
Ancient Greek Cosmogony by Andrew Gregory

London: Duckworth, 2007. Pp. xii + 314. ISBN 978-0-7156-3477-6.
Cloth £80.00

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This work is a study of theoretical treatments of how the world came to be, from the Presocratics to late antiquity. It takes the theories as quasi-scientific proposals, based at least in part on scientific criteria. ‘A key argument of this book’, explains Gregory, ‘will be that there are perennial philosophical and scientific problems relating to cosmogony’ [2]. Recognizing that most interpreters of ancient Greek philosophy view cosmogony ‘as a single issue’, and see it as ancillary to philosophical questions, the author wishes to show that cosmogony can be a complex subject that motivates debates among thinkers [1].

In the first chapter, Gregory distinguishes between mythological accounts of creation and philosophical cosmogony. He finds four issues ‘which separate myths from philosophy’ [13]. First, philosophical theories are ‘parsimonious’. Second, philosophical theories appeal to ‘invariance’. This he regards as more general than the often-invoked feature of ‘depersonalification’. It is not just that philosophers replace personified deities with things, but that, even if they allow for some personification (think of Empedocles, Parmenides, Plato), they take the beings in question to ‘act in a regular and predictable manner’ [14]. Third, philosophical theories are ‘non-contradictory’, a feature that might seem trivially true. But Gregory contrasts this situation with mythology, in which competing and incompatible myths are often accepted without demur. Finally, philosophical theories reject the supernatural—a feature that may follow from the others, but which he is content to treat as a distinct one. This list of features provides a wider range of considerations than are often used, and offers a useful set of criteria. The author presents it rather more briefly than the subject warrants. For instance, more needs to be said about what he means by ‘parsimony’ (in what way, for instance, is Thales’

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ISSN 1549-4497 (online)

ISSN 1549-4470 (print)

ISSN 1549-4489 (CD-ROM)

Aestimatio 5 (2008) 178–183

theory parsimonious that Hesiod's is not?), and it seems hasty to say that philosophical theories *reject* the supernatural. Ancient theories often ascribe to the ruling power of the universe what they understand to be supernatural powers (immortality, omniscience), but, in accordance with the third feature, take it to act in a rational and consistent way. Indeed, this harmonizes with the author's treatment of animism, anthropomorphism, and hylozoism, which ancient philosophers may allow but restrict to regular operation [15–18]. Gregory prefers the term 'panpsychism' to describe the numinous features of matter in early theories [28, 30].

In his second chapter, on the Milesians, Gregory confronts the question of whether the philosophers of Miletus employed a vortex motion in their respective cosmologies. He argues that they recognized a 'steering principle' immanent in matter (an instance of panpsychism) which directs the *κόσμος* [31–32]. This obviates the need for a vortex motion. It also obviates the need for multiple *κόσμοι*, which, as becomes clear in later chapters, are posited by those who see a *κόσμος* as being generated out of chance events. What emerges from this and subsequent discussions is a typology of theories: those with steering principles make do with a single *κόσμος*, those with chance encounters require plural *κόσμοι*. Furthermore, those which posit successive *κόσμοι* do so for certain determinate reasons.

This typology is attractive. Yet it is difficult to argue for it in light of doxographical statements to the contrary, for instance, claims that Anaximander had multiple *κόσμοι* and a perishable present *κόσμος* [39]. Gregory rejects these statements as misinformed, after giving five arguments for a unique world [33–36]. Unfortunately, several of these arguments tend to beg the question by assuming correlations that are in dispute. Gregory does show that there is no convincing evidence for a vortex motion in Thales and Anaximander, and argues this for Anaximenes. He ignores, however, one piece of evidence which might testify to a vortex motion in the last philosopher.¹ Epicurus argues against those who ring the earth with walls to protect against the vortex, an apparent reference to Anaximenes' high mountains. The passage is not necessarily decisive—Epicurus

¹ Epicurus *ap.* PHerc. 1042.8.vi [Arrighetti 1973, I'A' [33] with Perilli 1992].

may be assimilating Anaximenes to later theorists—but it provides *prima facie* support for the vortex reading.

Gregory takes Heraclitus as not offering a cosmogony (*versus* those who attribute a doctrine of periodic ἐκπύρωσις or conflagration to him). Heraclitus sees the κόσμος not as ‘a state of good order’ like the Milesians but as ‘a well-ordered process’ [62]. Fire is primary as the cause of cyclical changes and as maintaining the κόσμος through its steering function. It may or may not have temporal and ontological primacy. Parmenides presents a new problem for cosmogony with the ‘sufficient reason problem’ [71]. In a homogeneous initial state, why should a cosmogony begin at any given time? Or at any given place? Furthermore, what-is is one and not many. Parmenides goes on to produce his own cosmogony, which is meant as ‘a demonstration of some of the problems which face mortal cosmogony’ [74]. Parmenides argues against creation *ex nihilo*, a view that no one seems actually to have held before he criticized it [77]. (Does this suggest a failure in the standard interpretation of the Presocratics?)

Empedocles develops a cyclical cosmogony that is driven by Love and Strife, which are to be understood as principles of association and dissociation, respectively, rather than as forces. Chance plays a large role in the cycle, producing κόσμοι that are not identical from one cycle to another (except sometimes accidentally). Gregory gives reasons why teleology would be a difficult concept to connect with Empedocles’ cycle. Empedocles is in part reacting to Parmenides, but he is also appealing to conflicting principles to account for cosmogony, inspired in part by Heraclitus’ criticisms of the Milesians. He is the first philosopher to posit a cyclical cosmogony with successive κόσμοι. Anaxagoras has a κόσμος initiated by νοῦς. He envisions a single κόσμος (*pace* some readings of B4) and first appeals to an anthropic principle (the universe must have properties which allow life to develop) to account for the world.

The atomists, Leucippus and Democritus, appeal to an indifference argument to argue for an unlimited number of atoms with an unlimited number of shapes. The conditions conducive to cosmogony occur by chance in infinite space, so there are multiple κόσμοι. The atomists are the first philosophers to advocate a plurality of coexisting worlds, according to Gregory. They reject the notion of a governing principle and also avoid Parmenides’ sufficient reason problem.

Our world is not a unique product of special circumstances but part of a recurring process that takes place wherever conditions are right. Gregory briefly reviews other Presocratic figures such as Xenophanes (who has no full-blown cosmogony) and Diogenes of Apollonia, who, Gregory thinks, had only a single *κόσμος*.

In a detailed chapter on Plato, Gregory stresses the teleological character of his cosmogony. He defends a literal reading of cosmogony against those who would take it metaphorically. He is more cautious about Plato's account of chaos, which presents special problems. Overall, however, Plato provides another example of a cosmogony in which a steering principle, in this case personified in the demiurge, produces a single world. In contrast, Aristotle provides a cosmology without a cosmogony: the world has no beginning and no end. Thus, Aristotelian theory offers a sophisticated counterpoint to ancient theories of cosmogony.

Epicurus adopts atomic theory but he rejects indifference arguments as a basis for cosmogony. Rather, he claims that '*κόσμοι* form wherever there is a seed for them to form' [175]. He rejects providence as directing the universe. The fall of the atoms and the swerve are best taken as 'permanent features of . . . physics' rather than as the first causes of random motion in the universe [181–182]. By contrast, the Stoics believe in providential direction of the world and in a succession of *κόσμοι* interrupted by episodes of *ἐκπύρωσις*. In all other theories that allow multiple *κόσμοι*, each world is significantly different from the others. But for the Stoics, the successive worlds are identical or very similar. According to Gregory, 'the key question for the Stoics is how to couple together a degenerating *κόσμος* with the idea of a providential god' [195].

The Christians make an important innovation in theory by arguing that the world is created *ex nihilo*. This view was rejected much earlier by Parmenides and goes beyond anything explicit in the Bible. The Christians see God as creating not only matter but space also. God is completely omnipotent and able to create miraculously all things out of nothing. Gregory goes on to examine cosmogony in later Platonism. He finds that 'Philo believed in an origin for matter, space, time and the *κόσμος*. These were all generated by god at the same instant' [223]. This seems to clash with his view about the early Christian fathers as the originators of the idea of creation *ex*

nihilo, since they are writing after, and in several cases drawing on, Philo [215–216]. Platonists debated each other, Aristotelian theory, and Christian theology, which itself became increasingly Platonic.

In conclusion, Gregory identifies four main approaches to cosmogony in antiquity:

1. A unique *κόσμος* governed by design principles.
2. Multiple co-existent *κόσμοι* generated by chance.
3. Cyclical *κόσμοι*, of the Empedoclean or Stoic types.
4. Anti-cosmogony, of the Heraclitean, Parmenidean or Aristotelian types. [240–241]

A major shift in thinking occurs when the Christians conceive of God as creating matter and space as well as the world. One thing missing from all these accounts is anything like a theory of gravity, which is crucial to the modern understanding of cosmogony.

Gregory reviews essays in cosmogony, and even anti-cosmogony, from the sixth century BC to roughly the sixth century AD. He provides a coherent and attractive account of the issues, some of which continue throughout the period, and the developments in the field. He makes a plausible case of the importance of cosmogonical principles in shaping debates among thinkers and influencing the course of philosophical and scientific discussion. In most cases, I found myself in agreement with the author's specific interpretations of philosophers, some of which remain quite controversial.

Above I expressed doubt about whether Gregory had demonstrated that the Milesians did not posit plural worlds. Let me offer one interpretation that might help his case. Hippolytus claims that in Xenophanes extinction and regeneration of man occurs with a flooding and drying out, and that this change happens 'in all the *κόσμοι*' [Ref. 1.14.6]. This is typically taken as an expression of plural worlds; but in this case, the story makes sense only in a cycle of recurring wet and dry periods in the same world. Could it be that *κόσμος* means not 'world' or 'world-order' but 'phase' of the world? If that is so, it is possible that later writers, reading their own quasi-technical sense of *κόσμος* into non-technical occurrences may have misconstrued statements of Xenophanes and writers of his period.²

² See also the treatment of Anaximander at Hippolytus, Ref. 1.6.1.

In this work, Andrew Gregory gives us a study of cosmogonical theories from the whole of antiquity. He provides careful explication and thoughtful analysis of the theories studied. He often makes illuminating comparisons between ancient philosophical and modern scientific theories of cosmogony. There is no other work which deals with the subject of ancient cosmogony as a topic in its own right. One recent study, however, overlaps with Gregory's and complements it, namely, David Sedley's *Creationism and Its Critics in Antiquity* [2007], which focuses on teleological aspects of world-making. In these works, students of cosmogony can compare two provocative and lively treatments of a subject that has stirred little systematic interest until now. What Gregory's work offers is a comprehensive survey of cosmogony in antiquity, illuminated by an awareness of philosophical and scientific debates continuing to the present, and grounded in a solid study of the ancient evidence. Future studies of cosmogony should surely begin with *Ancient Greek Cosmogony* and will profit from its careful examination of the field.

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