

DARWIN, THOMISTS, AND SECONDARY CAUSALITY

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AT FIRST SIGHT IT WOULD SEEM INCONGRUOUS, even an oxymoron, to juxtapose the names of Charles Darwin and Thomas Aquinas. Darwin was a biologist of the nineteenth century whose theory of evolution demanded the mutability of natural species. Thomas Aquinas, the father of Thomism, was a theologian and philosopher of the thirteenth century who held that forms in themselves and the species they constitute are immutable.¹ Six centuries separated Darwin and Aquinas, centuries that witnessed the decline of Thomism and scholasticism in general, with Descartes's rejection of substantial forms (except in humans) and the advent of English empiricism and the positivism of Auguste Comte. Living in an antischolastic environment and convinced of the mutability of species, it would seem unlikely that Darwin would have any connection with Aquinas.

This paper aims to show that there is a connection, though indirect, between Darwin and Thomists through Darwin's use of the notion of secondary causes in his early essays and *The Origin of Species*. The notion of secondary causes has a long history in medieval philosophy, and it plays an important role in Thomistic philosophy, in particular appealing to the notion of secondary causality and to the principle that it is better for God the creator to do by means of secondary causes what he can do by himself. Darwin himself accepts this principle when he contends that it is better that the creator produce species by secondary causes rather than by special creation. This essay examines Darwin's and the Thomists' understandings of the notion of secondary causes and their use of the principle, and it suggests that it was

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¹According to Aquinas, forms are not subject to change but consist in an unchanging essence. However, they are subject to change insofar as their subject changes. Only God is absolutely immutable. "[F]ormae dicuntur invariables, quia non possunt esse subiectum variationis; subiiciuntur tamen variationi, in quantum subiectum secundum eas variatur"; *Summa theologiae* I, q. 9, a. 2, ad 3. See *De veritate*, q. 1, a. 6.

mainly through the Spanish Thomist Francisco Suárez that the notion of secondary causes and the allied principle were brought to the attention of Darwin and his circle of naturalists. At the same time the paper reveals an important side of Darwinism that is often neglected in popular accounts. The essay points out Darwin's interest in philosophy, even in metaphysics, and their influence on his scientific methodology and the theory of evolution.

I

Darwin. Throughout *The Origin of Species* Charles Darwin marshals evidence from biology, geology, and other sciences in support of his theory of evolution as "descent with modification," according to the law of natural selection.² In concluding his book, he acknowledges that some of the most eminent authors disagree with him on the origin of species and are "fully satisfied with the view that each species has been independently created."³ No doubt Darwin had in mind contemporary naturalists like Richard Owen, Adam Sedgwick, William Whewell, Sir Charles Lyell, and Sir John Herschel.⁴ Since these Christians and others at the time were not convinced by his scientific evidence and regarded evolution as incompatible with their religious beliefs, Darwin tried to persuade them to accept the evolution of species rather than their independent creation by appealing to the

² Charles Darwin, *The Origin of Species*, 6th ed. (New York: Dutton, 1928), 450. Unless otherwise noted, references are to this edition. Darwin was convinced that natural selection has been the main but not the exclusive means of evolution. Other factors such as the environment and use and disuse play a role in it. *Ibid.*, 454. See Michael Crawford and David Marsh, *The Driving Fire. Food, Evolution and the Future* (London: Heinemann, 1989), 2.

³ *The Origin*, 462.

⁴ For Darwin's life, thought, and relations to his fellow naturalists, see Adrian Desmond and James Moore, *Darwin* (New York: Warner Books, 1992); John Bowlby, *Charles Darwin. A New Life* (New York: W. W. Norton, 1990); Ronald W. Clark, *The Survival of Charles Darwin. A Biography of a Man and an Idea* (London: Weidenfeld and Nicolson, 1984); Peter Brent, *Charles Darwin, A Man of Enlarged Curiosity* (London: Heinemann, 1981); Janet Browne, *Charles Darwin*, 2 vols. (New York: Knopf, 1995, 2002); Edward Manier, *The Young Darwin and His Cultural Circle* (Dordrecht: Reidel, 1978); Neal C. Gillespie, *Charles Darwin and the Problem of Creation* (Chicago: University of Chicago Press, 1979).

belief in a creator and the production of things by means of secondary causes:

To my mind it accords better with what we know of the laws impressed on matter by the Creator, that the production and extinction of the past and present inhabitants of the world should have been due to secondary causes, like those determining the birth and death of the individual. When I view all beings not as special creations, but as the lineal descendants of some few beings which lived long before the first bed of the Cambrian system was deposited, they seem to me to become ennobled.⁵

Darwin here contends that no special intervention of the creator is necessary to explain an individual's birth and death; these are accounted for by secondary causes according to the laws of nature. So too, in accordance with these laws (which include the laws of the struggle for life and natural selection),⁶ the production and extinction of all individuals, past and present, can be more adequately explained by secondary causes than by special creation. His reason is that he feels that individuals acquire a dignity when they are viewed as descendants of a few primitive beings rather than as independently created. He does not explain why this ennobles them, but we can surmise that it is because he sees them not as nothing in themselves because miraculously created but as somethings that are victorious in the struggle for life. We feel somewhat the same difference between a person who inherits money and one who earns it with his own efforts. The argument makes no mention of the descent of species but only of the production of individuals, yet this implies the descent of species for in Darwin's view varieties and species (which are nothing but "well-marked and permanent varieties"⁷) are groupings of individuals having a common descent or ancestry.⁸

This is not the first time Darwin proposed a reason for accepting evolution based on the notion of secondary causes. In an essay written in 1842, predating *The Origin of Species* (1859), he gave another reason why it is better that the creator use secondary causes (here called "secondary means") to produce individuals rather than create them independently: it would belittle the deity to think that he specially created each individual. "It is derogatory," Darwin writes, "that the creator of countless systems of worlds should have created each

⁵ *The Origin*, 462.

⁶ *Ibid.*, 462–3.

⁷ *Ibid.*, 450.

⁸ *Ibid.*, 2, 50.

of the myriads of creeping parasites and slimy worms which have swarmed each day of life on this our globe. The creation and extinction of forms is the effect of secondary means."⁹ Consequently, from the point of view of both the creator and his creatures it is better that species evolve by secondary causes rather than being independently created.

While Darwin was revising the conclusion of the sixth edition of *The Origin* (1872), he received the support of his friend Charles Kingsley, an Anglican clergyman and novelist who wanted to reconcile science and religion. Darwin wrote that he had just received a letter from Kingsley (whom he cited anonymously as a "celebrated author and divine"), praising the book and adding that he has gradually learned to see that it is "just as noble a conception of the Deity to believe that He created a few original forms capable of self-development into other and more needful forms, as to believe that He required a fresh act of creation to supply the voids caused by the action of His laws."¹⁰ Darwin was overjoyed when he read these supportive remarks of his friend, which imply God's use of secondary causes. Surprisingly, he omitted the next sentence in Kingsley's letter, which suggested that it might even be a "loftier thought" that God created original forms capable of self-development than that he created each form independently.¹¹

The notion of secondary causes was a commonplace in Darwin's day, and others besides Darwin speculated about the creator's possible use of them in producing species. Darwin's good friend, Sir John Herschel, the renowned astronomer, wrote to Lyell in 1836 that the "mystery of mysteries," that is, "the replacement of extinct species by

⁹ *The Foundations of the Origin of Species. Two Essays Written in 1842 and 1844 by Charles Darwin*, ed. Francis Darwin (Cambridge: Cambridge University Press, 1909), 41.

¹⁰ *The Origin*, 455. Kingsley was one of the first Anglican clergymen to support Darwin's theory. He engaged in controversy with John Henry (later Cardinal) Newman over the Oxford movement. Newman replied with his *Apologia pro Vita Sua*.

¹¹ My italics. For Kingsley's letter see *The Autobiography of Charles Darwin and Selected Letters*, ed. Francis Darwin (New York: Dover Publications, 1958), 242. For the authorship of the letter see Desmond and Moore, *Darwin*, 477. Neal Gillespie writes apropos of Darwin's citing Kingsley's letter: "It has been suggested that Darwin welcomed this support from Kingsley as a means of overcoming popular opposition to evolution. It seems to me, in view of his theological concern in the *Origin*, that he also welcomed it as a reassurance of his own belief"; Gillespie, *Charles Darwin*, 132.

others,” might be solved by assuming that the creator “operates through a series of intermediate causes and that in consequence, the origination of fresh species, could it ever come under our cognizance would be found to be a natural in contradistinction to a miraculous process.” He adds, however, that “we perceive no indications of any process actually in progress which is likely to issue in such a result.”¹² It was precisely this process that Darwin was to supply by his law of natural selection.

Another close friend of Darwin, the eminent geologist Sir Charles Lyell, also thought of the creator’s possible use of intermediate or secondary causes in the production of new species. Indeed, he said that he implied this in his *Principles of Geology*, a book Darwin read with admiration on the *Beagle* and to which he was indebted. Lyell wrote to Darwin in 1838: “In regard to the origination of new species I am very glad to find that you think it probable that it may be carried on through the intervention of intermediate causes.” When the intervention of these causes first occurred to him, Lyell continued, “the idea struck me as the grandest which I had ever conceived so far as regards the attributes of the Presiding Mind.”¹³

In a letter to the Catholic biologist St. George Mivart, one of Darwin’s staunchest critics, the American botanist Asa Gray wrote that he concurred with Mivart that God uses secondary causes in the natural production of creatures. “Agreeing that plants and animals were produced by Omnipotent fiat,” Gray wrote, “does not exclude the idea of natural order and what we call secondary causes. The record of the fiat—‘Let the earth bring forth grass, the herb yielding seed’, etc., ‘let the earth bring forth the living creature after his kind’—seems even to imply them.” Mivart added that this “leads to the conclusion that the various kinds were produced through natural agencies.”¹⁴ The question remains, what are these agencies? Mivart was willing to give Darwin’s natural selection a minor role in evolution, but he denied the pure Darwinian theory “which relies upon the survival

¹² Cited by Clark, *The Survival of Charles Darwin*, 41.

¹³ Cited in *ibid.*, 57. Clark perceptively concludes: “The belief was to have a long history among those who tried to square their religious feelings with the evidence for the mutability of species. God moved in a mysterious way his wonders to perform, and that way might even include evolution”; *ibid.*

¹⁴ St. George Mivart, *On the Genesis of Species*, 2d ed. (London: Macmillan, 1871), 291–2. See Genesis 1:11–12, 24.

of the fittest by means of minute fortuitous indefinite variations.” Mivart insisted that there must be the “concurrence of some other and internal natural law or laws co-operating with external influences and with ‘Natural Selection’ in the evolution of organic forms,” but he could not say what these additional laws might be.¹⁵ Mivart thought Christians were perfectly free to accept the theory of evolution, which he believed had the support of Augustine, Thomas Aquinas, and Suárez, “a writer widely venerated as an authority and one whose orthodoxy has never been questioned.”¹⁶

William Paley, the English theologian and philosopher whose notion of a designer-God was one of Darwin’s main objects of criticism, resorted to “second causes” as the means whereby God brings about his effects. He conceived these causes in nature as so many mechanisms, like the wheels and cogs of a watch. As they will not work unless there is a force or power at their center, like a spring, so the secondary causes in nature, like plants or animals with parts related to each other for the good of the whole organism, need an intelligence to account for the orderly action of their parts. Paley wrote, “[T]here must be more in nature than what we see; and, amongst the things unseen, there must be an intelligent, designing, author.”¹⁷

Darwin struck at the heart of Paley’s theory by denying that secondary causes in nature are mechanical, like springs and cogs of a watch. With the discovery of the law of natural selection, he wrote, “We can no longer argue that, for instance, the beautiful hinge of a bivalve shell must have been made by an intelligent being, like the hinge of a door by man. There seems to be no more design in the variability of organic beings and in the action of natural selection, than in the course which the wind blows.”¹⁸ In a letter to Asa Gray in 1860 Darwin inclined (with some hesitation) to see design at least in the laws of nature, if not in their effects: “I am inclined,” Darwin wrote, “to look at everything as resulting from designed laws, with the details, whether good or bad, left to the working out of what we may call chance. Not that this notion at all satisfies me. I feel most deeply that

¹⁵ Mivart, *On the Genesis of Species*, 75–6.

¹⁶ *Ibid.*, 303.

¹⁷ William Paley, *Natural Theology: or Evidences of the Existence and Attributes of the Deity* (London: Wilks and Taylor, 1902), 450–1.

¹⁸ *The Autobiography of Charles Darwin*, ed. Nora Barlow (New York: Norton, 1958), 87.

the whole subject is too profound for human intellect. A dog might as well speculate on the mind of Newton.”¹⁹

Across the Atlantic, Asa Gray accepted with some hesitation Darwin’s theory of natural selection as a sort of “mediate creation,” which he thought consistent with his religious beliefs. To him, it was “the only alternative to supernatural creation [of species].”²⁰ Gray wrote, “All appears to have come to be in the course of Nature, and therefore under secondary causes; but what these are, or how connected and interfused with first cause, we know not now, perhaps shall never know.”²¹ He pointed out that the fathers of the Church and philosophers like Thomas Aquinas were aware of God’s use of secondary causes in natural productions, so that “mediate production of species by natural selection *may* indeed be completely theistic.”²² Like Mivart, however, he found it difficult (as some biologists still do today) to accept Darwin’s idea that simple additions of differences can produce a complex organ.²³

Clearly, the notion of God’s use of secondary causes in the production of things was widespread among the naturalists in Darwin’s day. He invented neither it nor the idea that it enhances both God and creatures. Darwin’s originality as a scientist lies in presenting evidence of the natural agencies that function as secondary causes of the production of new individuals and species, namely the laws of nature, and especially the struggle for existence and natural selection.

What is the nature of Darwin’s argument for evolution by secondary causes and what is its value? It does not belong to science but to natural theology for it concerns God the creator and the laws he has implanted in matter. It should more properly be called metaphysical for the argument turns on the distinction between primary and secondary causes, which are traditionally the concern of metaphysics. More specifically, it has the hallmark of a dialectical argument for it rests on the notion of secondary causes and the principle that it is better, or at least as good, that the first cause produce through secondary

¹⁹ Cited by Carl Zimmer, *Evolution. The Triumph of an Idea* (New York: HarperCollins, 2001), 342. See Desmond and Moore, *Darwin*, 479.

²⁰ Asa Gray, *Natural Science and Religion* (New York: Scribners, 1880), 71.

²¹ *Ibid.*, 77.

²² *Ibid.*, 68.

²³ *Ibid.*, 76. See, for example, Michael J. Behe, *Darwin’s Black Box* (New York: The Free Press, 1996).

causes what it can produce by itself. Since the time of Aristotle and medieval logicians, a dialectical argument has been considered to be one that uses commonly accepted principles or opinions leading to conclusions that are not necessarily true but tentative and probable.²⁴ Since Darwin's argument rests upon a commonly accepted principle, it should not be considered demonstrative but dialectical and only probably true.

Darwin's argument is in the first edition of *The Origin* (1859), and he retained it in the sixth and final edition of 1872. When he wrote *The Origin*, he firmly believed in the existence of God and considered himself a theist. In his *Autobiography* he says that his reason tells him of "the extreme difficulty, or rather impossibility of conceiving this immense and wonderful universe, including man with his capacity of looking far backwards and far into futurity, as the result of blind chance or necessity. When thus reflecting I feel compelled to look to a First Cause having an intelligent mind in some degree analogous to that of man; and I deserve to be called a Theist."²⁵ But this conviction was difficult for him to sustain when he thought that if the human mind evolved from the lowly mind of a primitive animal, how can we trust it in such lofty matters? He concludes: "I cannot pretend to throw the least light on such abstruse problems. The mystery of the beginning of all things is insoluble by us; and I for one must be content to remain an Agnostic."²⁶ However, while acknowledging himself to be an agnostic, he added, "but not always."²⁷ About 1850 he gave up his Christian faith (though not theism) for various reasons, including his failure to reconcile Christianity with the evil and terrible suffering he saw in the world, especially the death of his beloved daughter Anne.²⁸

²⁴ For the nature of dialectic in the Middle Ages and its sources in Greek philosophy, see Osmund Lewry, "Dialectic," *Dictionary of the Middle Ages* (New York: Scribners, 1984), 4:168–71. Aquinas describes the relations between metaphysics and dialectic in *Expositio in libros Metaphysicorum*, bk. 4, lect. 4, ed. M.-R. Cathala and Raymundus M. Spiazzi (Turin/Rome: Marietti, 1964), 160 n. 574.

²⁵ *The Autobiography of Charles Darwin*, 92–3.

²⁶ *Ibid.*, 94. See also *The Life and Letters of Charles Darwin, Including an Autobiographical Chapter*, ed. Francis Darwin, 2 vols. (New York: Appleton, 1898), 1:282. For Darwin's views on religion see Desmond and Moore, *Darwin*, 622–37; Gillespie, *Charles Darwin*, 134–45.

²⁷ See Gillespie, *Charles Darwin*, 142.

²⁸ For Darwin's reasons for abandoning Christianity as a revealed doctrine see his *Autobiography*, 85–96.

It may come as a surprise that Darwin proposed a metaphysical argument for evolution in *The Origin of Species*. Most modern accounts of Darwinian evolution pass over it in silence for it hardly fits in with Darwin's later agnosticism, which leaves no room for the distinction between the creator as a primary cause and creatures as efficacious secondary causes. It is not clear how much credence he gave to the argument when he wrote it; but at that time he still firmly believed in the existence of God, and this would suggest that he also believed in the persuasiveness of the argument. It is significant that he retained the argument in the last edition of *The Origin*. Up to that late date he seems to have thought the argument worthwhile to persuade religious-minded naturalists that even on religious and philosophical grounds there is reason to accept the evolution of species.

The fact that Darwin proposed a metaphysical argument for evolution by no means makes him a metaphysician. He was a widely read biologist living in the nineteenth century and influenced by his culture, which was steeped in religion and philosophy. Among the many books he read during the years 1836–37 were several in metaphysics, but he acknowledged that he was not at all fitted for these studies.²⁹ He could have added that he saw little value in metaphysics. He remarked that one might as well try to “illuminate the midnight sky with a candle as to throw the light of reason on metaphysics.”³⁰ Again, he said: “To study Metaphysics, as they have always been studied appears to me to be like puzzling at astronomy without mechanics.”³¹ Still, through his education and wide reading he absorbed metaphysical notions current in his day, which many neo-Darwinians have expunged from the doctrine of evolution. Edward Manier points out that “Charles Darwin's philosophical reading significantly influenced his

²⁹ *Ibid.*, 84–5. Darwin implies that he read them at his leisure, when tired of working at science. Unfortunately, he does not identify these books in metaphysics. Edward Manier (*The Young Darwin and His Cultural Circle*, 14–20) describes Darwin's cultural circle about 1837–39 and the books with a philosophical perspective that were ready at hand. For another listing of books Darwin read or intended to read see L. Robert Stevens, *Charles Darwin* (Boston: Twayne Publishers, 1978), 107.

³⁰ Cited by Desmond and Moore, *Darwin*, 634.

³¹ *Metaphysics, Materialism, & the Evolution of Mind. Early Writings of Charles Darwin*, transcribed and annotated by Paul H. Barrett, with a Commentary by Howard E. Gruber (Chicago: University of Chicago Press, 1974), 71. Darwin was not averse to metaphysics in itself but to most of the metaphysics in his day. He was confident that his own study would “transform the whole of metaphysics.” Cited by Desmond and Moore, *Darwin*, 237.

scientific activities."³² For example, Darwin intimates that evolution has a direction—though not an absolute one—rising in a “scale” or “ladder” of nature from plants to animals to humans. He thought that all existence is not on the same level: there is a “scale” of nature or life, a “chain of beings”—a well-known metaphysical notion.³³ Darwin did not hesitate to use value words like “good,” “progress,” and “perfection,” in his account of evolution—words generally avoided by contemporary neo-Darwinians who view evolution on the model of mechanics.³⁴ Thus, Darwin writes, “And as natural selection works solely by and for the good of each being, all corporeal and mental endowments will tend to progress towards perfection.”³⁵ Darwin also adopted, or at least was inclined to, metaphysical positions such as materialism, positivism,³⁶ the denial of the distinction between mind and brain, soul and body, and reason and instinct.³⁷ It should be noted that in the 1830s and 1840s he wrote notebooks that explore the subjects of materialism, metaphysics, and the evolution of mind.³⁸

³² Manier, *The Young Darwin*, 14. See Michael Ruse, “Darwin’s Debt to Philosophy. An Examination of the Influence of the Philosophical Ideas of John F. W. Herschel and William Whewell on the Development of Charles Darwin’s Theory of Evolution,” *Studies in History and Philosophy of Science* 6 (1975): 159–81.

³³ *The Origin*, chap. 3, p. 77; *Charles Darwin’s Natural Selection*, ed. R. C. Stauffer (Cambridge: Cambridge University, 1975), 471. The latter work publishes Darwin’s manuscript from which *The Origin of Species* was taken. For the history of the notion of “a great chain of being,” see Arthur O. Lovejoy, *The Great Chain of Being* (Cambridge: Harvard University Press, 1936).

³⁴ For a criticism of the mechanization of the doctrine of evolution see Etienne Gilson, *From Aristotle to Darwin and Back Again. A Journey in Final Causality, Species, and Evolution*, trans. John Lyon (Notre Dame: University of Notre Dame Press, 1984), 17–31.

³⁵ *The Origin*, 462. Darwin said, however, “in my theory there is no absolute tendency to progression.” He viewed an inexorable ascent of life and guaranteed progress as a radical myth. See Desmond and Moore, *Darwin*, 275.

³⁶ “Darwin’s own approach to evolution fell short of complete positivism. Because of the theological elements in his thought, he continued to speculate—how seriously is admittedly a question—on the possibility of the creation of the first form of life and was loath to abandon the universe to the full meaninglessness that a completely positive view of the cosmos entailed”; Gillespie, *Charles Darwin*, 146. As for Darwin’s materialism, it would seem to be “nothing more than positivism. It committed him, not to a metaphysics of matter in motion as the ultimate reality, but only to a system of naturalistic and lawful science. This system put God as a participant out of the natural world, it is true, but it did not make it inconsistent to deal with the idea of God or to see him as the Creator of the laws of nature”; *ibid.*, 140.

³⁷ See Desmond and Moore, *Darwin*, 360, 453.

Darwin gave some thought to the notion of cause. In his early notebooks he did not subscribe to the extreme empirical view that a cause only involves invariable succession. He pointed out that night's following day does not give rise to the notion of cause. There is more to necessary connection than mere succession; forces must be taken into consideration, such as mental force where effort is felt.³⁹

Herschel and Whewell influenced Darwin's conception of the methodology of science and his notion of a "true cause" (*vera causa*), a common notion at the time, which Herschel says Newton applied to proximate or intermediate causes.⁴⁰ Herschel described *verae causae* in science as laws that exist and act in nature and that can be arrived at by direct induction from experiments purposely contrived.⁴¹ Contrary to the positivist Auguste Comte, Herschel regarded science as a search for causes of this sort, which are found especially in forces of nature.⁴²

³⁸ *Metaphysics, Materialism, & the Evolution of Mind. Early Writings of Charles Darwin*, xix. This is an edition of the two notebooks "M" and "N," known as the *Metaphysical Notebooks*. The statement of L. Robert Stevens (*Charles Darwin*, 108): "[A]lthough [Darwin] was a metaphysician of mixed quality, he was better than he generally claimed to be" is exaggerated. Better balanced is the view of Manier (*The Young Darwin*, 3): "The young Darwin was a powerfully original and creative scientist, sensitive to methodological, metaphysical and moral issues." Janet Browne (*Darwin* 1:439) writes of his giving close attention to metaphysical questions. The Scottish philosopher Dugald Stewart, a contemporary of Darwin, called him a metaphysical romancer because he regarded ideas as material things, such as vibrations of the brain. See Dugald Stewart, *Philosophical Essays, Collected Works*, ed. William Hamilton (Edinburgh: Constable, 1855), 5:144.

³⁹ Darwin, "N Notebook," ed. Paul H. Barrett, *Metaphysics, Materialism, & the Evolution of Mind*, 81 n. 60; see the commentary by Howard E. Gruber, *ibid.*, 113–14. See also Manier, *The Young Darwin*, 125.

⁴⁰ "To such causes [namely proximate causes] Newton has applied the term *verae causae*; that is, causes recognized as having a real existence in nature, and not being mere hypotheses or figments of the mind"; John F. W. Herschel, *A Preliminary Discourse on the Study of Natural Philosophy* (Chicago: University of Chicago Press, 1987: facsimile of the 1830 edition), 144. The term *causae verae* occurs in Newton's *Regulae philosophandi*, 1 (which is a form of Ockham's razor): "Causas rerum naturalium non plures admitti debere, quam quae & verae sint & earum phaenomenis explicandis sufficient"; Isaac Newton, *Principia*, ed. Alexandre Koyré and I. Bernard Cohen, 3d ed. (Cambridge: Harvard University Press, 1972), 2:550.

⁴¹ Herschel, *A Preliminary Discourse*, 144–8, 197. See Edward Manier, *The Young Darwin*, 47–51; Michael Ruse, "Darwin's Debt to Philosophy," 113–14; "Darwin and Herschel," *Studies in History and Philosophy of Science* 9 (1978): 323–31.

⁴² See Michael Ruse, "Darwin's Debt to Philosophy," 159–81; "Darwin and Herschel," 323–31.

Darwin's concept of natural law seems at first to be at variance with Herschel's realism. In *The Origin* he describes laws as "the sequence of events as ascertained by us," and Nature as "only the aggregate action and product of many natural laws." He had no intention of personifying the word "Nature" or using the expression "natural selection" in the literal sense for there is no selector in nature as there is in domestic breeding. "Natural selection" would be a false term if taken literally.⁴³

Darwin is closer to Herschel, however, when he portrays another facet of the meaning of natural law. Speculating about the meaning of laws of nature, he sometimes speaks of them metaphysically as "laws impressed on matter by the Creator." In science, however, he regards them as tentative and fallible understandings of these laws. Hence scientific laws, like Darwin's own law of natural selection, would not be real but a construct that more or less approaches reality.⁴⁴ In this regard it should be noted that *The Origin* speaks of natural laws simply as "the sequence of events *as ascertained by us*." On the other hand, Darwin also seems to have thought of the laws of nature, like natural selection, as *verae causae*. In a letter of 1863 to George Bentham (botanist and nephew of Jeremy Bentham) Darwin says that the first distinguishing feature of natural selection is to be a *vera causa*, implying that it exists and acts in nature.⁴⁵

In the light of Darwin's preoccupation with philosophical and metaphysical notions, especially in his early years while preparing to write *The Origin of Species*, perhaps it is not so remarkable to find in it the ideas of a creator and secondary causes. He was the originator

⁴³ *The Origin*, chap. 4, p. 81.

⁴⁴ See Ruse, "Darwin's Debt," 159–81; Gillespie, *Charles Darwin*, 54–5. For the notion of law in Darwin's early writings, see Manier, *The Young Darwin*, 123–5. Manier, however, writes that Darwin "appeared to by-pass Herschel's important distinction of 'empirical laws' and 'laws of nature'"; *ibid.*, 115.

⁴⁵ *Life and Letters of Charles Darwin*, ed. Francis Darwin (London: Murray, 1887), 3 n. 4, 25. Darwin implies this in the statement: "[S]pecies are produced by slowly acting and still existing causes, and not by miraculous acts of creation"; *The Origin*, 461. See Ruse, "Darwin and Herschel," 327. The American philosopher John Fiske, who traveled to England to meet Darwin, also called natural selection a *vera causa*, "an agency," "a reality." See his *Darwinism and Other Essays*, rev. ed. (Boston: Houghton Mifflin, 1885; reprint, New York: Kraus, 1969), 12, 13. "[T]his no one denies" (*ibid.*, 20); "The theory . . . alleges a *vera causa*," 32. However, this seems to be inconsistent with his empirical view of cause on p. 6.

of neither the notion of secondary causes nor the principle that it is better that the creator produce by means of them what he could produce by himself. We have seen that other naturalists at the time were thinking along the same lines. What they lacked, and what Darwin (and Alfred Russel Wallace)⁴⁶ supplied, was the law of natural selection as the secondary cause by which the evolution of species takes place.

II

Francisco Suárez. In the revival of scholasticism from the fifteenth to the seventeenth centuries in Spain, Portugal, and Italy, the doctrine of secondary causes played a prominent role in commentaries on Aquinas and in treatises like those of Cajetan (1468–1534), Francis de Sylvestris (c. 1474–1528), Dominic Bañez (1528–1604), and John of St. Thomas (John Poincot) (1589–1644). But by far the most important source of the notion in early modern thought was the *Metaphysical Disputations* of the Jesuit Francisco Suárez (1548–1617).⁴⁷ He also seems to be the source of the notion of a “true cause” (*vera causa*), well-known to nineteenth-century naturalists. Published in 1597, this work was the first major systematic treatise in metaphysics in the Western world, and its success was phenomenal; it was a best seller in its day, and its ideas were widely disseminated. There is no evidence that Darwin read any of its pages, but through his contemporaries he could have been indirectly influenced by Suárez’s work. St. George Mivart was acquainted with it, and Thomas Huxley dipped into it to find out what Catholics like Mivart held in philosophy.⁴⁸ Very likely Descartes was introduced to metaphysics by Suárez’s *Disputationes*. Leibniz boasted that as a youth he had read the work “like a novel,” and Schopenhauer valued it as “a true compendium of Scholasticism.” It was widely used as a textbook in German Protestant universities in the seventeenth and eighteenth centuries. For Heidegger,

⁴⁶ For Wallace’s contribution to the notion of evolution by natural selection, see Desmond and Moore, *Darwin*, 468–9, 521–3.

⁴⁷ Francisco Suárez, *Disputationes metaphysicae. Opera Omnia*, editio nova (hereafter, “DM”), ed. D. M. André, 26 vols. (Paris: Vivès, 1856–77), 25–6.

⁴⁸ *Darwin. A Norton Critical Edition*, ed. Philip Appleman (New York: Norton, 1970), 438–43.

it was the principal medium by which Greek ontology passed from the Middle Ages to modern times.⁴⁹

In his *Disputations* Suárez treats at length of efficient causality in general and in particular of the division into primary and secondary causes. A cause, in the broad sense, he defines as anything that answers to the question, "why?" In the strict sense, "a true cause (*vera causa*) for the 'moderns' is that on which another essentially (*per se*) depends; or better (remembering Thomas Aquinas), it is a principle that essentially (*per se*) infuses being (*esse*) into something else." A false definition of a cause is "that at which something else follows."⁵⁰

Suárez defines a primary cause as entirely independent in its operation, whereas a secondary cause is dependent on the primary cause even though it acts through its own principal and proportionate power. The latter stipulation distinguishes a secondary cause from one that is purely instrumental, which lacks such a power.⁵¹ An example of an instrumental cause is a pen used by a writer; a team of horses driven by a man would be a true secondary cause. To the question whether creatures produce anything as secondary causes, he answers in the affirmative.⁵² The objection is raised that if creatures are truly causes of some effects, this would take away from God's causality for then he would not be the cause of everything. To this, Suárez replies that God is indeed the cause of everything as their primary and principal cause, though some effects are produced by creatures acting as secondary causes. Far from derogating from the divine efficacy, this enhances and reveals it by showing that God can communicate his power and goodness to creatures.⁵³

Suárez offers several arguments to prove that creatures are indeed efficacious causes. The first appeals to the evidence of the senses. What is clearer to the senses, he asks, than that the sun illumines, fire heats, and water cools? To deny such data of experience is

⁴⁹ For Suárez's wide influence see John P. Doyle's Introduction to his translation of Suárez, *On Beings of Reason. Metaphysical Disputation LIV* (Milwaukee: Marquette University Press, 1995), 12–14; also Frederick Copleston, *A History of Philosophy*, vol. 3, pt. 2, "The Revival of Platonism to Suárez" (Garden City, N.Y.: Image Books, 1963), 199–200.

⁵⁰ Suárez, *DM*, disp. 12, sec. 2, n. 3–5, 25:384–5. For Aquinas, "[H]oc vero nomen Causa importat influxum quemdam ad esse causati"; *In Metaph.*, bk. 5, lect. 1, ed. Cathala-Spiazzi, 208 n. 751.

⁵¹ Suárez, *DM*, disp. 17, sec. 2, n. 17–8, pp. 590–1.

⁵² *Ibid.*, disp. 18, sec. 1, n. 5, p. 594.

⁵³ *Ibid.*, n. 9, pp. 595–600.

to destroy the force of all philosophical reasoning. Could it be that fire has no power of heating but its presence is only the occasion for God to exercise his causality? All causality would then be centered in God, and creatures would be only occasions of his acting. But Suárez rejected occasionalism because it denies that things have natures which are natural sources of action and efficacy. A final argument, which Suárez calls a priori, contends that it is consonant with a creature's perfection that it have an active power as a secondary cause: "There is no contradiction in created things having the power of acting; on the contrary it is very consistent with their perfection. Hence, since God created everything perfect in nature, we should not deny that he created such things that have a connatural power of acting."⁵⁴

Suárez was not an evolutionist. He interpreted Genesis literally, as teaching that God created plants, animals, and humans on distinct days in their perfect state in distinct individuals or species.⁵⁵ Because the works of God are perfect, as Scripture says (Deuteronomy 32:4), they are endowed with the power of acting as secondary causes in dependence on the creator as the primary cause.

Suárez here implies the principle that it is better for God the creator to do by means of secondary causes what he could do by himself. By endowing his creatures with active powers and giving them the perfection and dignity of secondary causes, both the creator and the creature are dignified: the creator because he is shown to be good and powerful, the creature because it is not inactive and purely passive but endowed with its own proportional active power.

As we have seen, Darwin also implies this principle in his arguments analyzed above, suggesting that it is preferable to view the production and extinction of individuals and species as the result of secondary causes and not of an independent creation. Species are not "special creations"; they spring up and disappear as a consequence of secondary causes in accordance with the laws of nature. Suárez also gave a prominent role to secondary causes in the ordering and governing of the universe; but he never suspected that one of their most important roles might be the production of species in a universe in which species are not static and fixed but progressive and self-developing.

⁵⁴ *Ibid.*, n. 8, p. 595.

⁵⁵ Suárez, *De opere sex dierum, Opera Omnia* 3, lib. 2, chaps. 7–10, pp. 139–65.

III

Thomas Aquinas. The search for the origin of the notion of secondary causes leads to the schoolmen of the fifteenth to the seventeenth centuries, especially Francisco Suárez, beyond them to the schoolmen of the thirteenth century, and even further to the short seminal treatise called *The Book of Causes* (*Liber de causis*). It is a remarkable fact that the Western world, up to and including the naturalists discussed above, and beyond, owes to this small book the notions of primary and secondary causes. The work of an unknown author (probably Arab), it became known to the Latin West at the end of the twelfth century through a Latin translation probably from the Arabic. It may have come from the vicinity of Baghdad around 850. At first it circulated in the medieval universities as a work of Aristotle; but when the *Elements of Theology* of the Neoplatonist Proclus (410–85) was translated into Latin in 1268, Thomas Aquinas at once recognized it as derived from the Neoplatonic work.⁵⁶ A prescribed text of philosophy in the University of Paris in the thirteenth century, *The Book of Causes* was widely read and commented on several times, notably by Albert the Great and his pupil Thomas Aquinas.⁵⁷ It became a major influence on Aquinas's conception of primary and secondary causes and their relations.

The Book of Causes, like Proclus's work, consists of a series of propositions, each followed by a brief commentary. Its first proposition strikes the keynote of the whole book, stating that a primary cause has a greater impact on its effect than a secondary cause.⁵⁸ Commenting on this proposition, Thomas shows that this is true of the first cause or God in the causation of being (*esse*).⁵⁹ Since the first

⁵⁶ Etienne Gilson, *History of Christian Philosophy in the Middle Ages* (New York: Random House, 1955), 235–7. The Latin text of the *Liber de causis* was published by Adriaan Pattin in *Tijdschrift voor Filosofie* 28 (1966): 90–203; also in a separate publication: Louvain: Editions du "Tijdschrift voor Filosofie," n.d. [1966]. English: *The Book of Causes*, trans. with an Introduction by Dennis J. Brand (Milwaukee: Marquette University Press, 1984).

⁵⁷ Albert the Great, *Liber de causis et de processu universitatis*, ed. A. Borgnet (Paris: Vivès, 1890–99), 10. *Sancti Thomae de Aquino super Librum de Causis expositio*, ed. H.-D. Saffrey (Fribourg: Société Philosophique, 1954). *St. Thomas Aquinas. Commentary on the Book of Causes*, translated and annotated by Vincent A. Guagliardo et al. (Washington, D.C.: The Catholic University of America Press, 1996).

⁵⁸ "Omnis causa primaria plus est influens super causatum suum quam causa universalis secunda"; *Liber de causis*, prop. 1, p. 134 (in Pattin).

cause is pure being (*esse tantum*), his proper effect is the being of things. As *The Book of Causes* says, “The first of created things is being.”⁶⁰ The first cause alone causes things to be, purely and simply, which is another way of saying that he creates them. He is the universal cause of all being, presupposing no subject on which he acts. In other words, he brings things into being from nothing (*ex nihilo*).⁶¹

Since they are true causes, secondary causes also give their effects being, not purely and simply but limited being, and they do this not through their own power but through the power of the primary cause.⁶² Their distinctive role as causes is to particularize and specify, so to speak, the effect of the first cause, not making it simply to be but to be such and such a being, for example, human or white.⁶³

As a consequence, Aquinas viewed the action of God as reaching more deeply into a thing than that of a secondary cause. Because *esse* is God’s distinctive effect and *esse* is innermost in everything, God is present in everything at its core or center, at once giving it being and preserving it in being. The proper effects of secondary causes, such as humanity or whiteness, which specify being, are perfections less deeply rooted in a thing than its *esse*.⁶⁴ These causes give their effects being through participating in the divine power, and they cause specific perfections acting through their own power. Thus, their causality

⁵⁹ For Thomas’s doctrine of primary and secondary causes see Etienne Gilson, *The Spirit of Mediaeval Philosophy*, trans. A. H. C. Downes (New York: Scribners, 1940), 128–47; idem, *Thomism. The Philosophy of Thomas Aquinas*, trans. Laurence K. Shook and Armand Maurer (Toronto: Pontifical Institute of Mediaeval Studies, 2002), 210–18; these pages correspond to pp. 178–86 of Gilson, *The Christian Philosophy of St. Thomas Aquinas*, trans. Laurence K. Shook (New York: Random House, 1956). Oliva Blanchette, *The Perfection of the Universe according to Aquinas* (University Park: Pennsylvania State University Press, 1992), 149–54, 161–81. Rudi A. Te Velde, *Participation and Substantiality in Thomas Aquinas* (Leiden: Brill, 1995), 160–83.

⁶⁰ “Prima rerum creatarum est esse et non est ante ipsam creatum aliud”; *Liber de causis*, prop. 4, p. 142.

⁶¹ *ST* I, q. 45, a. 2.

⁶² “Est igitur esse proprius effectus primi agentis, scilicet Dei; et omnia quae dant esse, hoc habent in quantum agunt in virtute Dei”; *Summa contra gentiles* (hereafter, “*SCG*”), bk. 3, chap. 66, par. 4.

⁶³ “Secunda autem agentia, quae sunt quasi particulantes et determinantes actionem primi agentis, agunt sicut proprios effectus alias perfectiones, quae determinant esse”; *Ibid.*, par. 6. “[Deus] est dans esse rebus. Causae autem aliae sunt quasi determinantes illud esse”; *Scriptum super libros Sententiarum*. (hereafter, “*In Sent*”), bk. 2, d. 1, q. 1, a. 4, ed. Pierre Mandonnet (Paris: Lethielleux, 1929), 2:25.

⁶⁴ *In Sent* 2:25–6.

converges with that of the first cause, so that the same effect is immediately produced by God and also by the secondary cause, although in different ways.⁶⁵ This can be illustrated very imperfectly by an instrumental cause like a pen, which causes a written word not by its own power but by being moved by a writer. Both the writer and the pen immediately cause the whole word, each in its own way. The writer is obviously not superfluous for the movement of the instrument depends on him. Neither is the primary cause superfluous in the case of a true secondary cause (as Darwin thought in later life) for it gives the secondary cause both its substance and causality.

Aquinas's ascribing a true active power and causality to creatures was not acceptable to all philosophers in the Middle Ages. Like Malebranche, the tenth-century Muslim Ash'arite school of theology, in deep agreement with the Koranic conception of God, emptied the universe of all causality save that of God. Aquinas knew of the Ash'arite doctrine through Moses Maimonides (1135–1204), and he argued against it with his own metaphysical principles.⁶⁶

At first sight it might seem reasonable that God should be the only efficient cause for he is all-powerful and the most perfect cause, and as such he has no need of an intermediary to carry out his works. But Aquinas protests that it is not out of weakness that God gives creatures the power of secondary causes but out of his goodness, which prompts him to confer upon them the dignity of being causes.⁶⁷ Etienne Gilson expresses this well: "The urge by which certain philosophers are driven to take everything from nature in order to glorify the creator is inspired by a good intention, but a blind one. In fact, to

⁶⁵ "[N]on est inconveniens quod producatetur idem effectus ab inferiori agente et Deo: ab utroque immediate, licet alio et alio modo. . . . Patet etiam quod non sic idem effectus causae naturali et divinae virtuti attribuitur quasi partim a Deo, et partim a naturali agente fiat, sed totus ab utroque secundum alium modum: sicut idem effectus totus attribuitur instrumento, et principali agenti etiam totus"; *SCG*, bk. 3, chap. 70, pars. 5, 8.

⁶⁶ For the Ash'arite doctrine see Etienne Gilson, *History of Christian Philosophy in the Middle Ages*, 184–5; idem, "Pourquoi S. Thomas a critiqué S. Augustin," *Archives d'histoire doctrinale et littéraire du moyen âge* 1 (1926): 5–127. Thomas argues against the opinion of those who would take away natural things' own actions in *SCG*, bk. 3, chap. 69; *De potentia*, q. 3, a. 7.

⁶⁷ "Ad primum ergo dicendum quod non est ex indigentia Dei quod causis aliis indiget ad creandum, sed ex bonitate ipsius, qui etiam dignitatem causandi aliis conferre voluit"; *In Sent*, bk. 2, d. 1, q. 1, a. 5, 2:26 (in Mandonnet).

deprive things of actions of their own is to belittle God's goodness."⁶⁸ It is also to belittle his perfection and power for it amounts to saying that he is not perfect or powerful enough to give creatures their own actions and causality.⁶⁹ On the other hand, to uphold the efficacy of secondary causes is to enhance both the creator and his creatures; it gives greater dignity to them and glory to the creator.⁷⁰

In Aquinas's own day there were theologians, such as Bonaventure and some of his followers, who thought that Aquinas exaggerated the active power and causality of creatures, thereby diminishing the glory of God. Taking their cue from Augustine, they did not deny the efficacy of secondary causes but reduced it to the point of insufficiency. As examples of this tendency, Aquinas cites the doctrines of seminal powers (*rationes seminales*), of truth, and of virtue. The Augustinians of his day thought that the powers of nature are such that of themselves they cannot produce a new effect but only awaken the seeds or latent virtualities that God created in matter from the beginning. Similarly, they thought that the human mind cannot know the truth with certainty without a special or quasi-special illumination by God; nor can human beings do good without a corresponding moral illumination. In defense of the natural efficacy of secondary causes, Aquinas contended that created beings by their own powers—presupposing the action of the first cause—do produce new substances; that by the light of the mind human beings do reach some truths with certainty, and that by their natural virtues they can attain moral goodness.⁷¹

In his solutions of these three philosophical problems, Thomas Aquinas introduced a new notion of the relations between the first cause and secondary created causes. Gilson clearly expressed this innovation as follows: "In St Thomas man receives from God everything he receives from Him in St Augustine, but not in the same way. In St Augustine God delegates his gifts in such a way that the very

⁶⁸ Gilson, *Thomism. The Philosophy of Thomas Aquinas*, 213; corresponding to pp. 181–2 of *The Christian Philosophy of St. Thomas Aquinas*. See *SCG*, bk. 3, chap. 69, par. 16.

⁶⁹ *SCG*, par. 15.

⁷⁰ "[P]rima causa ex eminentia bonitatis suae rebus aliis confert non solum quod sint, sed etiam quod causae sint"; *De veritate*, q. 11, a. 1. *SCG*, bk. 3, chap. 69, par. 16.

⁷¹ *De veritate*, q. 11, a. 1; *De potentia*, q. 3, a. 7. Gilson draws upon these sources in his *The Spirit of Mediaeval Philosophy*, chap. 7 ("The Glory of God"), 128–47.

insufficiency of nature constrains it to return toward him; in St Thomas God delegates His gifts through the mediacy of a stable nature which contains in itself—divine subsistence being taken for granted—the sufficient reason of all its operations.”⁷² In considering the above philosophical problems, Thomas opts for solutions that in his view give greater glory to God and more dignity and perfection to creatures, implying the principle that it is better for God to produce by secondary causes what he could produce by himself.

Like other medieval schoolmen, Aquinas knew nothing of a theory of the evolution of species in the modern sense. Apart from exceptional cases, like species produced by spontaneous generation or a mule begotten by a donkey and a horse, he thought that species were not produced by secondary causes but by creation. In the creation of a species of living things, God created the first individual substances in the species, such as a human being and a lion (male and female), and he gave them powers to give birth to other individuals with the same form or essence, thus belonging to the same species.⁷³ In this process the role of secondary efficient causes is not to produce the form or essence as such but to beget individuals, similar to themselves in species, by bringing to actuality the forms of the individuals existing potentially in matter.⁷⁴

Aquinas hesitated as to whether all species were created at once or successively in time. The fathers of the Church were divided on the subject, and he considered both theories equally plausible and in conformity with Scripture.⁷⁵ He was sensitive to the possibility of the emergence of new species after the six days of creation, but he be-

⁷² Etienne Gilson, in notes for a seminar in the École Pratique des Hautes Études, the University of Paris in 1921, printed as an Appendix in Laurence K. Shook, *Etienne Gilson* (Toronto: Pontifical Institute of Mediaeval Studies, 1984), 397.

⁷³ *In Sent*, bk. 2, d. 1, q. 1, a. 4, 2:25 (in Mandonnet).

⁷⁴ Aquinas did not think a created secondary cause could produce a substantial form as such because, following Aristotle (*Physics* 1.9.192a16), a form is “something divine” (*divinum quiddam*). *SCG*, bk. 3., chap. 69, par. 27. All the secondary cause can do is to bring the form from the potentiality of matter to actuality. The same exalted notion of form is operative in Augustine’s doctrine of *rationes seminales*. Forms are already present in seminal reasons; “the creature does little more than put into play and utilize God’s creative efficacy”; Etienne Gilson, *The Christian Philosophy of Saint Augustine*, trans. L. E. M. Lynch (New York: Vintage Books, 1967), 207.

⁷⁵ See the long debate over these two opinions of creation in *De potentia*, q. 4, a. 2.

lieved that if they did come to exist they preexisted in the active powers of the heavenly bodies and the four elements.⁷⁶

IV

Jacques Maritain. It was left to followers of Aquinas to disengage his philosophical principles from his outmoded physics and to apply them to a philosophy of evolution. One of the most noteworthy attempts in this direction is Jacques Maritain's essay, "Toward a Thomistic Idea of Evolution."⁷⁷ As to be expected, Maritain approaches the subject of evolution not as a biologist or paleontologist but as a philosopher and a metaphysician. He accepts the scientific data upon which biologists base their theory of evolution, but he looks at the data from a Thomistic point of view. Moreover, he cautions his reader that his reflections on the subject should not be taken as definitive but as tentative and very imperfect.⁷⁸

The secondary causality of created being is at the heart of Maritain's reflections on the evolution of species. He points out that Aquinas, following Aristotle, ascribed to living things an immanent or self-perfecting activity, and it is precisely this activity that gives living things an active role in evolution. Maritain finds this to be "in accord with the general principle, dear to St. Thomas, that God has given to created beings the dignity of being causes themselves, under the movement of the primary Causality."⁷⁹

At this point Maritain goes beyond Aquinas and makes a distinction in the living being's powers of immanent or self-perfecting activity. In the first place there are powers that enable the living being to exercise its specific functions of governing itself and perpetuating its species. These powers are on the level of the living being's actual species; they do not extend beyond those species to higher ones. Biologists are concerned with these powers of living things when they

⁷⁶ *ST* I, q. 73, a. 1, ad 3. For a discussion of this subject see Oliva Blanchette, *The Perfection of the Universe*, 149–54.

⁷⁷ "Vers une idée thomiste de l'évolution," in Jacques Maritain, *Approches sans entraves* (Paris: Fayard, 1973), 6:105–62. This book is translated by Bernard Doering as *Untrammelled Approaches* (Notre Dame: University of Notre Dame Press, 1997). Citations are to the French edition. See Dennis Bonnette, *Origin of Human Species* (Atlanta: Rodopi, 2001), 142–3.

⁷⁸ *Ibid.* 1:105.

⁷⁹ *Ibid.* 5.19:143.

study the vital functions of species that are stable and fixed for a long period of time. In the second place, living things have a self-regulating biological power of a different order. This power, unlike the first, does not appear on the surface for the biologists' scrutiny; it only appears when the tendency of matter to acquire higher forms comes into play under the super-elevating and super-forming creative action of God. Acting along evolutionary lines, it makes—or made—living things better than they are or have been.⁸⁰

Maritain is here ascribing to God the primary causality in the evolutionary process but not to the exclusion of the secondary agency of creatures. The latter are real active causes in evolution that “invent” something new, at first in their own organisms and then through their genes passing it on to their descendants. To cite Maritain: “The immense adventure of evolution, which is now finished, presupposed at one and the same time *the super-elevating and super-forming movement of God, and in the living being the corresponding awakening of the transnatural aspirations of matter.*”⁸¹

For Maritain, Thomas Aquinas's notion of matter as a potentiality or “appetite” for forms of ascending perfection is the key to the philosophical understanding of evolution. Primitive or primal matter tends toward the actuality of form. This dynamic “urge” of matter toward a more perfect degree of actuality, and finally to the form of the human soul, is a tendency toward an ever greater participation in the supreme actuality of God.

Citing Thomas Aquinas, Maritain spells out the ascending levels of forms toward which primal matter is potential. It is first potential to the forms of the elements. Existing under these forms, it is potential to the forms of mixed or composite bodies. Considered under the form of mixed bodies, it is in potency to the vegetative souls of plant life, which are potential to the sensitive souls of animals, and which are finally potential to the intellectual souls of human beings. Thus matter tends toward the human soul as toward its ultimate form.⁸² According to Maritain, each stage in this evolution is prepared by an “ultimate disposition” of matter that calls for the emergence of a higher form, up to the form of the human intellectual soul. This form, however, being spiritual, is not drawn from the potentiality of matter,

⁸⁰ *Untrammelled Approaches* 5.19:142–3.

⁸¹ *Ibid.* 19:145 n. 29 (Maritain's emphasis).

⁸² *Ibid.* 1.3:109–10. *SCG*, bk. 3, chap. 22, par. 7.

as are the plant and animal forms, but is created by God and infused into the well-disposed organism, rendering it formally or actually human.⁸³ Maritain emphasizes that there is nothing extraordinary or miraculous about this. At a given moment it is demanded and called for by matter, and it happens according to a metaphysical law included in the creation of humankind.⁸⁴

For our present purpose it is not necessary to explore all aspects of Maritain's approach to the philosophy of evolution. What is of central concern from the viewpoint of this essay is his acceptance and use of the principle "dear to St. Thomas, that God has given to the beings created by him the dignity of being causes themselves, under the motion of the first Causality."⁸⁵ What are these causes but secondary causes active under the impulse and direction of the primary cause or God?

This essay neither presumes to judge the scientific merits of the Darwinian theory of evolution nor aims to settle any of the philosophical and religious issues occasioned by the theory. Its purpose is historical, namely, to trace the notion of secondary causes operative in Darwin's argument for evolution in the conclusion of *The Origin of Species* to Suárez and the medieval schoolmen, especially to Thomas Aquinas, and beyond them to the Neoplatonic *Liber de causis*. The argument is not scientific but philosophical and even metaphysical, aimed at persuading naturalists with religious interests, who did not accept Darwin's theory, that it includes at least as noble—if not a nobler—conception of God as the belief that he independently created each species. It has the twofold merit of showing that God's greatness is not diminished by the Darwinian theory and that creatures are ennobled as secondary causes of their self-development.

The success of Darwin's *Origin* was immense both in his own day and in years following. He reported that before the first edition of *The Origin* appeared, "he spoke to very many naturalists on the subject of evolution and never once met with any sympathetic agreement. It is probable that some did then believe in evolution, but they were either silent, or expressed themselves so ambiguously that it was not easy to understand their meaning. Now things are wholly changed, and almost every naturalist admits the great principle of evolution."⁸⁶

⁸³ Ibid. 3.14:130.

⁸⁴ Ibid. 15:132.

⁸⁵ Ibid. 19:143.

⁸⁶ *The Origin*, 457.

It must have been especially heartening to Darwin that his good friend Charles Lyell, the founder of modern geology and a giant in nineteenth-century science, who at first was repelled by the notion of an evolution of species, after the publication of *The Origin* fully accepted evolution by natural selection and used it in his geological theories.

This essay considers Darwin's views on evolution at a time when he confidently believed in a creator and secondary causes as the creator's means of producing new species. But this confidence waned, and in later life Darwin became (though not always) an agnostic. Then he was inclined to doubt the existence of a creator or the very notion of secondary causes. What remained was "life with its several powers" but no longer distinguished as primary and secondary.

For the theist, however, who is trying to reconcile the evolution of species with religion, the way pointed out by Darwin in *The Origin of Species* and developed with a more profound notion of primary and secondary causality by Thomists like Jacques Maritain remains persuasive. Darwin received a letter asking if he thought a person could believe in God and be an evolutionist. He replied that one could undoubtedly be an ardent theist and an evolutionist, and he pointed to Charles Kingsley and Asa Gray as examples.⁸⁷ But he did not have to go abroad for an example; he could have referred his correspondent to the conclusion of his own *Origin of Species*.

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⁸⁷ Cited by Carl Zimmer, *Evolution. The Triumph of an Idea*, 343; also by Desmond and Moore, *Charles Darwin*, 636.