientists who are pushing at the straightjacket of orthodox causation…, and although physics remains deeply reductionistic, there is a sense that the subject is poisoned for a dramatic paradigm shift in this regard."[8]

What is really at stake in the on-going discussion between reductionists and emergentists is the status of the higher levels of complexity. In his book *The Emergence of Everything*, Harold Morowitz describes the emergence of the complex world we live in in twenty eight steps, from the beginning of the universe all the way to the emergence of the spiritual.[9] That the universe evolves is not something under dispute. The real question under debate pertains, on the one hand, to the ontological status of the distinct levels, and, on the other hand, to the causes that underpin the evolutionary process. In Gregersen's words,

> The natural leaps of evolutionary novelty are to be accepted as empirical facts with an attitude of 'natural piety,' to use Samuel Alexander's famous phrase. What is up for debate, however, is the ontological status of emergent phenomena. Are emergent properties merely the epiphenomenal outcomes of fundamentally microphysical processes? Or do higher-order systems acquire new forms of causal influence which affect the lower-level entities by which they are constituted?[10]

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[6] For a concise historical account of the concept of emergence see: Philip Clayton: "Conceptual Foundations of Emergence Theory," in Philip Clayton and Paul Davies (eds.), *The Re-emergence of Emergence: The Emergentist Hypothesis* (New York: Oxford University Press, 2006), pp. 1-28. See also: Nancey Murphy, "Divine Action, Emergence, and Scientific Explanation," in Peter Harrison, *The Cambridge Companion to Science and Religion* (New York, Cambridge University Press, 2010), pp. 244-259. According to Nancey Murphy, the most significant criticisms of causal reductionism fall in three stages: an early emergentism movement (from approximately 1920 to 1950); the exploration of the concept of downward causation or whole-part-constraint (beginning in the 1910s); and, currently, an account of causation that combines both downward causation and emergence" (ibid., p. 247).

[7] Philip Clayton, "Conceptual Foundations of Emergence Theory," p. 1.

[8] Paul Davies, "Preface," in Philip Clayton and Paul Davies (eds.), *The Re-emergence of Emergence: The Emergentist Hypothesis* (New York: Oxford University Press, 2006), p. xii.

[9] Harold J. Morowitz, *The Emergence of Everything: How the World became Complex* (New York: Oxford University Press, 2002).

[10] Niels Gregersen, "Emergence, What is at Stake for Religious Reflection?" in Philip Clayton and Paul Davies (eds.), *The Re-emergence of Emergence: The Emergentist Hypothesis* (New York: Oxford University Press, 2006), p. 279.

While reductionists tend to collapse higher levels of complexity into the lower, emergentists safeguard the ontological consistency of each level. In other words, the novelties that appear throughout the process of emergence are considered to be real and exhibit new properties that cannot be found in the inferior levels. As Gregersen explains, "emergents are *qualitative novelties* which should be distinguished from mere resultants that come about by a quantitative addition of parts." [11] The acknowledgement of the ontological consistency of the different levels of complexity leads to a conception of nature as a *nested hierarchy* of ontological levels, "so that the higher emergent levels (e.g. living organisms) include the lower levels (e.g. inorganic chemistry), on which they are based."[12] Finally, most emergentists would agree that the qualitative novelties that arise at the higher levels cannot be deduced (at least by any finite subject) from the properties and laws that characterize the lower levels. In other words, insofar as the higher levels are not predictable from our knowledge of the constituent parts, emergentists are "explanatory holists." So far, most emergentists would agree. The opinions split, however, when we inquire about: (i) the reasons why the emerging properties cannot be explained in terms of our knowledge of the lower levels; and (ii) the causal capacities of the emergent phenomena. Different answers to these fundamental questions configure two distinct categories of emergence theories: *weak emergence* and *strong emergence*, which are, in short, the converse of epistemological (or weak) and ontological (or strong) reductionism, respectively.[13] Let me explain.

While they maintain the non-reducibility of the higher levels – something distinctively new appears – *weak emergentists* insists that all causal work happens at the base level: "however

[11] Gregersen, "Emergence and Complexity," in *The Oxford Handbook of Religion and Science*, printed from Oxford Handbooks On Line (www.oxfordhandbooks.com), Oxford University Press, 2015, p. 1.
[12] Idem.
[13] Murphy, "Divine Action, Emergence, and Scientific Explanation," pp. 249-250. It is important to note that the distinction between *strong* and *weak* emergence is not uniformly defined by different authors. While for some authors place the emphasis on the presence or absence of top-down causality, other authors place the emphasis on the (possibility or impossibility) of deriving knowledge of higher processes from knowledge of lower processes.

great the role of emergent patterns and explanations, ultimately the causal work is done at the microphysical level."[14] In other words, higher order emergent properties cannot – yet – be expressed in terms of lower-level properties. This might be due to the limitations of our current knowledge. For this reason weak emergence is often called "epistemological emergence."[15] While being truly distinct from lower level properties, higher order emergent properties could one day be explained, at least in principle, by the causes operative at the lower level.[16] In short, *weak* or *epistemological emergentism* can be summarized in two assertions: (i) *the feature of epistemic novelty*: "something distinctively new appears (relative to our present-day theories);" (ii) *the feature of non-reducibility*: "higher-order emergent levels are not (yet) expressible or explainable in terms of the explanatory models at hand concerning the micro-physical elements."[17]

Embraced by a smaller minority of scientists and philosophers of science is the conviction that emergent phenomena can obtain new causal capacities which endow higher-level systems with the capacity to exert top-down influence on the lower levels. Genuinely new causal agents or processes come into existence over the course of the process of emergence. This is what we call *strong* or *ontological emergence*.[18] In short, *strong emergentism* adds an additional requirement to the two assertions above: (iii) the *feature of top-down causality*: "higher or more comprehensive levels of organization do exercise a dynamic influence on their constitutive levels, for example, by positive feedback, negative feedback, or selective emphasis."[19] It is important to note that strong emergence cannot succeed in systems that are causally closed at the microscopic level. If this were the case, there would be no room for additional principles to operate at higher levels. We will see, in the next section, how chance may play an important role in this regard.

[14] Clayton, "Conceptual Foundations of Emergence Theory," p. 8.
[15] Idem.
[16] Gregersen, "Emergence, What is at Stake for Religious Reflection?," p. 283.
[17] Ibid., p. 284.
[18] See: Gregersen, "Emergence and Complexity," p. 6.
[19] Gregersen, "Emergence, What is at Stake for Religious Reflection?," p. 285.

The key distinction between *weak* and *strong emergence* is further refined by Niels Gregersen, who classifies different approaches to emergence in four distinct categories.[20] $Emergence_1$ coincides with strong programs of computational complexity (CC), which aims at developing simple bottom-up algorithms that simulate evolving phenomena. An example would be the emergence of fractal patterns on the computer screen. This type of emergence is not necessarily related to the real world. $Emergence_2$ refers to cases in which the higher levels are endowed with new properties or attributes but not with new causal capacities. This type of emergence can be modelled by CC. An example would be the formation of water from Hydrogen and Oxygen. $Emergence_{1,2}$ are examples of weak emergence. In $emergence_3$, the appearance of new properties and attributes at higher levels is accompanied by the emergence of new causal capacities. Finally, $emergence_4$ refers to the emergence of systems that are not-only self-referential, but also self-reflective. An example would be human consciousness. It is interesting to note that the term "emergent dualism" has been used to express the idea that while the mind is indeed produced by the human brains, once developed it acquires a causal autonomy that cannot be reduced to the lower levels. We could say that according to this view, the "soul" emerges out of matter.[21] The term "emergent dualism" is perhaps problematic, but it constitutes, no doubt, a powerful expression of what is really at stake in the concept of emergence.

So, where does the concept of emergence leave us? In which way is it helpful in our attempt to defend the truth of the theistic worldview? We have to acknowledge, in the first place, that emergentism does not break through the walls of naturalism. In fact, emergentists "subscribe to a robust naturalism, according to which mental processes supervene on biological processes, and biological processes on physical processes."[22] The whole idea is precisely to explain the

[20] Gregersen, "Emergence and Complexity," pp. 5-7.
[21] Ibid., p. 7.
[22] Ibid., p. 2.

whole reality in terms of purely immanent causes.[23] We have just seen how some authors claim that even the mind arises through an emergent process.[24] Moreover, theories of emergence tend to subscribe to a rigorous ontological monism: everything is matter, but matter has emergent properties.[25] "Reality is ultimately composed of one basic kind of 'stuff'. Yet, the concepts of physics are not sufficient to explain all the forms that this stuff takes – all the ways it comes to be structured, individuated, and causally efficacious."[26] Seen from this angle, emergentism does not seem to be of great help to our endeavor. There is no need, emergentist theories appear to claim, to go beyond nature to explain every aspect of reality, and in this sense God seems to remains a superfluous, even inconvenient, hypothesis. Whether this is a truly scientific or scientific-based affirmation is something that we will have to assess.

I would contend, nevertheless, that the concept of emergence has the great advantage of moving away from reductionism, thus recognizing the ontological consistency of each level of reality, even the spiritual. This move allows us to recognize whole realms of reality, including the spiritual, that were before regarded as mere *epiphenomena*. And once we do so, the question of

[23] Deacon, for example, believes to have uncovered, at least partially, the dynamics that underpins emergent phenomena: "emergent phenomena grow out of the amplification dynamic that can spontaneously develop in very large ensembles of interacting elements by virtue of continuing circulation of interaction constraints and biases, which become expressed as system-wide characteristics. In other words, these emergent forms of causality are due to a curious type of circular connectivity of causal dynamics, not a special form of causality" (Terrence Deacon, "Emergence: The Hole at the Wheel's Hub," in Philip Clayton and Paul Davies (eds.), *The Re-emergence of Emergence: The Emergentist Hypothesis* (New York: Oxford University Press, 2006), p. 124). We will come back to a variation of this idea in the next section, when considering the role of chance in the "emergence" of higher levels of complexity.

[24] Some authors will go even further and affirm that also God is the product of emergence. This is what Niels Gregersen calls "evolving theistic naturalism." (Gregersen, "Emergence, What is at Stake for Religious Reflection?," p. 288-290).

[25] When I say "tend," I have in mind authors like Terrence Deacon for whom non-material "absents" such as function, reference, purpose or value play a key role in the emergence of higher levels: "What is absent matters," Deacon affirms, "and yet our current understanding of the physical universe suggests that it should not. A causal role for absence seems to be absent for the natural sciences" (Terrence Deacon, *Incomplete Nature: How Mind Emerged From Matter* (New York/London: W. W. Norton & Company, 2013), p. 3) Note, that at the same time, Deacon is quite explicit about his intentions to remain within the confines of nature.

[26] Clayton, "Conceptual Foundations of Emergence Theory," p. 2.

God will inevitably acquire some traction.[27] To go back to Lonergan's intuition, as appropriated by Ormerod, "you cannot prove the existence of God to a materialist without first converting the materialist away from materialism."[28] Particularly important is the idea according to which the higher levels do not disrupt the integrity of the lower levels. To be more precise, the emergence of new causal capacities is not in conflict with the causes operating at the lower levels. On the contrary, the causal work at the base level is what underpins the higher levels and their causal capacities.[29] This way of understanding the relationship between different levels of complexity constitutes an insightful model for the relationship between God and the world: God informs and configures the world as a whole without compromising its integrity and autonomy.[30] This is how Gregersen explains it: "in a manner analogous to the way in which higher-level systems (for example, a flock of migration birds) exercise an informational influence on lower level systems (the individual birds), God informs and reconfigures the world-as-a-whole."[31] God is, in this sense, a kind of "couched in" causality that brings in new information without interfering with the natural processes.[32]

Before closing this section, it is important to observe that neither theists nor naturalists, reductionists or not, are exempted from demonstrating the metaphysical cogency of their explanation of our multi-leveled world: "at the level of ultimate explanations," Gregersen notes, "both the theist and non-theist will be asked how they propose to explain the fact that laws of nature are fertile as they are, and why evolution exhibits the upward drive that we are able to

[27] See Davies, "Preface," in *The Re-emergence of Emergence*, p. xiii.
[28] Ormerod, *A Public God*, p. 71.
[29] This way of understanding the relationship between the higher and lower levels of complexity is what Lonergan calls "sublation:" the lower is taken up in the higher, in such a way that it becomes part of a more complex system while retaining its own properties. See: Bernard Lonergan, S.J., *Insigh: A Study of Human Understanding,* edited by Fredrick E. Crowe and Robert Doran, Collected Works of Bernard Lonergan, Vol. 3 (Toronto: University of Toronto Press, 1992), pp. 446-48.
[30] This was an idea first proposed by Arthur Peacocke. See: Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming – Natural, Divine, and Human* (Minneapolis: Fortress Press, 1993), pp. 157-60.
[31] Gregersen, "Emergence and Complexity," p. 9.
[32] Idem.

observe. No metaphysics can avoid the task of explaining the fact of nature's stunning capacity for self-complexification."[33] In the end, it is difficult to avoid the impression that we are not being told the whole story when we hear that new levels of complexity can emerge from lower levels without the need of some cause that transcends nature. John Haught expresses the same uneasiness when reflecting about naturalistic explanations of the mind's origin: "after many years of looking at naturalistic writings I have yet to find a reasonable answer. Instead I find magic and alchemy everywhere. In almost every case, to put it bluntly, the naturalist's account of the origin of mind is one in which I am asked to believe that the lustrous gold of critical intelligence 'emerges' from the dross of pure mindlessness without also being shown how such alchemy works."[34] We have already noted how Haught's refusal to accept that the mind can emerge out of "mindless" leads him to espouse a kind of "panexperientialism" that ascribes even to the lowest levels of reality a certain degree of *inwardness*.[35] The question that naturally arises is whether this proposal is minimally credible from the scientific point of view. Can we really say that lifeless objects, like rocks, for example, are endowed with even a rudimentary type of *interiority*?

Is Chance Compatible with Purpose?

Chance is one of the most pressing challenges against the belief in a God who is both creator and provident. According to contemporary science, chance appears to play a key role both at the quantum level, and also in the process of biological evolution. Given that chance appears to be diametrically opposed to design, it seems difficult, if not impossible, to maintain that God created and rules the world according to a plan. In the words of John Haught, "evolutionary science has shattered every pious illusion that life and human existence were planned from all eternity. It contradicts all traditional religious intuitions that our universe is guided by divine wisdom and

[33] Gregersen, "Emergence and Complexity," p. 10.
[34] Haught, *Is Nature Enough?*, p. 135.
[35] See: ibid, ch. 2.

that a glorious destiny awaits it."[36] This opinion is shared by many contemporary scientists, for whom the story of the universe is an inherently meaningless process, the result of randomness and impersonal laws. In the words of Jacques Monod, the French Biologist and Nobel Prize of Medicine, "man at last knows he is alone in the unfeeling immensity of the universe, out of which he has emerged only by chance."[37] Although widely spread, the opinion that chance rules out purpose is debatable, and can be challenged even on scientific grounds. It is precisely the goal of this section to suggest that a nuanced understanding of chance and its role throughout the evolutionary process is not incompatible with an overall sense of direction and purpose for individual phenomena and the universe as a whole. Let me start by briefly mentioning the two realms where chance appears to play a major role: quantum mechanics, and Darwinian evolution.

Built upon the ground-breaking work of Isaac Newton, classical mechanics is utterly deterministic: the movement of physical bodies is explained by physical laws that can be expressed mathematically and are completely deterministic, in the sense that they provide a model of causation where a given effect follows necessarily from its cause. Despite their simplicity, it soon became obvious that their application even to very simple problems can be highly resistant to simple explanation. For example, even a system as simple as three bodies interacting gravitationally is very difficult to describe mathematically. This, however, did not prevent the rise of a mechanistic worldview: the state of the universe at a certain instant is completely determined by the past, and completely determines the future. If one knows the position and velocity of all the particles of the universe at a certain instant, then, by applying Newton's laws, one should be able to know with precision – provided that we would have a sufficiently powerful mind – the past and the future state of the universe. While Newtonian physics is still quite useful – they are basically

[36] Haught, *God After Darwin*, p. 11.
[37] Jacques Monod, *Chance and Necessity: An Essay on the Natural Philosophy of Modern Biology* (New York: Vintage, 1972), p. 180.

all we need in order to plan a trip to the moon, for example – the developments of modern science led to the inevitable collapse of the mechanistic worldview. Interestingly enough, the first strike against the Newtonian worldview came not from physics, but from biology and Darwin's theory of evolution. However, since we are now dealing with physics, let me briefly describe the way quantum physics challenged the determinism of classical mechanics.

In the beginning of the 20th century, a series of important experiments showed that Newton's laws of movement break down when applied to very small things, like electrons or atoms. Eventually, the physics of the very small came to be described by a new theory, known as quantum mechanics.[38] It is impossible, of course, to provide a satisfactory explanation of quantum mechanics within one or two paragraphs. For our purposes, however, it is enough to say that instead of being described in terms of their exact position and velocity, particles are now characterized by what physicists call a "wave function." Once the wave function associated with a given system (for example an electron within an atom of Hydrogen) is known, one can calculate the probability associated with the possible outcomes of a measurement of energy or position, for example. In other words, we can no longer know with precision the position and velocity of particles within a given system, but only probabilities associated with these physical quantities. The evolution of a system is ruled by Schrödinger's wave equation, which basically tells us how wave functions, and thus probabilities associated with physical quantities, evolve with time. This means that while we can no longer know with precision the position and velocity of the particles that constitute a certain system, we can still know how the system will evolve. The way probabilities evolve is, in fact, completely determined by Schrödinger's equation. In this sense, although this is often not acknowledged, quantum mechanics combines chance and determinism

[38] For an accessible and accurate description of the main features of the theory of quantum mechanics, and the main philosophical disputes associated with it, see: Ian Barbour, *Religion and Science: Historical and Contemporary Issues* (New, NY: HarperSanFrancisco, 1990), pp. 166-77.

in a way that was unknown to classical mechanics, and challenges the idea that chance is totally opposed to order and even purpose. We will return to this discussion, but let me now turn to Darwin and his theory of natural selection.

During the nineteenth century, scientists had to grapple with the mounting evidence, from both geology and biology, in favor of the dynamic understanding of the world, including the living species. Darwin's theory of evolution of species was preceded by approaches that somehow combined the dynamic character of biological history with a still clear sense of purpose.[39] The novelty introduced by Darwin was the idea that the evolution of species is driven by a mechanism of natural selection, related to environmental circumstances, that operates upon random genetic variations. Since it was first proposed, Darwin's theory of natural selection suffered innumerable adjustments, the most important of which was the assimilation or integration of the developments in the area of genetics and molecular biology, which is usually known as "Modern Synthesis."[40]

Despite the fact that we are still lacking a final and consensual account of the evolution of species, most biologists would agree that the evolution and diversification of species can only occur if three ingredients are present.[41] The first of these ingredients is chance, i.e., accidental, random, or *contingent* factors, like for example unexpected natural phenomena, random genetic mutations, or the randomness associated with the meiotic processes at the base of sexual reproduction. The second ingredient is lawfulness, i.e. the determinism associated with the laws of physics and chemistry, and with law of natural selection.[42] "Lawfulness 'constrains' randomness,

[39] See: Crysdale and Ormerod, *Creator God, Evolving World* (Minneapolis, Fortress Press, 2013), pp. 58-65.
[40] For an historical account of Darwin's original idea see: Eva Jablonka and Marion J. Lamb: *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life* (Cambridge: MIT Press, 2005).
[41] See: Haught, *God After Darwin*, pp. 19-20.
[42] It is worth mentioning that evolutionary biologists can still not agree whether natural selection operates on the level of the individual, on the level of the gene, or even on the level of the group (see: Barbour, *Religion and Science*, pp. 223-226).

placing it within limits, thus contributing order and consistency to life."[43] The final element is very large amounts of time: "without a vast amount of temporal duration the many improbable products of evolution could never have come about. In the absence of an intelligent designer, after all, an enormous amount of time is required to provide ample scope for the accidental emergence of those few genetic combinations that will permit survivable evolutionary outcomes."[44] In short, the three fundamental ingredients of Darwinian evolution are: contingency, law, and time. These ingredients can be accounted for in many different ways, but are present in any contemporary retrieval of Darwin's original idea.

The impact on theology is of course very important. In the first place, many scientists claim, as we have already said many times, that with these three elements alone we can account for the emergence of the immense variety of species, including the human species, in such a way that a creator God is completely dispensable. As Haught sharply observes, "mindless though this mechanism is, it appears to have been enough to bring about all the rich diversity and complexity we see in the fossil record and in living species today. And so, if nature is in this sense so self-creative, where is the need for a transcendent intelligence to act or intervene in evolution?"[45] The second challenge is directed against the idea of purpose, which is of course congenial to any religious interpretation of the world. The challenge is easy to understand: if everything we have is sheer chance and implacable determinism, how can we find any space for teleology? Moreover, if the world is the creation of a provident and caring God, "why has there been so much randomness, awkward engineering, wasted experiments and 'fooling around' until the cosmos became complex enough to be endowed with life, sensitivity, and consciousness?"[46]

[43] Haught, *God After Darwin*, p. 19.
[44] Ibid., p. 20.
[45] Ibid., p. 17.
[46] Haught, *Is Nature Enough?*, p. 58?

We have seen, so far, how chance, along with lawfulness, plays an important role in both quantum mechanics and Darwinian evolution. The pervasiveness of chance has led many authors to decree the impossibility of any type of teleology. In the words of the historian of science Will Provine, "all that science reveals to us is chance and necessity…. Modern science directly implies that the world is organized strictly in accordance with mechanistic principles. There are no purposive principles whatsoever in nature."[47] But is that so? Does chance really exclude purpose? Following closely the very insightful discussion of Cynthia Crysdale and Neil Ormerod in *Creator God, Evolving World*, I will suggest that the presence of chance does not necessarily do away with teleology. The core of the argument consists in overcoming the "misconstrued dilemma" between meaning, purpose, and order, on the one hand, and chance, chaos, and contingency, on the other.[48] In other words, we do not have to choose between chance and complete determinism, as if they were mutually exclusive, or as if the mere presence of chance would inevitably exclude any sense of purpose or direction. In fact, chance does not have to be nonsensical, and in this sense it does not necessarily exclude teleology, even if it might require a careful refashioning of its meaning. In the words of Cynthia and Ormerod, "the introduction of chance into our understanding of how the world unfolds (or has unfolded) does not pose as much of a threat to an intelligible, ordered, even purposeful universe as has been supposed. Chance is not opposed to order and regularity; rather, the two interact in an intelligible, albeit complex, manner that has contributed to the intricacy and magnificence of creation."[49]

It is crucial to understand, I insist, that chance should not be equated with nonsense. And the proof that chance is compatible with order lies in the mere fact that we can make science out of facts that at first sight look as if they were completely random. Statistics is, indeed, the

[47] Cited in Haught, *God after Darwin*, p. 121.
[48] Crysdale and Ormerod, *Creator God, Evolving World*, p. xii.
[49] Ibid., p. 20.

fundamental tool of most scientific disciplines. Instead of trying to uncover laws that apply to each individual situation, statistical sciences aim at finding patterns and correlations in what appears to be pure randomness. In short, statistical sciences try to "make sense of chance."[50] Although we tend to assume that chance is equivalent to *nonsense*, the truth is that most of the times there is some kind of intelligibility to chance, albeit certainly not the intelligibility of deterministic systems. In fact, establishing that a given set of data are completely random is a quite difficult, if not impossible, enterprise: "it is impossible to establish by empirical means alone that a given series of events is absolutely random and conforms to no conceivable intelligible pattern…. To claim that some series of events is absolutely random goes beyond scientific verifiability."[51]

It should be clear, by now, that the presence of chance in a given system does not have to render it nonsensical. But there is more. According to Crysdale and Ormerod, chance can play a decisive role in the emergence of novelty. To be more precise, novelty emerges through the interaction of chance and regularity: "far from an 'either/or' of determinism versus chance, world process unfolds in an elaborate interweaving of regularity and probability."[52] This is what Bernard Lonergan called *emergent probability*.[53] In order to grasp how the interaction between chance and regularity leads to the emergence of novelty, one has to take into account the presence, in nature, of causality sequences, known as "schemes of recurrence," that curl around in a circle, such that, when A causes B, B causes C, which in turn causes A again.[54] An example of such a scheme of recurrence is the Kreb's cycle, which accounts for the production of energy in living cells. The

[50] Ibid., p. 24.
[51] Patrick Byrne, cited in *ibid*., p. 31. "That some set of events is due to sheer chance" Crysdale and Ormerod conclude, "can only be determined over against the intelligibility of some pattern – either a correlation or an ideal frequency" (idem).
[52] Ibid., p. 39.
[53] See: Lonergan, pp. 144-51.
[54] The concept of scheme of recurrence is also explores by Lonergan. See: *Insight*, pp. 141-44.

fundamental idea is that the emergence of new schemes of recurrence dramatically shifts the probability of certain further events occurring, which increases the likelihood of more complex schemes of recurrence to emerge.[55] In short, "chance conditions interact with the emergence of schemes of recurrence to yield more and more complex integrations that, in turn, heighten the probabilities of further, more complex integrations."[56] According to authors like Francisco Ayala, this process is enough to explain the emergence of life, the diversity of species, and even consciousness.[57] Although I have my own reservations about this claim, for now I will not dispute it. The whole point of this discussion is not only to challenge the idea that chance is equal to nonsense, but also to suggest that chance, in its interplay with order, may even have a key role in the emergence of higher levels of complexity. As a final comment on this point, it is important to call the reader's attention to the common misconception that equates the process of natural selection with a completely random process. It is certainly true that natural selection operates upon accidental variations that come about through three mechanisms: mutation, migration, and genetic drift.[58] This is, however, only one of the necessary ingredients. In order for new species to emerge, an element of regularity, namely reproduction and the constant striving of life, is needed. One needs, once again, the interaction of regularity and probability, "both of which are subject to

[55] This is how Crysdale and Ormerod explain it: "when events A, B, and C are merely coincidental to one another, the likelihood that all three will occur together is the product of the likelihood of each single event singly. If we assign events A, B, C the probabilities of 1/3, 1/4, and 1/8 respectively the chances of all three happening together is the product of these chances: 1/3 x 1/4 x 1/8, which equals 1/96 or 0.010 or one chance in one hundred. But if a scheme of recurrence in which every occurrence of event A means that B and C will also occur (and likewise, if B, then C and A, and if C, then A and B), the likelihood of A, B, and occurring together jumps to the sum of the separate probabilities: 1/3 + 1/4 + 1/8, which equals 17/24 or 0.708 or approximately seventy-one chances in one-hundred. The point is that with each emergent scheme or system of schemes of recurrence, probabilities of further complexity increase substantially" (ibid., pp. 34-35).
[56] Ibid, pp. 35-36.
[57] See: Francisco J. Ayala, "Intelligent Design: The Original Version," Theology and Science 1 (2003), 9-32, at 20.
[58] See: Crysdale and Ormerod, *Creator God, Evolving World*, p. 37.

intelligible processes that can be explained, and that over time yield different types of organisms, and potentially, more complex systems of recurrence."[59]

The final, although crucial, question we still have to address pertains to the relationship between chance and purpose. We have seen, so far, that chance and order do not cancel each other. In other words, the presence of chance in a given system does not mean that the system is completely deprived of order. Moreover, chance appears to be a key ingredient for novelty to emerge. The question that still remains is whether chance is compatible with purpose or whether it renders the world directionless, meaningless, and without any purpose. In short, can we still talk of a final cause for the universe? Can we discern in nature any kind of purpose or finality? According to contemporary science, the response to these questions seems to be negative. As Terrence Deacon observes, "it has become common to contemporary science to treat all teleological phenomena as purposive in name only – teleonomic – and to assume that true teleology is illusory and that the supposed role of representation and the experience of intentionality even in human actions must be epiphenomenal."[60]

Now, if we would think of "finality" as a kind of predetermined plan that is accessible to us from the onset, then we would have to agree that the universe is deprived of purpose. But finality does not have to be understood in such a narrow way. Relying on the work of Bernard Lonergan, Crysdale and Ormerod propose that finality is "*indeterminately* directed," i.e. "finality is the upwardly but indeterminately dynamism of the world process."[61] This means that while the universe is indeed animated by an emergent process, we cannot not know *a priori* what is going to emerge: "the dynamism is 'upwardly directed' in that it heads toward higher integrations. What exactly will emerge depends not on some predetermined plan but on the contingent conditions

[59] Ibid., p. 38.
[60] Deacon, "Emergence. *The Hole at the Wheel's Hub,"* pp. 112-113.
[61] Crysdale and Ormerod, *Creator God, Evolving World*, p. 69. See Lonergan, *Insight*, ch. 15, pp. 470-76.

that happen to exist in any given place and time."[62] Whether this conception of finality is compatible with the classical understanding of divine providence is an important question that we will address later on. For now, the main goal is simply to make it clear that chance and purpose are actually compatible, provided that we reframe our conception of finality.[63]

To sum up, in this section we have suggested that the undisputable presence of chance throughout the evolutionary process not only does not render the universe meaningless, as it is not necessarily incompatible with a (modified) understanding of purpose or finality. In the next two chapters we will revisit the question of chance from a theological perspective.

The Victims of Evolution

While providing a detailed discussion of the problem of suffering in nature is beyond the scope of this thesis, it would be unacceptable to ignore it altogether. The amount of death, suffering and waste that pervades the evolutionary process constitutes, indeed, a serious challenge to the belief in a provident and benevolent God that no serious theology of evolution can ignore. In this section, I will briefly describe the problem, and point out factual information that somehow alleviates the problem. In the two forthcoming chapters we will have the opportunity to discuss different theological approaches to the problem of suffering in nature.

The process of evolution that animates the living world gave rise to an exuberant diversity of living creatures. Nature is full of creativity and beauty. The living world can be compared to a big tree – the tree of life – in which new species emerge from other species through a "branching process" governed by natural selection. If we focus in the exuberance and beauty of life alone, we

[62] Ibid., p. 69. Some pages later Crysdale and Ormerod affirm: "if we were to wind the clock back to the beginning of the Big Bang and then let the universe unfold one more, it is most unlikely that you and I would exist in this new universe. Or even that the earth would exist!" (ibid., p. 86).

[63] In Crysdale and Ormerod's words, "the point here is to recognize that built into the dynamism of the world is an orientation toward greater system, from atoms to human wonder. But this orientation is open ended. There is no antecedent agent or blueprint that establishes that these atoms will form these molecular bonds in this time and place. The orientation of finality – this directed dynamism – depends on the concrete circumstances in which certain atoms happen to be in proximity to other atoms with opposite charges" (ibid., p. 71).

cannot but think that God, if one believes that God exists, has to be an infinite source of goodness, beauty, and creativity. This is not the whole story, though. The process of evolution is tainted by the shadow of pain and death. This is what, from now on, I will be calling "evolutionary evil." According to Elizabeth Johnson, the high cost of evolution has four layers: pain, suffering, death, and extinction.[64] Pain and suffering are the shadow sides of important adaptive advantages: pain is a physiological stimulus that signals something harmful for the organism and encourages avoidance of what harms; suffering as the state of anxiety and anguish that arises in response to pain is the other side of sentience, felt experience, and consciousness.[65] Like pain and suffering, death is also pervasive in the process of evolution. While being the unavoidable consequence of the limited availability of resources, death is also the condition of possibility for the emergence of new species. The phenomenon of death goes beyond the individual level, though. Species also die. The great majority (according to Elizabeth Johnson around 98%) of the species that emerged throughout the history of evolution has gone extinct. Even if extinction seems to be essential as a way of creating opportunities for more complex forms of life to emerge, it is difficult to avoid the sense that many of the species that once populated the earth were nothing but a sub-product of a process that is blind, random and cruel. Not only living creatures die, and species go extinct, as death is often painted with traces of gratuitous and pointless cruelty. To use the words of Holmes Rolston, nature appears to be "random, contingent, blind, disastrous, wasteful, indifferent, selfish, cruel, clumsy, ugly, full of suffering, and ultimately death."[66]

Without attempting to dismiss the problem of suffering, it is important to acknowledge that evolution has a bright side to it. In other words, the progress of nature towards something higher somehow compensates the shadow side of evolution: "tragedy is the shadow of prolific

[64] Elizabeth Johnson, *Ask the Beasts*, pp. 182-184.
[65] Ibid., p. 183.
[66] Quoted in: ibid., p. 181.

creativity."[67] In other words, suffering and death is the price to be paid for something higher to arise: "without pain, no further exploration of life's potential forms; without death, no new life. These afflictions arose as essential elements in a tremendously powerful process that created and continuous to create the magnificent community of life in this planet."[68] This logic is completely engrained in the fabric of the world. Without some degree of disorder and chance there can be no freedom.[69] In other words, in order to give us freedom, God allows indeterminism, and this indeterminism, on its turn, produces suffering in nature. Anyway, without "opposition" and "struggle" no higher and more complex forms of life would have emerged: "half the beauty of life comes out of endurance through struggle."[70] In the same way, natural selection, a mechanism that appears to be blind and even cruel, works as a powerful "scanner" and "selector" of new ideas: "mutation scans for new 'ideas,' and natural selection throws out the trash and saves the gems. Evolutionary achievement is a rudimentary form of cognition."[71] Finally, death is the condition of possibility of new life, and in this sense it is life, and not death, that has the last word: "death is the key to replacement with new life. If nothing had ever died, nothing much could have ever lived…. Life is part of the life cycle, not life part of the death cycle."[72]

Recognizing the bright side of evolution is certainly a key element of a consistent attempt to make sense of suffering in nature. Nature is not only a place of pain and death, indeed. It is also full of life and creativity. At the same time, the problem of suffering in nature is not solved by the mere observation that the bright side of nature compensates the dark side. This would transform most of the living creatures that ever existed in mere means to an end, which is barely compatible

[67] Holmes Rolston, "Naturalizing and Systematizing Evil," in *Is Nature Evil? Religion, Science and Value*, ed. Willem B. Drees (London: Routledge, 2003), p. 85.
[68] Johnson, *Ask the Beasts*, p. 185.
[69] In Rolston's words, "there must be an interplay of order and disorder if there is to be autonomy, freedom, adventure, success, achievement, emergence, surprise, and ideographic particularity" (Rolston, "Naturalizing and Systematizing Evil," p. 69).
[70] Ibid., p. 79.
[71] Ibid., p. 80.
[72] Ibid., p. 83.

with a God that declared good everything that exists.[73] In the next two chapters we will retrieve this problem from a theological perspective.

The Metaphysics of Evolution

After having discussed at length some of the most pressing challenges that science and philosophy of science pose to a theistic interpretation of evolution, I want to inquire about the metaphysical underpinnings of evolution. The most fundamental question I want to address concerns the status of emergent evolution regarding a key principle of metaphysics, the so called "principle of causality" or "sufficient reason." In other words, emergentists should be able to give a credible response to the question: where does the *more* associated with new levels of complexity come from? I will then briefly return to the question of chance, in order to suggest that some degree of indeterminacy appears to be the condition of possibility of freedom. I will close the section by suggesting that only when we ask for the very origin of being itself does the question of God become somehow unavoidable.

Where Does the More *Come From?*

In what seems to me a disconcerting statement, Niels Gregersen declares that after the developments of contemporary science, the principle of sufficient reason has eventually been suspended: "scientists as well as philosophers are today prepared to accept that more can come out of less. Novelty is produced through new material constellations, which are able to do things

[73] As Cristopher Southgate puts it, "the regeneration of life out of the suffering of other life does not of itself 'redeem' the suffering experienced by individuals, be they dying sea lions or lame cheetahs succumbing slowly to hunger. Regeneration does not comprehend all that is connoted by the word redemption, and the suffering of individual organisms, even if it promotes the flourishing of others, must still remain a challenge for theodicy" (Christopher Southgate, "God and Evolutionary Evil: Theodicy in the Light of Darwinism," *Zygon: Journal of Religion and Science* 37, no. 4 (2002): 805).

that the individual parts cannot perform on their own."[74] I guess that my main point in this section is precisely to explain that I am not ready to accept that more can come out of less, although that would require a much more detailed discussion that I cannot undertake here. Let me try to rehearse an argument, though.

It is important to note, in the first place, that giving up the principle of sufficient reason would undermine the very groundings of science. What scientists do is precisely to look for causes that can explain natural phenomena. In this sense, making the gratuitous affirmation that *more* can come out of *less* represents a kind of unexpected renunciation to the fundamental vocation of science. In the end, if we give up the principle of causality we will be left with magic or alchemy. John Haught expresses this same opinion, when, in several instances, he complains that the assertion according to which the mind emerges out of matter is not sufficiently justified. According to evolutionary scientists, time appears to be (at least for authors like Richard Dawkins) the secret ingredient that accounts for the new properties that appear at the higher levels. According to Haught, however,

> No matter how long it takes to bring intelligence into being out of absolute unintelligence, logically speaking this is still pulling a rabbit out of a hat. By appealing to time's fathomless depth – as though time itself were causal – Dawkins has not avoided magic either. His assumption is that an enormous amount of time is explanatory, whereas a lesser amount is not. But then where is the cut-off point? How many millions or billions of years of gradual change does it take before time ceases being a framework and becomes an efficient cause? And, again, how is magic to be avoided?[75]

[74] "Thus [the author continues] the change from potential to actual states does not depend on the prior existence of a fully actualized being (as God), as has been claimed in Aristotelian and medieval metaphysics" (Niels Gregersen, "Emergence, What is at Stake for religious reflection?," p. 279).
[75] Haught, *Is Nature Enough?*, p. 114. In sort, "even after Darwin and the discovery of deep time, it does not seem foolish to ask just how mind could have emerged out of utter mindlessness" (ibid., p. 58).

The same opinion is expressed by philosopher Norris Clark in *The One and the Many*, where the author affirms the need for an adequate metaphysics of evolution.[76] The key question one has to ask is: "what is the *basic causal process* by which our material universe develops from simpler elements into more and more complex entities that are not just collections or aggregated of the component units but new intrinsic units manifesting this by *new properties* that are just not the sum of or deducible from the properties of the component parts?"[77] In other words, the task for the metaphysician is to analyze the scientific claim according to which higher beings have in fact emerged from lower beings, and render it intelligible by uncovering the causes at work, in such a way that the principle of causality is not violated.[78] Norris Clark considers the solutions offered by *reductive materialism*, *emergentism*, and *naturalism* to be inadequate.[79] Against reductive materialism, Clarke levels the critique we have already enunciated several times: the lack of acknowledgement of the genuine novelty and ontologically consistency of the higher levels. The problem with emergentism is that no adequate explanation of *how* the emergence of higher levels from lower levels takes place: "in its pure form it seems to be really just a reassertion under a new name of the fact that emergence of higher entities from lower actually does occur in nature…. The repetition of such a factual law under the technical term 'Emergentism' should not be allowed to present itself as a bona fide metaphysical explanation according to adequate causes, as it seems to

[76] Norris Clarke, *The One and the Many: A Contemporary Thomistic Metaphysics* (Notre Dame, Indiana: University of Notre Dame Press, 2001), pp. 245-260.
[77] Ibid., p. 247.
[78] It is important to note that the problem becomes particularly acute in what appear to be clear points of discontinuity, such as the emergence of life or the emergence of the human being. I agree with Clarke, when he affirms that the emergence of the structures of the universe, for example, can be understood as the unfolding of active potentialities the universe was endowed with, without the need of further intervention of the Creator. By the same token, the diversification of species could be understood as a purely natural process (ibid, pp. 252-53). The real metaphysical problem arises in the transition from life to non-life, from non-cognitive life to cognitive life, and in the transition from non-consciousness to consciousness (ibid., p. 254). Concerning the last problem, the emergence of consciousness, several authors have argues that consciousness could not have emerged out of mindless matter. See, for example: Hart, *The Experience of God*, ch. 4, pp. 152-237; Thomas Nagel, *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* (New York, Oxford University Press, 2012).
[79] It is interesting to note that Norris Clark names *reductive materialism* as the "Nothing But" School: "everything is nothing but, reducible to, the lowest elements, rearranged in different order" (idem).

be happening often today."[80] Clarke appears to have in mind the first generation of emergentists, like Lloyd Morgan and Samuel Alexander, who were writing in the early 20th century. To be fair to the emergentist school, which recently acquired a new impulse that Clarke fails to acknowledge, contemporary authors have been undertaking a remarkable effort to work out the causal details of the process of emergence.

Although I did not have the chance to work out the details, I did mention specific proposals which, according to their authors, account for the emergence of genuine novelty at higher levels. A feature common to these proposals is that they end up introducing what Terrence Deacon calls "absent causes," in the sense that they do not have an import in terms of mass and energy.[81] "Nothing matters," Deacon asserts.[82] In other words, "realities" that cannot be measured in terms of physical quantities (since they do involve neither energy nor matter) seem to play a key role in the evolutionary process. A good example would be the concept of "information." The key question one has to ask, however, pertains to the origin of these "ghostly" realities. Where does new *information* come from? What is the origin of function, reference, purpose, or value? The truth is that once we recognize that, as even emergence theories appear to suggest, that reality consists in a hierarchy of being, we cannot avoid asking "where does the more come from?" "For if what emerges is clearly on a qualitatively higher level of being, then the surplus of new being over what was contained in the previously existing causes would have to derive from nothing, thus violating the principle of sufficient reason."[83]

It is the job of science to explain natural processes in terms of immanent causes alone. In this sense, I am not suggesting that science should simply give up its vocation and introduce God as an explanatory hypothesis. Science should try to go as far as it can. At the metaphysical level,

[80] Ibid., p. 248.
[81] See Deacon, *Incomplete Nature,* pp. 1-17.
[82] Ibid., p. 539.
[83] Clarke, *The One and the Many*, p. 249.

however, I wonder whether there is in fact enough evidence for the need for a transcendent cause – God – that sustains the process of evolution without disrupting the integrity and autonomy of natural causes. In the words of Clarke, "it seems to me that only a metaphysical account that involves the ongoing collaboration of a higher cause with the immanent natural causes of our material cosmos can provide an adequate sufficient reason – and so intelligibility – of the central challenge presented by the evolutionary story of the universe we live in."[84] We will see, in the next two chapters, different ways of conceptualizing the role of God as a sustainer of evolution.

Chance as the Condition of Possibility of Autonomy and Freedom

We have dedicated a full chapter to the question of chance, but I would like to briefly revisit it, this time from a metaphysical point of view. The fundamental idea that I want to convey is that chance is the condition of possibility of freedom. In other words, without a certain degree of indeterminacy present in the fabric of the universe – either at the microscopic level or during the course of biological evolution, the emergence of individuals endowed with freedom would have been impossible. Chance is not, to be sure, the sole cause of freedom. We have already seen that evolution happens as an interplay of both chance and law. Chance is, nevertheless, one of the conditions of possibility for its emergence. Metaphysically, we can say that nothing appears at higher level that was not somehow already latent in the lower levels. We could say, in this sense, as an expression of the universe's fundamental openness to something radically new, chance is nothing but an incipient form of freedom. I will come back to this question in the following chapters.

[84] Ibid., p. 258. Clarke justifies his opinion with two reasons, which are worth reproducing here: "(1) there is a hierarchy of being, i.e., different qualitative levels of the perfection of being from the lower to the higher, not just different quantitative expressions of matter on the same ontological level – a flattened out universe, so to speak; and (2) causes on a qualitatively lower level just cannot supply the sufficient reason by themselves for the emergence of something higher – causes cannot give what they don't have in some equivalent way – and hence the collaboration of some higher cause on the same (or higher) level as a surplus of higher being in the effects must be introduced into the metaphysical account, though not scientific one, to make full sense of our universe."

Who Breathes Fire into the Equations?

In his treatment of creation, Aquinas begins by offering a brief overview of the history of metaphysics. [85] The whole process can be understood as a progressive deepening of the understanding the notion of causality. Distinguishing three phases, Aquinas shows how philosophy moved in the direction of a richer explanation of causality. In the first phase, associated with the pre-Socratics, everything that exists is made up of a single and underlying substance, and causality is nothing but accidental change. In the second phase, which has Aristotle as the main protagonist, a richer understanding of causality is introduced. The metaphysical principles of matter and form allow for a "higher" type of change by which new beings come into existence from potential matter by means of "more universal causes." In the third phase, the very cause of being is investigated. As the fullness of being, God is the only source of the being of all existent things. This is the deep meaning of creation: while the particular causes account for the change of things that already exist, "creation" accounts for the very existence of things. In the words of Aquinas, "whatever is the cause of things considered as beings, must be the cause of things, not only according as they are such by accidental forms, nor according as they are these by substantial forms, but also according to all that belongs to their being in any way whatever."[86]

Although it might seem somehow out of place, this short detour into Aquinas' metaphysics condenses a decisive insight concerning the coherence of the theistic worldview. The truth is that the question of God remains in the twilight until we ask for the cause of the being of all things that exist. The world appears to be endowed with a remarkable coherence and autonomy that can be described in terms of scientific laws. In other words, it is the role of science to study the net of

[85] See: *S. th.* I, q.44, a.2, *reply*. The quotes from the *S. th.* are taken from the following edition: *Summa theologica,* Part I. In *Basic Writings of Saint Thomas Aquinas*, Vol. 1. Edited by Anton C. Peguis. Indianapolis/Cambridge: Hackett Publishing Company, 1997. The quotes from the *SCG* will be taken from the following edition: Thomas Aquinas, *Summa contra gentiles,* translated by Anton C. Peguis et al. (Garden City, NY: Image Books, 1955-1957).
[86] Idem.

causality that underlines the dynamism of the world. We could say that contemporary science is at the same level as Aristotle's four causes insofar as it is describing the way things interact with and transform into one another. At this level, the question of God's existence is somehow irrelevant. Natural phenomena can, and should be, explained by immanent causes. The question of God does come into play, however, when one gives one step further and dares to ask about the source of being that gives existence to all things.[87] Science can describe how things are, can disclose patterns and even make predictions, but, in the end, it cannot explain why things exist at all and why they behave in this way and not the other. Also, we, humans, are able to fabricate new things, but can only do it out of something that already exists. The power to give existence is totally beyond our power and beyond the power of any created thing. Why does the world exist at all? Why is it intelligible? Who or what keeps it into existence? What sustains its dynamism? These are the questions that science leaves unanswered and that invite us to risk the leap into metaphysics. This is not the place to attempt a rational proof of God's existence. The issue is simply too difficult and controverted to be taken within the context of such a limited thesis. It is worth suggesting, though, that the existence of the world, its dynamism, and its intelligibility would certainly make much more sense if one would admit that the world arises not from nothing but from an absolute and self-sufficient Being that is pure dynamism, and sheer intelligibility. To affirm otherwise amounts to a kind of metaphysical "nihilism" plagued with insuperable contradictions.

It is striking, nevertheless, the obsession of some contemporary intellectuals with trying to prove that the world comes from nothing. Let us be clear: if the world comes from nothing, it is nothing. One of the most "sacred" postulates of physics is the principle of conservation of mass-

[87] For a particularly insightful discussion of what is usually called the argument from contingency, see. Hart, *The Experience of God*, ch. 3, pp. 87-151.

energy, which basically states that different forms of matter and energy can convert in one another, but cannot simply appear or disappear. Now, insofar as existence is more fundamental than either mass or energy (nothing can have energy or mass without existing), it would be completely absurd to suppose that existence can just happen. This is, in the end, the fundamental logic behind Aquinas' five ways: movement presupposes a first mover, intelligibility presupposes a primordial intelligence, and contingent existence presupposes a necessary Being.

Concluding Remarks

In this chapter, we addressed three pressing challenges to a theistic interpretation of the world: emergence, chance, and natural evil. Making an effort to bring into the discussion recent scientific developments and philosophical discussions, I suggested that a theistic interpretation of the world appears to be more plausible now than some decades back when mechanisms and reductionism were taken for granted. The retrieval, in the last few decades, of *emergentism* does not go beyond naturalism, but it does provide a powerful challenge to scientific materialism, and invites a much deeper appreciation for the different levels of reality, including the human, and within the human also the spiritual. Chance, on its turn, is not the synonym of nonsense. In fact, chance is perfectly compatible with purpose, even if our understanding of purpose has to be re-worked. In a second stage, we tackled evolution from a more metaphysical perspective, and adopted a more "offensive" strategy, trying to raise some questions concerning the compatibility of a purely naturalistic approach to emergent evolution with the key metaphysical principle of sufficient reason.

To put my cards on the table, the goal of this chapter was to invite the reader (especially the atheist or agnostic reader) to assess the consistency of a worldview that affirms God, who is pure being and sheer dynamism, as the ultimate origin of everything that exists, and the one who enables and sustains the evolutionary process. It will be the reader's call to decide whether this

view is more or less consistent with the view that takes matter (even if emergent matter) to be the source of all things. As for me, I agree with Hart when he affirms that "the only fully consistent alternative to belief in God, properly understood, is some version of 'materialism' or 'physicalism' or (to use the term most widely preferred at present) 'naturalism.'" And I also agree with him – and I hope that after this chapter it is clear why – when he says that "naturalism – the doctrine that there is nothing apart from the physical order, and certainly nothing supernatural – is an incorrigibly concept, and one that is ultimately indistinguishable from magical thinking."[88]

[88] Hart, *The Experience of God*, p. 17.

Chapter 3

Contemporary Retrievals of Aquinas' Wisdom

> *Divine providence works through some intermediaries. For God governs the lower through the higher, not from any impotence on his part, but from the abundance of his goodness imparting also to creatures the dignity of causing.*
>
> Thomas Aquinas, *S. th.*, I, q.22, a.3, *reply*.

In the previous chapter, I tried to defend the viability of a theistic interpretation of evolution. Towards the end of the chapter, we saw how a careful consideration of the metaphysics of evolution raises the question of whether immanent causes alone can account for the emergent of higher levels of being. My argumentation did not provide an unequivocal proof of God's existence, and that was not the goal. I have defended, in fact, that we should not consider the scientific description of evolution to be faulty, in such a way that God would supply some kind of lacking piece, and thus be reduced to an immanent cause ("God of the gaps"). This is the approach of intelligent design, which I consider to be both scientifically and theologically problematic. When we bring the conversation to the metaphysical level, however, the question of God starts to loom, and it becomes particularly pressing when one ponders the metaphysical question par excellence: what is the source of the being of all things that exist? Attempting at demonstrating that emergent evolution requires the existence of God is a quite demanding task that would entail special metaphysical skills. It seems less difficult, in my opinion, to simply recognize how the existence of a creator God, the ultimate ground of all things, lends coherence to the evolutionary process. It is easier, in short, to go from more to less, than from less to more.

When pursued with sufficient metaphysical awareness and intellectual openness, rational inquiry might well lead one to affirm that God exists and that God is the ultimate source of every

existent thing. Reason by its own powers cannot go much further, though. Indeed, what we know about God and divine action was disclosed to us through divine revelation. That the world is the creation of a provident and benevolent God, for example, is a matter of faith, and not the conclusion of a rational argument. Now, when we bring truths of faith into our conversation, we have already left behind the realm of science and philosophy and have entered the realm of theology, which has divine revelation as its starting point. If for philosophy God is somehow an (eventual) point of arrival, for theology God is the point of departure. Theology starts with God and with that which God has revealed about Godself, and interprets every reality in its relation to God as the Creator of all things. In other words, theology interprets reality in the light of divine revelation.

It is precisely the goal of this and the next chapters to interpret emergent evolution in the light of divine revelation. We will critically engage two different theological approaches to evolution. We will call them "theologies of evolution." The first "theological avenue," which we will be exploring in the present chapter, remains within classical theism, and includes creative retrievals of Aquinas' theology, in particular the key distinction between primary and secondary causality, by contemporary authors like Karl Rahner, Elizabeth Johnson, and Denis Edwards. The second avenue, which we will explore in the next chapter, is more akin to compromise the key tenets of classical theism – in particular God's omnipotence and omniscience, and the related belief that God created and governs the world according to divine providence – and takes its inspiration from process philosophy and theology.

Before immersing ourselves in the realm of theology, it is important to set out some methodological guidelines. As I have already said, it should be clear, from the onset, that the starting point of theology is divine revelation. As Karl Rahner explains it, "theology is the science of faith. It is the conscious and methodological explanation of the divine revelation received and

grasped in faith."[1] While God has revealed Godself through the order of nature and the inner voice of conscience – this is what we call "natural revelation" – God's self-disclosure has occurred more fully and intimately through special events at particular times and places – this is what we call "special" revelation – and culminated in the life, death, and resurrection of Jesus Christ, and the outpouring of the Holy Spirit.[2] God's definitive self-disclosure in the Christ event is transmitted from generation to generation by the witness of the Holy Scriptures and the Church's worship and living tradition under the authoritative guidance of the Magisterium. In the words of Khaled Anatolios, "divine revelation is available through its inspired witness in the Scriptures, as interpreted by acts of ecclesial communion (synodal councils) and as appropriated and performed in worship and discipleship."[3]

Now, any attempt to develop an authentic "theology of evolution" has to acknowledge the authority of divine revelation and the means by which it becomes available. This means that even when one attempts at offering a theological interpretation of aspects of reality that we came to know through science – as it is the case with evolution – Scripture and ecclesial tradition should have the primacy. In this sense, in our evaluation of the different theological interpretations of evolution we will be considering it will be important to assess the way they appropriate and acknowledge the authority of Scripture and tradition, in particular doctrinal statements. Does this means that science is irrelevant to the endeavor of reflecting theologically on the way God creates the world and interacts with it? The response to this question is obviously negative. Science cannot overturn the contents of divine revelation, but can certainly offer a new insight on them. As we have seen, the natural world is a *locus* of divine revelation, which cannot, of course,

[1] Karl Rahner, "Theology I: Nature," in *Encyclopedia of Theology: The Concise "Sacramentum Mundi,"* ed. K. Rahner (New York: Seabury-Crossroad, 1957), 1687.
[2] See: Avery Dulles: "Faith and Revelation," in *Systematic Theology: Roman Catholic Perspectives*, ed. Francis Schüssler Fiorenza and John P. Galvin (Minneapolis: Fortress Press 2011), p. 83.
[3] Khaled Anatolios, *Retrieving Nicaea: The Development and Meaning of Trinitarian Doctrine* (Grand Rapids, Michigan: Baker Academic, 2011), p. 282.

contradict what God manifests about Godself through special revelation. In this sense, new scientific data should not be understood as a threat to faith, but as an opportunity to arrive at a deeper grasp of the contents of divine revelation. In the words of Christopher Mooney, the motivation of theology to engage science "has to come from the realization that, if God is in fact the all-encompassing reality Christian faith proclaims, then what science says about nature, whether physical, chemical, or biological, can never be irrelevant to a deeper experience of God."[4] In fact, ignoring the discoveries of contemporary science may have as a consequence that theological statements on the contents of faith will be regarded as "irrelevant mythologies."[5] It is crucial to understand, on the other hand, that it is not the role of theology to disrupt the integrity of science, and in particular what science tells us about evolution, but to offer a theological interpretation of new scientific data in the light of divine revelation. As I have suggested in the first chapter, science and theology belong to different levels of engagement with reality, and if the specificity of each levels is respected there is no reason for conflict to happen. We will return to this issue some pages down, in the context of our discussion on Rahner's theological approach to evolution.

It is worth re-stating, finally, the way this theological endeavor fits within the general plot of this thesis. If in the first two chapters, we tried to remove important obstacles to the acceptance of a theistic interpretation of the evolution, in the last two chapters, we will attempt at offering a theological account of the God of evolution. In other words, I will assume that the world was indeed created by God, and address, by critically engaging different theological approaches to evolution, the following question: how can the evolving world be understood as God's creation?

[4] Christopher F. Mooney, S.J, *Theology and Scientific Knowledge: Changing Models of God's Presence in the World* (Notre Dame and London: University of Notre Dame Press, 1996), p. 25. "The language of science" the author continues, "is now the common possession of humanity as a whole, and not to use this language in understanding and communicating Christian teaching entails a serious risk of not being heard."
[5] See: ibid., p. 154.

In other words, if God does exist and is Creator, as Christian doctrine teaches, how is God present and active in the process of emergent evolution? Or, to use Elizabeth Johnson's words, "how does the Vivifier relate creatively to the process of evolution which in scientific terms proceeds according to its own principles?"[6] For the non-believer reader, this might be an important opportunity to appreciate the consistency of the theistic worldview.

After this brief methodological excursus, let me now detail the goal of the present chapter. The developments of modern science induced, as we have been seeing, a significant transformation in the way we understand ourselves and the universe we inhabit. At the same time, it would be naive to think that before the emergence of contemporary science Christian authors had never thought about the apparent tension between the belief that the world was created by a good and provident God and the awareness that the natural world has its own integrity and autonomy, and history unfolds according to a dynamism of its own. Christian thinkers were, since the beginning, well aware of these questions, and developed a variety of approaches that continue to be illuminating. Among the several approaches to divine action rehearsed throughout the history of theology, I find particularly insightful the distinction, introduced by scholastic theology and significantly clarified by Thomas Aquinas, between primary and secondary causality. According to Thomas, God endows creatures with the capacity to cause. "It is characteristic of the creative power of God," Elizabeth Johnson explains "to raise up creatures who participate in the divine being to such a degree that they are also creative and sustaining in their own right…. God's act giving creatures their very nature is what makes autonomous creaturely action possible at all. The Source creates and sustains, while creatures receive their form and power to act with their own efficacy."[7]

[6] Elizabeth Johnson, *Ask the Beasts: Darwin and the God of Love* (London: Bloomsbury, 2014), 181.
[7] Ibid., p. 164.

Although forged during the Middle Ages, when a static understanding of the world was not questioned, the distinction between primary and secondary causation is still crucial, I believe, to address the problem of divine action within the evolutionary framework of contemporary science. In the same way as Aquinas could say that it is God who creates and empowers all creatures to act, we can now say that it is God, as pure act and the cause of all causes, who creates and sustains the ongoing process of evolution and endows it with the capacity to generate higher levels of complexity. This basic intuition has been appropriated by several contemporary theologians in their attempt to build a consistent theology of evolution. It will be the goal of this chapter to explore the proposal of three authors that have made important contributions in this area: Karl Rahner, Elizabeth Johnson, and Denis Edwards. After offering a brief review of Aquinas' treatment of the key distinction between primary and secondary causality, I will discuss Rahner's creative retrieval of this distinction. In the next section, I will discuss Johnson's and Edwards' contribution to the discussion, namely the way they use the primary-causality construal to address theologically the interplay of law and chance that underscores the evolutionary process, and the pneumatological character of their approach. I will conclude with some critical remarks.

God Behind the Scene: Primary and Secondary Causation in Aquinas

According to Christian revelation, the world is created by God, who sustains and governs it according to divine providence. Rather than creating the world and abandoning it to its own fate, God is permanently active in all things, and nothing that happens is alien to the divine plan. Well supported by both Scripture and tradition, the doctrine of divine providence appears to be contradicted by the most basic experiences. Even a child will know, for example, that animals and plants are born from other animals and plants from other plants. And one does not need a sophisticated knowledge of history to know how every human society, and indeed the whole

humanity, is inevitably shaped by the decisions of concrete human beings. How is this compatible with the idea that our world is governed according to a plan that resides in God's mind? A consistent response to this challenge can only rest in an adequate understanding of the interplay between divine and creaturely causality. And this is where Aquinas can be quite helpful.

Aquinas' metaphysics captures with singular clarity and precision what is really at stake in the Christian doctrine of creation. The divine act of creation establishes a unique relationship between God and God's creatures, and should not be placed at the same level with any other phenomenon that happens within the world. God is not one cause among other immanent causes, but the one who bestows being on everything that exists. And if God is the only source of being, this is because God is absolute being. The very essence of God is to-be. God is the plenitude of being, pure act, and everything that is exists as participation in this unlimited and uncreated source of being. In Johnson's words, "the very nature of what it means to be God lies in sheer aliveness, overflowing plenitude, the pure act of being. God's very essence is to-be, without origin, limit, or end."[8]

Now, precisely because only God is absolute being, pure act, and the source of being of everything that exists, God cannot be placed at the same level of creatures. God is not simply the highest level of being. God is the very source of being, and in this sense it absolutely transcends every created being. As Johnson explains it, "the rigorous distinction between the One who is being itself and all else which receives being intends, rightly, to place the Creator beyond any category commensurate with creatures."[9] At the same time, precisely because God is absolutely transcendent, God can also be said to be fully immanent: "as the source of creaturely existence, God must also be immanently present in creation. For nothing is more intimate to any being that

[8] Ibid, p. 144.
[9] Ibid., p. 145.

its own existence, and God is present to each creature as the source of its being."[10] Because God is not only the origin of creaturely existence, but also the one who sustains every creature in existence (*creatio continua*), God is present in all things in the most intimate way:

> Since it is God's essence to exist [Aquinas explains], created existence must be his proper effect, as burning is fire's proper effect. But God causes this effect in things not just when they begin to exist but all the time they are maintained in existence, just as the sun is lightening up the atmosphere all the time the atmosphere remain lit. During the whole period of a thing's existence, therefore, God must be present to it.[11]

As Creator of all things, God not only enables them to exist, but also enables them to act. In other words, God creates and sustains both the being of things and their capacity to cause. This is where the distinction between primary and secondary causality comes into play. God is the primary cause in the sense that God creates all things and endows them with autonomy and the capacity to act (secondary causation). It is important to stress that primary and secondary causation operate at completely different levels: God is not a kind of "super-cause" among other causes. God is, rather, the cause of all causes, the sustainer of all immanent activity, and as such it cannot be placed at the same level of creaturely causality. God is not a cause like other causes in the world. This is the reason why creaturely causality is not overwhelmed by divine causality: "since God is the creator who has gifted each creature with its proper own causality according to its nature," Michael Dodds explains, "his influence does not interfere with the proper causality of the creature, but is rather its source".[12] God as source of the being of all things is absolutely transcendent, and this is precisely why God is able to work in the intimacy of each thing without violating its integrity.

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[10] Michael J. Dodds, O.P., *Unlocking Divine Action: Contemporary Science and Thomas Aquinas* (Washington, D.C.: The Catholic University of America Press, 2012), p.165.
[11] *S. th.* I, q.8, a.1, *reply*.
[12] Dodds, *Unlocking Divine Action*, 191.

By placing divine and creaturely causality in different levels, Aquinas is able to uphold the autonomy of creation without loosening its complete dependence on God. While the interaction of two univocal causes is also a zero-sum game – the more one does, the less the other can do – primary and secondary causes act together in such a way that their effect belongs entirely to both. Instead of suppressing or diminishing the action of the secondary causes, the primary cause enables them. We can say, in this sense, that when God, as primary cause, acts through a creature, the effect is attributed wholly to both God and the creature: "it is apparent that the same effect is not attributed to a natural cause and to divine power in such a way that it is partly done by God and partly by the natural agent; rather, it is wholly done by both, according to a different way, just as the same effect is wholly attributed to the instrument and also to the principal agent."[13] God does not replace creaturely causality, but insofar as God is the single origin of the power by which creatures operate, we can say that God is even more immediate to the effects of natural causation than creatures themselves: "in this way, God acts in all things. The effect is attributed to both God and the creature, but most especially to God, since God is the source of the very causality of creatures."[14]

Developed in the context a static worldview, the scholastic distinction between primary and secondary causality can be easily applied to a natural world that evolves. Yes, science has disclosed the immanent causes that drive the evolutionary process. It is God, however, who sustains the whole process and upholds its autonomy. Taking Aquinas one step further, Karl Rahner developed a robust framework that accounts for the emergence, throughout the evolutionary process, of new levels of complexity.[15] If Aquinas elucidated how the Creator

[13] *SCG*, III, 70, n. 5. The quotes from the *SCG* will be taken from the following edition: Aquinas, Thomas, *Summa contra gentiles,* translated by Anton C. Peguis et al. (Garden City, NY: Image Books, 1955-1957).
[14] Ibid., 192.
[15] According to Mooney, "Karl Rahner is the theologian who has done most to link Aquinas' understanding of God's creative action with the evolution discovered by science. This he does first by retrieving from Christian tradition the

enabled things to exist and act, Rahner will propose that God also enables creatures to become something radically new. It will be the goal of the next section to discuss his proposal.

Empowering Emergence: Rahner on Evolution

We have seen, in the previous section, how the distinction between primary and secondary causation makes the belief in the creator God compatible with an authentic (yet still relative) autonomy of creation. On the epistemological level, this distinction is translated into a relationship between theology and science that safeguards the autonomy and integrity of each discipline: "theology and natural science," Rahner asserts, "cannot in principle contradict one another since both right from the outset are distinct from one another in their area of investigation, and in their methodology."[16] While the object of theology is God, the one and absolute ground of all realities, the natural sciences investigate individual phenomena and their relationship to one another. Rahner's Thomistic background transpires, at points quite explicitly, in the way he understands the relationship between theology and science, a relationship that "mimics" the relationship between God and creation. Since God transcends the immanent phenomena studied by the natural sciences, the scientific method does not have the means to probe the divine. "So," Rahner concludes, "natural science is methodologically atheist…. God is not to be classified as an individual factor in the series of phenomena."[17] In the same way, theology does not have the tools to explore the causal networks that relate natural phenomena to each other in its coherence and autonomy. In this sense, theology and natural sciences are two fundamentally distinct entities which do not threaten or negate one another. If conflict nonetheless occurs, this is because of a

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sense in which God is immanent in the creative process, and second by elucidating what we know today to be the effect of such immanence, namely matter's capacity for self-transcendence" (*Theology and Scientific Knowledge*, p. 158).

[16] Karl Rahner, "Natural Science and Reasonable Faith," in *Theological Investigations* 21 (New York: Crossroad, 1988), p. 19.

[17] Ibid., p. 21.

mutual trespassing of boundaries: "the basic reason for such conflicts is found of course in the trespassing of boundaries on either or both sides in respect to an objective question of theology or of natural sciences."[18] According to Rahner, it is precisely the mutual trespassing of boundaries that explains the historical conflict between the Catholic Church, and other Christian groups, and the proponents of the theory of evolution. Insofar as this conflict is still not completely overcome, Rahner addresses himself the problem.

Active Self-Transcendence under Divine "Pressure"

While Rahner does not explain the details of the scientific theory of evolution, he does identify with precision its metaphysical underpinnings: evolution is "emergent," which means that throughout the evolutionary process "more really comes from less."[19] In other words, matter appears to be endowed with the capacity to transcend itself: planets and stars emerge out of cosmic dust; the increasing complexity of molecular structures eventually gave rise to living cells; through a "branching process" governed by natural selection new species emerged from other species. This is what Rahner calls "active self-transcendence:" "each [individual reality] in its own stage can become something else, can change and become 'more' ('higher')."[20] While in "Natural Science and Reasonable Faith," Rahner appears to imply that the principle of sufficient reason is no longer valid,[21] elsewhere he clarifies that this fundamental metaphysical principle cannot be violated: "this notion of active self-transcendence – self-transcendence by which an

[18] Ibid., p. 24
[19] Ibid., p. 39.
[20] Ibid., p. 38. Elsewhere, Rahner describes matter's capacity for "active self-transcendence" in the following way: "there is becoming, and this becoming is ultimately not just the merely spatially, temporally and quantitatively transformed combination of elements which remain statically the same, but is the becoming of something really new which has an intramundane origin and yet is not simply the same as that from which it originates…. Thus, real becoming is not just duplication but a surpassing of self in which what becomes more than what it was and yet this 'more' is not simply something added to it from the outside (which would cancel out the notion of genuine intramundane becoming)" ("The Unity of Spirit and Matter in the Christian Understanding of Faith," in *Theological Investigations* 6 (New York: Crossroad, 1973), p. 174).
[21] Rahner, "Natural Science and Reasonable Faith," p 40.

existing and active being approaches to higher perfection still lacking to it – must not, however, turn non-being into the very ground of being and turn emptiness as such into the source of fullness – in other words, we must not violate the metaphysical principle of causality."[22] As it became clear in the last chapter, I am sympathetic to Rahner's concerns.

According to Rahner, then, while things do have an inner tendency to become something more, they owe this capacity to their relationship with the Creator. "The capacity to become more," Rahner explains, "is an ontological determination of every being which is necessarily implied in this being, and which includes that more precise relationship of God as continuing creator."[23] In other words, if matter can transcend itself, this is because the Creator has endowed it with this inner tendency. If emergent evolution can happen at all, this is because finite beings are subject to the constant "pressure" of the divine being. "This 'pressure' is not," Rahner clarifies, "one of the essential constitutive elements of a finite being. It can, however, always make this being into something more than it is 'in itself,' or, as the case may be, it is that which in the first place makes the finite being what it is."[24] It is worth noting that the idea according to which God is permanently sustaining and empowering the process of evolution offers an insightful expansion of the classical distinction between *creatio originalis* and *creatio continua*. In an evolutionary framework, in which creation unfolds in an ongoing process, the idea of *creatio continua*, through which God sustains the evolutionary process, becomes all the more natural.

In his creative retrieval of the distinction between primary and secondary causality, Rahner carefully safeguards both divine transcendence and the integrity and *relative* autonomy of the evolutionary process. God, the one who exerts divine "pressure" on finite beings and empowers them to become something more, is absolutely transcendent: "divine pressure" is not a

[22] Karl Rahner, "Christology within an Evolutionary View of the World," in *Theological Investigations* 5 (New York: Crossroad, 1970), pp. 164-65.
[23] Rahner, "Natural Science and Reasonable Faith," p. 39.
[24] Ibid., p. 37

constitutive principle of the essence of created being. If this were the case, Rahner explains, "then this being would be no longer capable of any real becoming in time and history, since it would already possess the absolute fullness of being as something absolutely proper to it."[25] The flip side of absolute transcendence is, of course, total immanence: God, the one who bestows being on things and empowers them to become something radically new, acts from within and is at the same time absolutely interior and radically distinct from the process of evolutionary emergence.[26]

Moreover, precisely because God is absolutely transcendent, God can support the process of evolution without disrupting its integrity: while being constantly supported by divine "pressure," active self-transcendence is a property that really belongs to created things. In other words, both the adjectives "active" and "self" should be taken seriously: creatures are more than passive agents in their own process of becoming. In short, the process of "becoming" happens "by the power of the absolute being, all of which, however, does not deny the fact that this is a question of genuine, active self-transcendence."[27]

It is important to note, finally, and perhaps for the disappointment of scientists, that insofar as God is absolutely transcendent, the divine "pressure" that empowers the process of becoming remains beyond the scope of the natural sciences: "for metaphysical knowledge this 'pressure' is a given; for a purely ontologically a posteriori knowledge, which is that of the scientist, it cannot be discerned."[28] I wonder, in this sense, whether the expression "divine pressure," which Rahner

[25] Rahner, "Christology within an Evolutionary View of the World," p. 165.
[26] "The immanence of God in the world," Rahner explains, "must be conceived as of so radical a kind that the process of self-transcendence inherent in being in process of becoming genuinely is an active process of self-transcendence. At the same time, however, the transcendence of God must be maintained and that too not merely by reason of God's sovereign independence of the world, but to ensure that what emerges from this process is that which is genuinely new" (Karl Rahner, "Christology in the Setting of Modern Man's Understanding of Himself and of His World," in *Theological Investigations* 11 (New York: Crossroad, 1982), p. 225).
[27] Rahner, "The Unity of Spirit and Matter," p. 177.
[28] Rahner, "Natural Science and Reasonable Faith," p. 37. "The idea of *self*-transcendence," Denis Edwards explains, "indicates that at the empirical level of science the emergence of the new is completely open to explanation. There I no need for a god of the gaps" (Denis Edwards, *How God Acts: Creation, Redemption, and Special Divine Action* (Minneapolis: Fortress Press, 2010), p. 44).

coined in order to express the way God empowers beings to become something more, is the most appropriate. In fact, this term "pressure" evokes a "physical" interaction, and might lead one to lose sight of the transcendent character of divine causality. It is perhaps worth trying to express the same idea using alternative expressions. Maybe the more Biblical category of "calling" could be offer a suitable substitute, insofar as it moves us a way from physical interaction and invites us to think in terms of relationship.

The Human Being: the Self-Transcendence of Living Matter

Rahner's concept of matter's active self-transcendence under the "pressure" of God provides firm foundations for a sound theology of evolution that safeguards the belief in the creator God without compromising the integrity of the evolutionary process. By affirming God as the transcendent ground of self-movement of the world, Rahner can uphold the idea of emergent evolution in its most radical form: matter can become something genuinely new, and even give rise to the spirit. Insofar as the evolutionary process is propelled by the constant "pressure" of God, who is pure being, matter can transcend itself in the direction of the spirit. This means that the spirit should be regarded not as the result of a special divine act, but as a moment in the movement of self-transcendence. In other words, "the spirit itself may be regarded as the result of the history of nature when it arrived at certain point in its history."[29]

For Rahner, then, the evolutionary process is a continuous ascension in the direction of higher forms of being that arrives at a critical stage when, in the human being, the universe becomes conscious of itself. The human being is not, in this sense, exterior to the process of evolution, but the self-transcendence of living matter. In Rahner's words, "man is not only the spiritual *observer* of nature – since he is a part of it and must precisely continue its history too – his history is not only a history of culture (in the sense of an ideological history situated above

[29] Rahner, "The Unity of Spirit and Matter," p. 172.

natural history) but is also an active alteration of this material world itself."[30] This understanding of evolution is profoundly teleological and appears to have little space to accommodate chance.[31] The history of nature is directed to a goal: to become, in the human being, conscious of itself and conscious of the one who upholds the movement of self-transcendence.[32]

Not surprisingly, Rahner finds problematic the idea that the human soul is directly created by God and infused in a body prepared according to the laws of biological evolution.[33] To begin with, the idea of infusing the soul in the evolution-prepared body appears to compromise the essential unity of the human being, as if the body and the soul could exist separated from each other. Second, this solution fails to appreciate that while being qualitatively different from other animal species, human beings exhibit a certain degree of continuity with them: "man has a long preparatory history, which, in every higher steps of living forms endowed with psychic life, at least leads very close to him."[34] Although Rahner does not explore this direction, the idea that human beings are somehow in continuity with other animals could ground a realistic eco-theology that acknowledges the value of non-human creatures.[35] Finally, a God that intervenes to create directly the human soul resembles too much a "God of the gaps." If God, as the ground and sustainer of the process of evolution, enables the emergence of higher levels of complexity, why would God not do the same with the spiritual dimension of the human being? Affirming that the emergence of spirit by-passes secondary causation, ends up reducing God's causality to "an activity in the world *beside* other activity of creatures, instead of it being the ground of all the

[30] Rahner, "Christology within an Evolutionary View of the World," p. 168.
[31] See: ibid., p. 169
[32] Ibid., p. 172.
[33] This teaching of Pius XII was reaffirmed by John Paul II (*Message to the Pontifical Academy of Sciences: on Evolution* (1996). Accessed in 10/26/2015. https://www.ewtn.com/library/PAPALDOC/JP961022.HTM).
[34] Rahner, "The Unity of Spirit and Matter," p. 174.
[35] For a thorough treatment of this theme see: Celia Deane-Drummond, *The Wisdom of the Liminal: Evolution and Other Animals in Human Becoming* (Grand Rapids, Michigan/Cambridge, U.K.: William B. Eerdmans Publishing Company, 2014). It is the author's goal to argue "for a much richer and embedded understanding of the human rooted through millennia of evolutionary living in a common creaturely world" (p. 3).

activity of all creatures."[36] While Rahner's proposal is certainly worth taking into account, this is a question that deserves a deeper treatment than what I can accomplish here. Given that the tradition has repeatedly affirmed that the human soul is directly created by God, can we say the spirit emerged from matter without compromising the Christian tradition? I intend to resume this discussion elsewhere.[37]

Christ: the Climax of Evolution

While it represents a critical stage in the movement of matter's self-transcendence, the emergence of the human being does not represent, yet, the culmination of the evolutionary process. According to Rahner, the goal of the world "consists in God's communicating himself to it."[38] In other words, the process of evolution can arrive at its goal only when an interlocutor for God has finally emerged: "the whole history of becoming of the world, therefore, proceeds in ever higher stages of self-transcendence towards that point at which this self-bestowal of God can be and is accepted as such."[39] This interlocutor is the human being, of course. In the human being, the universe becomes not only conscious of itself, but also capable of accepting God's self-communication: "in the history of the world considered as the history of self-transcendence that being which appears as capable of accepting such a self-bestowal on God's part is called man."[40]

While being human means to be capable of God, the total and irrevocable acceptance of God's self-communication happened historically in the person of Jesus Christ, the Word of God made flesh. In him, God's communication is perfectly accepted, and the Universe's movement of self-transcended arrives at its climax: "the whole movement of this history lives only for the

[36] Ibid., p. 173.
[37] For an insightful and well-argued defense of the traditional position, see: Brendan Purcell, *From Big Bang to Big Mystery: Human Origins in the Light of Creation and Evolution* (Dublin: Veritas, 2011), especially ch. 11.
[38] Rahner, "Christology within an Evolutionary View of the World," p. 172.
[39] "Christology in the Setting of Modern Man's Understanding of Himself and of His World," p. 226.
[40] Idem.

moment of arrival at its goal and climax."[41] Now, if in Christ God's self-bestowal is completely accepted, this is because in him the human and divine natures become intimately united. In the one person of Christ, the Word of God incarnate, God's self-communication is simultaneously offered and accepted. In Christ, the irrevocable self-bestowal of God and its definitive acceptance coincide. This is, according to Rahner, the deep meaning of the doctrine of the Hypostatic Union. "Jesus is the one who – by what we call his obedience, his prayer, and the freely accepted destiny of his death – has achieved also the acceptance of his divinely given grace and direct presence to God which he possesses as a man."[42]

Now, since it is only in the definitive acceptance of God's self-bestowal that the history of the world arrives at its climax, the Incarnation becomes somehow "necessary," i.e. "hypothetically" necessary, in the sense that it is contingent on God's decision to create a world "destined" to be united with him. In other words, if the world was, from the outset, created to be the receptacle of God's self-communication, the Incarnation had to be part of God's plan from the beginning.[43] "It is almost impossible," Rahner explains "to see how one could understand the Incarnation as a higher event or even the highest stage in the reality of development of the world … without the aid of the theory that the Incarnation is itself already an intrinsic element and condition of the general gift of grace by which God gives himself to the spiritual creature."[44]

It is important to note that this way of conceiving the Incarnation can be easily correlated with Rahner's understanding of the relationship between nature and grace. Human nature, the author defends, is intrinsically ordained to grace. In other words, "human nature is such that it

[41] Rahner, "Christology within an Evolutionary View of the World," p. 175.
[42] Ibid., p. 176. Later in the same article, Rahner will repeat the same idea in the following way: "in the human reality of Jesus, God's absolute saving purpose (the absolute event of God's self-communication to us) is simply, absolutely and irrevocably present; in it is present both the declaration made to us and its acceptance – something effected by God himself, a reality of God himself, unmixed and yet inseparable and hence irrevocable" (pp.183-85).
[43] This is also the view of the Franciscan School (in particular Duns Scotus): instead of being contingent to human sin, the Incarnation was part of God's original plan (see: ibid., p. 184).
[44] Ibid., p. 180.

must look to grace for its absolute fulfillment," and, in this sense, union with God appears to be the "expectable" fulfillment of nature.[45] The problem with this understanding of the relationship between nature and grace is that it runs the risk of transforming grace into something "necessary," something due to the human being, and in this sense not grace anymore. A version of this concern applies also to Rahner's understanding of the Incarnation. If we say that the Incarnation was after all necessary – the natural culmination of the process of evolution – are we not limiting God's freedom? A preliminary response to this objection should note that the necessity of the Incarnation is *hypothetical*, as we have already noted. In other words, if the Incarnation becomes necessary this is only because God wanted the world to be fulfilled in union with him. It is somehow like saying that once God creates triangles, then it is necessary that the angles of a triangle will sum 180º.

It is appropriate to close this section on Rahner with a note on eschatology. While in Christ the world has already arrived at its goal, what begun in Christ is meant to spread out to the whole human race: "if this total event of divinizing sanctification of humanity attains its consummation, it must be a concrete, tangible phenomenon in history … and hence must spread out spatio-temporally from one point."[46] In this sense, according to Rahner, we can say that a kind of "hypostatic union" is somehow meant for every human being: "whenever God – by his absolute self-communication – brings about man's self-transcendence into God, in such a way that both these factors form the irrevocable promise made to all men which has already reached its consummation in this man, there we have an hypostatic union."[47] Although suggestive, this use of the expression "hypostatic union" may be misleading, and calls for a clarification. We should distinguish, in fact, between the union of God's eternal Word with the human nature of Jesus,

[45] Karl Rahner, "Nature and Grace," in *Theological Investigations* 6 (London: Darton, Longman & Todd, 1969), p. 186.
[46] Rahner, "Christology within an Evolutionary View of the World," p. 181-82.
[47] Ibid., p. 182.

which is properly called "hypostatic union," from the believer's union with God, in which he or she becomes by the grace of adoption what Christ is by nature. So, believers will not be hypostatically united with the eternal Word, but will be united with God through the Spirit.

Divine Creativity and the Interplay of Law and Chance

As I have mentioned in the previous section, Rahner shows little sensitivity to the role of chance throughout the process of evolution. Chance is, however, a crucial ingredient of any contemporary account of biological evolution, and to that extent it cannot be ignored by any serious attempt to build a theology of evolution. The task of supplementing Rahner's seminal ideas on evolution with a theological treatment of the role chance in the evolutionary process was taken by Denis Edwards in *How God Acts*, and by Elizabeth Johnson in *Ask the Beasts*. Both of these authors draw from Arthur Peacocke explorations of the theme.[48] Remaining within the primary-secondary causality framework, the authors propose that instead of being a challenge to the idea of a creator God, contingency and chance should be seen as secondary causes through which God acts. In other words, God is the ultimate ground and source not only of regularity and law, but also of chance.[49]

Theologians tend to consider chance as troublesome.[50] God is usually associated with order and teleology, and, as such, chance appears to be a challenge to the idea of creation. If what God does is to impart order, and if the process of evolution is pervaded by chance, this can only mean that this God is not, after all, the one who sustains evolution. According to Johnson,

[48] See: Arthur Peacocke, *Theology for a Scientific Age: Being and Becoming – Natural, Divine, and Human* (Minneapolis: Fortress Press, 1993), pp. 115-121.
[49] Edwards, *How God Acts,* p. 53.
[50] It is interesting to note that Thomas Aquinas, who lived centuries before the emergence of evolutionary ideas, had no problems with chance. Asking whether providence is incompatible with chance, he said that "it would be inconsistent with divine providence if all things happened of necessity…. Therefore it would be contrary to the nature of providence and to the perfection of the world if nothing happened by chance" (*SCG* III, ch. 74). Otherwise, Aquinas remarks, there would be no contingency, and God would have no space to exert governance. See: Mooney, *Theology and Scientific Knowledge*, pp. 162-63.

however, chance does not have to be seen as something negative. While it is true that chance can have disastrous consequences for some, it is also the condition of possibility of creativity and novelty. In fact, chance works as a kind of "scanner" of new possibilities. Sure, without a certain degree of order and regularity, the process of evolution would be dissolved in chaos and anarchy. But without chance, no novelty. In this sense, the process of evolution is better understood as the interplay between chance and law. Johnson's argumentation is persuasive:

> If all were law, the natural world would ossify; its ordered structure would be rigid, repetitive, deterministic. If all were chance, nature would be dissolved in chaos; no new patterns would persist long enough to have an identity. But chance operating within a lawlike framework introduces novelty within a pattern that contains and directs it…. Rather than being an enemy of law, then, chance is the very means by which nature becomes continuously creative.[51]

Chance is, also, the condition of possibility of freedom. Without a certain degree of indeterminacy within the very fabric of matter, it is difficult to see how higher forms of life could be endowed, in different degrees, with agency and freedom. Chance is, in fact, one instance of creaturely freedom. "At the very least, the freedom of natural systems to explore and discover themselves within a context of lawlike regularity is one of the natural conditions for the possibility of the emergence of the possibility of free and conscious human beings as part of the evolving universe."[52]

Interestingly enough, the element of chance invites a deeper appreciation of divine creativity. Yes, God is the ground of the world's order and regularity. But the Creator is also an infinite source of novelty and surprise, which God bestows on the world through the interplay of law and chance. "The deep regularities of the world in their own finite way reflect," Elizabeth Johnson explains, "the faithfulness of the living God, reliable and solid as rock." On the other

[51] Johnson, *Ask the Beasts*, p. 171.
[52] Ibid., p. 172.

hand, "the occurrence of chance in the world in its own finite way reflects the infinite creativity of the living God, endless source of fresh possibilities."[53] We will see, in the next chapter, the way John Haught, taking his inspiration from process theology, develops this idea.

A Pneumatological Approach to Evolution

In the first line of the Book of Genesis, we are told that a "wind of God swept over the face" of the waters" (Gen. 1:1), and in Psalm 104 we read that the presence of the Spirit renews the face of the earth (Ps. 104:30). Also, the third article of the Nicene Creed refers to the Spirit as the "Lord and Giver of life." There is a sense, then, in which can say that it is through the Spirit that God's self-bestowal becomes available and operative in the world. Making use of this fundamental intuition, Johnson develops a *pneumatological* approach to evolution. According to her, the language about the Spirit is particularly apt to talk about God's creative presence in our evolving world: it is the Spirit who enlivens the world from within, and enables its movement of becoming. Better than concepts, the traditional symbols of the Spirit – wind, water, fire, bird, and wisdom – allow us to express the Spirit's presence in the world: "wind, water, fire, bird, holy Wisdom's mobility, beauty and creative power: these symbols provide guides for how to think about the hidden presence and activity of the Spirit of God in the world. This ineffable presence is innermost to creatures, a vital power that enlivens, nurtures, sparks, and fructifies them in every instant."[54] When put together, these images convey the sense that the Spirit is an untamable source of novelty of creativity, the novelty and creativity that we can contemplate in the process of evolution where both law and chance play a key role. "The Giver of life," Johnson explains, "creates what is physical – stars, planets, soil, water, air plants animals, ecological communities –

[53] Ibid., p. 173. "Divine creativity," Johnson continues, "is much more closely allied to the outbreak of novelty than the older order-oriented theology ever imagined. In the emergent evolutionary universe, we should not be surprised to find the Creator Spirit hovering very close to turbulence" (Idem).
[54] Ibid., p. 143.

and move in these every bit as vigorously as in soul, minds, ideas. Earth is a physical place of extravagant dynamism that bodies forth the gracious presence of God."[55]

Critical Remarks

In this chapter, we have engaged theological approaches to evolution that creatively retrieve the scholastic distinction between primary and secondary causality. The fundamental idea behind these approaches can be summarized in the following way: God, who is absolute being and the source of all created being, not only enables creatures to exist and to act, but also endows them with the capacity of active self-transcendence, thus allowing them to become something more. Developed by Karl Rahner, this framework was complemented by authors like Denis Edwards and Elizabeth Johnson, who make use of the basic distinction between primary and secondary causality to interpret theologically the role of chance in the evolutionary process. According to them, we can understand both chance and law as "chief secondary causes" at work in the process of evolution. In other words, God, who is the source of order and regularity but also of creativity, creates through the interplay of law and chance. The claim that it is God who sustains the process of evolution and enables its integrity and autonomy offers an alternative to the idea that the process of evolution is blind and deprived of a *telos*. The history of the universe is, rather, a coherent and continuous ascension towards higher levels of being. This process of becoming, which arrives at a critical point when the human being emerges and the universe becomes conscious of itself and of its Creator, reaches its climax when, in Christ, God's self-bestowal is definitively accepted.

The primary-secondary causality construal offers a solid foundation for a sound theology of evolution that affirms without reserves the faith in the Creator God without compromising the integrity and autonomy of both the evolutionary process and of its description by the natural

[55] Ibid., p. 150.

sciences. This approach is not totally immune to criticism, though. Let me conclude, then, by assessing the strengths and weakness of theological interpretations of evolution that rest, in one way or another, on the distinction between primary and secondary causality. According to some critics, the main problem with the primary-secondary causality approach is its lack of explanatory power. In other words, this approach asserts that the evolutionary process is created and sustained by God, but it says nothing about how this is accomplished.[56] In the literature, we can find several attempts to pinpoint divine action: God as determiner of indeterminacies (on the quantum level, in complex systems, or in biological evolution), God as communicator of information, or process theism.[57] The problem with these approaches is that they all end up compromising God's transcendence by placing divine action at the level of other immanent causes. When treated as an immanent cause, divine action is in competition with natural causes, and one has only two ways of addressing the problem, neither of them satisfactory. Either God is almost completely stripped of divine power – in which case we end up with a caricature of God – or the autonomy and coherence of the natural world is disrupted. The alternative is, of course, to say that God is above natural causes as their primary cause. Even if this is disappointing for scientific minds, it is true that within this approach God is no longer within the scope of the natural sciences.[58] A metaphysical meditation on the conditions of possibility of science can indeed lead one to affirm the existence of God. But it would be a mistake to think that one day we will be able to find God as some kind of missing link within the network of natural cause. No, God is not a scientific

[56] See: ibid., p. 167.
[57] See: Barbour, *Religion and Science: Historical and Contemporary Issues* (New, NY: HarperSanFrancisco, 1990), pp. 312 ff.
[58] In the first chapter, we have criticized the assumption, typical of scientific naturalisms, that the scientific method is the only reliable source of knowledge and truth. This criticism can bear on this discussion. In fact, the obsession of trying to place God at the level of scientific explanations can only be understood within the context of a narrow epistemology that fails to acknowledge distinct levels of explanation. For an interesting criticism of this cultural assumption, see: Iain McGilchrist, *The Master and His Emissary: The Divided Brain and the Making of the Western World* (New Haven: Yale University Press, 2009).

explanation, but the one who creates the world and upholds its autonomy. As Herbert McCabe provocatively explains

> If God is the cause of everything,", "there is nothing that he is alongside. Obviously God makes no difference to the universe; I mean by this that we do not appeal specifically to God to explain why the universe is this way rather than that, for this we need only appeal to explanations within the universe…. What God accounts for is that the universe is there instead of nothing. I have said that whatever God is, he is not a member of everything, not an inhabitant of the universe, not a thing or a kind of thing.[59]

The second line of criticism claims that the primary-secondary causality approach violates the autonomy of the process of evolution and suffers from an inevitable determinism that cannot account for the occurrence of genuine chance at different levels of the evolutionary process. "If in God's view there is only one outcome," Barbour explains, "no genuine alternatives exist, though we may think they do."[60] This objection is simple to understand: if an omnipotent God governs the world according to divine providence, how can we say that secondary causes have real autonomy? If everything that exists is ultimately caused by God, how can we account for genuine freedom, and genuine randomness? To provide a consistent answer to this question, which has been the object of some of the most controverted disputes in the history of theology, is beyond the scope of this paper. Let me offer two remarks, though. First, a consistent approach to this problem has to be grounded in a sound understanding of God's divine transcendence: God, as the ground of everything that exists, is the one who creates other causes. For God, to create can only mean to create a (relatively) autonomous world that evolves according to its own laws. Second, the idea that the only freedom or autonomy truly deserving that name is *absolute* freedom is better understood as a cultural assumption that stems from the individualism that characterizes contemporary Western societies. The fact that the autonomy of creation is empowered by God,

[59] Herbert McCabe, *God Matters* (New York: Bloomsbury, 1987), p. 6.
[60] Barbour, *Religion and Science*, p. 312.

and thus only *relative* autonomy, does not mean, in fact, that this autonomy is less genuine. It simply means that its source and fulfilment is God.

I have already alluded, finally, to the concern that Rahner's conception of the evolutionary process as oriented to the Incarnation ends up undermining God's freedom. I wonder, also, whether this is an overly optimistic understanding of the history of the universe that fails to acknowledge the overwhelming presence of pain, death, and extinction throughout the evolutionary process, and downplays the significance of sin and the possibility that it frustrates God's plan.

Chapter 4

Beyond Classical Theism: the Lure of Process Theology

The teleology of the universe is its aim towards beauty.

Alfred North Whitehead, *Adventures of ideas*[1]

In the previous chapter, we engaged theological approaches to evolution that retrieve the scholastic distinction between primary and secondary causality. The fundamental idea is that God, as primary cause, enables and sustains the process of evolution, while at the same time fully respecting its integrity and autonomy. Insofar as divine and immanent causality are placed at different levels, God is not in competition with the immanent causes operative throughout the evolutionary process. On the contrary, it is through immanent causes that God governs the world according to his divine providence. While attempting at engaging the evolutionary paradigm set forth by contemporary science, this theological approach remains mostly within the confines of classical theism, and, as such, the classical attributes of God are not questioned or radically re-interpreted.

The goal of the present chapter is to explore an alternative theological *take* on evolution that goes beyond classical theism and modifies the classical doctrine of God in order to more easily accommodate the description of reality provided by evolutionary data. Modern and contemporary liberal theology offers a whole panoply of alternatives to classical theism. It is not possible, within the limited space of this work, to present a comprehensive review of all these approaches. I will, instead, focus my attention on the proposal of Catholic theologian John Haught, who has been our companion of journey throughout this thesis. While he cannot be considered a

[1] Alfred North Whitehead, *Adventures of Ideas* (New York: The Free Press, 1967), p. 265.

process theologian *tout court*, John Haught does appropriate key insights of process thought in his own theological interpretation of evolution. One of the great virtues of Haught's proposal, which we can regard as a kind of modified process theology, is its commitment to take evolutionary data seriously while at the same time attempting to remain in dialogue with Scripture and the Church's living tradition. John Haught acknowledges that evolution challenges theologians to reconsider the traditional teachings about God and the way God interacts with the world. This does not mean, however, that we have to retreat and give up altogether the theistic interpretation of the world. Evolutionary news about nature should, in fact, be taken as "an invitation for us to enlarge our sense of the divine."[2] In other words, the goal of evolutionary theology should be "to show how our new awareness of cosmic and biological evolution can enhance and enrich traditional teachings about God and God's way of acting in the world."[3] Whether Haught's proposal is in line with the key elements of the classical doctrine of God is something we will have to assess. We will have to ask, in other words, whether Haught's approach offers a real "enhancement" and "enriching" of the tradition, or whether it ends up comprising fundamental elements of classical theism. Haught's theological approach is certainly consistent, or at least it tries to be, with what science tells us about biological and human history. The question we have to ask is whether it is consistent enough with the Biblical tradition.

Insofar as process theology appears to be an important inspiration for Haught's theology of evolution, I will open this chapter by offering a brief review of key insights of *process thought*, a fecund philosophical and theological tradition that sprung out of Alfred North Whitehead's effort to build a robust metaphysics that would incorporate the fundamental developments of modern science, and in particular the evolutionary paradigm. In the following section, I will critically

[2] Haught, *God After Darwin: A Theology of Evolution* (Boulder, Colorado: Westview Press, 2000), p. ix.
[3] Ibid., p. 36.

engage the key aspects of Haught's theological approach to evolution, and attempt at tracing the way process theology appeared to have influenced his work. I will focus my attention on the way Haught modifies the classical understandings of creation, divine providence, and the divine attributes, in particular divine omnipotence and impassibility. I will conclude the chapter with some critical remarks.

On the Path of Alfred Whitehead: a (Brief) Review of Process Theology

In the previous chapters, we had the chance to appreciate how the developments of modern and contemporary science have progressively challenged both the medieval and Newtonian worldviews, thus calling for the development of new metaphysical and theological categories.[4] In their attempt to answer this call, process philosophers, following the thread of Alfred North Whitehead's seminal essay *Process and Reality*,[5] have developed a systematic metaphysics that is consistent with the evolving and many-leveled universe disclosed by contemporary science.[6] Within the framework of process philosophy, the universe is undergoing an open ended "process" that leaves space for real creativity and emergence, and where different levels of complexity are intrinsically interdependent. The world is better understood as an organism, or as a community of events, in which the parts contribute to and are also modified by the unified activity of the whole. Spontaneity and self-creation are dominant characteristics of higher levels of complexity, but in different degrees they are also present also in the lowers levels of complexity: every entity takes

[4] According to Ian Barbour, the new view of nature that emerges from the impressive developments of contemporary science displays the following key characteristics: (i) nature is evolutionary, dynamic, and emergent; (ii) in place of determinism, there is a complex combination of law and chance; (iii) nature is seen as relational, ecological, and interdependent; (iv) an holistic approach that acknowledges the integrity of each level of complexity is retrieved; (v) humanity is seen as integral part of nature, the dualism mind/body is abandoned, and nature is better seen as a community (*Religion and Science*, pp. 283-84).

[5] Alfred North Whitehead, *Process and Reality: An Essay in Cosmology*, 6th ed., (New York, The Macmillan Company, 1929).

[6] See: Ian Barbour, *Religion and Science: Historical and Contemporary Issues* (New York, NY: HaperSanFrancisco, 1997), pp. 284 ff.

account of other events and reacts and responds to them.[7] Process philosophy proposes a rich and complex understanding of causality that goes much beyond the deterministic outlook of modern science: besides efficient causation, there is an element of self-causation, and the recovery of final causation, understood "as a creative selection from among alternative potentialities in terms of goals and aims."[8]

Insofar as it ascribes to God an important role, process philosophy opens up to what is usually called "process theology," a popular theological trend in the 20th century.[9] Alfred North Whitehead's seminal ideas were appropriated by numerous authors and developed in many different directions. It is possible, nevertheless, to identify main themes and a common understanding of God, creation, and divine action. Let me identify, then, some of the key aspects of process theology. First, while classical theism tends to see God as a *designer* who creates and governs the world according to a pre-determined plan, process theologians place the emphasis on divine creativity – God is the ground of both order and novelty – conceiving the universe as dynamic and essentially open to the novelty that future brings about. For process theology, God is not immune to the openness and dynamic character of the universe. Temporality, change, and openness to the future pertain to both God and the universe: "process involves the emergence of novelty. Temporality brings new experiences to God and to the creaturely world. Accordingly, the future is not predetermined but open and surprising for us and also for God."[10] As I have said, for process theology, God is both the source of order and the source of novelty, but novelty has somehow the priority. "The Primordial Nature of God," Conn and Griffin explain, "is the goal toward novelty in the universe, stimulating us to realize new possibilities after the old ones no

[7] Ibid., p. 285.
[8] Ibid., p. 286.
[9] For two accessible introductions to process theology see: Bruce Epperly, *Process Theology: A Guide for the Perplexed* (London/New York: T & T Clark International: 2011), and John Cobb and David Griffin, *Process theology: An Introductory Exposition* (Philadelphia: The Westminster Press, 1976).
[10] Epperly: *Process Theology,* p. 21.

longer are sufficient to give zest to our enjoyment of being actual."[11] We can say, in short, that process theology places the emphasis on novelty, and ascribes to the "future" an unprecedented prominence.

Moreover, and this is the second point, the key categories of process metaphysics, such as temporality, interaction, and mutual relatedness, apply also to God.[12] God influences the events of this world and is influenced by them. In this sense, God can longer be considered as impassible. "In our dynamic and ever-changing world," Epperly asserts, "God is the most dynamic and ever-changing reality; God's becoming embraces the eternal, the temporal, and everlasting in an ever-creative, self-surpassing dialogue with the universe."[13] Process theology's downplay of divine impassibility is concomitant with a strong emphasis on divine immanence. It is true that God has a unique role within the universe: nothing comes into being apart from God, who maintains a unique relationship to each member of the "cosmic community," and has the power to influence, through persuasion and not imposition, the overall direction of the universe. At the same time, God is a member of the "cosmic community," and acts at the same level of other causes.[14]

Third, process theology deflates the absolute power that classical theology ascribes to God. Instead of coercing, God persuades: "the process God does have power, but it is the *evocative power* of love and inspiration, not controlling, unilateral power."[15] We can think of God as a kind of "*leader* of the cosmic community," inspiring the evolving Universe towards new and richer possibilities.[16] We can say, in this sense, that God is not in full control of what happens within the universe: "since actuality as such is partially self-creative, future events are not yet

[11] Cobb and Griffin, *Process theology*, p. 59.
[12] See: Barbour, *Religion and Science*, p. 293.
[13] Epperly: *Process Theology,* p. 21.
[14] See: Barbour, *Religion and Science*, p. 295.
[15] Ibid, p. 326. It is interesting to note that according to Barbour this portrayal of God resonates with central themes of Christian faith, namely salvation through the cross: in the cross Christ manifests transformative love rather than sheer power.
[16] Ibid., p. 322.

determinate, so that even perfect knowledge cannot know the future, and God does not wholly control the world. Any divine creative influence must be persuasive, not coercive."[17] Process theologians are deeply committed to affirm God as loving and benevolent, which leads them to understand divine power as being persuasive rather than imposing. It is important to note that downplaying divine power turns out to be an effective way of exonerating God of the responsibility of being the author of both good and evil.

We can say, in short, that process theology strips God of the attributes associated with classical theism, namely omnipotence, omniscience and impassibility, or at least modifies their meaning. The advantages of this approach are not difficult to grasp. Within process theology, the problem of suffering in nature finds an easy resolution. Since divine omnipotence is rejected, God cannot be blamed for the suffering and death that pervades the process of evolution: "by accepting the limitations of divine power we avoid blaming God for particular forms of evil and suffering; we can acknowledge that they are contrary to divine purposes in that situation."[18] Moreover, by downplaying divine power, process theologians can easily account for the agency and freedom of creatures, in particular the human being: "process thought has no difficulty in representing human freedom in relation to both God and causes from the past. In particular, omnipotence and predestination are repudiated in favor of a God of persuasion, whose achievements in the world depend on the response of other entities."[19] At the same time, process theology has been the target of harsh criticism. Besides running the risk of imposing on Christianity a rigid philosophical system, process theology seems to depart too far from classical theology.[20] The question is whether this reformulation is justified. In the end of this chapter we will analyze these concerns in further detail.

[17] Cobb and Griffin, *Process theology* , pp. 52-53.
[18] Barbour, *Religion and Science*, p. 323.
[19] Idem.
[20] See: Barbour, *Religion and Science*, pp. 325-27.

As I have said, the original metaphysics of Alfred North Whitehead has been taken in many different directions, some of them wandering way too far from orthodox Christianity, and some others making a serious effort to stay within the boundaries set forth by the tradition. In the next section, we will see how John Haught has creatively appropriated key insights of process theology in his attempt to propose a theological interpretation of evolution that remains committed to a serious and healthy dialogue with the Catholic Tradition, even if not exempt from serious problems.

A God for Evolution: the Modified Process theology of John Haught

I have already noted many times throughout this thesis how evolution is, at least for many thinkers, an unsurmountable challenge to a theistic interpretation of the world, "the final defeat of theism."[21] One of the main goals of this thesis has been, in fact, to inspire a reconsideration of this opinion, and suggest the viability of a theistic interpretation of evolution. According to Haught, evolutionary thought does not have to be seen as a threat to the belief in the creator God. On the contrary, the evolutionary description of the world offers an opportunity for a deeper, and more expansive, understanding of the mystery of God, and a richer understanding of the meaning of creation that recovers aspects that the tradition has overlooked. In this sense, evolutionary data are a gift for theology, Haught suggests, and theologians should not look at them with suspicion, but embrace them with enthusiasm. "Hasn't Darwin's evolutionary science," Haught asks "placed in serious doubt the religious sense that we inhabit a meaningful universe? Or is it instead possible that what scientific skeptics often take to be religiously ruinous consequences of Darwin thought

[21] Haught, *God After Darwin*, p. ix.

are in fact fresh openings to mysterious sacred depths of reality previously unfathomed?"[22] Haught's answer to this question is, as it will become quite clear, a definitive yes.

In chapter 2, we had the chance to address three critical challenges to the belief in a creator God who is also all-powerful, all-loving, and provident: (i) the idea according to which immanent causes alone can account for the emergence of all levels of reality, thus supposedly rendering superfluous the very idea of creation; (ii) the role of chance not only in the process of evolution, but also at the quantum level, which appears to be incompatible with the belief in an omnipotent God who created and governs the world according to divine providence; (iii) the pervasive presence of suffering and death throughout the process of biological evolution, which makes one doubt that God can be at the same time all-powerful and all-loving. John Haught is well aware of these three challenges, and takes them seriously. In fact, according to Haught, these three "facts" associated with the evolutionary account of reality invite theologians to revise, by retrieving aspects of the tradition that have been overlooked, the traditional teachings about God, creation, and divine action.

For Haught, the main point of contention is the tendency to associate God with "cramped" notions of order and design. "A theology obsessed with order," Haught asserts, "is ill prepared for evolution…. Evolutionary science compels theology to reclaim features of religious faith that are too easily smothered by the deadening disguise of order and design."[23] In this sense, evolution summons theologians to undertake fundamental conceptual adjustments. Instead of regarding God as the "designer" who forces creation to unfold according to a pre-determined plan, theologians are invited to think of God as an infinite source of creativity that, without coercion, provides the

[22] Ibid., p. 10. The starting point of Haught's theology of evolution is, in fact, the conviction that "Darwin has gifted us with an account of life whose depth, beauty, and pathos – when seen in the context of the cosmic epic of evolution – expose us afresh to the raw reality of the sacred and to a resoundingly meaningful universe" (idem, p. 2).
[23] Ibid., p. 5. "A persistent distaste for evolution," Haught observes, "stems … from questionable theological habits of identifying God with cramped notions of order and design. I believe we must look 'beyond design' as a first step in thinking responsibly about God after Darwin" (idem, p. x).

world with new opportunities: "the God of evolution is an inexhaustible and unsettling source of new modes of being, forever eluding encapsulation in orderly schemata."[24] Detaching himself from the conception of a God that enforces a pre-determined plan, Haught proposes that creation is better understood as an act of divine humility that opens up space for the world to be itself. This emphasis on divine humility, or divine *kenosis*, is concomitant with a mitigated conception of divine omnipotence: God is indeed all-powerful, but somehow refrains from using divine power in order to open up space for a world that is truly autonomous. Appropriating one of the slogans of process theology, Haught affirms that "divine love does not compel, but invites," and does so from the future.[25] In other words, instead of imposing a pre-determined plan, God addresses creation form the future, inviting it to new possibilities. This is what Haught calls "metaphysics of the future." Supposing, finally, that one accepts Haught's rejection of the traditional understanding of divine providence, how can we maintain that the world is endowed with a sense of direction and purpose? Sensitive to this challenge, Haught will propose that the universe was created in order to display beauty. In other words, the goal of the universe is to "expand the provinces of beauty."[26] This is what John Haught calls the "aesthetical cosmological principle."[27] It is the aim of the present section, which constitutes the core of chapter 4, to discuss, in three consecutive sub-sections, the three aspects of Haught's theology of evolution that I have just alluded to: the humility of God, the metaphysics of the future, and the idea that the universe was created in order to display ever intensifying beauty.

[24] Ibid., p. 9.
[25] Ibid., p. 41.
[26] Ibid., p. 113.
[27] Ibid., p. 136.

The Humility of God*: Re-thinking Divine Omnipotence*

One of the most troubling aspects of evolutionary science is, as we have seen, that the process of evolution seems to have no direction or inherent meaning. This apparent lack of design constitutes, of course, a serious challenge to the classical idea of an omnipotent God who creates and governs the world according to a pre-determined plan that exists in the divine mind. According to Haught, the seeming incompatibility between the scientific description of the evolutionary process and the belief in a loving and effective God stems from the way we tend to conceive divine omnipotence, which is usually "uprooted from any grounding in the actual religious intuition of God as self-emptying love."[28] Haught argues that the Christian tradition has the resources we need to make sense of the scientific accounts of evolution. According to the author, instead of focusing on a narrow understanding of "design," theology should bring to the fore the central mystery of Christian faith: the humility of a self-emptying God, who becomes flesh, and dies on a cross. "The data of evolutionary science," Haught affirms, "can be more intelligibly situated within a theological metaphysical framework centered around the biblical picture of 'humility of God.'"[29] Let me clarify the meaning of this concept and explain how it can shed light on the theological meaning of creation within an evolutionary framework.

It is important to clarify, from the beginning, that the idea of divine humility does not have to be understood as weakness or powerlessness on the part of God. More than lacking power, God refrains from using it, in order to open up space for something other than God to exist. The power

[28] Ibid., p. 111.

[29] Ibid., p. 47. Theologians, Haught affirms, have often fled from the "revolutionary" idea of a humble God who decides to be vulnerable and empty himself. According to the author, however, the humility of God is not simply a peripheral detail. It is, rather, a central aspect of the Christian understanding of God: "the image of a vulnerable and humble deity may seem shocking to some, but is crucial to the Christian sense of the nature of ultimate reality. It is in a God who submits to crucifixion that Christian faith invites us to put the fullness of our trust. The portrait of a self-giving rather than self-aggrandizing mystery has always been implicit in the symbols of Christian faith. In fact, through its Trinitarian doctrine Christianity has made the crucifixion of Jesus an inner dimension of God's experience rather than something external to deity. But theologians and religious educators have often fled from this disquieting and revolutionary idea" (idem).

of God is not self-imposing and destructive power. On the contrary, God makes Godself "defenseless" and "vulnerable" so that the other can be. According to theologian Jürgen Moltmann, it is God's "self-limitation," rather than divine might, that allows the creation of the universe: "God withdraws into himself in order to go out of himself. He 'creates' the preconditions for the existence of his creation by withdrawing his presence and his power…. It is the affirmative force of God's self-negation which becomes the creative force in creation and salvation."[30]

Now, according to John Haught, this *kenotic* image of God turns out to be crucial in the attempt to build a consistent theology of evolution that makes sense of "unfathomed epochs of wandering experimentation, struggle, apparent waste, and suffering that occur in the larger story of life as the result of evolution by natural selection."[31] The fundamental idea is that creation happens not as the enforcement of a divine plan, but as the consequence of God's loving "letting be." This theology of divine humility "makes room for true novelty to spring spontaneously into being – a feature logically suppressed by deterministic materialist interpretations, as well as by the notion that the universe is simply the unfolding of an eternally fixed divine design or plan."[32] In other words, according to Haught's view, God does not impose a plan on creation, but allows it to explore its fundamental openness, which is expressed in the randomness and tentativeness visible in the process of evolution. Understood in this way, nature would be neither the result of a blind and impersonal process, as scientific naturalism claims, nor a kind of project implemented according to a blueprint already available in the mind of the divine designer, but precisely a

[30] Jürgen Moltmann, *God in Creation: A New Theology of Creation and the Spirit of God*, translated by Margaret Kohl (Minneapolis: Fortress Press, 1993), p. 87. "God 'withdraws himself from himself to himself' [the author continues] in order to make creation possible. His creative activity outwards is preceded by this humble self-restriction…. God's creative love is grounded in his humble, self-humiliating love…. Even in order to create heaven and earth, God emptied himself of his all-plenishing omnipotence, and as Creator took upon himself the form of a servant" (ibid., p. 88).
[31] Haught, *God After Darwin*, p. 49.
[32] Ibid., p. 54.

dynamic reality endowed with the capacity to be self-creative. According to Haught, if one abandons a "dictatorial concept of divine power" and accepts the humility of God, the features of the evolutionary process disclosed by contemporary science become almost *expectable*:

> In the presence of the self-restraint befitting and absolute self-giving love, the world would unfold by responding to the divine allurement at its own pace and in its own particular way. The universe would then be spontaneously self-creative and self-ordering. And its responsiveness to the possibilities for new being offered to it by God would require time, perhaps immense amounts of it. The notion of an enticing and attractive divine humility, therefore, gives us a reasonable metaphysical explanation of the evolutionary process as it manifests itself to contemporary scientific inquiry.[33]

Haught makes a serious effort to ground his "theology of divine humility" in divine revelation. Throughout his discussion, the author keeps pointing to the cross of Christ as the true paradigm of divine action. Divine self-emptying is, according to the author, the primary *datum* of Christian faith, and evolutionary science provides the occasion for a deeper appreciation of this mystery.[34] At the same time, however, Haught does not hide the influence of process theology on his own attempt to offer a theological interpretation of evolution. As we have seen, it is a characteristic of process theology to compromise the attribute of divine omnipotence: "evolution, according to process theology, occurs in the first place only because God's power and action in relation to the world take the form of persuasive love rather than coercive force…. Divine love does not compel, but invites. To compel, after all, would be contrary to the very nature of love."[35] In short, instead of coercing, God persuades; instead of enforcing, God invites. The approach of process theology is certainly very convenient, insofar as it can easily accommodate nature's randomness and self-creativity, and even human freedom. In my opinion, however, it is far from

[33] Ibid., p. 53.
[34] See: ibid., p. 52.
[35] Ibid., p. 41.

being grounded in divine revelation as transmitted through Scripture and the Church's living Tradition. More on this in the conclusion of the chapter.

It is important, finally, to briefly mention Haught's approach to the problem of suffering in nature, which is not dissimilar to Elizabeth Johnson's proposal, which we discussed in the previous chapter. The core of Haught's response to what we have called "evolutionary evil" resides in the idea of divine solidarity. In other words, the suffering of creation is not alien to God, who embraces the suffering and struggle of every creature and of the whole universe: "the agony of living beings is not undergone in isolation from the divine eternity, but is taken up everlastingly and redemptively into the very 'life-story' of God."[36] We have seen how process theology overcomes the problem of evil by downplaying divine omnipotence. By accepting the limitations of divine power we can avoid blaming God for suffering and evil.[37] Haught's approach is slightly different. In fact, the author does not say that God lacks power. It is more that, in his humility, God somehow refrains from using divine power, and instead choses to be vulnerable and to suffer alongside creation. Expanding the idea of a God who accepts the limitations of human life in order to redeem it, Haught suggests that in his divine suffering, God embraces "the struggles of the entire universe and not just our own species' brief history here. God's empathy enfolds not just the human sphere but the whole of creation, and this can mean only that the vast evolutionary odyssey, with all of its travail, enjoyment, and creativity, is also God's own travail, enjoyment, and creativity."[38] As I see it, the idea of a God who suffers is in many ways problematic, and I intend to briefly explain why in the conclusion to this chapter.

[36] Ibid., p. 50.
[37] Barbour, *Religion and Science*, p. 323.
[38] Haught, *God After Darwin*, p. 51.

God as the Power of the Future: *Re-thinking Divine Providence*

According to Aquinas, a plan for ordering things to their end pre-exists in the divine mind, and this is what he calls divine providence.[39] The question that naturally arises is: how can this understanding of divine providence be compatible with the randomness and tentativeness of the evolutionary process? We have seen, in the last chapter, that Aquinas is not caught off guard concerning the compatibility between divine providence and chance. It is true, nevertheless, that within contemporary science, particularly in quantum mechanics and biological evolution, chance has a much more prominent role than Aquinas could have anticipated, to the extent that some scientists claim, as we have seen, that evolution is totally deprived of directionality. Chance is, indeed, one of the most pressing challenges to the belief in a provident and all-powerful God. In the last chapter, we saw how, within the primary-secondary causality framework, chance can be understood as a kind of secondary cause that mediates divine action. In this sense, God can be seen as source not only of regularity and law, but also of chance, which then becomes an expression of divine creativity. Well aware of how difficult it is to maintain that creation unfolds according to a pre-determined plan, Haught proposes a re-formulation of the idea of divine providence. In a nutshell, Haught suggests that instead of being a kind of designer that has a plan for creation, God is a "transcendent force of attraction" that acts out from the future. This is what he calls "metaphysics of the future." Let me explain.

According to Haught, the different metaphysical approaches that have dominated Western thought were focused either on the present or on the past. Plato, for example, is an all-influential proponent of what Haught calls "metaphysics of the "eternal present," according to which "the natural world is the always deficient reflection of, if not a perverse deviation from, a primordial perfection of 'being' that exists forever in affixed realm generally pictured as 'above' creation,

[39] *S. th.*, I, q.22, a.1, *reply.*

untouched by time."[40] This fundamental idea – the "Great Chain of Being" notion – was creatively retrieved by many of the most influential Western authors, and according to Haught keeps influencing contemporary religious thinking: "Western religious sensibilities," Haught asserts, "still carry at least some residue of the pre-evolutionary prejudice that cosmic time can bring about nothing that has not already been fully realized in a perfection existing from all eternity."[41] Scientific materialism, on the other hand, espouses what Haught calls a "metaphysics of the past." Everything that emerges throughout the process of evolution can be reduced to the lower and temporally prior levels of complexity:

> The extravagant proliferation of living beings on this planet over the past several billion years, clear evidence of evolution's inclination to bring about unprecedented novelty, is for the pure materialist nothing more than a reshuffling of lifeless stuff that has always been there…. Conceived in this way, the entire life-process, rather than being evidence of nature's openness to the arrival of genuine novelty, is only the explication of what was fully latent already in lifeless matter from the time of cosmic beginnings.[42]

What is common, then, to both scientific materialism and to religious and philosophical mindsets that embrace some variation of the "Great Chain of Being" notion" is the refusal to accept that something genuinely new can emerge throughout the process of evolution.[43]

Taking his inspiration from the work of Teilhard de Chardin, Haught suggests that evolution requires an alternative view of reality grounded in a "metaphysics of the future," by which he means "the philosophical expression of the intuition – admittedly religious in origin – that all things receive their being from out of an exhaustible resourceful future that we may call

[40] Haught, *God After Darwin*, p. 85.
[41] Idem.
[42] Ibid., p. 86.
[43] "In both cases," Haught explains, "being is already virtually given in full, whether eternally from above or implicitly in the indefinite cosmic past. There is no room in either standpoint for the emergence of real novelty, and so both standpoints imply that the future will be inherently barren. In these lusterless conceptions, the future is nothing more than the predictable 'outcome' of what has gone before in time or in eternity" (ibid., p. 96).

God."[44] Since neither a "fixed past" nor an "eternal present" can really account for emergence of true novelty throughout the process of evolution, only the future can be the ultimate source of genuine newness.[45] According to Haught, then, God is not a *designer*, but "the transcendent future horizon that draws our entire universe, and not just human history, toward an unfathomable fulfillment yet to be realized."[46] Instead of imposing an order from the past, God, who is "the Power of the Future," an "ultimate force of attraction," draws the Universe towards ever new possibilities, deeper coherence, and ultimately its final fulfillment in God.[47]

This "metaphysics of the future," Haught claims, offers an alternative and more consistent way of making sense of evolution. God, as the "Power of the Future," is the ultimate explanation of evolution: "theologically speaking, we may surmise that evolution occurs at all only because in some analogous sense all of nature is being addressed by the future that we call God. Evolution happens, ultimately, because of the 'coming of God' toward *the entire universe* from out of an always elusive future."[48] To be more concrete, when the priority of the future is acknowledged, even the most disturbing aspects of evolution, namely the interplay of chance and law, and the vastness of time evolution entails, start to make sense.[49] "I would argue," says Haught, "that it is precisely the implied metaphysics of the future that can account for the three cosmic qualities –

[44] Ibid, p. 90.
[45] We could say, in this sense, that future is more real than the past or the present; "the future claims the status of being eminently real not only because it always shows up even after every present moment has slipped away into the past, but ultimately because it is the realm from which God comes to renew the world" (ibid, p. 118).
[46] Ibid, p. 84.
[47] It is interesting to note that the twentieth century has witnessed to a renewed interest in eschatology, which has led several theologians to recover the theological prominence of the future. Accordingly, Jürgen Moltmann has reminded that in the biblical view of things the world "God" means, before all else, "Future;" Karl Rahner spoke of God as the "Absolute Future;" Wolfhart Pannenberg and Ted Peters think of God as the "Power of the Future" (see: ibid., p. 84).
[48] Ibid., p. 99.
[49] It is important to note that the acceptance of the metaphysics of the future happens more as a kind of *intellectual conversion* than as scientific conclusion. According to Haught, such intellectual conversion may be possible only if we learn to see things in a hopeful way. "I would not deny," Haught explains, "that a serious commitment to the metaphysical primacy of the future may be possible only if we first learn personally to dwell within a tradition or a faith community that enables us to develop the skills of seeing things in a hopeful rather than pessimistic way" (ibid., p. 94). Needless to say, that the commitment to a metaphysics of the past, such as scientific materialism, is no less a matter of belief.

chance, lawfulness, and temporality – that allegedly provide the raw stuff of biological evolution."[50]

To sum up, Haught claims that an alternative metaphysical framework that acknowledges the prominence of the future can offer a plausible interpretation of evolutionary data, in particular chance, law, and temporality. As we noted in the beginning, Haught's metaphysics of the future takes its inspiration from the "biblical vision of the cosmos," and is certainly backed not only by Teilhard de Chardin, but also by contemporary theology retrieval of the eschatological dimension of Christian faith. At the same time, the influence of process theology is in many aspects quite explicit. In the brief introduction to process theology that opened this chapter, we had the chance to see, indeed, how process thought emphasizes novelty and creativity, thus promoting the idea that the future is not pre-determined, which is precisely what Haught says.[51] It is worth noting that Haught's "metaphysics of the future" is not exempt of problems, either. The most obvious one, at least if one takes seriously divine transcendence, is that God is not in the past, present or future, but simply outside time. Moreover, if God addresses creation from the future, then who created the initial material *substratum* and its capacity to respond to the irruption of the divine future? Does God create a kind of undetermined "potencies" that can develop in whatever direction? What does this tell us about God? Is this the God of Scripture?

The Aesthetical Cosmological Principle

As we have seen, Haught tries to move away from the image of God as a "planner" or "designer." God is, rather, the "infinitely ground of new possibilities."[52] Does this mean, then, that the universe is deprived of a goal or a sense of directionality? Haught responds negatively. In his

[50] Idem.
[51] See: Epperly, *Process Theology*, pp. 28-29.
[52] Haught, *God After Darwin*, p. 119. "We might say," Haught affirms, "that God is more and better than a planner. A God whose very essence is to be the world's open future is not a planner or a designer but an infinite liberating source of new possibilities and new life" (ibid., p. 120).

theological interpretation of evolution, it does not make sense to say that the evolutionary process unfolds according to a pre-established plan. It would be inaccurate, on the other hand, to say that the evolutionary process is totally deprived of a *telos*. What the universe will ultimately become was not set in stone from the beginning. We can say, nevertheless, that the universe was always meant to increase in complexity, diversity, and ultimately beauty. It is difficult to deny, indeed, that the evolutionary process has been journeying from simplicity to complexity, from triviality to harmony, with a corresponding maximizing of beauty.[53] As I have briefly mentioned in the second chapter, it has been noted that the physical constants and initial conditions of the universe are delicately fine-tuned in such a way that if they had even slightly different values life would not have emerged.[54] This has led some authors to suggest that the universe was set, from the beginning, to allow the emergence of human beings. This is the so called "anthropic cosmological principle." As we have seen, relying on the evidence provided by evolutionary data, Haught rejects the idea that the evolutionary process unfolds according to a pre-determined plan, which leads him to modify and expand the scope of the anthropic principle. Apparently taking his inspiration from process theology, Haught proposes what he calls the "aesthetic cosmological principle," which basically affirms that the universe is oriented to an increase in beauty.[55] This is how Haught explains it:

> The general physical features of the universe are shaped by what we might call the 'aesthetic cosmological principle.' Unlike the so called 'anthropic cosmological principle,' which views the physical constants and initial conditions of the universe as pointing only toward the eventual emergence of humans, the aesthetic principle suggests more broadly

[53] This is, for Haught, the meaning of beauty: "beauty is a delicate synthesis of unity and complexity, stability and motion, form and dynamics. It precariously resolves contradictions or clashes into 'interesting' arrangements that constrain variety without smearing it out" (ibid., p. 131).
[54] For an introduction to the anthropic principle, see: John D. Barrow and Frank J. Tipler, *The Anthropic Cosmological Principle* (New York: Oxford University Press, 1988); Barbour, *Religion and Science*, pp. 204-207.
[55] The idea that the aim of the universe is directed toward the "realization of beauty" is an insight that can be found in the philosophy of Alfred North Whitehead: "the universe is the theatre of divine artistry and glory" (Epperly, *Process Theology*, p. 49).

> that the universe has been set up, as it were, from the very beginning in such a manner as to allow for the ongoing creation of beauty.[56]

We are left, then with a very different conception of God. Instead of a designer or planner, who pre-determines and foresees everything that happens in the world, as classical theism would maintain, God is more like a "cosmic director" that summons creation to become a kind of "cosmic symphony."[57]

It is interesting to note, finally, the contrast between Haught's and Rahner's proposals. We saw, in chapter 2, how for Rahner the evolutionary process was, from the beginning, directed to a specific goal: to become, in the human being, conscious of itself and conscious of the one who upholds the movement of self-transcendence. In other words, the emergence of the human being was in store from the first moment of creation, and in this sense we can say that Rahner's theology of evolution is firmly teleological. Haught's proposal, on the other hand, embraces a looser conception of teleology: the evolutionary process evolves in the direction of greater complexity and beauty, but it seems that no specific form of organization, not even the human being, was necessarily part of a pre-determined plan.

Critical Remarks

In this chapter, we have explored some of the most prominent features of John Haught's theological engagement with evolutionary science. It is clear, in my opinion, that Haught makes a serious effort to take seriously both the scientific account of evolution and the core beliefs of the Christian faith. It is no less true, on the other hand, that the image of God that emerges out of his

[56] Haught, *God After Darwin*, p. 128.
[57] See: ibid., p. 129. It is interesting to note that the analogy of God as a music director and the world as the unfolding music of the Creator, which Haught mentions *en passant*, is further developed by Arthur Peacocke in *Theology for a Scientific Age*. "God as a Creator," he explains, "we might now see as a composer who, beginning with an arrangement of notes in an apparently simple subject, elaborates and expands it into a fugue by a variety of devices of fragmentation, augmentation and reassociation…. Thus might the Creator be imagined to enable to be unfolded the potentialities of the universe which he himself has given it, nurturing by his redemptive and providential actions those that are to come to fruition in the community of free beings an Improviser of unsurpassed ingenuity" (pp. 174-75).

theological interpretation of evolution diverges significantly from the image of God set forth by classical theism. To say that Haught gives up the classical attributes of God altogether would be unfair. There is no doubt, however, that drawing on the insights of process theology, Teilhard de Chardin, and a number of other contemporary theologians and philosophers, Haught proposes significant, and at times provocative, modifications to the classical understanding of creation, divine providence, and the attributes of God, in particular divine omnipotence and divine impassibility. Haught's fundamental insight is that the randomness and tentativeness of evolution is not consistent with the image of a God who creates according to a pre-determined plan and enforces a certain order. In his response to this challenge, Haught proposes that although God is indeed all-powerful, God refrains from using divine power so that an autonomous and free creation can emerge. This is what Haught called "divine humility." Also, rejecting metaphysical approaches that see the world as either the reflection or participation in a higher reality ("metaphysics of the eternal present") or the unfolding of what was already latent in lifeless matter ("metaphysics of the past"), Haught proposes that God addresses creation from the future offering it new possibilities, and inviting it to grow in beauty ("metaphysics of the future").

Haught acknowledges the influence of process theology on his own theological engagement with evolutionary science, and throughout the last section we had the chance to point out, even if briefly, the points of contact between process theology and Haught's theology of evolution. At the same time, John Haught's theological endeavor is not in total continuity with process theology. In fact, Haught distances himself from process theology in at least two key aspects: (i) he attempts at safeguarding divine transcendence, although we can doubt whether he does so successfully; (ii) while process theology does give up divine omnipotence, Haught proposes that the limitation in divine power is self-imposed, i.e. God is all-powerful but decides

not to use divine power in a way that is coercive and disruptive of creation's autonomy and integrity.

In continuation with the last chapter, the main goal of this chapter was to invite the reader to contemplate the evolutionary process through the lens of an alternative theological framework, and stimulate the reader's philosophical and theological imagination. I will not refrain, however, from offering some critical remarks. I have three main concerns regarding Haught's proposal. First, in order to accommodate evolutionary data, in particular the challenging facts of chance and natural selection, Haught qualifies divine omnipotence – God is all powerful but decides not to use his power – and modifies significantly the idea of divine providence. Now, I wonder whether undermining the doctrine of divine providence and compromising divine omnipotence ends up undermining Christian hope. Without the belief that everything that exists is ultimately sustained by God's providential love, the world becomes a hostile place where both humans and all living creatures are on their own. Compromising God's power might be the easiest way to accommodate chance, safeguard creaturely freedom, and exonerate God from the scandal of evil and suffering in nature. It is also the best way to surrender hope.[58]

We should ask, in the second place, whether Haught's approach safeguards the absolute priority and normativity of divine revelation, as transmitted through Scripture and tradition, in what regards knowledge about God and the way God creates and interacts with the world. It is certainly true that science and philosophy can certainly help us to arrive at a deeper understanding of the contents of Christian revelation. It seems to me, however, that Haught ends up making too generous concessions to both science and philosophical reflection. It is science, in other words, that motivates Haught to modify the classical doctrine of God. The obvious question that this

[58] For a more developed discussion on this concern see: Atle Ottesen Søvik, *The problem of Evil and the Power of God* (Leiden/Boston: Brill, 2011), pp. 223-229.

approach raises is: what will happen when if science changes (and we can be sure it will eventually change)? Do we change the doctrine of God again? Should our knowledge of God "fluctuate" according to scientific data, or should we rather rely on Scripture and tradition as the normative witnesses to divine revelation? It is important to acknowledge that Haught qualifies divine power and loosens the idea of divine providence by claiming to find in Scripture and tradition sufficient support for his proposal. However, besides noting that Haught's Scriptural quotes are scarce, it is noteworthy that Haught appears to dismiss many other Scriptural passages, not to mention the almost unanimous voice of the tradition, that clearly affirms divine providence, i.e. the idea that God creates according to a plan, and describe God as clearly making use of his omnipotence.[59]

The final concern I wanted to express has to do with Haught's approach to "evolutionary evil," which relies on the idea of divine solidarity and affirms without enough nuance that "God suffers," thus dismissing the classical attribute of divine impassibility. It is beyond the scope of this work to provide a careful discussion of this complex question. It is worth noting, however, that the surrender of divine impassibility is concomitant with the tendency of certain trends in contemporary theology, among them process theology, to compromise divine transcendence and make of God some kind of "glorified creature." In the words of Thomas Weinandy, "if the sin and evil of the created order caused God to suffer, it would demand that God and all else would exist in the same ontological order, for only if He existed in the same ontological order in which the evil was enacted could He then suffer."[60] Now, if God ends up enmeshed in the world and the evil

[59] It is interesting to note that according to Søvik, God does act coercively in many different instances. This would be the case of miracles, for example (see: Søvik, *The problem of Evil and the Power of God*, pp. 237-39).
[60] Thomas G. Weinandy, "Does God Suffer?", in *First Things* 117 (November 2001).

that afflicts it, then "humankind, and even God Himself, are deprived of any hope of ever being freed from evil and so the suffering that it causes."[61]

Despite this reservations, Haught's theology of evolution remains as a particularly valuable attempt to interpret theologically even the most challenging aspects of evolutionary science. At points, Haught appears to be overly optimistic about the capacity of theology to integrate disturbing facts of evolution such as chance, natural selection, and the pervasive presence of suffering, death, and waste throughout the evolutionary process. We might also ask whether he concedes too much to science and philosophy. And yet, we do not have to regard Haught's proposal as a finished theology of evolution. We can regard it as a valuable contribution for a theological endeavor that is still rehearsing its first steps.

[61] Idem.

Conclusion

Overcoming the Boundaries of Pure Immanence

This thesis can be seen as long invitation to broaden our perception of reality. One way of engaging reality is through the lens of empirical sciences. Circumscribing themselves to what can be empirically verified and measured, scientists keep probing the depth and immensity of our universe, and attempt at disclosing the intelligibility of nature, which they describe in terms of models and theories. Given the remarkable success of natural sciences, which have decisively shaped the way we understand ourselves and the world we inhabit, and have sponsored an almost vertiginous technological development, one might experience the temptation to remain within the narrow confines of science and believe that the limits of reality and the limits of what science can probe coincide. This is what we called "scientific naturalism." We had the chance to see the extent to which scientific materialism is underpinned by a threefold reductionism – methodological, epistemological, and ontological – which precludes any form of transcendence and, in its most radical forms, reduces to mere *epiphenomena* vast domains of human experience (scientific materialism).

The first two chapters of this thesis can be understood as an invitation to broaden one's sight, and contemplate reality from a broader perspective. Or, to be more precise, the invitation was really for one to open up to the possibility that reality is after all wider (or deeper, if one prefers) than science can tell. It was my goal, in other words, to bring the reader to the verge of an intellectual conversion, in such a way that he or she would accept to look at reality from a new and broader perspective, or "horizon," to use Bernard Lonergan's terminology, which is the theological interpretation of reality. The acceptance to move to the next level is not simply the

result of argumentation. It is, rather, the choice to open up to a new world of inquiry, which, without disrupting the previous horizons, reveals "ever greater depth and breadth and wealth."[1] This does not mean, however, that argumentation become superfluous. As I see it, one should push upwards from the side of science and philosophy as much as one can. But in the end, it is true, the move to the next horizon has to happen as a decision. This is what Lonergan calls "vertical freedom."

My argumentation entailed several steps. On a first moment – this was the goal of the first chapter – I tried to suggest that scientific naturalism is a worldview underpinned by methodological, epistemological, and metaphysical presuppositions that are not in themselves scientific. One might believe that scientific naturalism, or even materialism, is the most coherent description of reality. But this belief is just that. If my attempt to bring to light the non-scientific presuppositions of scientific naturalism was persuasive enough, it should no longer be possible to naively accept that scientific naturalism is the obvious and unavoidable consequence of the empirical sciences.

If the goal of the first chapter was somehow to "level the field," and uncover the "hidden" premises of scientific naturalism, my aim in the second chapter was to invite the reader to open up him or himself to the possibility of a theistic worldview. I followed a twofold strategy. The first *move*, in the first part of the second chapter, was an attempt to address serious challenges to the theistic worldview in an evolutionary context, namely, the claim that natural causes alone can account for the emergence of all things, including the human being, the claim that the role of chance in quantum mechanics and biological evolution is incompatible with a teleological interpretation of the world, and the pervasive presence of suffering, death, and extinction throughout the evolutionary process. We had the opportunity to see, in particular, how scientific

[1] See: Bernard Lonergan, S.J., *Method in Theology* (New York, NY: Herder and Herder, 1972), pp. 237 ff.

materialism is nowadays being contested even on scientific grounds. This openness to a deeper appreciation of the ontological consistency of the different levels of reality can set in motion an important dynamism: the acknowledgement that different levels of reality can be nested in one another without the integrity of the lower levels being disrupted by the higher levels, and without the possibility of deducing the higher levels from the lower ones. While this observation is certainly not enough to force a transition to the theological level, it can at least suggest that God's existence does not have to disrupt the relative autonomy and integrity of nature. We saw, as well, that chance is perfectly compatible with an over-all sense of purpose for the universe, even if our understanding of purpose might have to be re-worked. The main goal of the first *move* of my twofold strategy was, then, to remove obstacles to the acceptance of the theistic worldview.

In the second *move*, I adopted a more "offensive" strategy and invited the reader to a more philosophical discussion that focused on the metaphysic underpinnings of emergent evolution. The fundamental question that one has to ask is: can we really say that higher levels of complexity emerge out of the lower levels without violating the principle of sufficient reason? I understand that the response to this question is not straightforward. Personally, I am convinced that without a transcendent cause it is impossible for nature to successively climb higher levels of complexity, provided that they are really higher, in the sense that they have greater ontological consistency. I am aware, however, that my argumentation is not necessarily conclusive. I believe, on the other hand, that this was not something we should expect, anyway. The theistic interpretation of existence is not *self-contained* in the philosophical or scientific accounts of reality. A serious meditation on inconvenient metaphysical and limit questions – like *why something rather than nothing?* – can, in my opinion, provide sufficient *impetus* for one to overcome the boundaries of pure immanence. But this, more often than not, is not the result of a merely rational argumentation.

As I said, however, I do believe that we are to press the arguments from the side of science and philosophy as hard as we can.

This, in fact, one of the tasks I hope to embrace in the future: to argue that immanent causes are not enough to explain the emergence of the different levels of being that constitute reality. This will involve a serious study of the "emergentist proposals," on the one hand, and some metaphysical imagination, on the other. It is important to clarify that I am not expecting to find some kind of missing chain in the naturalistic accounts of evolutionary emergence. I believe, in fact, that the process of emergence has its own integrity, and we should not introduce God as an extra hypothesis that would account for some causal link that is still missing. In short, God will never be found in the lab, simply because God is not just one more natural cause. I believe, however, that a serious meditation on the metaphysics evolution might cause a kind of "metaphysical dizziness," which on its turn can constitute a powerful invitation for one to "jump" to the theological level. As I said, there is still much work to be done at this respect, and hope to take in a near future. I want to stress, once again, however, that in my opinion even metaphysics will be seriously limited and barely sufficient to make one jump to the theological level. For this to happen, a kind of religious conversion is, in fact, required. And once one has accepted the invitation to look at reality from the lens of theology, the coherence and truth of this perspective will finally start to emerge.

The third and last step of my argument was precisely to invite the reader to contemplate evolution form the side of theology, i.e. by looking at evolutionary data through the lens of divine revelation as transmitted by Hole Scripture and the Church's tradition. This is, I believe, where the reader, if he or she is a scientific naturalist, has the greater chances to feel *cross-pressured*. In my discussion, I explored two different theological approaches to evolution. The first one, undertaken by Karl Rahner and other contemporary authors like Elizabeth Johnson and Denis

Edwards, retrieves the scholastic distinction between primary and secondary causality. The fundamental idea is that God, as the ground of all things, is the one who sustains the very process of evolution. This approach somehow remains within the boundaries of classical theism, in the sense that the classical attributes of God and the classical understanding of divine providence and divine action are not blemished. The question arises, of course, whether subscribing to classical theism is still tenable. In fact, for authors like Haught, who takes his inspiration, at least partially, from process thought, science, in particular scientific evolutionary data, demands a significant modification of the understanding of the divine attributes, in particular divine omnipotence, and divine providence. Throughout my discussion, it became clear, I hope, the reason why I think that the two theological avenues we explored are not at the same level, and why I prefer Rahner's approach. The main reason behind my preference is that the distinction between primary and secondary causality is very successful in safeguarding divine transcendence, and at the same time the integrity and relative autonomy of the created order. My invitation to the reader was for him or her to take the risk of really accepting to leap from one level of reality to the other. The Thomistic approach allows the final leap – the one into transcendence – to be absolutely radical. I have the impression, indeed, that the reason why Haught, and many other authors that go much further than him in their modification of classical theism, feel the urgency to downplay divine power has to do with an insufficient acknowledgement of divine transcendence.[2] In fact, the leap into God is the leap into a completely new level that cannot be reduced to what we know from science or any other human activity. To understand why God can be at the same time provident and omnipotent, and creator of a world where chance and suffering are disconcerting realities, we

[2] It is interesting to note how Hart acknowledges that classical theism, and divine attributes such as omnipotence, omniscience, or impassibility, originates all sorts of philosophical problems. Usually, however, these problems "follow from a failure properly to think of God's way of being as truly transcendent of ours, rather than as merely another version of our way of being, but on a much more impressive scale" (David Bentley Hart, *The experience of God: Being, Consciousness, Bliss* (New Haven and London: Yale University Press, 2013), p. 137).

have to look at creation through God's eyes, something we can do only if we open ourselves to God's self-communication in the history of salvation and especially in the Christ event.

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