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# FROM EXTRINSIC DESIGN TO INTRINSIC TELEOLOGY

Ignacio Silva\*

*Instituto de Filosofía, Universidad Austral, Mariano Acosta 1611, Edificio Plaza de  
Transferencia, 1er piso, (B1629WWA) Pilar, Argentina*

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## Abstract

In this paper I offer a distinction between design and teleology, referring mostly to the history of these two terms, in order to suggest an alternative strategy for arguments that intend to demonstrate the existence of the divine. I do not deal with the soundness of either design or teleological arguments. I rather emphasise the differences between these two terms, and how these differences involve radically different arguments for the existence of the divine. I argue that the term ‘design’ refers to an extrinsic feature that was in history understood to be imposed by God in nature, while one may argue for an internal tendency, what I call ‘teleology’. I first offer a historical tour of design arguments and how the basic notion of design was understood in extrinsic terms. I then briefly present three kinds of objections available in history to these arguments: philosophical, scientific, and theological. I finally move to discussing an intrinsic understanding of teleology, and how this notion differs from that of extrinsic design. I end the paper showing how this notion could be useful in interpreting processes in nature, in particular the reproductive tendencies in living beings.

*Keywords:* arguments, teleology, teleological, Thomas Aquinas

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## 1. Introduction

Design and teleology are two closely related notions; one may even say that they are first cousins. In this paper I want to argue, however, that one should not say that they are identical twins. This is not a common idea, evidence for which is the fact that in introductory volumes to philosophy of religion we readily find arguments for the existence of God named the ‘teleological argument’ or ‘argument from design’, labels that usually refer to the same set of arguments, making little, if any, distinction between these closely related notions. As an example, one may take a look at the Stanford Encyclopaedia of Philosophy, which in its entry ‘Teleological Arguments for God’s Existence’ (revised substantially in 2015) says that these sorts of arguments, “in their various logical forms... are classified as teleological arguments (or, frequently, as arguments from or to design)” [1]. Another clear example is the Oxford

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\*E-mail: [IASilva@austral.edu.ar](mailto:IASilva@austral.edu.ar)

Handbook of Philosophy of Religion, which affirms in its chapter on Cosmological and Design Arguments that “What is essential to the *teleological* argument, its defender will insist, is that both watches and the universe, or some subset of it such as a biological organism, show a marvellously complex interrelation of parts” [2].

Arguments from design, or teleological arguments, are typically presented in two forms: 1) they either start from the marvellously designed-like features of things in nature (with examples mostly referring to the parts of living beings), concluding that these features seem to require some sort of agency that designed them. Or 2) they use a machine-like analogy comparing the workings of the Universe as a whole (or parts of it) with human-built machines to argue for the necessity of a producer of that universal machine. Perhaps the most important feature both arguments share is that both conclude on the existence of an agent that designed things. That is, the causal explanation for the designed-like features found in nature is referred in these arguments to a being that transcends those apparently designed things.

This sort of arguments became popular in the philosophical and theological literature of the seventeenth and eighteenth century, in particular due to the exquisite understanding provided by the new natural experimental philosophy of the modern era. As I will show below, this new natural philosophy provided the framework for these design arguments to flourish during much of two centuries. So, even if these traditional arguments faced some objections during the eighteenth century, they were the most reasonable available argument until Darwinian evolution provided a plausible alternative for explaining those features. In fact, design arguments for the existence of God had such deep roots in theological discourses during the nineteenth century, that 1859 Darwin’s *On the Origin of Species* led Princeton theologian Charles Hodge, perhaps one of the most influential theologians in the US at the time who attempted to harmonise science and religion, to end his review of Darwin’s volume with the following remarks in 1874: “What is Darwinism? It is Atheism. This does not mean, as before said, that Mr. Darwin himself and all who adopt his views are atheist; but it means that his theory is atheistic, the exclusion of design from nature is, as Dr. Gray says, tantamount to atheism.” [3]

Whether these statements are sound or not, whether they have any argumentative weight towards proving (or not) the existence of God by referring to the purported design in nature, I shall not address in this article. It might very well be that one can find such design in nature, and thus Hodge can be at ease. Or it may be that Darwinian evolution certainly blows away the possibilities for holding the existence of God through this particular argument.

What I want to argue, instead, is that either way there is another strategy with which teleological thinking can lead to prove the existence of God and that this other strategy is not confronted by Darwin’s ideas in the same way that traditional arguments from design might be. I find this other strategy in the thinking of Thomas Aquinas, in particular in his thinking about final causality, which I will call teleology.

I will present a brief history of design arguments, from the seventeenth until the nineteenth century, to show the peculiar characteristics that were used to describe design, in particular the fact that it was an extrinsic feature of the created nature, which allowed natural philosophers and theologians to arrive at the existence of the Creator. I want to argue that this peculiarity, the being extrinsic, is what will distinguish essentially design arguments from teleological arguments, and that will, in the end, provide the key to understanding why design arguments are open to criticism and objections from a Darwinian perspective, while teleological arguments do not seem to be. Once more, I do not claim that design arguments are simply defeated by Darwinian evolution. I only accept the fact that traditional design arguments are objected from Darwinian perspectives, and I want to offer another teleological strategy that would, plausibly, avoid those objections.

## **2. A brief history of arguments from design**

Raymond Sebonde (c. 1385-1436), a Catalan monk of the late middle ages, offered perhaps the first argument from design (not from teleology), even if it was a bit idiosyncratic. In his *Liber naturae sive creaturarum*, later to be known as *Theologia Naturalis*, written between 1434 and 1436, Sebonde presents an argument that looks at the order of the universe as a whole to infer the existence of an intelligent and omnipotent artificer of the world in comparison to human artificers (the translation and highlights are my own): “What should we gather from this comparison and special harmony of men to the four degrees of being? This special harmony and likeness argue for, and claims first, that there is one and the same artificer [*artifex*], one and the same lord, one ruler for men, animals, and other things and degrees, one design [*concilium*], one providence. Second [these harmony and likeness] argue for its highest power, highest prudence, and highest goodness. *There would not be so much harmony and likeness between men and trees, plants, and animals, if there were two designers [conciliatores] in things, two rulers, two artificers [artifices]; nor would the operations of plants and trees would follow so orderly, and would proceed like the works of humans.*” [R. Sabonde, *Theologia Naturalis*, Venice: apud Franciscum Ziletum (1581), c. 59, 47 (my translation), University of Cambridge Digital Library, <https://cudl.lib.cam.ac.uk/view/PR-MONTAIGNE-00001-00008-00013/1>]

Sebonde argues for the existence of one and only designer, ruler, lord, that is, God, from the special harmony and likeness between the four degrees of being of his own metaphysical system, claiming that this would not be the case if there were more than one God. Regardless of the soundness of this argument, regardless of its argumentative strength and logical rigour, it is not only its terminology interesting and certainly telling of a proto design argument from the fourteenth century, but also the move to compare the order in nature to the order in the works humans worth considering. In particular if one recognises the analogical move in more modern design arguments comparing the works of God

in nature to the works of human artificers. As Benjamin Jantzen explains “the explosion of arguments for the existence and attributes of God that began in the mid seventeenth century were predominantly of this type” [4]. To these discussions I now turn my attention.

The seventeenth century saw the birth of a new way of looking at the natural world; a new natural philosophy. It was new, basically, because it was no longer an Aristotelian outlook on the world. Rather, authors such as Galileo, Descartes, Boyle, Gassendi, Newton, among many others, depicted nature in mechanical, mathematical and atomic terms, which was to be investigated in experimental ways. As such, this new perspective on nature did not typically allow referring to the four classical Aristotelian causes to explain the happenings in nature. History books suggest that what was the rich formal, material, efficient, and final causation of Greek and Medieval natural philosophy, was no longer a valid tool for describing the behaviours of natural things. Instead, natural philosophers needed to refer to the laws of nature that extrinsically guided the movements of corpuscles and atoms in a void.

The corpuscular mechanical conception of nature entailed that there were insensibly small portions of matter that were indivisible, called corpuscles or atoms. Each atom had an unchanging shape and size and a changeable degree of motion or rest. All properties of the material world were reducible to and arose as a consequence of the arrangements and motions of the underlying atoms. In particular, properties possessed by macroscopic objects, both those detectable directly by the senses, such as colour and taste, and those involved in the interaction of bodies with each other, such as elasticity and degree of heat, were to be explained in terms of the movements and place of atoms. This new perspective of nature allowed explaining the works of nature with the language of mathematics, not used in Aristotelian philosophy, as well as ‘reconstructing’ nature in terms of a machine.

In particular, an idea that will be rather important for my purposes, this new atomic philosophy was useful for placing God as being in charge of nature. In an Aristotelian world, nature had too many causal powers; so many that even if medieval scholars strongly argued that God was undoubtedly involved in the works of nature (such as Thomas Aquinas), it still seemed for many moderns that Aristotle did not leave much space for God in the created order: a powerful nature, a natural world filled with causal powers of its own (derived from the formal causes of natural things), powers to cause and produce real changes in the world, would seem not only to prevent God’s involvement, but, most importantly, God’s dominion over nature. For seventeenth century philosophers, the more power nature had the less power God had over nature.

An atomic philosophy, on the contrary, built on the grounds of Greek atomism, provided the perfect situation to put God back in the rightful place where He belonged. Atoms had no powers of their own, since they lacked formal causes, i.e. the very source of the powers of nature in an Aristotelian world. Atoms only possessed movement in the void. These atoms, however, behaved regularly: their movements were describable with precise mathematical

formulations, which were to be called the laws of nature, laws that were imposed extrinsically on nature by the most perfect of law-givers: God. In an Aristotelian world, full of natural powers and causes, the very meaning of a 'law of nature' ruling the behaviour and movement of things was simply meaningless. In an atomic world, however, God was in charge through these very extrinsically imposed laws.

The Aristotelian notion of final cause suffered a similar fate (as Margaret Osler has convincingly shown [5]): just like intrinsic natural formal causes were replaced by extrinsically imposed laws of nature, intrinsic final causation was either rejected absolutely (by Bacon, Descartes or Spinoza, for example), or transformed into an extrinsic notion (by Gassendi, Boyle and Newton, for example). The simple story is that since atoms do not have forms, they cannot have a natural inclination towards an end, a *telos* to which to tend naturally. Atoms, thus, cannot have an intrinsic final cause flowing from their natures.

Francis Bacon opposed the search of final causation in natural philosophy affirming that "the final cause rather corrupts than advances the sciences, except such as have to do with human action" [6], while Spinoza thought that appealing to final causes only showed ignorance of the true causes of things. Descartes also held a similar idea, explicitly rejecting final causes as explanations in natural philosophy, but he did so because he thought that it would be presumptuous to admit that one can know God's purposes: "Concerning natural things, we shall not undertake any reasonings from the ends which God or nature set Himself in creating these things, (and we shall entirely reject from our Philosophy the search for final causes): because we ought not to presume so much of ourselves as to think that we are the confidants of His intentions" [7].

Still, many other natural philosophers thought during the seventeenth century that final causes, extrinsically imposed by God on natural bodies, were recognisable in nature in the design of the parts of the animals and in the universe as a whole. Thus we encounter Pierre Gassendi (1592-1655), Robert Boyle (1627-1691), and Isaac Newton (1643-1727).

Gassendi was a French philosopher, priest, astronomer, and mathematician, who opposed both Aristotelian and Cartesian philosophy in many respects. Although he explicitly rejected formal and material causation in any Aristotelian fashion, replacing it with a strong version of mechanical philosophy, Gassendi did think that one could demonstrate the existence of God referring to the evidences of design in the natural world, thus searching, and finding, final causes within natural philosophy: "The royal road, smooth and easy to follow, by which one comes to recognize the existence of God, his power, his wisdom, his goodness, and his other attributes, which is nothing other than the marvellous working of the universe, which proclaims its author by its grandeur, its divisions, its variety, its order, its beauty, its constancy, and its other particularities" [8].

Of these particularities, Gassendi is particularly fond of anatomical and physiological processes, which disclose the purpose for which each part within the body was intended. He wrote: “we see in animals, in plants, and in other things that all parts are accommodated to certain ends” [8, vol. 1, 285-286].

It is important to stress the separation that Gassendi creates between his thought and that of Descartes. While for Descartes one should not presume to know the divine goals, Gassendi understood that only the knowledge of those goals, as discovered in the ends that the universe and its parts showed, was a safe path to demonstrating the existence of God, and to recognising God as creator and governor of the universe. Without these ends, without these final causes, one could fall into the temptation of assuming that the universe and its parts was a result of chance alone. So God’s intentions could not be hidden from the human understanding, as Descartes would want, since without them one could not reach His existence.

Now, since Gassendi explicitly rejected all forms of Aristotelian natural philosophy, these final causes were not intrinsic to natural things, they did not come from the natures of natural things. Instead, the divine designer extrinsically imposed these final causes to the natural world. Finality was, thus, supernaturally imposed to the behaviour of an atomic nature [9]. The purposes one found in this nature were, thus, nothing more than a divine purpose, divinely imposed from without.

Robert Boyle was a chemist pioneer, and a fervent defender of the new natural mechanical philosophy. Still, even in his opposition to Aristotelian philosophy and rejection of most of its tenets, Boyle strongly held that final causes were to be found in nature, and used in natural philosophy against any Cartesian whim. In fact, he published a whole treatise on the matter in 1688, titled *About the Final Causes of Natural Things: Wherein it is inquired, Whether, and (if at all) with what Cautions, a Naturalist should admit them?* [10]. Addressing the Cartesian doubt over whether we could know final causes, Boyle affirmed two ways in which “a man may pretend to know the ends of God in his visible works: for he may either pretend to know only some of God’s ends, in some of his works; or he may pretend to know all his ends”. Only in the latter sense one acts presumptuously. But “to pretend to know God’s ends in the former sense, it not a presumption, but rather to take notice of them is a duty” [10, p. 89]. Boyle further expresses this ideal thus: “It is not injurious to the divine Author of things, to believe that some of the ends, to which He destined divers of his corporeal works, were to exert and communicate his exuberant goodness, and to receive from his intelligent creatures, such as men, an ardent love, a high admiration, and an obsequious gratitude, for having displayed so much wisdom and beneficence, in exquisitely qualifying his works to be wonderfully serviceable to one another, and a great number of them to be particularly subservient to the necessities and utilities of men” [10, p. 90].

For Boyle, thus, God imposed final causes on natural things first, to express His greatness; and second, to allow human beings to offer Him love, admiration, and gratitude. For God shows in natural things His wisdom and care

to human beings. Following Gassendi, Boyle also found that plants and animals, their bodies and parts, were perfectly designed for their functions plainly evidencing final causes in nature. In fact, much more so than what was at the time one of the most admired human-made machines: “There is incomparably more art expressed in the structure of a dog’s foot, than in that of the famous clock at Strasbourg” [10, p. 98].

For Boyle, God “was able to contrive the whole fabric, and all the parts of it, in such a manner, that, whilst his general concourse maintained the order of nature, each part of this great engine, the world, should, without either intention or knowledge, as regularly and constantly act towards the attainment of the respective ends which He designed them for, as if they themselves really understood, and industriously prosecuted, those ends” [10, p. 111].

Within the framework of a mechanical account of nature, Boyle believed that it was possible to discover finality, which, like motion, was imposed on the matter in the world by God, who stands outside the world. “[I]t more sets off the wisdom of God in the fabric of the universe, that he can make so vast a machine perform all those many things, which he designed it should, by the mere contrivance of brute matter managed by certain laws of local motion and upheld by his ordering and general concourse, that if he employed from time to time an intelligent overseer... to regulate, and control the motions of the parts.” [10, vol. 10, p. 447]

Finally, Boyle did not see any incompatibility in referring to final causes as explanations within natural philosophy: “In Physics we should indeed ground all things upon as solid reasons as may be had; but I see no necessity, that those reasons should always be precisely physical; especially if we be treating, not of any particular phenomenon, that is produced according to the course of nature established in the world, already constituted as this of ours is; but of the first and general causes of the world itself; from which causes, I see not, why the final causes, or uses, that appear manifestly enough to have been designed, should be excluded” [10, p. 91].

So even if the discovery of efficient causes was for Boyle the primary goal of natural philosophy, “the studious indagation of them will not prejudice the contemplation of final causes” [10, p. 150].

Sharing much of the intellectual landscape of the time, Isaac Newton expressed very similar ideas to those of Pierre Gassendi and Robert Boyle had before him: God’s goals are impressed on His creation. He referred as well to the examples of the bodies of plants and animals and the anatomy of the eye as evidencing finality in nature. Following Boyle, Newton understood this finality to be imposed by the will of God, the greatest designer of all, and to be available for search within the realms of natural philosophy. In a draft of his *General Scholium* Newton wrote: “Indeed, if God did reduce to order the System of the Sun and Planets, final causes will have a place in natural philosophy, and it will be legitimate to inquire to what end the world was founded, to what ends the limbs of animals were formed, and by what wisdom they have so elegant an arrangement” [11].

In a similar manner to that of Gassendi, Newton was concerned with showing a path to demonstrate the existence of God through the recourse to design found in nature. In a wonderful, though rather long, passage from his *Optiks*, Newton expresses his argument from design thus: “What is there in places almost empty of Matter, and whence is it that the Sun and Planets gravitate towards one another, without dense Matter between them? Whence is it that Nature does nothing in vain; and whence arises all that Order and Beauty which we see in the World? To what end are Comets, and whence is it that Planets move all one and the same way in Orbs concentrick, while Comets move all manner of ways in Orbs very excentrick; and what hinders the fix’d stars from falling upon one another? How came the Bodies of Animals to be contrived with so much Art and for what ends were their several Parts? Was the eye conceived without Skill in Opticks, and the Ear without Knowledge of Sounds? How do the Motions of the Body follow from the Will, and whence is the Instinct in Animals? And these things being rightly dispatch’d, does it not appear from Phaenomena that there is a Being incorporeal, living, intelligent, omnipresent, who in infinite Space, as it were in his Sensory, sees the things themselves intimately, and thoroughly perceives them, and comprehends them wholly by their immediate presence to himself... And though every true Step made in this Philosophy brings us not immediately to the Knowledge of the first Cause, yet it brings us nearer to it.” [12]

For many seventeenth-century natural philosophers final causes came to be understood in a way compatible with the underlying metaphysics of the new philosophy that reduced causality to the impact of material particles [5], that these final causes were simply imposed by the divine providence on these material particles, and that the study of these final causes was an essential part of the new mechanical, mathematical, atomic natural philosophy.

With a quick jump to the end of the eighteenth century, one finds the image of the most famous of natural theologians, William Paley (1743-1805), who in 1802 published his book *Natural Theology or Evidences of the Existence and Attributes of the Deity*, which came to be a sort of text book for natural theologians during the first half of the nineteenth century. The book, which the title describes perfectly, presents a vast array of examples of contrivance in nature, all of which are interpreted as to evidencing the existence and the different attributes of the divine. Paley starts his volume with the famous image of someone walking a finding a watch: “In crossing a heath, suppose I pitched my foot against a stone, and were asked how the stone came to be there: I might possibly answer, that, for any thing I knew to the contrary, it had lain there for ever; nor would it perhaps be very easy to show the absurdity of this answer. But suppose I had found a watch upon the ground, and it should be inquired how the watch happened to be in that place; I should hardly think of the answer which I had before given, – that, for any thing I knew, the watch might have always been there. Yet why should not this answer serve for the watch as well as for the stone? Why is it not as admissible in the second case as in the first? For this reason, and for no other, namely, that when we come to inspect the watch, we



perceive - what we could not discover in the stone - that its several parts are framed and put together for a purpose... This mechanism being observed... the inference we think is inevitable, that the watch must have had a maker: that there must have existed, at some time and at some place or other, an artificer or artificers who formed it for the purpose which we find it actually to answer, who comprehended its construction and designed its use.” [13]

Paley makes a bold move when comparing this argument when he considers the eye: “Every observation... concerning the watch may be repeated with strict propriety concerning the eye, concerning animals, concerning plants, concerning, indeed, all the organized parts of the works of nature” [13, p. 31]... “the eye... would be alone sufficient to support the conclusion which we draw from it, as to the necessity of an intelligent Creator” [13, p. 44].

Alister McGrath, Andreas Idreos Professor of Science and Religion at the University of Oxford, explains that Paley used the term ‘contrivance’ to convey the dual notions of design and fabrication, appealing to the popular interest in machinery characteristic of the new age of industrialization then emerging in England. Paley’s detailed analysis of the watch mechanism is intended to establish that it is a contrivance, showing evidence of being initially designed and subsequently constructed for a specific purpose, and thus indicating the existence of a designer [14]. But once again, the designer imposes His design on natural things, which, now far from any anti-Aristotelian discussion, do not possess natural tendencies of their own; their purposes and goals are rather given from the outside.

### **3. Some modern objections**

The eighteenth century saw numerous objections to the argument from design, most importantly those coming from the philosophy of David Hume. The nineteenth century presented at least two kinds of objections coming from different sides of the story: one from natural history, through the ideas of Charles Darwin, and the other from Theology itself, represented in the thought of Cardinal John Henry Newman. I will briefly present the core of these objections as to have a sense of why design created such unease in scholars of different backgrounds. As I said in my opening remarks, it is not my intention to show that these objections actually debunk the argument from design. I am simply utilising them as evidence that the argument from design was, and is, not straightforwardly accepted, and that there might be another strategy at hand for the same purpose.

Perhaps the most influential of critiques ever made to the argument from design is the one that David Hume (1711-1776) crafted in his *Dialogues Concerning Natural Religion*, posthumously published by end of the eighteenth century in 1779. Hume addressed the argument from design as it was typically presented at the time, following the same lines that Gassendi, Boyle, and Newton would have: “Look around the world: Contemplate the whole and every part of it: You will find it to be nothing but one great machine, subdivided into

an infinite number of lesser machines... All these various machines, and even their most minute parts, are adjusted to each other with an accuracy, which ravishes into admiration all men, who have ever contemplated them. The curious adapting of means to ends exceeds the productions of human contrivance; of human design, thought, wisdom, and intelligence. Since, therefore the effects resemble each other, we are led to infer, by all the rules of analogy, that the causes also resemble; and that the Author of nature is somewhat similar to the mind of man; though possessed of much larger faculties, proportioned to the grandeur of the work, which he has executed.” [15]

Speaking of the machine of the world and its parts, Hume presents how this machinery resembles human-made artefacts, with the conclusion that it must have an artisan who designed it. His objections, however, are strong: first, there is a weak analogy between the world and human productions. The gap between human artefacts and the whole Universe is so vast; the similarity upon which the argument rests is so remote, that the argument itself is, as he claims in his *Enquiry Concerning Human Understanding* “both uncertain and useless”. Hume further objects that we are in no position to attribute perfection to God unless we observe perfection in nature, but since there are “many inexplicable difficulties in the works of nature” [15, p. 43] we cannot conclude God’s perfection. In fact, for all we know, this world “is very faulty and imperfect, compared to a superior standard”. Hume suggests that we can even conjecture that “some infant Deity, who afterwards abandoned it, ashamed of his lame performance” created this world [15, p. 45].

Hume’s critique to finding design in nature that would lead to the existence of God basically points to the idea that we either have to admit that the divine resembles human intelligence far too much or to accept that we do not know the divine nature at all, renouncing to understand God’s nature and attributes.

Moving to nineteenth-century objections, there is not much need to revisit the tremor that the work of Charles Darwin (1809-1882) created in natural theology, in particular in those natural theologies that followed the path of Gassendi, Boyle, Newton, or Paley in finding evidences of design in the whole or parts of the natural universe, in particular in the anatomical structures of the bodies of animals. Hodge’s review of the *Origin* mentioned above should be enough evidence for this statement. Still, other examples include Darwin’s bulldog Thomas Henry Huxley (1825-1895), who claimed in 1864 that “teleology, as commonly understood, had received its deathblow at Mr. Darwin’s hands” [16]. Or even, Daniel R. Goodwin, provost of the University of Pennsylvania, expected that in destroying “the marks, the proofs of design, and consequently the evidence of an intelligent controlling cause”, Darwin’s theory would “surely breed atheism and pantheism” in whomever held it [17].

Darwin’s theory of evolution by natural selection, as John Brooke explains, “showed how nature could counterfeit design... Over innumerable generations, this process of natural selection would lead to the accumulation of favorable variations, giving rise to new and well-adapted species having all the

appearance of design. No longer could finely honed organic structures constitute proof of a Designer in the manner suggested by Paley.” [18] Darwin crudely puts it in his autobiography, claiming that his theory of evolution by means of natural selection destroys, he thinks, the argument from design: “The old argument of design in nature, as given by Paley, which formerly seemed to me so conclusive, fails, now that the law of natural selection had been discovered. 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.” [19]

Of course, there were other natural theologies, even before Darwin, that referred to the idea of the laws of nature or the order of the universe as a whole to express the marvellous ordering God had imposed on nature. William Whewell took this line in his *Bridgewater Treatise* of 1833 titled *Astronomy and General Physics considered with reference to Natural Theology*, arguing that a law presupposed an agent, a supreme legislator, an argument to which Darwin was sympathetic for much of his younger years. These arguments will not, however, be treated in this paper.

Moving to theological objectors to design arguments, John Henry Newman (1801-1890) was not keen on any argument aimed at proving the existence of God, for he thought they did not reach the true personal nature of the Christian God. Thus, he cared not much for the design argument either, and even less after Darwin’s volume appeared in 1859. By 1870 he wrote in a letter to a friend: “I have not insisted on the argument from design, because I am writing for the 19<sup>th</sup> century, by which, as represented by its philosophers, design is not admitted as proved. And to tell the truth, though I should not wish to preach on the subject, for 40 years I have been unable to see the logical force of the argument myself. I believe in design because I believe in God; not in God because I see design.” [20]

In fact, Newman felt rather comfortable with Darwin’s new ideas, and not much with Paley’s. After all, natural theology, and in particular the argument from design, could only reach three divine attributes, namely power, wisdom, and goodness, but it did not speak of the true Christian God, whose essential features were holiness, justice, mercy, and providence.

Design, understood in the terms of Boyle and his seventeenth century peers, or Paley and eighteenth century natural theology, was easily attacked by a scientific theory such as Darwin’s, a philosophical argument such as Hume’s, or a theological outlook such as Newman’s because it was not an intrinsic design, it was not immanent to the natures of things, but rather, an extrinsic, coming from outside design, imposed by the divine designer. I will, thus, move on to presenting a different strategy to understanding the seemingly evident purposeful features found in nature, and to showing how from this evidence one might understand the existence of God.

#### 4. Thomas Aquinas on final causes as teleology

Thomas Aquinas developed the strategy I will now present in the thirteenth century following Aristotle's principles of natural philosophy. It might be worth noting that Aquinas' argument is not unknown to scholars working critically on design arguments. Jantzen affirms that "the only medieval design argument we'll scrutinize in this way appears early in Aquinas' *Summa Theologica*... The famous Fifth Way is our first example of a design argument" [4, p. 52]; adding later on that "Aquinas produced the most closely argued if not the most original medieval design argument" [4, p. 57]. McPherson, in his classic from 1972, affirms that "it would be denied by some scholars that Aquinas' Fifth Way is properly to be seen as a version of the Argument from Design. Nevertheless, it has been taken in this sense." [21] I am one of those scholars denying that Aquinas' fifth way should be seen as a version of the design argument; and here is my rationale behind that claim.

Aquinas worked with what is usually known as the classical notion of cause, the definition of which is that a cause is that upon which something depends for its being or becoming. The notion of causality as a relation of dependence opens the path for understanding that there can be different modes of causes, modes that can vary greatly depending on the kinds of causes involved.

According to this Aristotelian tradition, something depends upon four different causes, which are used to explain both why something is what it is, and why it can change and become something else. These four different causes, thus, will not all cause in the same way. Each of them will cause in a particular way, being, each of them, that upon which something depends, though that dependence would be with respect to different features of the thing caused. The four Aristotelian causes are well known: formal, material, efficient, and final. Two of them determine the existence of a new being without being constituents of the effect in its own being. The first of these is the final cause, being the aim, goal, *telos*, that starts and guides the action of the second of these, the efficient cause. The efficient cause is that upon whose influx or action depends the existence of a new being: the effect. The efficient cause is such by causing a new disposition or form in some already existing matter. This new form in an already existing matter is what constitutes the new being or effect. The other two causes are co-principles of the effect's being or existence. These two, with their own being, constitute, and hence cause, the existence of the effect. Matter is the first co-principle: it is the subject that receives the determination or form from the efficient cause. The second co-principle is the form, which is received in the matter and disposes it to be this or that different kind of being. In this perspective the formal cause explains why something exists as this particular kind of thing, and the material cause explains why it can cease to be what it is and become something else. For Aquinas, there is a fundamental order among these four modes of causes: by the final cause the efficient cause is moved to produce the form in a pre-existent matter [22].

There is much one could say about the four kinds of causes, but I will focus on Aquinas' understanding of the final cause, as to see the differences between the medieval and the modern notions of teleology. So, to final causality. For Aquinas, the definition of the final cause is that which moves the agent to cause as attracting it to cause [23]. Nevertheless, in the natural world, and even more if we limit our analysis to inanimate beings, it does not seem that things (be it an atom, a planet, the wind, or a rock) act towards ends; in fact, it appears that things simply act, and do so without pursuing anything. Still, in his *Summa Theologiae*, Aquinas explains why he understands that things always act towards an end: "For if the agent were not determinate to some particular effect, it would not do one thing rather than another: consequently in order that it produce a determinate effect, it must, of necessity, be determined to some certain one, which has the nature of an end. And just as this determination is effected, in the rational nature, by the 'rational appetite', which is called the will; so, in other things, it is caused by their natural inclination, which is called the 'natural appetite'." [24]

For Aquinas, if natural things did not have ends for their actions, there would be no reason for the thing doing this or that, simply because things would not have any natural inclination to act. Epistemically, we would have no explanation why the thing acted in this or that manner. The difficult question is, then, where does this tendency come from? In a traditional Aristotelian fashion, Aquinas affirms that the form is the principle of action in any natural thing. It is fairly patent that each natural thing acts in a particular manner, and it is due to its form that a natural thing acts in this or that manner. Thus, the end of the action of the agent arises from its own form. Following Aristotle, Aquinas affirms that "the form itself and the nature of a thing are the end and the cause why a thing is made", and that "the very form is the end" [24, I-II, q. 49, a. 2, co.]. The formal cause is, thus, also a final cause when it is considered not in relation to an existing entity, but in relation to the process of production or action. The formal cause and the end are one reality in the thing, but their causal roles are different. This conclusion implies that the final cause, that which creates the tendency to act in things, is an intrinsic cause in natural things. This disposition that comes from the form to act towards an end is usually called in Thomistic natural philosophy a natural inclination.

Of course, this does not mean that the final cause of the action of a non-rational being is easily discoverable. In fact, for Aquinas the final cause is that which is especially difficult to find [25]. In this respect, Aquinas would agree more with Descartes than with Boyle, even if not with Descartes' motivation. Some Thomistic scholars, such as Richard Connell, William Wallace, or Michael Dodds, have argued that one can discover that inanimate natural things have a natural tendency that emanates from their own nature. This, they claim, is discovered by Science in, for example, the tendency toward a state of rest, or equilibrium in chemical processes. The ability of elements to react with other elements is seen as a tendency that flows from within their own substances. As well, among living beings, they give examples such as digestion, which stops

when there is no more food in the stomach, the repair of wounded tissue finished when the wound has healed, etc. Even if I am not so sure about these statements, Aquinas was at least certain that natural things acted following an intrinsic tendency.

Turning to Aquinas' theological thinking, when he presents his famous five ways for demonstrating the existence of God, he uses this notion of final causality in the fifth and last way in his *Summa*, which is, he says, based on the evidence for governance among natural bodies. Aquinas notes that certain things that lack knowledge, i.e. natural bodies, act for the sake of an end. This is clear, he argues, from the fact that they always, or at least usually, act in the same way. Hence this cannot be accounted for by chance; rather it is by intention, by the tendency towards their end, that they reach their end. But things that lack knowledge cannot tend to an end unless they are directed by some knowing and intelligent being, just as an arrow is directed by an archer. Therefore, there is some intelligent being by which all natural things are ordered to their end, and this intelligent being we call God. As John Wippel explains, this argument should not be regarded as based on order and design, but as based on final causality, in the way that I have explained above [26]. Thus, one may say that this inclination is created by God, but that it is not imposed on things externally after things were created, as was the case for seventeenth century natural philosophers (and most after them), who understood design as an extrinsic feature of things.

I will make a short, though interesting, detour, on my argument to show how translation can sometimes play a role in the traditions of understanding texts, and how in this case it will prove essential for understanding my argument. Thomas Aquinas' fifth way has been translated in at least two editions I managed to consult to English in terms of design (with the only exception of the Blackfriars edition). The key phrase in the original Latin is "unde patet quod non a casu, sed ex intentione perveniunt ad finem", where the Latin term 'intentione' refers to the intrinsic tendency of natural things to reach their ends I explained above. Two examples of English translations show the misunderstanding that the process of translation can have; the second two present more literal translations:

1. "Hence it is plain that not fortuitously, but designedly, do they achieve their end" [27] (surprisingly, Davies and Stump labelled this translation a "literal rendering of the text" [28]).
2. "Consequently it is clear they do this not by chance but by *design*" [29].
3. As I mentioned, the Blackfriars edition translates the passage more accurately: "Which shows that they truly *tend to* a goal, and do not merely hit it by accident" [30] (Davies and Stump refer to this edition as 'sometimes unreliable'. At least on this occasion, it is the most reliable version of the text [28]).
4. Timothy McDermott [31] also offers a fair translation of this passage: "Showing that they truly tend to goals and do not merely hit them by accident."

If one reads Aquinas' argument in the key of design, with all the semantic weight that the term 'design' carries given by about four centuries of use (since the early modern natural philosophers of the seventeenth century, going through the natural theologians of the eighteenth and nineteenth centuries, and the apologists of the twentieth century), most objections raised to Paley seem to address Aquinas' argument the same. If one acknowledges, however, that there are two very distinct notions, usually referred to with the terminology of teleology, such as 'final causality' in the sense of intrinsic tendency and 'design' as an extrinsically imposed feature of natural things, a contrivance as Paley or Boyle called it, then one must acknowledge that there are two distinct arguments from teleology to God.

Hume's critiques to design arguments, then, which were aimed at those early modern natural philosophers who included the discourse about God within their natural philosophies (Boyle, Newton, or Gassendi, for example), or even post-Darwin arguments against design during the second half of the nineteenth century (that actually persist until today), are not truly aimed at an argument from teleology understood in the terms Aquinas describes his own argument. This understanding of the evidence, then, might prove as a useful strategy to overcome endless arguments about design.

## **5. Final considerations**

As I said, my goal was to offer an alternative strategy to work with teleological arguments in nature in order to arrive, plausibly, to God. I distinguished between extrinsically imposed purpose and design, and intrinsic teleology in nature. Roughly, what seventeenth to nineteenth century scholars understood design to be, and what a medieval scholar working within an Aristotelian framework, Thomas Aquinas, understood of the teleological tendencies in nature. So how is this useful today? McGrath comments on this distinction saying: "Teleology must be distinguished from design... Design is to be understood as conscious intent and artifice applied *externally* to the order of nature...; teleology can be interpreted simply as evidence of function or purpose *within* nature" [14, p. 189, my highlight], thus suggesting the same understanding I offered throughout these pages.

Spanish evolutionary biologist Francisco Ayala strongly argues for the necessity of using teleological explanations in the realm of biology. He says: "A teleological explanation implies that the system under consideration is *directively* organized... Moreover, and most importantly, teleological explanations imply that the end result is the explanatory reason for the existence of the object or process which serves or leads to it... if the above reasoning is correct, the use of teleological explanations in biology is not only acceptable, but indispensable." [32, p. 12]

Following Ayala's trend of thought, McGrath is quick to say that there is a widespread opinion within biology that the terminology of teleology is legitimate, at least in certain respects. This kind of terminology is required to

describe, at least, the goal of “reproductive fitness that plays such a central role in accounts of natural selection” [14, p. 190]. That is, the theory of evolution by means of natural selection assumes that the individuals of any biological species *tend to* reproduce and generate individuals of the same species. Basically, the theory would not work at all, or even stronger, the theory would not refer to any process in nature, if this intrinsic natural tendency were not, in effect, existent. Ultimately, it is only due to this tendency to self-reproduction and towards the preservation of the species that one may meaningfully speak of actual random mutations (which could or not, in turn, be naturally selected, as the theory of evolution by means of random mutation and natural selection suggest). As Aquinas explains: “fault is not found save in those things that are for an end... we find fault in things that are ruled by nature” [33]. That is, only in those things that have a tendency towards something is that that tendency can fail, a failure that today could be read in evolutionary biology as a mutation of a gene that tends to replicate itself. It is this kind of idea that leads McGrath to claim: “although some have argued that rejection of any form of teleology is integral to the evolutionary synthesis, it is clear that this judgment is unreliable” [14, p. 190].

As quick as is McGrath to claim the necessity of accepting teleological processes in nature today, he is also careful to mention that this teleology could be interpreted theistically or with no reference to the divine. In fact, Aristotle, who coined the notion of internal teleology as a natural tendency of beings, did not refer this tendency to a divine creator who included that tendency within its creation [14, p. 189]. This warning serves my purposes well, since all I want to claim with this paper is that these internal teleological tendencies discovered in natural things, particularly necessary for the workings of evolutionary biology, present a radically different strategy for arriving to a different kind of argument for the existence of God. Aquinas’ fifth way is one argument of this kind, which I have argued is different from the traditional design argument.

Finally, I have neither claimed that traditional design arguments, such as those from seventeenth-century natural philosophers or nineteenth-century natural theologians, do not work; nor that the objections raised by philosophers like Hume, scientists like Darwin, or theologians like Newman are insurmountable. In addition, I have not argued for the suitability of Aquinas’ type of teleological arguments to demonstrate the existence of the divine. All I have done is showing the possibility of an alternative strategy for these arguments; a strategy that considers teleological processes in nature (and not evidence for design), as a novel way to approach these arguments. The evaluation of such teleological arguments should remain for another occasion.

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