

ANCIENT ATOMISTS ON THE PLURALITY OF WORLDS*

What difference, if any, would or should it make to the way we think of ourselves and our lives if it were true that there are many—perhaps infinitely many—other worlds, some like this one, some utterly unlike this one? This question probes one of the many possible links between physical or cosmological speculation and ethical thought. It is worth asking not only because it has some intrinsic interest, since the answer to it may reveal an extent to which our own general outlook is influenced by such cosmological thoughts, but also because the ancient atomists in particular did conclude that the antecedent of the conditional in my opening question is true. There are, according to them, many—in fact an infinite number—of other worlds. Some are utterly unlike this world. Others are just like this world. Indeed, some are so like this world that there are apparently identical people to us in those worlds living lives just like ours. We might assume that the acceptance of this conclusion would radically alter one's view of one's own life and its significance, perhaps indicating the absurdity of human ambitions or the vanishingly small importance of one's own affairs. After all, consider the presumed consequences for our own view of ourselves if it should be conclusively shown that there is some other life of whatever sort elsewhere in the universe, let alone intelligent life or life otherwise similar to ourselves.¹ (Similarly, we could ask what, if anything, would follow if it should be shown conclusively that we are the only intelligent life in the universe.) I shall argue that in fact the ancient atomists in general took a laudably sober view of the ethical consequences of there being innumerable other worlds. What ethical consequences they did draw from their cosmological arguments stem primarily from the very general principles of atomist physics and cosmology, not directly from the fact of there being innumerable other worlds. The conclusion that there are innumerable other worlds is a further consequence of the same general atomist cosmological principles.

It is difficult to capture just how startling a conclusion this assertion of an infinity of worlds would have seemed to an ancient audience. It is possible that earlier philosophers also argued that there is in fact a plurality of *kosmoi*.² But the atomists

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¹ Recall the interest sparked in 1996 by the suggestion that Martian meteorite ALH 84001 discovered in Antarctica in 1984 showed evidence of life.

² Anaximander and Anaximenes were considered by some later doxographers to have thought that there were infinite *kosmoi* but the evidence is not particularly compelling. See G. S. Kirk, J. Raven, and M. Schofield, *The Presocratic Philosophers* (Cambridge, 1983²), 122–6 and 151, n. 1, and D. Furley, *The Greek Cosmologists, 1: The Formation of the Atomic Theory and its Earliest Critics* (Cambridge, 1987), 139. On the possibility of multiple worlds in Anaxagoras' cosmology see M. Schofield, 'Anaxagoras' other worlds revisited', in K. A. Algra, P. W. van der Horst, and D. T. Runia (edd.), *Polyhistor: Studies in the History and Historiography of Ancient Philosophy Presented to Jaap Mansfeld on his Sixtieth Birthday*. *Philosophia Antiqua* 72 (Leiden, 1996), 3–19, and C. Louget, 'Note sur le fragment B4a d'Anaxagore: pourquoi les autres mondes doivent-ils être semblables au nôtre?', in A. Laks and C. Louget (edd.) *Qu'est-ce que la Philosophie Présocratique* (Villeneuve d'Ascq, 2002), 497–530. Diogenes of Apollonia may also have been a

are by some way the most prominent ancient proponents of this particular cosmological consequence and, it seems, were concerned to produce demonstrations of the necessity of this view. It is certainly a view which captured the attention of later doxographers and they record not only the atomists' view that there are such infinite worlds but also preserve a number of arguments that were produced to secure this conclusion. Indeed, we have evidence for this cosmological thesis being held by each of Leucippus, Democritus, the 'Democriteans' Metrodorus of Chios and Anaxarchus,³ and the later atomists, the Epicureans.⁴ My interest here is not, however, on the manner in which the various atomists sought to argue for this particular thesis. Rather, I wish to explore the links—if any—between this thesis and the atomists' conception of how humans should view themselves and their lives. In short, did they believe that there were any significant ethical repercussions of the realization that there are infinitely many worlds?

The evidence is, of course, rather thin in the case of the earlier atomists—Leucippus, Democritus, and his immediate followers—and rather better in the case of the Epicureans. For the most part, our information on Democritus' and Leucippus' physical and cosmological theories comes from reports by other, often much later, sources and these tend not to be similarly concerned with any ethical views these atomists may also have held. It is therefore difficult to show with any certainty any systematic links between atomic cosmology and ethical theory or recommendation.⁵ My attention will therefore be focused primarily on Epicurean atomist theory for which we have much more material relating to the connection between ethical conclusions and physical or cosmological theories. I wish to offer two complementary discussions of the consequences which may flow from an acceptance of this thesis of innumerable *kosmoi* in order to clarify exactly why this conclusion matters. First, let us consider what it does not show. It does not show that we should view ourselves and our lives differently simply because it is now the case that the universe is inhabited by many other sentient beings, some of whom will be very like us. Second, however, it is worth dwelling on the fact that the atomist vision of man's place in the universe does provoke a number of important changes of view, mainly as a result of related anti-teleological and theological claims. Nevertheless, that change of view is already at least implied by the fundamental atomist cosmological theses of limitless space and time and an infinite number of everlasting and constantly moving parcels of matter. Indeed, the bare premiss that there are an infinite number of other *kosmoi* is insufficient to produce these anti-teleological conclusions alone. Lucretius will provide an example of the working through of these considerations.

'multiple worlds' theorist. See DK 64 B2, A10. Plato *Tim.* 31b insists strongly on the uniqueness of this *kosmos*, perhaps responding to some dissenters.

³ Leucippus: DL 9.31; Democritus: Hippol. *Ref.* 1.12–13 (Diels *Dox.* 565, DK 68 A40), Cic. *Acad.* 2.55 (DK 68 A81); Philop. in *Phys.* 405.23 (not in DK, see S. Makin, *Indifference Arguments* [Oxford, 1993], 223–4); Metrodorus of Chios: Aët. 1.5.4 (Diels *Dox.* 292, DK 70 A6); Anaxarchus: Plut. *De tranq. anim.* 466D, Val. Max. 7.14 ext. 2 (DK 72 A11).

⁴ Epicurus, *Ep. Hdt.* 45, 73–4; *Ep. Pyth.* 88–90; Diog. Oin. fr. 63 Smith; Cic. *Nat. D.* 1.53. See also Us. 301.

⁵ I do not think that such links are to be ruled out, however, and I suggest some ways of approaching the question of the relationship between Democritus' ethics and physics in J. Warren, *Epicurus and Democritean Ethics: an Archaeology of Ataraxia* (Cambridge, 2002). Nausiphanes, Epicurus' teacher, is perhaps the most likely candidate for being an atomist who attempted to derive ethical conclusions from physics. See Warren (this n.), 164–83, and compare J. Porter, 'ΦΥΣΙΟΛΟΓΕΙΝ: Nausiphanes of Teos and the physics of rhetoric: a chapter in the history of Greek atomism', *CErc* 32 (2002), 137–86.

Let us begin by considering a passage from one of the Pseudo-Hippocratic letters, probably written some time in the Hellenistic period.⁶ There is no reason to think that these were composed by a philosopher of any sort, let alone an atomist philosopher, but the author clearly has a good knowledge of atomist philosophy and of at least the titles, if not the contents, of some of Democritus' own works. Some of these letters form a narrative about the citizens of Abdera inviting Hippocrates to come to 'cure' Democritus from a bout of insanity. The doctor and philosopher meet, the philosopher is agreed not to be insane as the foolish Abderans believe, and he and Hippocrates begin to correspond on the nature of insanity. In the first letter of the sequence, the citizens of Abdera write to Hippocrates. They describe Democritus' symptoms as follows (letter 10; Littré 9.320–2):

ἐκλαθόμενος γὰρ πάντων καὶ ἑωυτοῦ καὶ πρότερον, ἐργηγοῶς καὶ ἡμέρην καὶ νύκτα, γελῶν ἕκαστα σμικρὰ καὶ μεγάλα, καὶ μηδὲν οἰόμενος εἶναι τὸν βίον ὅλον διατελεῖ. γαμῆ τις, ὁ δὲ ἐμπορεύεται, ὁ δὲ δημηγορεῖ, ἄλλος ἄρχει, πρεσβεῖται, χειροτονεῖται, νοσεῖ, τέτρωται, τέθνηκεν· ὁ δὲ πάντα γελᾷ τοὺς μὲν κατηφείς τε καὶ σκυθρωπούς, τοὺς δὲ χαίροντας ὀρών. ζητεῖ δὲ ὁ ἀνὴρ καὶ περὶ τῶν ἐν Αἰδου καὶ γράφει ταῦτα καὶ εἰδῶλων φησὶ πλήρη τὸν ἡέρα εἶναι καὶ ὀρνέων φωνὰς ὠτακουστέας καὶ πολλάκις νύκτωρ ἐξαναστὰς μόνος ἡσυχῇ ὥδ᾽ ὥδ᾽ ἄδοντι ἔοικεν· καὶ ἀποδημεῖν ἐνίοτε λέγει ἐς τὴν ἀπειρίην καὶ Δημοκρίτους εἶναι ὁμοίους ἑωυτῷ ἀναριθμήτους.

For, previously inattentive to everything, including himself, he is now constantly wakeful night and day, laughs at everything large and small, and thinks life in general is worth nothing. Someone marries, a man engages in trade, a man goes into politics, another takes an office, goes on an embassy, votes, falls ill, is wounded, dies. He laughs at every one of them, whether he sees them downcast and ill-tempered or happy. The man is investigating things in Hades and writes about them, and he says that the air is full of images. He listens to birds' voices. Arising often alone at night he seems to be singing softly. He claims that he goes off sometimes into the boundless and that there are numberless Democrituses like himself. (trans. W. D. Smith)

The irony exploited by the writer of the letters is that the various symptoms catalogued by the Abderans are the results of Democritus' rational cosmological thinking, not some pathology. But whether it is thought to be a sign of madness or not, Democritus is presented here as finding some clear absurdity in human ambitions and behaviour; hence his constant laughter at human affairs.⁷ No doubt it is possible to see such things as absurd as a consequence of an atomist view of the universe and the vanishingly small importance of a person's life against the background of infinite space, time, and the infinite number of other *kosmoi* and lives. Nothing which any one person does will affect in any significant way the whole universe however much significance and meaning they themselves choose to invest in their actions. The gap between humans' pretensions and the ultimate insignificance of their lives is what fuels Democritus' laughter.⁸

Indeed, this potentially depressing conclusion is said to have been drawn by none other than Alexander the Great as a result of listening to the Democritean Anaxarchus. In a rare report of the direct ethical use of this cosmological thesis from

⁶ The most recent edition of these letters is W. D. Smith, *Hippocrates: Pseudepigraphic Writings* (Leiden, 1990). He dates the Democritus letters (nos. 10–17) to some time in the last two centuries B.C. (p. 29).

⁷ The laughing Democritus became a traditional figure, often teamed with the weeping Heraclitus. For further references see Warren (n. 5), 30, n. 5.

⁸ Hippol. *Ref.* 1.13 (DK A68 40) includes a reference to Democritus' ridicule immediately after relating his view on the formation and destruction of *kosmoi*: οὗτος ἐγέλα πάντα ὡς γέλωτος ἀξίων πάντων τῶν ἐν ἀνθρώποις.

atomist thinkers earlier than the Epicureans, Plutarch offers the following example in making his case for the ability of reasoning (λογισμός) to produce great contentment and change (εὐκολία καὶ μεταβολή) in one's life by contrasting Alexander's gloom on this occasion with Crates' and Diogenes' contented poverty, and Socrates' contented philosophical discussions while in prison (*De tranq. anim.* 466E–F).

Ἀλέξανδρος Ἀναξάρχου περὶ κόσμων ἀπειρίας ἀκούων ἐδάκρυε, καὶ τῶν φίλων ἐρωτῶντων ὅ τι πέπονθεν, “οὐκ ἄξιον,” ἔφη, “δάκρυειν, εἰ κόσμων ὄντων ἀπείρων ἑνὸς οὐδέπω κύριοι γεγόναμεν;”

Having heard Anaxarchus on the infinity of *kosmoi*, Alexander wept and, when his companions asked what was the matter, he said, ‘Is it not worthy of tears that, when there are infinitely many *kosmoi*, we are not yet masters of even one?’ (Plut. *De tranq. anim.* 466D)

It is not clear whether Anaxarchus himself intended to cast Alexander into such a gloom by reminding him of the infinite number of *kosmoi* as yet unconquered or whether Alexander himself drew this conclusion merely on the basis of an Anaxarchan physics lecture.⁹ It is certainly true that were one to have the project of conquering all that there is, then this atomist thesis would be bad news. But even if Alexander were not himself aiming for total dominion, the newly revealed existence of infinitely many other *kosmoi* would cast even his impressive achievements in a new light. From this universal perspective even Alexander's achievements are negligible.

Such considerations as these have led some to think that atomist cosmology necessarily creates difficulties for anyone attempting to combine it with recommending a positive ethical system. It has, for example, been argued that the Epicurean account of the workings of nature not only reveals nature as a valueless set of mechanistic processes but also in doing so threatens the Epicureans' own attempt to find value in pleasure and personal interaction with the world. Were this claim true, not only would most people's values and investment in their lives be revealed as absurd, but the Epicureans' own attempt to proffer an ethical goal would be similarly doomed.¹⁰

Indeed, it is possible to find in Epicurean texts expressions of the sort which might lead one to think that human projects and plans are revealed to be absurd or meaningless in comparison with the universe as a whole. Epicurus stresses the immutability of the universe at *Ep. Hdt.* 39: the whole (τὸ πᾶν) always has been and always will be exactly as it is now.¹¹ From a sufficiently detached perspective, the universe is one in which there is no change. Nothing fundamental—no atoms and no void—comes to be nor passes away, there is nothing outside for anything to pass into nor from which anything will enter to alter the universe, and, in an infinite universe, at every moment every possible atomic configuration is somewhere instantiated. In this sense, it is true that nothing ‘new’ ever happens. This universal perspective is indeed sometimes used by Lucretius to make direct ethical points. For example, Lucretius

⁹ The anecdote is repeated in Val. Max. 8.14 ext. 2 who adds that Anaxarchus offered the thesis of an infinity of worlds *ex auctoritate Democriti*. For a discussion of Anaxarchus which highlights his relationships with great kings and tyrants, see J. Bruntschwig, ‘The Anaxarchus case: an essay on survival’, *PBA* 82 (1992), 52–88.

¹⁰ P. De Lacy, ‘Process and value: an Epicurean dilemma’, *TAPA* 88 (1957), 114–26. See the convincing response in A. A. Long, ‘Lucretius on nature and the Epicurean self’, in K. Algra, M. H. Koenen, and P. H. Schrijvers (edd.), *Lucretius and his Intellectual Background*, (Amsterdam, 1997), 125–39, at 125–30.

¹¹ On which see J. Bruntschwig, ‘Epicurus’ argument on the immutability of the all’, in his *Papers in Hellenistic Philosophy* (Cambridge, 1994), 1–20, and compare Lucr. *DRN* 3.816–18, 5.361–3.

concludes the third book of his poem by asking the reader to consider his or her own lifetime against the backdrop of the everlasting universe. Considered in this way, there is no reason to wish to prolong life simply in order to avoid being dead for a longer period. However long one lives, when one eventually dies, one will be dead for ever. Death is everlasting (*mors aeterna* 3.1091) since the universe will go on for ever. It is not difficult to imagine that someone might respond to such arguments by questioning whether there is therefore any sense in human life at all. Whether such a consequence ought to follow, or necessarily follows, is another matter.¹² Epicurus' reply, presumably, would be to reject the implication that human life has to be meaningful from the perspective of the universe as a whole in order to be meaningful at all. Rather, when setting out to establish what is the human good life, Epicurus begins with a staunchly naturalist perspective. What is it which we naturally pursue? Given that we are animals of the kind that we are, what attracts us and what repels us?¹³ This is where Epicurean ethical reflection begins and although Epicurus will on occasion refer to his physical theory to bolster particular ethical claims (about death, for example, and—as we shall see—to support his anti-teleological cosmology), Epicurean ethical theory is not, so to speak, deduced from Epicurean physics or cosmology. There is no mention of atoms in the *Letter to Menoeceus*. How we should view our lives and what counts as a good life are therefore questions that can be settled to a large degree independently of the particular atomist cosmological background against which those lives are viewed and led.¹⁴ It is therefore no surprise that the Epicureans reserve particularly harsh words for Epicurus' tutor, Nausiphanes, and his proposal that a knowledge of *physiologia* is a sufficient basis for the provision of compelling and correct ethical instruction.¹⁵

Returning to the pseudo-Hippocratic letters, perhaps the most startling of Democritus' views is the thought that there are innumerable other Democrituses just like him somewhere out in the 'boundless' (*ἀπειρίῃ*). This is a perfectly sound atomist conclusion, of course. We can deduce from atomist cosmology that there are at this very instant in other *kosmoi* atomic arrangements just like those which constitute me and therefore persons just like me in other *kosmoi*. Perhaps the revelation of this further consequence provokes a further question. Should I feel any concern for my duplicates? Should this consequence itself cause me to view my life differently? The clear answer is: no. There is no psychological connection between their lives and mine (even if their lives are—as will be the case for some of the duplicates—very like or indeed exactly like mine). We can compare here the famous Lucretian *palingenesis* argument (*DRN* 3.847–61), which is the diachronic analogue of this synchronic claim. Here too, Lucretius reassures us, no concern passes between an individual and a past

¹² T. Nagel, 'The absurd', in his *Mortal Questions* (Cambridge, 1979), 11–23, at 12: '[S]uppose we lived for ever; would not a life that is absurd if it lasts seventy years be infinitely absurd if it lasted through eternity? And if our lives are absurd given our present size, why would they be any less absurd if we filled the universe (either because we were larger or because the universe were smaller)? Reflection on our minuteness and brevity appears to be intimately connected with the sense that life is meaningless, but it is not clear what the connection is.' Epicurus certainly does not think that our lives would be improved by our living for ever. See J. Warren, *Facing Death: Epicurus and his Critics* (Oxford, 2004).

¹³ See Cic. *Fin.* 1.30, Epic. *Ep. Men.* 128–9, DL 10.137, with J. Brunschwig, 'The cradle argument in Epicureanism and Stoicism', in M. Schofield and G. Striker (edd.), *The Norms of Nature* (Cambridge, 1986), 113–44.

¹⁴ Cf. D. Sedley, 'The inferential foundations of Epicurean ethics', in S. Everson (ed.), *Ethics: Companions to Ancient Thought* 4 (Cambridge, 1998), 129–50.

¹⁵ The evidence for this view, and the Epicureans' reaction to it, comes mainly from Philodemus' *Rhetoric* (*PHerc.* 1015/832). See Warren (n. 5), 164–83.

or future exact rearrangement of that individual's atoms, even though in the *palingenesis* scenario these instantiations are identical (they are the same person).¹⁶ Importantly, therefore, just as there is no concern between instantiations separated by time, there is no concern between instantiations in different *kosmoi* separated only by space. Indeed, it might well be thought that the *palingenesis* argument would provide more reason if any for someone to feel concern.

An Epicurean could, if he wished, mount an effective *a fortiori* argument from the conclusion of the *palingenesis* argument to generate a similarly negative answer to the question of whether I should feel anything for my duplicates. If it is the case that I should feel no concern for later people who are in fact me, there is much less reason for me to feel concern for those who are merely 'just like' me. One difference remains between the two situations, however, which is possibly pertinent. While it is logically impossible for me and my later reconstructed self to meet since it is hypothesized that the two of us (or, better, the two versions of me) are constituted by the very same matter, it remains at least logically possible for me to meet one of my duplicates from another *kosmos*. While the Epicureans had no reason to think inter-cosmic travel or commerce possible, it seems to me that there is no way they could definitively exclude it. (Epicurus is at least said to travel beyond the *kosmos* in thought at Lucr. *DRN* 1.72–7.) In that case it is at least possible in this sense for me to meet and get to know one of these duplicates from another *kosmos*. Would we get on? Would we strike up an immediate friendship? I have no idea, nor do I think it is clear what the Epicureans would say. But it seems that nothing in particular is added to help to answer these questions by the fact that we would be duplicates. The friendship which emerges, if any friendship does emerge, would do so for the same reasons that any such relationship emerges between two people, on the basis of shared interests, pleasures, and so on.

We can also usefully compare the similarly negative conclusions drawn by Lewis when considering the possible ethical ramifications of his thesis of modal realism.¹⁷ Lewis also recognizes a plurality of worlds—all of them real but only one of them (this one) actual; the others are possible but not actual worlds.¹⁸ There are, of course, important distinctions between Lewis's innumerable worlds and the ancient atomists' innumerable *kosmoi*. In Lewis's terms, Democritus in *kosmos* 1 and the qualitatively identical Democritus in *kosmos* 2 are in fact in the same 'world'—they are spatiotemporally related—so the ancient atomists do not recognize a plurality of worlds in Lewis's sense of worlds. They recognize a plurality of bounded *kosmoi* within the single universe (*τὸ πᾶν*).¹⁹ Indeed, they recognize an infinitely large number of such *kosmoi* (whereas Lewis presumably would recognize in agreement with modern accounts of the universe that each of his worlds is finitely large—though perhaps expanding—and contains a finite amount of matter). Nevertheless, both the ancient atomists and Lewis agree that however a world (or *kosmos*) could be, some world (or *kosmos*) is. This is the important shared consequence that I want to consider. For

¹⁶ For a defence of this reading of the passage, which denies that Lucretius relies upon a psychological condition of personal identity, see J. Warren, 'Lucretian palingenesis recycled', *CQ* 51 (2001), 499–508.

¹⁷ D. Lewis, *On the Plurality of Worlds* (Oxford, 1986), esp. 123ff.

¹⁸ 'Actual' is given an indexical analysis whereby it means 'this-worldly'. The claim: 'This world is the actual world' is therefore trivially true in whichever world it is tokened. See Lewis (n. 17), 92.

¹⁹ D. Furlley, 'The cosmological crisis in classical antiquity', in his *Cosmic Problems* (Cambridge, 1989), 223–35, at 229: the atomists and Aristotelians agree that the cosmos we live in is finite and bounded. 'So for the atomists it is the universe that is unbounded; the cosmos retains its closed, friendly, familiar structure.'

plenitude: however a particular natural phenomenon can be explained, it is to be thus explained—at least in some *kosmos*.²¹ The Epicureans turn this new-found ability to offer objectively true explanations through producing multiple possible explanations to an ethical end. For them, the project of natural philosophy importantly serves an ethical goal of removing anxieties about the world. Indeed, the *Letter to Pythocles* reminds the reader that the only aim of enquiry into celestial phenomena is the pursuit of tranquillity and sure conviction.²² To the extent, therefore, that it is necessary in order to remove anxieties about some celestial phenomenon to have a sure belief about its true causal explanation, then it is perhaps not sufficient merely to have a list—even a complete list—of possible explanations. Although Epicurus does claim that peace of mind can be reached through the acceptance of multiple possible explanations (*Ep. Hdt.* 79–80), it is certainly conceivable that someone might not be content with a set of merely possible explanations and feel further anxiety in wondering which of them is true. With the addition of the conception of infinite *kosmoi* the Epicureans can claim not only that one of the possible explanations is the true one but that in fact all of them are true. In this way they can hope to bridge the gap between offering multiple merely possible explanations and the provision of sure, tranquillity-producing, conviction.²³

Lucretius also relies upon the thesis of infinite *kosmoi* elsewhere in his didactic and therapeutic enterprise. Towards the end of the second book of *De rerum natura*, he turns to offer what he promises to be a new and startling set of conclusions. A long prefatory passage (2.1023–47) asks Memmius not to reject what he is about to hear simply because it is novel and counter-intuitive. After all, Lucretius claims, the sky, the sun, and the other heavenly bodies are indeed marvellous although simply due to their familiarity they do not provoke constant attention. This is not a coincidental choice of analogy given that Lucretius is about to embark on an argument against teleological explanations of the formation of our *kosmos*. The wonder and order of the heavenly bodies is a prime example for those who wish to infer an intelligent designer as the cause or creator of the world.²⁴ Lucretius here steals this exhibit and insists that the atomists too can agree that such phenomena are indeed awesome, but it will turn out that this is no reason to abandon a generally anti-teleological stance.²⁵ The passage as a whole therefore combines two lessons for Memmius. First, neither mere novelty nor mere familiarity is a reliable indicator of importance or truth. Second, there is no reason to infer from the fact that some natural phenomenon is awesome or impressive that it must be thought to have been divinely caused or designed (cf. 5.1183–93).

Next, Lucretius recalls the basic cosmological conclusions that space and matter are limitless and that the innumerable atoms are in constant motion (argued at 1.958–1057 and 2.80–111). Given these premisses, Lucretius argues, it is unthinkable that our earth and heaven should be the only such *kosmos* (2.1052–63). The same conditions that

²¹ Cf. J. Allen, *Inference from Signs: Ancient Debates about the Nature of Evidence* (Oxford, 2001), 197.

²² *Ep. Pyth.* 85: πρῶτον μὲν οὖν μὴ ἄλλο τι τέλος ἐκ τῆς περὶ μετεώρων γνώσεως εἶτε κατὰ συναφὴν λεγομένων εἶτε αὐτοτελῶς νομίζειν εἶναι ἥπερ ἀταραξίαν καὶ πίστιν βέβαιον, καθάπερ καὶ ἐπὶ τῶν λοιπῶν.

²³ See also E. Asmis, *Epicurus' Scientific Method* (Ithaca, 1984), 321–30.

²⁴ See e.g. Cic. *Nat. D.* 2.4, 95–6, the latter of which appears as in Ross's edition of Aristotle *De philosophia*, fr. 13.

²⁵ He is also prepared elsewhere to question the evidential basis of those who want to infer a divine and benevolent creator from apparent design. The world is in fact, he argues, not so perfect after all. Indeed, it is in many ways quite unfriendly to humans. See 2.167–83, 5.195–234.

formed our particular *kosmos* must have obtained, must now obtain, and will necessarily obtain in the future elsewhere in the universe and there must therefore be now, have been in the past, and be in the future, other *kosmoi* elsewhere (1067–76). Indeed, we might confirm the general thought that there is no single unique item by considering the fact that there are no unique animals in this *kosmos*. Every individual animal belongs to a kind and is one of a number of similar (if not identical) animals. It should be no more surprising that our *kosmos* is similarly merely one of a group of like *kosmoi*.

Thus far, Lucretius has been offering what is a familiar atomist indifference argument. The formation of our *kosmos* is not special; the conditions needed for it to come to be must be reproduced elsewhere and there is ‘no more’ reason for our *kosmos* to come to be than for some other similar *kosmos* similarly to come to be. However, Lucretius is never slow to draw important ethical lessons for Memmius from such cosmological arguments. The section of text which follows this argument is worth considering in more detail (*DRN* 2.1090–104):

quae bene cognita si teneas, natura videtur	1090
libera continuo, dominis privata superbis,	
ipsa sua per se sponte omnia dis agere expers.	
nam pro sancta deum tranquilla pectora pace	
quae placidum degunt aevom vitamque serenam,	
quis regere immensi summam, quis habere profundi	1095
indu manu validas potis est moderanter habenas,	
quis pariter caelos omnis convertere et omnis	
ignibus aetheriis terras suffire feracis,	
omnibus inve locis esse omni tempore praesto,	
nubibus ut tenebras faciat caelique serena	1100
concutiat sonitu, tum fulmina mittat et aedis	
saepe suas disturbet et in deserta recedens	
saeviat exercens telum, quod saepe nocentes	
praeterit exanimatque indignos inque merentes?	

If you hold fast to these convictions, nature is seen to be free at once and rid of proud masters, herself doing all by herself of her own accord, without the help of the gods. For I appeal to the holy hearts of the gods, which in tranquil peace pass untroubled days and a life serene: who is strong enough to rule the sum of the immeasurable, who to hold in hand and control the mighty bridle of the unfathomable? who to turn about all the heavens at one time and warm the fruitful worlds with ethereal fires, or to be present in all places and at all times, so as to make darkness with his clouds and to shake the serene sky with thunder, then to launch lightnings and often to shatter his own temples, and as he passes away into the wilds to cast that bolt in his wrath which often passes the guilty by and slays the innocent and undeserving?

(trans. W. H. D. Rouse and M. F. Smith)

Lucretius is evidently warming to his anti-teleological theme through the passage and it is a fine *tour de force* of sustained polemic.²⁶ The new view of divinity and the rejection of any thoughts about god being needed to create, maintain, and police the world will have important ethical repercussions. In particular, they will contribute in no small measure to the acceptance of the very first of Epicurus’ *Kyriai Doxai* and the first element of the *tetrapharmakos*: the gods should not concern us; we do not concern them. However, Lucretius has not been careful to keep a close eye on which of these thoughts against interventionist gods follow from which parts of his previous argument. In particular, he does not keep distinct in this passage those

²⁶ The parting shot about the gods’ lack of accuracy in dispensing justice is resumed later in the poem when Lucretius returns to the discussion of lightning: 6.379–422.

conclusions that follow simply and directly from the general atomist view on the formation of *kosmoi* through the purposeless interaction of atoms and those that follow from the additional thought that this process of *kosmos* formation occurs again and again within the universe. The opening lines are a fair inference from the former, general conclusion. In the light of the new Epicurean explanation of the formation of worlds, we can see that Nature needs no master to control and direct her. She can be liberated from the need of divine demiurges since now she is sufficient to produce worlds on her own.

Yet Lucretius passes swiftly from this thought to a further argument against divine intervention. Not only does Nature not need any assistance in producing worlds, but no assistance could be offered. The rhetorical question which begins in line 1093 and continues to the end of the passage is a much weaker piece of argument. Lucretius first helps himself to the Epicurean conception of perfectly tranquil divinities, itself perhaps sufficient to show that they do not intervene in the world, since to do so would impugn this essential divine characteristic. Nor, he assures us, do the gods have to exert themselves ensuring the continuity of meteorological processes, since this too is supposed to be incompatible with their perfect happiness. (This is an argument that Epicurus himself employs twice, at *Ep. Hdt.* 76–7 and *Ep. Pyth.* 97, and Lucretius also uses elsewhere: 5.156–94.) Then Lucretius proceeds to ask, expecting a negative response, a new question based on the finding that there are an infinite number of *kosmoi*. How could it be possible for a god to rule this limitless universe? No god, he implies, is strong enough to haul the heavens of all the worlds, nor able to maintain and police all of these worlds. But this is very unpersuasive and no theist would be particularly moved to abandon the thought that gods do indeed intervene in the world simply on this basis. The mere fact of there being limitless *kosmoi* is compatible with a number of theist views, some of which retain interventionist gods. First, why not simply legislate that god *is* strong enough to haul all the heavens? There is presumably no need, once we have allowed ourselves the thought that there is some kind of divinity in the first place, to think that the means by which he exerts this force is by physically grabbing the stars and pulling them round. And in any case, even were he to have to do this labour manually, there is no reason to think that this is itself an impossible task. Can we not, contrary to Lucretius, think of a god being present ‘in all places and at all times’, a thought Lucretius would appear to rule out entirely? Further, why should we be limited to one god only? Even if we are prepared to grant to Lucretius the notion that all things in the universe must be composed of atoms arranged in the void, which he might reasonably claim to have proven already, there is still scope for conceiving of atomic gods who nevertheless intervene in, create, and manage *kosmoi* in a way compatible with Epicurean metaphysics. Each *kosmos* could have its own creator and curator, thereby lessening the workload placed on each divinity and giving each a more manageable task.²⁷

In short, Lucretius’ ridicule of a particular kind of theological view will win agreement only if either one is predisposed to think of the gods as paradigmatically tranquil and therefore not intervening in this *kosmos* or one has already ruled out on

²⁷ It might be objected that any polytheistic system would require some single divinity to oversee or control all the *kosmoi*, which would itself be an impossibly large task. I am not convinced that this is required by polytheism, even if many polytheistic systems do posit some chief divinity. The Epicureans themselves are polytheists (*θεοὶ μὲν γὰρ εἰσὶν*: *Ep. Men.* 123) but do not seem to propose a hierarchy of divinities.

other grounds various other theological positions that are in fact compatible with there being infinite, divinely maintained, worlds. Before this section of the poem Lucretius has twice asserted that the gods live a tranquil life (1.44–9, 2.646–51) but he has not given a demonstration of this, nor of how it relates to the Epicurean conception of cosmogony. For that, we will have to wait for further elaboration at, for example, 5.156–94, where Lucretius will rely on the idea that we impugn the ideal blessedness of the gods by thinking that they needed to create a world to avoid boredom and need our continued worship. Of course, the Epicureans do think that they can persuade us of the truth of their theological view, but the specific notion that there is an infinite number of *kosmoi* is itself neutral between interventionist and non-interventionist theologies. It should appear in the Epicurean anti-interventionist argument only as a consequence of the logically prior thought that the conditions of the universe, specifically the fact that it is infinite and composed of constantly moving and colliding particles of matter, are such that they already provide sufficient reasons for the formation of a *kosmos* and therefore exclude the need to posit divine agency to account for the world we live in. The crucial point is that these Epicurean cosmological premises are so strong that they provide sufficient conditions not only for the formation of some *kosmos*, but they also provide sufficient conditions for the formation of a *kosmos* just like ours (so there is no need to invoke divine agency of some sort to account for our world) and, further, the very same conditions which are sufficient for the formation of our *kosmos* are sufficient conditions for the formation of infinitely many other worlds like and unlike our own.

We can contrast the Epicureans' own position with the weaker set of cosmological premisses used by the character Philo in Part VIII of David Hume's *Dialogues Concerning Natural Religion*, finished in 1776 and published posthumously.²⁸ When he revives what he calls 'the Epicurean hypothesis', Philo rightly notes that in order to show that a non-teleological origin of this *kosmos* is possible it is not necessary to postulate that matter, space, and time are all unlimited. It is enough to have a finite—but large enough—amount of matter and space and infinite time for every possible arrangement necessarily to occur an infinite number of times. He therefore modifies the Epicurean argument and uses only these weaker premisses. Philo's aim is dialectical. He wishes to offer an alternative hypothesis to Cleanthes' design argument, so he is concerned only to show that the empiricist Cleanthes is not entitled to insist that there must be a designer if we are to account for the observable nature of our world. The Epicureans' own original cosmology is not similarly designed merely as a dialectical counter to a design argument. Their cosmological premisses of infinite time, space, and matter are produced independently of any teleological or anti-teleological presumption. Nevertheless, as a result, the Epicurean cosmological outlook relies on particularly strong premisses sufficient to show the necessary existence not only of

²⁸ Philo: 'For instance, what if I should revive the old *Epicurean* hypothesis? This is commonly, and I believe justly, esteemed the most absurd system that has yet been proposed; yet I know not whether, with a few alterations, it might not be brought to bear a faint appearance of probability. Instead of supposing matter infinite, as *Epicurus* did, let us suppose it finite. A finite number of particles is only susceptible of finite transpositions; and it must happen, in an eternal duration, that every possible order or position must be tried an infinite number of times. This world, therefore, with all its events, even the most minute, has before been produced and destroyed, and will again be produced and destroyed, without any bounds and limitations. No one who has a conception of the powers of infinite, in comparison of finite, will ever scruple this determination.'

some *kosmos* just like our own but also innumerable other *kosmoi*, like and unlike this one.²⁹ Philo's revised Epicurean argument does not similarly produce infinitely many simultaneous *kosmoi*, although it does produce infinitely many sequential *kosmoi*. (A similarly reduced set of 'Epicurean' premisses which postulates infinite matter and space and a finite—but long enough—period of time would, of course, produce infinitely many simultaneous *kosmoi*.)

The anti-teleological and anti-interventionist theology and the thought that there are an infinite number of *kosmoi* are related logically in the Epicurean system by their both being conclusions drawn from the same set of general cosmological principles. The Epicureans did not deduce the claim that the gods did not create and do not maintain the world from the existence of an infinite number of *kosmoi*, even if the notion that there are infinite *kosmoi* is sometimes used as a particularly startling way of demonstrating that there is nothing special, nothing privileged, and nothing of particular significance about the *kosmos* in which we happen to live which would justify certain sorts of theological and teleological explanations for the way our *kosmos* just happens to be.

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²⁹ There are other indications in this work that Hume had some knowledge of ancient discussions of teleological and anti-teleological explanations of the *kosmos*. Compare his use of the argument from the recent discovery of the sciences in Part VI with Lucr. *DRN* 5.332–4 (itself answering Theophrastus: cf. D. Sedley, *Lucretius and the Transformation of Greek Wisdom* [Cambridge, 1998], 168–74). Philo also refers to Epicurus' 'argument from evil' in Part X: 'Is [God] willing to prevent evil, but not able? then he is impotent. Is he able, but not willing? then he is malevolent. Is he both able and willing? whence then is evil?' Cf. Lact. *De ira dei* 13.19 (Us. 374), reporting an Epicurean argument: '[deus tollere mala] aut potest et non vult, aut neque vult neque potest, aut et vult et potest. si vult et non potest, inbecillus est, quod in deum non cadit. si potest et non vult, invidus, quod aequae alienum a deo. si neque vult neque potest, et invidus et inbecillus est, ideo nec deus. si et vult et potest, quod solum deo convenit, unde ergo sunt mala? aut cur illa non tollit?' See further C. Wilson, 'Epicureanism in early modern philosophy', in J. Miller and B. Inwood (edd.), *Hellenistic and Early Modern Philosophy* (Cambridge, 2003), 90–115.