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Creation and End-Directedness

John F. Owens

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Abstract Does the act of creation show itself anywhere within the creation? A common contemporary ontology tends to see two possibilities for those who want to defend a notion of creation. The first is to argue that an original set of materials was brought into existence out of nothing by divine action a long time ago. The second, in the tradition of Paley, posits a specific divine action that oversees the development of some of the materials into entities with an end-directedness. Much contemporary energy focuses on the second possibility. The argument of the paper is that the ontology behind both of these possibilities, which limits itself to the notions of a creation of materials and the building of some of the materials into end-directed entities, conceals rather than reveals the idea of creation. The paper tries to show how an Aristotelian sense of nature, with its recognition of internal teleology and original spontaneity, offers a better starting point for coming up against the mystery of divine creative activity.

Keywords Creation · Teleology · Intelligent design · Paley · Aristotle

'Creation' In Contemporary View

Notions of creation are affected by the background ontologies that play into their formulation. Contemporary reflections on creation often assume the kind of ontology favoured by the Western scientific imagination, which allows for two kinds of thing, original materials on the one side and things that are built up out of the materials, along with their qualities, on the other. This opens various avenues for reflection on the notion of creation. The creative act can be seen as bearing in on the original materials, bringing the antecedents of the Big Bang into existence from nothing.

J. F. Owens (✉)
Lecturer in Philosophy, Good Shepherd College, 20 Ponsonby Rd., Box 3440, Auckland 1011, New Zealand
e-mail: owens@gsc.ac.nz

When thought in this way, creation becomes a rather distant affair, something that happened long ago, that does not show itself in any of the detail of the world. It rather takes on the status of an add-on that is important to religious believers, but that seems to make little difference to our experience of the world. Perhaps for this reason, there have been periodic attempts to pursue a second, more intuitive possibility for locating God's creative action. Here the creative process is seen as bearing in on some of the building that goes on within the world's history, so that the creator is seen as directly active in producing some of the entities of the world. Paley proposes something like this, and his general line of argument is carried on by contemporary 'intelligent design' arguments. Certain entities seem to be made by someone with something in mind, rather as artefacts show the influence of a human designer. This line of argument regards teleology as something added to the workings of the original materials of the world from outside, supplementing the ordinary processes of nature. We feel that someone must have brought ends and means into relation with one another, and are led to conclude that an intelligent agent had a part in the process.

Teleology has long been a controversial topic, but it could be that it is not controversial enough. Too often the meaning of the term is taken for granted, and it means what Paley means by it, referring to a supplementary purpose that is added on to the normal workings of things. My suggestion is that the background ontology of Paley and friends is hopeless for understanding anything much about creation. In fact, an ontology of this sort tends to hide rather than reveal the force of the doctrine. To get a sense of what is involved in creation, we would do much better to recover a different notion of teleology, one that comes from the philosopher Aristotle, who, ironically, did not believe in the doctrine. He held the view that teleology does not supplement nature, but in a fundamental sense *constitutes* nature, so that natural things do not acquire an end-directedness from outside, but are originally identified with an end-directedness. Such a notion enables Aristotle to develop a concept of nature that sits between a creator on the one side and things that are 'built' on the other. To see the significance of this, I will attempt a more detailed consideration of Paley and his shortcomings.

Paley on End-Directedness

Paley begins with a famous example, a watch lying on a heath, and proposes an analogy. When we find an artefact with sufficient complexity and purpose, like a watch, we conclude that it has an intelligent designer. So when we find natural mechanisms that have even more complexity and purpose, we should conclude that they too are intelligently designed. In fact, given that their degree of complexity far exceeds that of the watch, we should conclude to a designer of far higher degree.

The transition that begins the argument, from the discovery of an artefact of sufficient complexity to a belief in an intelligent designer, is one that is familiar to us in the everyday. The precise structure of the argument needs however to be clarified. The inductive argument, that we have observed many cases of production of watches and have noticed that they always include an intelligent designer, is of no use for developing an argument from aspects of creation to an intelligent creator. We have

knowledge at best of a single universe coming into existence, and therefore lack the repeated instances that could establish causal connections, as Hume notes (1976: 272). Paley insists in fact that the argument does not go back to an induction of this sort: '(i)f there were but one watch in the world, it would not be less certain that it had a maker' (Paley 1837: 16). The Paley argument is quite different, and relies on the fact that parts that have no interest in a valuable outcome combine together to achieve such an outcome. The metals that make up the parts of a watch have no interest in keeping time, but form a complex whole that does seem to have such an interest. In this situation, it is reasonable to conclude that an intelligent agent set the parts up. If we came upon a flock of chickens that, whenever someone blew a blast on a whistle, formed themselves in lines to spell out the words 'Northern Poultry Cluster',[1] we would conclude to the presence of an intelligent agent who had trained the chickens to do this. The parts of Paley's watch behave in a way that is similar, combining to perform a valuable function in which they themselves have no interest. As Paley puts it '(u)nconscious particles of matter take their stations, and severally range themselves in an order, so as to become collectively plants and animals…'. (Paley 1837: 81). The basic paradigm here is the artefact, which precisely brings together the notions of parts that have no interests beyond themselves and a valuable higher purpose that they come together to achieve. The designing mind sees the higher purpose and arranges the parts so that they are put in relation to it. Paley takes the example of a bird patiently maintaining the warmth of eggs in a nest, seeing such an action as going against the felt-interests of the bird, so that it is held in place, as if by an 'invisible hand' that imposes a connection to wider interests, of which the bird is not aware (Paley 1837: 59). If left to itself, the bird would be doing other things. The fact it is engaged in a teleological activity that is useful for the wider creation betrays the presence of an intelligent agent who is directing it to these purposes. When developing the argument about the watch, Paley's main example of a natural entity is the structure of the eye: parts that have no interest in an end combine to achieve an end. Given that we conclude to a designer when artificial entities behave in this way, we should also conclude to a designer in the case of natural entities.

If we adopt the analogy of an artefact as a basic model of a natural entity, certain significant consequences follow. Firstly, we lose any sense of a large qualitative difference between natural and artificial things. For all that its arrangement is far more complicated, Paley's eye is conceived in a way that is not very different from the way in which he conceives a watch.

> Every indication of contrivance, every manifestation of design which existed in the watch exists in nature with the difference, on the side of nature, being greater and more, and that in a degree which exceeds all computation… (Paley 1837: 3).

The only apparent difference between the two is that the product of the creator has a quality that is 'greater and more' than that of the human artisan, and that the

[1] A poultry company situated in northern Victoria

creator therefore shows a degree of contrivance that 'exceeds all computation'. The argument more or less requires that we think of the creator's mind as working in the same way as the mind of a human artisan, and performing the same sorts of tasks. For all that its action has a greater scope and requires a greater power; it is focused on a similar worldly task, directing parts towards an end in which they themselves have no interest.

The fact that the end or interest remains external to the parts in this way is a further significant consequence of accepting the artefact analogy. The chickens' spelling out 'Northern Poultry Cluster' comes on top of any interests they might have as chickens, so that it comes to them as something extraneous or supplementary. This is vital to the argument towards an intelligent maker, as Paley notices. We do not appeal to an intelligent agent to account for the chickens' moving around, pecking at food, or roosting at night. The argument needs an end-directedness that comes on top of any ends that the parts might have of themselves. It aims to demonstrate a gap between the end achieved and anything that could have been produced by the natural activities of the parts. Metals do not form themselves into machines directed at telling the time, and carbon molecules do not form themselves into organs directed at seeing. We need to appeal to a mind if we are to bridge the gap.

Darwin himself uses the artefact analogy, noting a similarity between living things and machines. He proposes however a crucial difference between the artificial and the natural, observing that natural 'machines' are not made all at once, but arise in a historical process where they inherit parts of older machines.[2] The story is familiar. The machines that have picked up parts that are advantageous for survival in the circumstances in which they find themselves manage better to reproduce themselves, gaining an advantage over their competitors and eventually taking over an ecological niche. If creatures with eyes came into existence all at once, so that organic parts that had no interest in seeing suddenly came together to form an organ capable of seeing, we would have to conclude that an intelligent agent had set them up. But Darwin's appeal to a long history of development offers a way around this conclusion, showing that there need not be anything 'directed' about the evolutionary process. The mechanisms of variation, heredity and selection are enough to explain how complex organisms that are well adapted to life in their environment can come into existence without being set up by an intelligent agent. It is not as if complex end-directed things suddenly came into existence from parts that had no interest in the end, the sort of thing that might have led us to conclude to the existence of an intelligent designer. It is striking that for all its disagreement on the conclusion, contemporary intelligent design theory has no problem with the structure of this argument. To get its position up and running it needs to establish that at least some complex functional things in the world, like the famous bacterial flagellum, came

[2] '(I)f a man were to make a machine for some special purpose, but were to use old wheels, springs and pulleys, only slightly altered, the whole machine, with all its parts, might be said to be specially contrived for its present purpose. Thus throughout nature almost every part of each living being has probably served in a slightly modified condition, for diverse purposes, and has acted in the living machinery of many ancient and distinct forms' (Darwin 1862: 348).

into existence *all at once*. This restores the necessary distance between materials and end-directed outcome, so that we are driven back to a mind that does the arranging, putting the parts into relation with an end in which they have no interest.[3] By contrast, Darwin tries to show a way that the end could have arisen by gradual changes that need no mind.

Adoption of the artefact analogy as a basic model therefore pushes towards seeing the crucial question between theology and science as a quantitative one. Could so much complex adaptation of ends and means come about without a creative mind that arranged it, or at least arranged crucial parts of it? Darwinism says that it could have, because a certain sort of historical narrative can bridge the gap. Contemporary followers of Paley deny the possibility, because they believe that end-directed parts of some natural entities must have come about all at once, and it is unthinkable that they should have done this without the direction of a mind. In a quantitative dispute of this sort, time is with the scientific side, which has the hope that future discoveries will fill in the remaining gaps, especially given the spectacular progress that has been made in recent decades. Given the argumentative moves available to both sides, it is unlikely that the argument will be concluded in favour of theology.

Aristotelian Teleology

I want to suggest that the ontology that Paley assumes is hopeless for explicating the notion of creation, and that the ontology of Aristotle is more credible and promising. Such a project requires that we distinguish the ways in which different entities relate to the notion of end-directedness. In particular, we need to get clear about how Aristotle understands the end-directedness of artefacts, animal organs, and whole living entities. My position is that only when we take a whole living entity do we see the fundamental meaning of Aristotelian teleology, and that we will be misled if we limit ourselves, as does Paley, to the workings of artefacts, or the teleological functions of organs like the human eye. Aristotle would certainly accept that organic parts of living things are similar to artefacts in as much as a direction towards a goal is part of the *definition* of each. A room heater is defined by the goal of heating a room, and a watch is defined by the goal of telling the time. There is a fundamental sense in which a heater that has lost the power to heat, or a watch that has lost the power to tell time, is no longer a heater or a watch. Aristotle sees this point as carrying over to the functions of living organs like the human eye. Given that an eye is a functional organ, and is defined by the possibility of sight that it offers, an eye that cannot see is no longer an eye. While it may retain the outward aspect of an eye, so that it could serve perhaps to represent one, it is lacking the one necessary thing that could make it an actual eye. Aristotle expresses the point with his customary brevity:

> When seeing is removed the eye is no longer an eye except in name – no more than the eye of a statue or of a painted figure. (Aristotle 1984c: 657, 412b20-23)

[3] The point is nicely summed-up in a title of William A. Dembski: *No Free Lunch: Why Specified Complexity Cannot Be Purchased Without Intelligence* (Dembski 2002).

This is the extent of the analogy that Aristotle recognizes between artefacts on the one side and functional organs like eyes on the other. Both have a necessary relation to a goal or end, so that when they lose this relation, they cease to be themselves.

But none of these examples serve to exemplify the fundamental notion of Aristotelian teleology, which first emerges when we consider *whole living things*. These bring into play a single massive factor that remains overlooked so long as we restrict our interest to things like watches and eyes, the categories of artefacts and organs. However cleverly such things are devised to achieve goods or ends, they do not themselves *have* goods or ends in any significant sense. While we are familiar these days with sophisticated domestic heaters that can maintain the temperature of a room to a fraction of a degree, such artefacts do not have the slightest interest in maintaining temperatures, or in anything else. This point applies to organs of a living entity as well. For all its sophistication, an eye has no interest in seeing, and no interest in anything else. It is surprising how often this simple point is overlooked, and we hear talk about a brain that 'performs' functions,[4] as if it had an interest in certain outcomes, and took measures to see that they were achieved. In fact, only a whole living thing, like a whole human or a whole chicken, has interests like this.

Aristotle notices the further point that end-directedness is not added as a supplementary feature to whole living things, but is originally identified with them. Their very existence consists in a striving for goals, so that it is not possible to think of them as existing at all, unless they are performing the peculiar striving that is 'living'. For a chicken to exist is precisely for it to be pursuing the goods of a chicken, foraging, laying, reproducing. A chicken that has lost this end-directedness is no longer even a chicken and has lost what counts as actual existence for a living thing. Examples like this display the basic paradigm of Aristotelian end-directedness and show how it differs from the end-directedness of artefacts, and even of organs of living things. The fundamental end-directedness of the living thing is presupposed in fact when we talk about the end-directedness of an artefact or organ. To say that my heater keeps an even temperature in the room is not meant to imply that the heater has an interest in room temperature, but rather says that its living owner has particular purposes and finds the heater useful for achieving them. The end-directedness of artefacts is external and secondary, being imposed on collections of materials from outside them. Even with organs of living things, the end-directedness is that of a kind of instrument, which serves the end-directedness of the living whole. It is only with living wholes that we come to a final identity of end-directedness and reality. As Aristotle says, 'their being is to live…' (Aristotle 1984c: 661, 415b14), or as the familiar Latin tag expresses it, *vivere est viventibus esse*. Their existence is identified with the peculiar sort of striving called 'living'.

The naturalist viewpoint can of course object that Aristotle is getting the dependence the wrong way round. What he is calling a living thing might be just a complex configuration of materials whose only difference from something like a

[4] For example, Nancey Murphy believes that as neuroscience progressively reduces faculties of the mind to the functioning of certain regions or systems of the brain 'it becomes more and more appealing to say that it is in fact the brain that performs these functions' (Murphy 1998: 13).

heater lies in the complexity of the material relations, and the fact that in the living thing, the relations loop around to maintain the thing itself in existence.[5] What we tend to see as a life principle that seems to precede the combination of parts in some mysterious sense, in that it brings them into existence, is really just a property of the combination, an 'emergent' or 'supervenient' property. Aristotle anticipates this argument and has a brief but striking rebuttal. He holds that if the life of the thing is a function of the actions of the parts, then the death of an organism should not be as definitive as it seems to be. After considering the naturalist argument that the apparent life of an organism might be a simple function of the actions of the parts of which it is made up, he says:

> But, if this is possible, it would also be possible for a soul which has left the body to enter in again; and upon this would follow the possibility of resurrection for animals which are dead. (Aristotle 1984c: 647, 406b4-5)

If a heater or a clock breaks down, it is usually possible to fix it again. The death of an organism seems however to take it beyond recovery, as if it has gone through some large qualitative change, which is possible for a living thing, but not for an artefact. In fact, we have difficulty even in imagining what it could mean for a particular body to come to life again after death. There is no problem in imagining the body starting to move again as it used to. But we tend to feel that it would not be the same as before and that it would not get beyond a kind of simulation. By contrast, almost any machine than has broken down can be repaired, and restored to a functioning state. Aristotle's conclusion is that something new comes into existence when a living thing is born and passes away again when it dies. He thinks this shows that it is not just a set of materials that have arrived at a certain configuration, as happens with an artificial object. If it was like this, it is very puzzling that we cannot seem to get the configuration in question back again once it is gone. Aristotle uses different concepts to express this contrast. Materials that acquire new configurations undergo a secondary kind of 'change' (*alloiosis*), while the beginning and end of a living organism involve a more absolute 'coming-into-existence' and 'passing-away' (*genesis* and *phthora*) (Aristotle 1984b: 512, 314a1-7).

The original paradigm of end-directedness is therefore the existence of a whole living thing. To see something as living is to see it as constituted by its aiming at a good, so that it seeks the better futures that are open to it and tries to avoid those that are worse. The ones at which it is aimed and that it tries to realize, represent its completion, an improved state of being. The life of a living thing is not just one thing after another, but a succession of ordered changes aimed at realizing the good of the thing. Aristotle calls this good its 'completion' or 'actualization' (*entelecheia* or *energeia*) (Aristotle 1984c: 656, 412a13; Aristotle 1984a: 1655, 1048a35ff).

It can seem as if Aristotle is here attempting a pan-psychist view of the world or is reading awareness into the lives of things like plants by seeing them as end-directed. But Aristotle insists that the notion of end-directedness is independent of the

[5] The philosopher Michael Ruse has a succinct expression of this view: 'it has proven impossible to distinguish between a biological phenomenon like sweating and a non-biological phenomenon like a swinging pendulum, because, questions of function apart, there is no essential difference' (Ruse 1973: 192).

possibility of awareness. The key example of such a separation comes with arts and crafts. 'It is absurd to suppose that purpose is not present because we do not observe the agent deliberating. Art does not deliberate' (Aristotle 1984d: 341, 199b27-28). It is at least possible to imagine examples of productive processes, like the production of a ship, implanting themselves in natural entities like timber, so that the ship builds itself, in the way that a tree builds itself. This would be an example of a process that is end-directed, but involves no deliberation. Examples of great art make the point clearer, in that the great violinist does not have to think about where the fingers should go. Even at the level of crafts, skilled human artisans ply their trade quickly and efficiently, with a minimum of thought, and often without having to think about it at all. In a somewhat different context, Anthony Kenny has suggested the example of learning to ride a bicycle, observing that the body itself knows where to shift its weight so that the bicycle remains upright, and a purposeful end is served without the need for any conscious direction (Kenny 1992: 36). Aristotle understands the act of living in this way, as a sort of end-directed activity that does not of itself involve deliberation.

Aristotelian Teleology and Creation

While contemporary scientific ontologies limit the notion of creation to the production of original materials before the Big Bang or to subsequent tinkering with the evolutionary history of the world, an Aristotelian view exposes the strange mixture of dependence and independence that characterizes living things, which seem to be sustained mysteriously from beyond themselves. Certainly they belong to a different category from the one in which the contemporary scientific worldview tends to put them, that of sophisticated artefacts. When we get it clearly in view, the act of living seems oddly elusive and seems situated strangely beyond the kinds of things we can handle and control.

This is not of course to deny that we exercise a certain control over the production and growth of living things. But this control appears to have strict limits. I can affect where and when my flowers grow, but cannot seem to produce the end-directed aspect of the flowers, the drive that brings them into existence in the first place. This difficulty seems to go beyond mere quantitative or technical difficulties. When we imagine the appearance of life out of the materials produced by an original Big Bang, there are large technical problems concerning the presence of the right materials at the right temperatures and concentrations in the right places and so on. But we can feel that even if we imagine such conditions as fulfilled, there is a further question as to why the outcome should be *life*, and not just the sort of thing we regard as a simulation of life. The world of elements and combinations is relentlessly 'positive', in that while it may include tension and release of tension, it has no 'tendencies'. It shows nothing of the drives associated with living things, whose very existence consists in aiming towards a completion that is yet to be achieved. So there is a very large and radical question as regards the world we live in, as to how the teleology got in there, and how it is sustained.

This point is reflected in Aristotle's awareness that so far as our everyday judgements are concerned, a further factor needs to come into play if we are to

conceive of a transition from configurations of materials to living things. Again he draws a contrast with the situation of artefacts. A set of materials could be 'potentially' a functioning room heater, in that we could imagine producing such a thing out of material parts. But the parts of a living thing do not offer any parallel to this. Living things are not put together like Frankenstein's monster (which significantly requires a bolt of lightning to come to life), but grow oddly out of themselves, having been produced by other living things. Aristotle asks what has the potential for life and concludes that it is something that is actually living:

> We must not understand by that which is potentially capable of living what has lost the soul it had, but only what still retains it. (Aristotle 1984c: 657, 412b26-27)

While this can strike us as bizarre, it reflects the oddness of the living thing, which does not increase by just picking up bits that were outside it, but seems to grow out of itself.

The point is not that living things could not have somehow grown out of the development that followed the Big Bang. Aristotle goes so far in fact as to entertain the possibility of spontaneous generation, as does his follower Aquinas (Aristotle 1984a: 1630, 1032a30; Aquinas 1995: 467, n.1400). The point is rather that the emergence of living things requires two complementary narratives, one of which sets down the conditions under which they come into existence, while the other takes account of the reality itself that comes into existence. The contrast between the two sides comes out in simple examples. While I am responsible for my flowers growing in a particular place at a particular time, I do not produce their 'growing', but rather rely on their natural end-directedness. A style of talk has grown up in the contemporary world where people talk about 'making a baby', as if a baby were a straightforward production of art. But while the conception of a child at a particular time and place goes back to the actions of the parents, the new entity that comes into existence has a strange independence, being in a rudimentary way self-directed from the beginning. Thomas Aquinas distinguishes here between the 'being' of a thing and its 'becoming', seeing human agents as responsible for the latter, but not for the former, so that such finite agents are not the cause of the form itself that gives the being of the thing, but cause it 'in regard only to its coming into being' (Aquinas 1975: 41, 1a,104,1). He makes a similar distinction between the act of living and the individual that articulates it, seeing the latter as going back to the qualities and actions of the parents, but not the former. A human father is not the absolute cause along with the mother of the child that is produced, but is only 'the cause of human nature being *in this human individual* who is born' (Aquinas 1967: 47, 1a,45,5 ad 1, emphasis added). Believers sometimes describe scientific explanations as 'limited', as though there is an aspect of reality that they miss. Aquinas offers a useful suggestion here for how this can be understood, seeing such explanations as limited to the conditions that articulate the act of living, without touching the act itself. Contemporary ontologies attempt of course to recover the aspect that seems to elude science under the rubric of an 'emergent' property. Life is not however a property in this sense for Aristotle, given that the living thing grows out of itself, and the body that has a potential for life is a *living* body.

It is only in fact with the example of living things that we see something really new coming into existence at all. This has been discussed recently in a paper by

Maureen Condic, who talks about the strangeness of the moment where sperm and egg suddenly form a one-celled embryo, and emphasizes the sharp dividing line between their status as materials and their status as living entity (Condic 2008: 3). We realize that most of the time, when we think of things coming into existence, we don't really think of anything new coming into existence at all. We think according to the artefact analogy, which only ever delivers a redistribution of existing parts. And there is nothing very mysterious about this. But in the case of a living thing coming into existence, there is something genuinely new, as though appearing from nothing, a new existent, where before there were just the material conditions for this. There is a massive unexplained factor here, as though some force were bearing in on the world from outside. I think this offers a promising beginning for reflection on the created status of the things of the world.

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