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## JOHN PHILOPONUS: CLOSETED CHRISTIAN OR RADICAL INTELLECTUAL?

The sixth century Alexandrian Christian philosopher John Philoponus is known today only to specialists. Yet scholars have recently shown that he is an enormously important figure in the history of science and philosophy. Philoponus produced a careful critique of Aristotelian science that laid seeds for much later developments. His critique was developed by Islamic philosophers and was then built on by western medieval scholars like the fourteenth century Parisian Jean Buridan (Grant, 1996: 93-98). Philoponus produced an early and quite sophisticated version of impetus theory, the ancestor of Newtonian inertia. He also produced a significant critique of Aristotle on falling bodies and made a significant attempt to unify celestial and terrestrial dynamics (Sorabji, 2010a; Wolff, 1987; Zimmerman, 1987).

Richard Sorabji has recently stressed another of Philoponus's intellectual contributions, his startling arguments for the claim that time must have had a beginning (Sorabji, 1983: 210-224; Sorabji, 2010b). Herbert Davidson has shown that these arguments had a great impact on Islamic and Jewish philosophy (Davidson, 1987). Sorabji and others have traced the influence of the arguments through the western world up to the time of Kant. They argue that Philoponus changed the intellectual landscape by making the claim that time had a beginning intellectually respectable. Sorabji further argues that critical discussion of Philoponus' subtle arguments led to important developments in medieval and later thought about infinity.

Sorabji's view of Philoponus is that his intellectual influence was beneficial because he showed up real problems with Aristotelian thought and presented a serious and well thought out alternative. This alternative was to play an important role in later scientific and mathematical developments. On Sorabji's account, it

was Philoponus' Christian intellectual outlook that made the alternative possible. We will see that while the influence of Philoponus' intellectual Christianity was in some ways beneficial, it blinkered his outlook and that of his successors in other ways.

## PHILOPONUS AND THE BEGINNING OF TIME

To give the reader some idea of Philoponus's arguments, I will explain one argument that Sorabji has shown to be particularly influential. Philoponus aims this argument specifically at the Neoplatonist philosopher Proclus, though the underlying target seems to be paganism.

Philoponus starts the key part of his discussion by claiming that everyone accepts that Aristotle has proved in many ways that the infinite cannot exist. He notes that by infinite he means infinite in extension or in number (Rabe, 1899: 7–8; Share, 2004: 23). He then argues that this means that the universe cannot be infinite in time because, if there cannot be an infinity that exists all at once, there certainly cannot be an infinity which is brought into being a piece at a time. His main reason for this is that if such an infinity could be brought into existence a piece at a time this would be analogous to counting out an infinity a piece at a time. In this way, an infinity would have become traversable, even if the parts of time ceased to exist one after another – however, the infinite is untraversable (*adiexiton*) (Rabe, 1899: 10; Share, 2004: 24).<sup>1</sup> The implicit conclusion is that time and the universe must have had a beginning, contrary to Aristotle.

Sorabji discusses various responses to this argument from the medieval period. He also puts his own criticisms of it (Sorabji, 1983: 219–224, Sorabji, 2010b). I think there is more to be said in favour of the argument than Sorabji allows. Nevertheless, I do not want here to take up the issue of whether the argument is sound.

I am here interested in the claim that the argument is important because it is a crucial part of a shift of thought in a scientific revolution (Sorabji, 2010a: 48–49). Sorabji claims that it was possible for Philoponus to be able to produce a unification of celestial and terrestrial dynamics because of his belief in a creator god.<sup>2</sup> That dynamics was partly justified through his arguments for the beginning of time and of the world. This is perhaps to underrate how important the arguments

for the beginning of time were in their own right. While some Christians and Jews had already postulated that the world had a beginning, they usually treated this claim as a matter of revelation. A few Christian philosophers produced arguments for it, but these were often attempts to deal with pagan criticisms of Christianity rather than argued criticisms of the pagan view (Gregory, 1997: 209-237). Perhaps for the first time, Philoponus used known philosophical and scientific materials to argue for the claim and against the pagan view that the world is eternal in an extremely thorough manner. In this way, he made the claim part of an intellectually respectable tradition. He also argued that the standard Neoplatonist view that the world is eternal is incoherent. It might well be said that this constitutes something like a paradigm shift in the sense of Thomas Kuhn. According to Kuhn, a crucial feature of a paradigm shift is that central assumptions of a scientific tradition that appeared unquestionable are abandoned (Kuhn, 1970).

To spell out the point, consider that amongst pagan philosophers it was thought inconceivable that everything in the world and time as such had had a beginning. The reason is that it was thought obvious that nothing comes from nothing. This means that even a creator god must have had both pre-existing materials to work from and some pre-existing forms. Further, it seemed inconceivable that time could have had a beginning; at best it was conceivable that well ordered time had a beginning. In the new paradigm, everything except God began: time, the world, and everything in it.

How radical were Philoponus's arguments for the beginning of the world? Did his intellectual commitment to putting the Christian God and his power at the centre of his picture of the world allow him to break through the limitations of pagan thought to raise radically new possibilities?

### CONTINUITY OR REVOLUTION?

It can be argued that Philoponus's philosophical views and arguments originate in the Neoplatonist thought of late antiquity and that we do not need to turn to his Christianity to find a motivation for them. After all, Christian texts generally do not contain arguments, and the Judaic tradition in which Christianity originated appeals to revelation and mystical experience rather than to argument. Argument

was the province of the Greek pagan tradition, which in his time was represented by Neoplatonist thought in Athens and Alexandria. Philoponus was taught in Alexandria by the pagan Neoplatonist Ammonius who in turn was taught by the pagan Neoplatonist Proclus. Further, his philosophical texts barely refer to Christian views. In any case, Plato believed that the world as we know it had a beginning, so it is not too much of a stretch to argue that Philoponus is building on Plato to rebut Aristotle (Lang and Macro, 2001: 5-13).

However, this view has been plausibly rebutted. While nothing like Philoponus's arguments can be found in Christian texts, work on his philosophical texts reveals that he was driven by his Christianity to develop his arguments (Baltzly, 2002: 3; Share, 2004: 1-6)<sup>3</sup>. In any case, Philoponus argues that everything in the world had a beginning – matter, form and even time, a claim that seems to be unknown in the pagan tradition (Gregory, 2007: 203; Sorabji, 1983: 270). Philoponus, following Eusebius of Caesarea, wrongly read that claim back into Plutarch's and Atticus's interpretations of Plato's *Timaeus* (Share, 2004: 5). Plato's line of argument seems to have been that by following the eternal forms the demiurge imposes much greater order on the material world than previously existed. His demiurge does not produce form or matter in the world outside himself. Further, it is well known that the Neoplatonist tradition of Proclus and others aimed to reconcile Plato and Aristotle by arguing that the world is eternal in both matter and form and arguing that Plato's description of the demiurge's activities in creating the ordered world was metaphorical. Neoplatonists like Proclus aimed to give god a crucial role in the world as the "creator" of a beginningless universe, that is, they argued that existence of the universe and its order was dependent on god (Sorabji, 1983: 193; Lang and Macro, 2001; Wildberg, 2007). In addition, Philoponus' picture of the world can be understood to be more coherent if we assume that his aim is to put the Christian god into the centre of his cosmology (Sorabji, 2010a: 49). Nevertheless, it should be emphasised that the starting point for his arguments are two apparent inconsistencies in Aristotle.<sup>iv</sup> First, Aristotle's commitment to the eternity of the world is incompatible with his critique of actual infinities. Second, Aristotle's commitment to the view that the world must be eternal because nothing can come from nothing is incompatible with his views elsewhere which imply that new forms can come into existence (Wildberg, 1987: 130). Philoponus is clear that he is using Aristotle's own claims and argumen-

tative methods against Aristotle and Neoplatonism. There is no revolution in methods of argument in Philoponus. As a key feature of a Kuhnian paradigm change is a change in intellectual standards and methods of argument, the shift brought about by Philoponus is not a Kuhnian paradigm shift.

To sum up this section of my paper, I can only partially agree with Lloyd Gerson that “John Philoponus ... is the Neoplatonist whose embrace of Christianity actually marks the beginning of the unravelling of the entire enterprise of constructing and articulating the perennial pagan philosophy” (Gerson, 2005: 4). Philoponus’s cosmogony is very different from a Neoplatonist cosmogony. His view that time and everything in it began is truly startling. Nothing like it seems to be present in Neoplatonism. Indeed, nothing like it seems to occur in all of pagan thought. However, Philoponus’s methods of argument are much like those in Neoplatonism.

### NEW SCIENCE OR NEW PHILOSOPHY?

To make a case that the revolution in thought produced by Philoponus is a *scientific* revolution we would need evidence that Philoponus used scientific methods of argument for his claims.

To what extent are Philoponus’s arguments based on scientific considerations? As is well known, science only existed to a limited extent in antiquity. Astronomy was in some ways scientific, as it was based on careful observation and the building of models of the behaviour of the heavens. These models were supposed to conform to observation and to known principles of physics in a reasonably simple manner. Philoponus wrote the only surviving treatise on the astrolabe, and it is clear that he was aware of scientific astronomy (Sorabji, 2010: 20–24). In certain ways, his astronomical views were more scientific than many of his pagan predecessors. As is well known, Aristotle thought of the heavens as being divine. Ptolemy thought that we perceive in the heavens what is really a kind of circle dance of divinities (Taub, 1993: 135–153). Philoponus puts God into a more remote position as providing the impetus for various kinds of movements in the world, including the movements of the heavens. In this way, he naturalises the heavens.

Occasionally, Philoponus appeals to observation in criticising Aristotle’s views in a way which seems to show a grasp of the idea that however intuitively

plausible a view, it must answer to observation. His criticism of the view that the movement of a body after a mover has left it is caused by the air behind it is a well known example (Cohen and Drabkin, 1948: 221-223). A clearer example is his equally well known criticism of Aristotle on falling bodies. He points out that contrary to Aristotle, bodies do not fall in proportion to their weight, saying that you can prove this “from the plain facts better than with demonstrative argument. For if you take two weights differing from each other by a very wide measure, and drop them from the same height, you will see that the ratio of the times of their motion does not correspond with the ratio of their weights, but the difference between the times is much less” (Furley and Wildberg, 1991: 59).

However, there is no clear sign that Philoponus uses a careful experimental method in physics or cosmogony. I should say that this does not distinguish Philoponus from most other ancient thinkers. It is difficult to find thinkers in the ancient world outside of medicine who defended the claim that properly conducted experiments should be used to settle all scientific disputes.

As is well known, Aristotle seems strangely ambivalent in his use of scientific method. On the one hand, his biological writings at times display an excellent grasp of the importance of observation and dissection. They also display a grasp of the idea that classification should be based on observable similarities (Lennox, 2000). On the other hand, the same writings show him making cavalier comments that can easily be refuted by observation and appealing to models of that are quite untestable. His overall idea of how a good science should ideally work, set out in *Posterior Analytics*, does not appeal to experience or experiment as the ultimate arbiter of the fundamental assumptions of a science. He thinks that ultimately science should be based on principles that are self-evident and necessary, though he recognises elsewhere that his ideals are unachievable. Commentators often try to re-interpret *Posterior Analytics* so that the problems disappear. Nevertheless, their attempts to re-interpret it are unconvincing<sup>5</sup>.

In an Arabic paraphrase of a lost work arguing for the eternity of the world, Philoponus' ideal procedure is set out. Philoponus says that he has refuted the sophistries of Proclus, Aristotle, and others. Presumably he is talking about two works: the largely extant work *Against Proclus, on the Eternity of the World* (Rabe, 1899; Share, 2004), and the work we only know from fragments, *Against Aristotle, on the Eternity of the World* (Wildberg, 1987). He says that as the speculative

thinkers may regard his claims as uncertain, he will now turn to demonstrating that the world is created in time. This is a little puzzling as his refutations in previous works often consisted of presenting his arguments for his positive thesis. However, he talks of “improving” the proofs for the temporal creation of the world (Pines, 1972: 321-322). I take it that he means that he is setting out his proofs in a more properly deductive manner. The discussion that follows is rather messy and covers various arguments. He comments on some of his claims that they are “true propositions by a priori knowledge, which per se does not need to be demonstrated” (Pines, 1972: 323). (Pines comments that what he translates by using “a priori” literally means “first knowledge”.)

Later, in what the Arabic summary says are the main points of the third treatise of the book, he discusses explicitly his main arguments concerning the beginning of time. He there sets out three principles which he tells us are known and recognised, and which he claims cannot be refuted. His arguments seems to have been intended to proceed in a deductive form from that point (Pines, 1972: 330). It is interesting that the three principles he sets out are the same as the axioms Simplicius says Philoponus used in a proof in a treatise against Aristotle on the eternity of the world (Wildberg, 1987: 144).

Whatever the details of Philoponus’ lost work, it is pretty clear that in that work and in the earlier works on the issue, empirical considerations play no significant part. In any case, Philoponus’ arguments for a beginning of time and the world are meant to be based on self-evident premises and to state necessary truths. This means that he cannot be seen as a precursor of modern scientific debates about the beginning of time.

### PHILOPONUS’ LIMITATIONS AND THE LIMITATIONS OF LATE PAGAN THOUGHT

While Philoponus’ thought is in some ways radical, the thought world of the early Byzantines seems in other ways much more limited than that of earlier antiquity. No one seems to defend the Epicurean view that the only gods are rather like humans and that the system of the world needs no gods to keep it going. Various interesting pre-Socratic options have also disappeared. In addition, The Neoplatonist conception of Plato and Aristotle as consistent was so dominant that no

one seems to have understood that gods, and even the prime mover, only play a very marginal role in Aristotle. As a result, no one seems to have thought of producing a more naturalistic version of Aristotle. Why was the thought world of the early Byzantines so intellectually impoverished in these important respects? I think it was too dangerous to defend options that were wildly different from Christianity in the Christian Roman empire. It is significant that despite the fact that the teachings of the pagan philosophical schools in Athens were far more innocuous than Epicureanism or various other options, the pagan schools were shut down by the emperor Justinian in the year 529 – the very year in which Philoponus published *Against Proclus*. The events of 529 came after centuries of harassment of pagans by Christians. The murder of the Neoplatonist philosopher Hypatia by a Christian mob in 415 is too well known to need detailed recounting. If views as theologically innocuous as those of Neoplatonists could arouse rage long before Philoponus, it is no surprise that the available alternatives to Christianity in the early Byzantine period resemble Christianity.

The trends I have described in the previous paragraph continue long after late antiquity. Herbert Davidson points out that in the debates of Islamic and Jewish philosophers about whether the world is eternal or began, the idea that God might not exist was not treated as if it were a serious option. Indeed, he notes that those who thought that the existence of God is unprovable were theological conservatives who questioned human reason. They were not defending atheism or scepticism (Davidson, 1987: 1-2). A plausible explanation of the continuation of these trends is the political and social influence of Islamic theology – it was more tolerant than Christianity in regard to peoples of the Book (the Old Testament), but arguably more intolerant in regard to other views. Grant has pointed out that in the Islamic world, philosophy was quite distinct from theology and widely regarded as suspect. He sums up the situation by saying that in the Islamic world “natural philosophy was always on the defensive; it was viewed as a subject to be taught privately and quietly, rather than in public, and it was taught most safely under royal patronage, as seen in the careers of some of Islam’s greatest natural philosophers” (Grant, 1996: 182).

The debates in the medieval west, which started when Bonaventure revived Philoponus’ arguments in the thirteenth century, were pervaded by similar theological assumptions. A central interest of philosopher/theologians was in whether God’s power is limited so that he could have only created a world which begins.



Another issue of importance to them was whether the sense in which the world might have been eternal is different from the sense they assumed God to be eternal (De Grijns, 1990; Thijssen, 1990). Although philosophers offered proofs for the existence of God, much of their interest was in the limits of human reason and in the precise nature of God. There is no sign in philosophical discussion that anyone takes seriously the possibility that the world might have a beginning in time, but did not require God to bring it into existence. In the west, the power of the Catholic Church to shut down debates would certainly have been a factor in limiting the discussion of various options. As an example of how debate on issues to do with the power of God could be shut down it is instructive to consider the notorious condemnation of 1277. 219 propositions were condemned by Parisian ecclesiastical authorities who wanted to shut down discussions in the University of Paris, including discussions about views on the eternity of the world. The threatening aspect of those views seems to have been the claim that God's power might be very limited. Two important philosophers who were teaching on the eternity of the world, Siger of Brabant and Boethius of Dacia, fled Paris as a result of the condemnation (Grant, 1996: 70-80). Grant, following Duhem, notes that the condemnation led some philosophers to question Aristotelian views that seemed to limit the power of God. This questioning facilitated the development of better thought out views concerning the possibility of a vacuum (Grant, 1996: 82-83). Nevertheless, he does not note that the condemnation shut down discussion of views that might eventually have developed into a scientific atheism or agnosticism.

Despite my remarks in the previous paragraph, let me acknowledge that due to the institutional structures in which medieval western universities operated, there was considerable freedom of public discussion. Church and state in the west were separate and both recognised to some extent the separate rights of universities as corporate entities (Grant, 1996: 172).

The published literature on later Byzantine thought does not display any evidence that there was any thorough debate about arguments for the beginning of time. Much of later Byzantine philosophy displays similar limitations to Arabic philosophy and western medieval philosophy. There were revivals of Neoplatonism, often integrated with Christian thought (Tatakis, 2003). However, there seems to have been no serious discussion of more radical alternatives. This may well have been because it was too dangerous to discuss such alternatives.

Grant argues that the later Byzantine world failed to make a significant contribution to the foundations of science, including discussions of the eternity of the world. He claims that this was for a variety of reasons. One was that scholarship in the Byzantine Empire was carried out by a tiny minority of laymen. Neither church nor state institutionalised the study of natural philosophy and science. In addition, he says that Byzantine scholarship in the area was pedantic rather than innovative (Grant, 1996: 190-191). If he is correct, the Byzantine world missed an important opportunity.

### PHILOPONUS' THOUGHT WORLD AND THE THOUGHT WORLD OF DAVID HUME

To understand the limitations of Philoponus' thought, it is useful to contrast his thought with that of the eighteenth century British philosopher David Hume. One of the central aims of Hume's *Treatise of Human Nature* is to distinguish carefully issues that can be dealt with by reason alone and issues that cannot. Hume wants to claim that the only issues that can be dealt with by reason involve mere relations of ideas. All other issues are empirical. Hume is able to say these things because he lives in an age that has been profoundly affected by the power of the scientific revolution. Ideas that seemed obvious, like the claim that something needs a motive force to keep it moving, have been abandoned in the light of science. It has become important to be much more careful in formulating supposed necessary truths.

When Hume turns his attention to religion in the *Dialogues Concerning Natural Religion*, his views are even more striking by contrast to those of Philoponus. A priori arguments for the existence of God are dismissed quickly. He argues that the number of possible ways the universe could have been produced is bewilderingly large. For instance, he argues that it might have been produced by an unintelligent thing, like an infinite spider. Further, he says that perhaps the current order of the world is the result of coincidence.

What, apart from the scientific revolution, has made the *Dialogues* possible? Hume lived in a much more open minded intellectual culture than the culture in which Philoponus' operated. Although Hume could not publish the *Dialogues* in his lifetime, he lived in a world in which he could engage in discussion with agnostics (who were called "sceptics" at the time) and atheists.

## CONCLUSION

Philoponus made an important intellectual contribution in criticising in detail the prevailing pagan view that the world must be eternal. Through his arguments, he showed up real flaws in that view and made rational thinkers realise that there were other options. In this sense, he made the formulation of later, much more scientific alternatives, possible. As has been shown by a number of philosophers, many scientific theories do not result from mere observation of facts; rather they are interpretations of facts within a wider conceptual framework (Popper, 1980; Couvalis, 1989: 1-38; Couvalis, 1997: 62-86). Had the pagan framework remained the only one available, it might have been impossible for western scientists to even conceive of a theory like the big bang theory, which postulates a beginning of the universe and time.

Despite Philoponus' contributions, his thought was significantly limited. He did not grasp that the issue of whether time began might be empirical. However, he could hardly have grasped this without experiencing the Scientific Revolution. Nonetheless, the absence of an ancient Scientific Revolution does not explain another limitation in his thought. He shows no understanding that God might not be necessary to explain the causeless beginning of time. I have argued that this limitation comes not from Neoplatonism but from the power of the repressive monotheistic world in which he lived. Unfortunately, this repressive world persisted long after his time. Its persistence explains important limitations in later philosophy.

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## ENDNOTES

- 1 Philoponus produces similar arguments in other works (Edwards, 1994: 96-7; Pines, 1972; Wildberg, 1987: 144-146.).
- 2 Sorabji distinguishes between the notion of a creator god motivating Philoponus' unification of dynamics and the notion making it possible. I cannot see that it made it possible. There are many ways to unify dynamics without a creator god. Sorabji may mean that it made possible Philoponus' specific kind of unification, but that too is unconvincing. All Philoponus seems to need is something producing a universe, and then some continual driving force from outside the universe. This need not be a creator god. For a general criticism of recent arguments for a creator god, see Couvalis, 2009.
- 3 I should emphasise, however, that Christian thinkers were divided at the time as to whether the book of Genesis implied that the world was created *ex nihilo* (Sorabji, 1983: 194-197). Kenneth Seeskin points out that the first line of Genesis is grammatically ambiguous as to whether God was working with pre-existing materials. He also says that Rabbis have disputed the meaning of that passage and many others for millennia (Seeskin, 2005: 14-18). Andy Gregory has recently argued that the Biblical accounts of creation are an incoherent mixture of views (Gregory, 2007: 203-217).
- 4 Note, however, that Wolff argues that Philoponus's arguments for impetus rely on distorting Aristotle because Philoponus reads Aristotle as thinking that the cause of motion is internal to objects (Wolff, 2010). I do not agree with Wolff's understanding of Aristotle. I think Aristotle sometimes talks as if the cause of motion is internal to objects. In any case, in some contexts it would be incoherent for Aristotle to think the cause of motion is not internal to objects. For instance, if someone is driven to do something by a non-existent object, she is driven by her idea not by the object.
- 5 For a magisterial survey and critical discussion of various views about *Posterior Analytics* see Lloyd, 1996: 7-37. I am not convinced by Lloyd's attempt to make Aristotle's views about proof and evidence more coherent.