

Where Do Substantial Forms Come From? —A Critique of the Theistic Evolution of Mariusz Tabaczek*

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Introduction

The question posed in the present article is whether it is possible to be a proponent of theistic evolution and, at the same time, of the metaphysical

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principles elaborated by St. Thomas Aquinas. The authors of *Thomistic Evolution: a Catholic Approach to Understanding Evolution in the Light of Faith*, recently published in Polish, imply that Aquinas's doctrine was not only compatible with the idea of biological macroevolution, but also—on some level—endorsed it.¹ In his "Afterword" to the above publication, Mariusz Tabaczek points out certain deficiencies in the argumentation provided by its authors, simultaneously underlining that he agrees with the book's principal thesis.

I will not examine the book by the American Dominicans in this article because I have already addressed their arguments in full in my book entitled *Aquinas and Evolution*,² where I demonstrated that it is impossible to be both a proponent of theistic evolution and a follower of the philosophical views proposed by St. Thomas. In his "Afterword," Tabaczek presents a contradictory thesis. He claims that being both of the above is possible, provided that one modifies St. Thomas's teaching in four "essential aspects." The very approach of this kind already raises doubts. After all, if St. Thomas's doctrine indeed needs to be modified in order to reconcile his thought with evolution, it suggests that, in fact, it cannot be reconciled with it. Therefore, perhaps the problem comes down to asking whether the four points of incompatibility indicated by Tabaczek really constitute an "essential" part of Aquinas's doctrine? If it is not the case, they might be omitted or modified. If, however, they relate to certain essential elements of Aristotelian-Thomistic metaphysics, disregarding them equals denying St. Thomas's teaching and, consequently, makes it impossible to reconcile it with theistic evolution.

In order to settle the problem, I devote the first part of my article to determining whether the points presented by Tabaczek refer to the essential elements of Aquinas's discourse. In the second part of my text, however, I move to a more important point, namely the fact that theistic evolution encounters many more problems in the context of Thomistic metaphysics. Since I have already addressed this matter in several places,³ I limit the scope

¹ Nicanor Pier Giorgio Austriaco, James Brent, O.P., Thomas Davenport, O.P., and John Baptist Ku, O.P., *Thomistic Evolution: A Catholic Approach to Understanding Evolution in the Light of Faith* (Tacoma, WA: Cluny Media, 2016).

² Michael Chaberek, *Aquinas and Evolution: Why St. Thomas' Teaching on the Origins Is Incompatible with Evolutionary Theory*, 2nd ed. (British Columbia: Chartwell, 2019).

³ Michael Chaberek, "Classical Metaphysics and Theistic Evolution: Why Are They Incompatible?" *Studia Gilsoniana* 8, no. 1 (2019): 47–81; Chaberek, "The Metaphysical Problem for Theistic Evolution: Accidental Change Does Not Generate Substantial Change," *Forum Philosophicum*, 26, no. 1 (2021): 35–49; Chaberek, *Knowledge and Evolution: How Theology, Philosophy and Science Converge in the Question of Origins* (Eugene, OR: Wipf and Stock, 2021), 114–31.

of the second part of my article to only one such problem: the emergence of new substantial forms (new species) via the mechanism of evolution. Thus, the object of the present analysis is to examine whether the solution suggested by Tabaczek provides an explanation to the problem of the origin of new substantial forms in theistic evolution.

Commentary on the Four Points of Incompatibility

According to Tabaczek, the teaching of St. Thomas can be reconciled with theistic evolution under the conditions of:

(1) recognizing the possibility of the emergence of new species, that is, acknowledging that the perfection of the universe can increase every day not only in terms of the number of individual beings, but also as regards the number of species; (2) emphasizing the fact that God's initial act of creation is limited to the derivation of matter of the lowest degree of complexity out of nothing (*ex nihilo*); (3) recognizing the fact that the processes of chemical, biochemical, and biological evolution belong to the work of adornment (*opus ornatus*), whose subsequent stages spread out across the entire history of the universe and, therefore, are not limited to a finished and past time period; and finally (4) acknowledging that God's direct intervention in the creation of the first representatives of plant and animal species (with the exception of man) is not necessary.⁴

Ad (1) and ad (3). Points 1 and 3 boil down to the same idea, since they are both concerned with the fact that evolution continues, whereas from the Christian perspective, the divine work of creation had already finished. Therefore, if one adopts theistic evolution, the Christian truth of God completing his creative work with the creation of man has to be rejected. The problem is that the above is not a philosophical truth, but a strictly religious one, that is, revealed by God. Obviously, scientific research, such as that conducted in the fields of geology and palaeontology, can provide some historical details, but does not, on its own, provide an explanation for the origin of the world, species, and man. It is at this point that we uncover that theistic evolution is not so much conflicted with Thomistic metaphysics per

⁴ Mariusz Tabaczek, "Afterword to the Polish Edition of *Thomistic Evolution A Catholic Approach to Understanding Evolution in the Light of Faith*," 234–35.

se as it is with something of a more fundamental character—the Christian faith as interpreted by the Church over the centuries.

The truth regarding creation as completed is not an idea encountered only in the writings of Aquinas, although—as in the case of the other truths of faith—he expresses it in a very accurate manner. St. Thomas says, for example, that, after creation was completed, new individuals of particular species can still emerge, but new species cannot.⁵ Of course, it needs to be continuously borne in mind that what we refer to in discussions of macroevolution is the idea of species understood more broadly than merely as biological species. We mean entirely new natures, as different as a dog, cat, horse, or a monkey. St. Thomas repeats in accord with the Bible and traditional theology that creation is finished exactly in terms of the emergence of such absolute innovations of this kind. It needs to be noted that also the natural sciences point to devolution and entropy, rather than the arrival of essential innovations in the world. What we do observe in nature is merely speciation, the development of biological species. A process of this kind can be traced both in laboratories and in nature. Still, the development of new races, varieties or strains does not prove the emergence of entirely new forms of life. In fact, speciation takes place mainly through devolution, the biological impoverishment of a population.⁶ Therefore, the above claim of theistic evolution not only stands in opposition to the Christian truth defended by St. Thomas, but is at odds with the facts of nature.

Ad (2). The second point is baseless, because Aquinas does not state anything other than the things identified by Tabaczek as a point of incompatibility. For St. Thomas, the first act of creation (*prima creatio*) is precisely the bringing out of nothing of a certain primordial matter of an indefinite form. He assigns the shaping of that matter to the second act of creation (*secunda creatio*), the work of distinction and the work of adornment.⁷ Also, the scientific view of the formation of the world demonstrates the gradual increase of the complexity of beings taking place over the course of time. Such a vision corresponds to the theological concept

⁵ See *ST I*, q. 118, a. 3, ad 2: “Something can be added every day to the perfection of the universe, as to the number of individuals, but not as to the number of species.”

⁶ A thorough analysis of this process can be found in Michael Behe, *Darwin Devolves* (New York: HarperOne, 2019).

⁷ St. Thomas distinguishes between the first creation and the second creation, i.e., the supernatural shaping of the world over the course of time to which the Book of Genesis refers as the six days. The second act of creation is divided into the work of distinction (*opus distinctionis*) and the work of adornment (*opus ornatus*). See *ST I*, qq. 65–74; *De pot.*, q. 3, a. 18, obj. 12 and ad 11; q. 5, a. 9, ad 8. See also *In II sent.*, d. 12, q. 1, a. 5, corp.; d. 15, q. 1, proem.

of the second act of creation (*opus distinctionis, opus ornatus*). Thus, also in this case we can see that—with regard to its essential aspects—the traditional Christian doctrine is consistent with data provided by contemporary science.

Ad (4). The fourth point is no different from points (1) and (3), since the conviction that new species are still emerging means simply that the work of creation is not finished. Thus, the response given to points (1) and (3) is applicable also in this case. Nonetheless, I examine point (4) separately because its author makes another common mistake here, which consists in confusing the work of creation with divine intervention. Let us briefly explain what the nature of that mistake is.

Intervention (Latin *inter-venio*, to come between) signifies God's involvement in a certain sequence of cause and effect in order to change its outcome. For instance, during the Annunciation, God, employing a secondary cause (enacted by Archangel Gabriel) comes to the Virgin Mary to change the story of her life and, simultaneously, the course of human history. Similarly, various miracles of healing, in which human fate is altered thanks to God's supernatural action, can be counted as interventions. Making the sun stand still over Gibeon was also an instance of divine intervention, owing to which the Israelites were able to gain a full victory, as was the Miracle of the Sun in Fatima, as a result of which many atheists willingly converted. Nevertheless, there is no intervention in the work of creation, since the divine act of creation is not interfering with a chain of cause and effect, but rather initiating a sequence of that kind. Intervention entails the existence of causes and effects, whereas creation does not entail any existence (or implies nothingness). As long as there was no species, there was also no chain of cause and effect it might have been involved in. Creating a particular species was not a case of intervention, but of introducing a new kind of being. Obviously, once created, a new species is immediately involved in numerous cause-and-effect chains. This is why God speaking to the prophet through a donkey's mouth represents divine intervention, but the creation of the equine species does not.

What also needs to be questioned, with regard to point (4), are the grounds on which Tabaczek limits God's direct creative action to only two moments: the first act of creation (*creatio ex nihilo*) and the creation of the human soul. As already stressed, science does not provide information on *how* species emerged, but only informs us *that* they did. Palaeontology may indicate to us when particular species came into existence, and even provide us with their numbers and the amount of time that had passed before they became extinct. Nevertheless, science does not give us an explanation on the origin of species. Therefore, there is no available scientific data that

would require limiting God's creative action to merely two points in time. On the other hand, not even the Bible limits divine acts of creation to the first creation (*prima creatio*) and to the creation of the human soul. After all, it refers both to the development of the world and to the creation of species and the first human body. Thus, the limits set by Tabaczek are entirely arbitrary—they are neither grounded in scientific data nor based on theological premises. They are a result of an attempt to subordinate Christian faith to the theories of evolution. The problem is that, within the framework of consistent naturalism, the creation of the world (in the sense of its absolute beginning) is also rejected, and so is the creation of the soul. Consequently, on this point, theistic evolution is incompatible both with traditional Christian faith and with consistent evolutionary theories.⁸

The Problem of the Origin of New Substantial Forms

One of the fundamental elements of classic metaphysics is the division of being into substance and accidents. In the simplest terms, substance signifies *what* an entity is, whereas accidents indicate its traits, what it is *like*. Accordingly, we can distinguish between two types of change—the substantial one, in which it is the essence (substance or nature) of an entity that changes (an entity ceases to exist and is replaced with a new entity), and the accidental one, in which an entity continues to be what it is and only its accidents change (i.e., its properties and various characteristics). By definition, the accidental change does not alter the essence of a being; it cannot make a being cease to be itself. Should an entity lose its essence as a result of change, it is not through the accidental, but the substantial one.

This fundamental principle of Aristotelian-Thomistic metaphysics poses a difficulty for theistic evolution. This is because, within evolution viewed as a regular process of nature (which is how evolution is understood in theistic evolution), all changes are merely accidental. The often evoked “evolutionary change” of this kind is that of genetic mutations, which—consolidated by natural selection—are supposed to result in the origin of new organic structures, and eventually also new species (keep in mind that we mean

⁸ By “traditional Christian faith” we mean the teachings of the Church on the act of creation exactly as they were presented before the era of theistic evolutionism, i.e., until the beginning of the twentieth century. The above teaching was articulated in a theological treatise *De Deo creante* (often under the title *De Deo creante et elevante*, since it also incorporated the doctrine of original sin). The foundations of the above teaching can be found in the texts of authors such as Camillo Mazzella, Joseph Pohle, Christian Pesch, P. Boyer, P. Mannens, Adolphe Tanquerey, and others.

new taxonomic families, or the so-called “natural species”). Therefore, the accumulation of a series of accidental changes in subsequent generations would result in a substantial change. Nevertheless, in the light of Thomistic metaphysics, it is impossible, because accidental changes always remain on the level of accidents and cannot produce a new nature. Thus, either theistic evolution is logically contradictory (assuming that an accidental change is simultaneously the substantial one), or it completely negates the existence of substance in a strict metaphysical sense. This is precisely the problem encountered by the proposition formulated by Tabaczek, who provides the following explanation for evolution:

We can perceive evolutionary change as a series—consolidated by natural selection—of contingent (accidental) changes in the structure of genetic material (DNA). These changes are reflected in the morphology and physiology of a given organism, or a line of organisms of a given species. They result in a gradual alteration of PM’s disposition [PM = primary matter],⁹ leading to a specific moment in which the PM formed by the _{ovum} SF [SF = substantial form] and _{sperm} SF—during the course of a substantial change arising from their joining together—is not disposed to being formed by the SF typical of parents belonging to species S_1 , but to being formed by the SF of a new/other kind, belonging to species S_2 . Such a form is educed (*educatur*, from the Latin *educere*) from the PM’s potentiality.¹⁰

It is worth pointing out that the solution suggested above does not introduce anything new into the discussion concerning St. Thomas and evolution. It had been already put forward nearly a century ago by Charles De Koninck, and in more recent times the argument was modified by Michael Bolin, who pushed it to the limits.¹¹ Since Tabaczek introduces certain biological elements to this otherwise metaphysical argument, my response is divided into two parts. I address philosophy first and then move to the biology included in his argument.

⁹ It should be pointed out that Tabaczek makes an imprecise use of the term “primary matter.” Primary matter with a disposition is a designated matter (*materia designata*), and it is a type of matter that—together with form—makes up an individual entity.

¹⁰ Tabaczek, “Afterword,” 233.

¹¹ I respond to this argument in *Aquinas and Evolution* (2nd ed.), 45, 78–80.

Philosophical Challenge for the Proposed Solution

Incorrect Understanding of Substance

Thomists who claim that new substantial forms can originate as a result of accidental change make one of two possible mistakes. Both errors stem from an incorrect understanding of Aquinas's interpretation of substantial form.

In the first scenario, Thomistic evolutionists formulate a claim approximately to this effect: "If we cut off a chicken's head, we introduce an accidental change which, nonetheless, leads to a substantial change, since the essence of the chicken is lost. The chicken changes into chicken meat, an entirely different nature. Apparently, accidental change can result in substantial change after all." What we are witnessing in this instance, however, is substantial form (i.e., the species form) being mistaken for the individual form of a given being. Actually, killing a particular chicken does not in any way alter the chicken species. It only causes the loss of a chicken's substantial form, the one existing in this one chicken, the individual form. Various accidental changes alter the individual form of a given being, but what remains unchanged in the being in question is its substantial form, which determines its belonging to a given species. If, however, the changes introduced to an individual being exceed certain limits, resulting in matter losing its proportion to form, form will fade away and a given being will cease to exist. All the same, it does not lead to the emergence of any new species, but merely to the annihilation of an individual member of a particular species.

The above mistake is also made by Tabaczek, who expressly rejects the existence of substantial form in specific individuals. In the light of his interpretation, the substantial form exists in the mind of God and it becomes realized only in particular beings as changeable individual forms.¹² This approach is closer to Plato's interpretation, whereas in the Aristotelian-Thomistic tradition the substantial form of a given species really

¹² See Tabaczek, "Afterword," 233–34:

In sum, for Aristotle and St. Thomas, species exist in reality and are immutable, as well as eternal, in the sense that each is defined in reference to SF, which determines the fact that a given species is what it is and displays certain permanent features, the permanent principles of motion and rest (mutability and permanence), action and reaction. These forms are a realization of exemplary ideas in God's mind which actualize corresponding and properly disposed PM. At the same time, each species exists only as realized (instantiated) in specific, individual, and changeable organisms immersed in time. Hence, the essential intrinsic properties of species are immutable, whereas their realization in nature is changeable and diversified (it is manifested on the level of accidental properties of organisms belonging to the same species).

exists (*in re*) in every individual being. Therein lies *differentia specifica* of the Thomistic approach, referred to as moderate realism (opposed to various kinds of idealisms). Thus, in order to reconcile evolution with metaphysics, Tabaczek *de facto* forsakes Thomistic metaphysics, since moderate realism—the real existence of species within individuals—constitutes the very core of Aquinas’s metaphysics and its fundamental cognitive assumption.

In the second scenario, Thomistic evolutionists maintain—in summary—that: “When we add salt to water, we obtain brine. Adding salt is an accidental change; however, water and brine are two different substances.” One could provide many examples of this kind. Freezing water results in it changing to ice and appropriate nuclear reactions transform an atom of lead into an atom of gold. Tabaczek, in turn, gives the example of sulphur changing into sulphur dioxide, and sulphur dioxide changing into hydrogen sulphide.¹³ All of the above are instances of accidental change. Therefore, apparently, accidental change can lead to the emergence of a new substance.

However, in this case, evolutionists forget about the analogical meaning of substance and mistake it for things that can be hardly called substances in the metaphysical sense. Substance is the most definite, most distinct, and most indivisible. That is why, in the strictest sense, only God is a substance, because he is the most simple, indivisible, definite, and distinct and, in the ultimate sense, he exists. Everything else is a substance only by way of participation. St. Thomas assumes a hierarchy of substances, which in descending order extends from angels, past humans, animals, and plants, to compounds and elements. Hence, elements are substances only in a very weak sense, to the degree that they, in fact, cannot be referred to as such. They are, precisely, elements, negations of substance, because they are most divisible, mixed, and indefinite. The first real substances, on the level of complex entities, are plants, and even more precisely, only the species of the so-called higher animals (or “perfect species”) are substances in the strict sense (St. Thomas exemplifies them with a lion and a man, hence one can infer that what he means are all mammals—probably also birds and reptiles).

Since elements are not substances, no changes occurring within them are, strictly speaking, substantial ones. Obviously, in everyday speech we refer to sulphur and hydrogen sulphide as two different substances, but the colloquial use of the word “substance” cannot be confused with its metaphysical meaning. On the level of changes which occur within elements

¹³ See Tabaczek, “Afterword,” 230. In support of this thesis, Tabaczek quotes *Q.D. de an.*, q. 9, corp. However, the quote cannot be used in the context of evolution, because what St. Thomas refers to at this point is ontogenesis, whereas biological evolution involves phylogenesis.

and compounds, no innovation emerges. For instance, the formation of crystals—which for theistic evolutionists is probably the best example of the so-called “emergence”—does not result in any innovation whatsoever. What is manifested in changes of this kind are merely certain physical properties of elements which are present in them all the time but do not become apparent under different conditions. In contrast, the process of biological macroevolution would result in entirely new substantial forms, such as a cat, an eagle, or a whale. And an innovation of such kind cannot come into existence due to accidental change. A new type of nature has to start existing as a certain whole, by creative act, instantly, because it is a new substance in the metaphysical sense.

As a side note to the present discussion, we should add that Thomistic evolutionists often argue against the so-called “reductionism” in biology which regards living organisms as machines, the sum of their parts. Thomists recognize that organisms are more than that and that they cannot be reduced to the sum of their parts because living beings have an immaterial principle of their operation, which is the substantial form. We should notice, however, that one cannot coherently state that organisms are not a sum of their parts and maintain, at the same time, that they emerged in the course of evolution, which is an accumulation of minute changes. After all, if the emergence of new species is determined by subsequent biological components being added to old species, the logically inferred conclusion should be that organisms indeed are a compilation of parts. Incidentally, the said reductionism in biology stems precisely from assuming that evolution can explain the emergence of biological diversity. Thus, Thomists adopting evolutionism have no grounds to reject mechanistic reductionism in biology, since they themselves presuppose it.

Faulty Understanding of the Disposition of Matter

Another well-known argument appearing in Tabaczek’s reasoning is that new substantial forms (new species) emerge—as it were—spontaneously, when matter determined by one form acquires a disposition to assume a new form.¹⁴ Again, this argument stems from a mistaken understanding of the Aristotelian-Thomistic hylomorphism.

According to St. Thomas, matter is actualized by form, but not in such a way that there is a certain disposition of matter that can change independently

¹⁴ Most probably the first to propose this solution was Charles DeKoninck, “The Cosmos: The Philosophic Point of View,” in *The Writings of Charles De Koninck*, ed. and trans. Ralph McInerny, vol. 1 (Notre Dame, IN: University of Notre Dame Press, 2008), 256–321, at 278–83.

from the form.¹⁵ The first disposition of matter is its quantity, since there has to be an appropriate quantity of matter for a given form. However, matter does not determine itself—it is the form that provides the whole designation (the entire actuality of matter). When a disposition changes and a new species emerges, it is because the form changes. Hence, it is not that, in a certain being, under given form, the disposition of matter is changing independently until, eventually, matter assumes a new form. Should that be the case, disposition might play the part of form, and form would be redundant. Some of Aquinas's statements explicitly contradict the solution proposed by Tabaczek:

The difference of form which is due only to the different disposition of matter, causes not a specific but only a numerical difference: for different individuals have different forms, diversified according to the difference of matter. (*ST* I, q. 85, a. 7, obj. 3)

Forms are not consequent upon the disposition of matter as their first cause; on the contrary, the reason why matters are disposed in such and such ways is that there might be forms of such and such kinds. Now, it is by their forms that things are distinguished into species. Therefore, it is not in the diversity of matter that the first cause of the distinction of things is to be found. (*SCG* II, ch. 40, no. 3)

In the interpretation presented by Tabaczek,¹⁶ a new substantial form appears like a rabbit out of a magician's hat as soon as matter acquires a suitable disposition. In his approach, what serves as the active (actualizing) factor is not form anymore, as St. Thomas maintains, but matter. Thus,

¹⁵ See the following passages from St. Thomas: "Dispositions of matter remain with the substantial form" (*In I sent.*, d. 1, q. 4, a. 2, corp.); "Form and matter must always be mutually proportioned and, as it were, naturally adapted, because the proper act is produced in its proper matter. That is why matter and form must always agree with one another in respect to multiplicity and unity. Consequently, if the being of the form depends on matter, its multiplication, as well as its unity, depends on matter, but if this is not the case, then the form will have to be multiplied in accordance with the multiplication of the matter, that is to say, together with the matter and in proportion to it; yet not in such a manner that the unity or multiplicity of the form itself depends upon the matter" (*SCG* II, ch. 80, no. 8); "So long as the matter's disposition to the form remains, the form itself remains, and when the disposition goes, the form also goes" (*In I de an.*, lec. 9, no. 13). Note that the fact that a lack of disposition of matter necessitates the departure of the form does not imply that the presence of disposition of matter necessitates the arrival of a new form.

¹⁶ See Tabaczek, "Afterword," Figure 2 on 233.

Tabaczek's view boils down to a view that matter reshapes itself into new forms on its own. This is the essence of materialism, but has nothing to do with Thomistic metaphysics.

Invoking the idea of *concurus divinus* in this context does not solve the problem, since divine cooperation relates to the order of providence and not the order of creation. *Concurus divinus* explains the way in which God cooperates in the natural events occurring in the already formed world. The emergence of species, on the contrary, refers to the order of creation, the supernatural and direct action of God aimed at forming the world. Moreover, the very concept of *concurus divinus* is as alien to Aquinas as the idea of *creatio continua*.

Incompatibility with Biological Findings

In the light of Tabaczek's approach, new species emerge as a result of the accumulation of numerous genetic mutations:

The above-discussed process is of a polygenic character, a result of many mutations (the effects of which are regulated by natural selection). Consequently, capturing the moment in which a species actually changes is extremely difficult, probably even impossible, which, however, does not rule out the possibility of it occurring.¹⁷

It is an empirically confirmed fact that new biological species can develop by way of microevolution; therefore, there is no denying that to a very limited extent the above view is correct.¹⁸ However, as we have already pointed out, in the debate on evolution, the dispute does not concern the origin of the minor changes, but of the entirely new life forms—like the ones found on the taxonomic level of genus or family. And, should species be defined thus, Tabaczek's approach faces at least two problems of a biological nature.

1. First of all, it is not true that any kind of mutation brings about evolution. For evolution to progress, even by the smallest of steps, a mutation

¹⁷ See Tabaczek, "Afterword," 233.

¹⁸ The capacity and limitations of Darwinian evolutionary processes have been described by Michael Behe. Behe shows numerous examples of evolutionary processes making a few steps forward by creating some organic change that provides some adaptive advantage. However, Behe also shows why the same mechanism is unable to produce any novel genes or proteins. See Behe, *Darwin's Black Box* (New York: Free Press, 1996); Behe, *The Edge of Evolution* (New York: Free Press, 2008); Behe, *Darwin Devolves* (New York: HarperOne, 2019).

has to cause a change that would—at least—result in the enhancement of a certain function, or the development of a new one, beneficial for the survival of an organism. Only in this situation will a mutation be visible to natural selection, which is governed by a paradigm of preserving the things that give a competitive advantage. An advantage of this kind is not provided by just any mutations. As stated by Michael Behe, in many cases, such an advantage is of relative nature and stems from the destruction or deterioration of a given function. In particular circumstances, a mutation like this can prove “beneficial” (just as breaking off car mirrors and throwing away car seats can result in the car becoming lighter and fit for winning a short-distance race), but mutations of this kind do not lead to the emergence of any biological innovations. In fact, what they result in is the degeneration and extinction of species (devolution), which can be actually observed in nature.

Consequently, scientists posed a question regarding the type of mutation which might push evolution forward so as to produce any biological innovation. It transpires that it would have to be a mutation causing the development of a new protein or a new function within it. In order to do so, scientists located two relatively simple proteins (Kbl and BioF) belonging to the same family, that is, serving the same kind of a biologically different function. The conversion from one such protein to another would, theoretically, constitute the shortest evolutionary step (i.e., a change smaller than the one in question would not be visible to natural selection). Subsequently, researchers examined which changes should be introduced to the DNA for the expression of the gene encoding Kbl₂ to alter to the degree sufficient for the protein to serve the function of BioF₂. It appears that it requires at least seven nucleotide substitutions. We know, however, that mutations occurring in the course of one generation are most often single, less frequently double, and never triple. Statistically, an event of this kind could take place in an *E. coli* after 10³⁰ generations, which vastly exceeds the time of the existence of the world.¹⁹ Thus, a mutation able to cause the development of the most minute biological innovation, meaningful from the perspective of the emergence of species, would never be possible to occur.

¹⁹ Douglas Axe and Anne K. Gauger write: “We estimate that some 10³⁰ or more generations would elapse before a *bioF*-like innovation that is paralogous to *kbl* could become established. This places the innovation well beyond what can be expected within the time that life has existed on earth, under favorable assumptions. In fact, even the unrealistically favorable assumption that *kbl* duplicates carry no fitness cost leaves the conversion just beyond the limits of feasibility” (“The Evolutionary Accessibility of New Enzyme Functions: A Case Study from the Biotin Pathway,” *Bio-complexity*, 2011, issue 1, 1–17, at 12).

Another example is the research conducted on amino-acid sequences producing functional proteins. It transpires that, out of all possible sequences, the functional ones, those that have any biological meaning, may be as rare as 1 in 10^{77} .²⁰ What does this mean? It is more or less as if each atom in the entire universe stood for a chemically possible structure, but only one atom in the whole world possessed any biological function. (Obviously, there are many more such functional structures, but that is because all atoms in the world are by far outnumbered by chemically possible structures).

What do these results say about Tabaczek's claim that species differ to a mere marginal extent, in a manner which, supposedly, renders the conversion from one to another an "empirically elusive" moment? Scientific evidence demonstrates the exact opposite. There is a chasm between species filled with the possible organic structures which, nonetheless, cannot form living organisms. The same fact is confirmed on a macroscale, on the level of species, because we do not find "intermediate species" in the fossil record. Species emerge—as it were—out of nowhere, in a fully developed form, and remain unaltered over the millions of years of their existence (stasis). Therefore, scientific data contradicts theoretical assumptions regarding a gradual conversion of one species into another and, thereby, renders theistic evolution a theological theory that diverges from facts.

2. Secondly, genetic mutations cannot change whole organisms, which would be required within macroevolution, since DNA is not the only source of information in a cell. Essentially, DNA can be divided into regulatory and coding regions. The coding regions provide cells with information on how to produce proteins, and the regulatory ones, in turn, inform of the quantity and time in which proteins need to be produced. This, however, is merely the beginning of the life process. It can be compared to building a house: DNA sends information on the amount and type of material to be delivered to the building site, but it does not specify how to arrange such material into a three-dimensional structure. As Stephen Meyer points out:

²⁰ Douglas Axe, "Estimating the Prevalence of Protein Sequences Adopting Functional Enzyme Folds," *Journal of Molecular Biology* 341, no. 5 (2004): 1295–315. It needs to be explained that Axe's research covered a relatively select group of protein folds leading to active enzymes. However, the author himself points to more general conclusions that can be drawn from these findings. From the perspective of our argumentation, it is irrelevant what degree of extrapolation might be assumed for the research in question, because even narrowing the conclusion down to the actually examined structures sparks a difficulty which is the crux of our argument. This stems from the fact that all living organisms of higher-level species need many active enzymes to perform their basic life functions.

Other sources of information must help arrange individual proteins into systems of proteins, systems of proteins into distinctive cell types, cell types into tissues, and different tissues into organs. And different organs and tissues must be arranged to form body plans.²¹

Ultimately, the number and type of mutations taking place in DNA is irrelevant, because even an infinite number of mutations cannot produce epigenetic information necessary for the development and life of each organism. In the light of such findings, the genocentric, reductive optics of biological evolutionism falls apart.

Let us remark that, typically, theistic evolutionists say that their theory is “better” because it is compatible with science. Nevertheless, whenever authors writing from this perspective draw on scientific research (if at all), they refer to findings which concern only slight changes within particular species. They do not mention studies that might confirm the occurrence of macroevolution.²² We might wonder, therefore, whether theistic evolution is compatible with science or with one specific theory presented in science, or maybe with just a philosophical idea of evolutionism which serves as a

²¹ Stephen C. Meyer, *Darwin's Doubt: The Explosive Origin of Animal Life and the Case for Intelligent Design* (New York: HarperOne, 2013), 276–77.

²² For instance, Austriaco, the main author of *Thomistic Evolution*, refers to his own experiments, in the course of which, as a result of a series of coordinated mutations, it is possible to ensure that a lizard does not form a pair of limbs at its developmental stage. According to Austriaco, this research is supposed to demonstrate how evolution might have led to the emergence of the first snakes out of lizard-like ancestors. Nonetheless, even though the cited research outcomes display the essential part played by genes in certain biological functions, and demonstrate the contemporary possibilities of genetic manipulation, they fail to illustrate macroevolution—for at least three reasons. First of all, the mutations in question are a series of coordinated mutations in the course of which biologists act towards a particular aim, and during the entire process the damaged lizards are kept alive artificially and reproduced artificially. Therefore, changes of the above kind would not be possible outside of the laboratory, without access to specialized equipment and genetic engineers supervising each step of the process. Secondly, the final outcome of the experiment, i.e., mutants, are not capable of living independently, hence they would not be able to serve as an evolutionary link. Thirdly, the loss of limbs is—at best—an example of devolution, i.e., a biological degradation, not the emergence of any biological innovation whatsoever. Austriaco's experiments confirm the claims of classical metaphysics—accidental changes in a lizard result in a mutated lizard, or a dead lizard (should the number of alterations lead to matter losing its proportion to form). But they will never result in a lizard transforming into another natural species, such as a snake. See Nicanor P. G. Austriaco, “In Defense of Thomistic Evolution: A Response to Chaberek,” *Public Discourse*, March 7, 2018, thepublicdiscourse.com/2018/03/20975.

filter to examine scientific data putting a one-sided interpretation on it. One can look at the same data differently, namely through the lens of the classical Christian idea of creation, and there is nothing that one could find incompatible with it. Hence, rejecting evolutionism does not entail (as Tabaczek suggests) rejecting science, but merely contradicting one of the theories proposed by scientists which is not exactly in accord with many well-known facts.

Conclusion

Theistic evolution became widespread in Thomistic circles only in the second half of the last century. Before that, Thomists unanimously defended the classical doctrine of creation by drawing upon the classical metaphysics elaborated by Aquinas. It was not until Western culture became dominated by the evolutionary paradigm that Thomists have also modified their stance. They started to advocate the thesis that St. Thomas's teaching was compatible with the idea of species transformism through natural evolution. From its very onset, however, the new approach encountered difficulties stemming from the principles of Aristotelian-Thomistic metaphysics. Thus far, scholars adopting the perspective of Thomistic evolution have failed to explain how accumulation of accidental changes over the course of evolutionary development might lead to the emergence of new substantial forms. We will not find a solution to this problem in the studies authored by contemporary Thomistic evolutionists either. Thus, at this stage, we need to conclude that St. Thomas's teaching cannot be reconciled with the idea of biological macroevolution, which collides not only with some individual doctrines elaborated by Aristotle or St. Thomas, but with the very foundations of classical metaphysics. Not only does theistic evolution deny the divisions in being (e.g., substance–accidents), but it also strays from the moderate realism which forms the foundations for the entire Aristotelian-Thomistic philosophy.

At the same time, we should add that the present article is not aimed at assessing the veracity of Thomistic metaphysics, nor the legitimacy of theistic evolution. The question posed in this study simply concerns the compatibility of Thomistic metaphysics with the metaphysics of theistic evolution. We have demonstrated that there is a fundamental incompatibility between these two metaphysics. Evaluating which one of them deserves to be endorsed within the contemporary cultural, scientific, and theological context lies beyond the scope of this article.