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SPONTANEITY, DEMOCRITAN CAUSALITY
AND FREEDOM

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Abstract

Critics have alleged that Democritus' ethical prescriptions ("gnomai") are incompatible with his physics, since his atomism seems committed to necessity or chance (or an awkward combination of both) as a universal cause of everything, leaving no room for personal responsibility. I argue that Democritus' critics, both ancient and contemporary, have misunderstood a fundamental concept of his causality: a cause called "spontaneity", which Democritus evidently considered a necessary (not chance) cause, compatible with human freedom, of both atomic motion and human actions. Some influential contemporary compatibilists have argued that freedom and responsibility are compatible with causal determinism, but not intentional constraint where some other agent is intentionally manipulating or coercing one's actions. In line with this, Democritus holds that humans should not blame their actions on other agents like the gods, or agent-like external forces like

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fate or chance, but should assume ultimate intentional control over their own choices and actions. The famous remark of his associate Leucippus that “everything happens for a reason and out of necessity” is a fitting slogan of their atomistic philosophy, for Democritus pursued what can without anachronism be recognized as a causal theory of freedom.

Keywords

Democritus, Nature, Cause, Spontaneity, Chance, Necessity, Freedom

The ethical fragments and *gnomai* attributed to Democritus assume the reality of human freedom and responsibility, and explicitly prescribe overcoming the vicissitudes of chance. Yet his materialist natural philosophy embraced universal causal determinism. The result is that modern interpreters have accused him of being inconsistent, incoherent, careless, or naïve. This surprising and depressing estimation, like a failing grade given by frustrated professors to an earnest but somewhat awkward, difficult and challenging student, turns out to be unfair. But in order to see this, one has to investigate in some detail the more general issue of the relationship between Democritus’ physics and ethics. While this has already been done with extraordinary depth with respect to a wide range of issues¹, there has been no adequate reply to the charge of a disconnection between Democritus’ physics and ethics²,

¹ The principle recent essays on Democritus’ ethics and physics are: G. VLASTOS, *Ethics and Physics in Democritus*, «Philosophical Review», LIV (1945) pp. 578-92, and LV (1946) pp. 53-64; S. LURIA, *Zur Frage der materialistischen Begründung der Ethik bei Democrit*, Berlin 1964; C.C.W. TAYLOR, *Pleasure, Knowledge, and Sensation in Democritus*, «Phronesis», XII (1967) pp. 6-27; L. EDMUNDS, *Necessity, Chance, and Freedom in the Early Atomists*, «Phoenix», XXVI (1972) pp. 342-57; R. MÜLLER, *Naturphilosophie und Ethik im antiken Atomismus*, «Philologus», CXXIV (1980) pp. 1-17; D. KONSTAN, *Democrito sulla responsabilità dell’agente*, «Quaderni dell’istituto di filosofia dell’Università degli studi di Perugia», VI (1987) pp. 11-27; and C. FARRAR, *The Origins of Democratic Thinking*, Cambridge 1988.

² Zeller argues that there is little or no connection between Democritus’ ethics and physics, but he rejects the idea they are entirely inconsistent (E. ZELLER, *A History of Greek Philosophy*, II, trans. S.F. Alleyne, London 1881, pp. 285-6, cfr. pp. 303-4). Zeller’s position is dismissed, but with insufficient argumentation, by

specifically in his issuing ethical precepts and undermining their utility by making all actions predetermined³.

The prescriptive ethical statements in question are attributed to Democritus, occasionally under the misspelling “Democrates”⁴. Important scholarship has warned us that several of these semi-aphoristic fragments or “*gnomai*” may have been affected by compression, change of vocabulary, and even fabrication. Equally important considerations suggest that Democritus himself was famous for composing *gnomai*⁵. It

P. NATORP, *Die Ethika des Demokritos: Text und Untersuchungen*, Marburg 1893, pp. 111-2. G. VLASTOS, *Ethics and Physics*, cit., decisively overthrew the argument that Democritus perceived no interconnection between his physics and ethics, but concentrates on issues other than free will. J. WARREN, *Epicurus and Democritean Ethics*, Cambridge 2002, perceptively sifts the key evidence for the relation between physics and ethics in Democritus and considers it likely that there was a close connection, but he is wisely cautious given the sorry state of our evidence (pp. 71-2); still he concludes that «Democritus’ own ethical thought was at least consistent with his physics» (p. 198).

³ Modern critics of Democritus on this score include: C. BAILEY, *The Greek Atomists and Epicurus*, Oxford 1928, pp. 187-8; S. LURIA, *Zur Frage der materialistischen Begründung*, cit., p. 5; J. BARNES, *The Presocratic Philosophers*, London 1979, pp. 534-5; W.C. GREENE, *Fate, Good, and Evil in Pre-socratic Philosophy*, «Harvard Studies in Classical Philology», XLVII (1936) pp. 125-6; L. EDMUNDS, *Necessity, Chance, and Freedom*, cit., p. 357; P. HUBY, *The First Discovery of the Free Will Problem*, «Philosophy», XLII (1967) pp. 353-62; R.S. BRUMBRAUGH, *The Philosophers of Greece*, Albany 1981, p. 83.

⁴ I indicate “DEMOCRATES” in the citation where a fragment is drawn from that collection but I consider the *gnomai* attributed to “DEMOCRATES” as attributable to Democritus, even though it is possible that they are a product of a later collection of sayings based on a genuine work of Democritus. One must at a minimum retain those parts of the Democrates collection otherwise attested; this is the method followed by C.C.W. TAYLOR, *The Atomists: Leucippus and Democritus, A text and translation with a commentary*, Toronto 1999, esp. pp. 222-5. But if the point is pressed I would not dispute it here but express the thesis of the present study as an attempt to demonstrate that the physics of Democritus is entirely consistent with the ethics of both Democritus and Democrates. See further R. PHILIPPSON, *Demokrits Sittensprüche*, «Hermes», LIX (1924) pp. 369-419, whose thesis is in part followed by D.-K. pp. 153-4 note 1.

⁵ Democritus was in fact famous for his *gnomai*, and «had actually written books, and most of what was attributed to him came from them, even if it was

has also been demonstrated that the surviving fragments have been to some extent “mediated” or (depending on one’s mood) “contaminated” by Cynic ideas; there are good reasons to think that it is due to Cynic collection and anthologizing that many of the ethical fragments take the form that they do⁶. I have no intention of advancing or retreating from that thesis: my intention is to defend the philosophical views in the attributed fragments and reports *en bloc*. If it follows from this procedure that all I have shown is that essentially or originally Cynic ethical ideas are consistent with Democritean physics, then so be it.

In two famous remarks, Democritus comes across as a strong proponent of political freedom.

«Poverty in a democracy is as much more desirable than so-called welfare under tyrants, as freedom (ἐλευθερία) is more desirable than slavery»⁷.

«Frank speech is intrinsic to freedom, but danger lies in the discernment of the right opportunity»⁸.

Democritus also expresses his commitment to practices that presuppose freedom in a deep sense, like deliberation and voluntary action:

«It is better to deliberate (προβουλεύεσθαι) before action than to regret it afterwards»⁹.

sometimes corrupted in the direction of banality» according to M.L. WEST, *The Sayings of Democritus*, «The Classical Review», XIX (1969) p. 142.

⁶ Z. STEWART, *Democritus and the Cynics*, «Harvard Studies in Classical Philology», LXIII (1958) pp. 179-91; F.K. VOROS, *The Ethical Fragments of Democritus: the Problem of Authenticity*, «ΕΛΛΗΝΙΚΑ», XXVI (1973) pp. 191-206. The position is advanced by A. BRANCACCI, *Democrito e la tradizione cinica*, in F. ROMANO (a cura di), *Democrito e l'atomismo antico*, Catania 1980, pp. 411-25, who also offers a useful conspectus and bibliography of the various attribution issues on pp. 411-5.

⁷ DEMOCRIT. *apud* STOB. IV 1.42 (= *Die Fragmente der Vorsokratiker*, ed. H. DIELS-W. KRANZ. (6th ed. Berlin 1951) [D.-K.] 68 B 251), trans. C.C.W. TAYLOR, *The Atomists*, cit., fr. D 115.

⁸ DEMOCRIT. *apud* STOB. III 13.47 (D.-K. 68 B 226). All translations are mine, unless otherwise noted.

⁹ DEMOCRATES 31 (D.-K. 68 B 66).

«Those who undertake work voluntarily (ἐκούσιοι) prepare themselves more easily for involuntary work»¹⁰.

Here are three fragments important in a discussion of freedom because they show a commitment to freedom in a deep sense by endorsing praise, blame, just punishment, and shame.

«One must punish those who commit injustice, and not to let them off. For to do so is just and good, but not to do so is unjust and bad»¹¹.

It is easy to praise and to blame that which one should not, but both belong a corrupt character»¹².

«Do not feel shame more before other people rather than oneself, and do not do bad deeds more if no one will know than if all people know. But feel shame most of all before yourself, and establish the law within your soul (τοῦτον νόμον τῆ ψυχῆ καθεστάναι), to do nothing unfitting»¹³.

The last fragment is especially important and interesting because of its striking encouragement to autonomous – “self-governing” – adherence to morality. There are many other aspects of Democritus’ ethics that could be used to research what exactly this might have meant, including his: emphasis on intentions, focus on the individual (one might say “atomic”) agent, discussion of the importance of understanding and not resisting what is necessary, and theory of the end of human life couched in negative terms (e.g. “freedom from disturbance”). But these positive doctrines would be in vain if Democritean ethics is in principle incoherent because incompatible with his physics, and so before we can accept them we must address the charge of inconsistency.

I

The charge of an inconsistency between the *gnomai* and Democritus’ physical theory was most completely stated by Bailey.

«In the physical world [...] he had emphatically asserted the supremacy of

¹⁰ DEMOCRIT. *apud* STOB. III 29.63 (D.-K. 68 B 240).

¹¹ *Ibid.* IV 5.43 (D.-K. 68 B 261); cfr. D.-K. 68 B 262, 265.

¹² *Ibid.* III 2.36 (D.-K. 68 B 192).

¹³ *Ibid.* IV 4.46 (D.-K. 68 B 264).

'necessity' (ἀνάγκη) as the controlling force: 'by necessity are foreordained all things that were and are and are to come'. He intended by this assertion to establish the idea of natural law and to eliminate both the theological conception of the world and the idea of chance. If this notion were extended – as in strictness it should – to the field of human action, it should result in a pure determinism; and if man's actions are determined, if everything he does is the inevitable outcome of the past, and what he is to do in the future is foreordained, what is the value of a moral theory or indeed even of moral precepts? Strangely enough, this question seems never to have occurred to Democritus' mind. There is no trace of it in any extant fragment or in the authorities, and the precepts are given as though man were perfectly free to obey or disobey them. Still more oddly the figure of chance (τύχη) raises its head again on the moral side, and there are several passages in which it seems to be set in opposition to man's will and foresight [...] In each of these passages 'chance' is no doubt used in a loose and popular sense of the unpredictable issue of events, and is not necessarily in contradiction with a fundamental belief in necessity: results are determined by natural law working itself out, but to man, who cannot fathom all the workings of law, they take the appearance of chance. Nevertheless there is here a striking contrast to the suppression of the idea of chance in the physical theory and it seems to show that Democritus' ethics are largely independent of his physics. The same independence must be assumed in regard to his silence on the fundamental question of determinism. To Epicurus the problem presents itself acutely, and he fights as violently against the 'destiny of the physicists' as he does against the 'myth of the gods': but by the time of Democritus this great question was apparently not even simmering and he proceeds to lay down his directions for the moral life with a simple *naïveté*, unconscious of the problem which he himself had raised by his insistence on the supremacy of 'necessity' in the physical world. His moral precepts are given on the assumption that man is free to act as he will»¹⁴.

Several subsequent writers have leveled the same charge, often citing Bailey¹⁵. Let us examine the charge in detail.

¹⁴ C. BAILEY, *The Greek Atomists*, cit., pp. 187-8.

¹⁵ S. LURIA, *Zur Frage der materialistischen Begründung*, cit., p. 5; W.C. GREENE, *Fate*, cit., pp. 125-6; L. EDMUNDS, *Necessity, Chance and Freedom*, cit., p. 357; P. HUBY, *The First Discovery*, cit., pp. 353-62.

Bailey rightly points out that Democritus emphasized necessity in his physics, and that in so doing he intended to counter the theological view of the world, and the idea that chance, destiny or fortune had an immense influence on the shape of one's life. What Bailey fails to notice, however, is that Democritus sought to counter these precisely because they were understood to be the greatest threats to human autonomy and responsibility at the time he was doing philosophy. The vicissitudes of chance and the whim of the gods, not causal necessity, were understood to be the real threats to freedom. This I will argue below.

Pace Bailey, there is no evidence that Democritus sought "to establish the idea of natural law". The idea of natural law was not invented until much later, and probably would have seemed anthropomorphic or paradoxical to Democritus. The point is important because in contemporary metaphysical debates about free will, the issue is usually framed as an antithesis between determinism and free will, where determinism is defined in terms of the state of the physical world at a moment (usually the remote past) plus the laws of nature¹⁶. That being said, Democritus did surely accept universal causal determinism, holding that everything has necessary causes for all time, and he is implicitly committed to a view about causal regularity, that the same causes have the same effects in the same circumstances. As I will argue, there is nothing in these doctrines that necessarily precludes freedom and responsibility. For causal determinism is not constraint or coercion. In fact, it is arguable that causal determination is a condition of responsibility, especially if the alternative is divine control, fate or chance¹⁷.

¹⁶ P. VAN INWAGEN, *An Argument for Incompatibilism*, in G. WATSON (ed.), *Free Will*, Oxford 2003², pp. 39, 45; J.J.C. SMART, *Free Will, Praise, and Blame*, *ibid.*, p. 60; J.M. FISCHER, *Frankfurt-style Compatibilism*, *ibid.*, p. 190; D. HODGSON, *Quantum Physics, Consciousness, and Free Will*, in R. KANE (ed.), *The Oxford Handbook of Free Will*, Oxford 2002, pp. 85-6; I. HAJI, *Compatibilist Views of Freedom and Responsibility*, *ibid.*, p. 202. For a broader and more inclusive definition, see R. KANE, *The Contours of Contemporary Free Will Debates*, *ibid.*, p. 6.

¹⁷ For the argument that freedom is compatible with causal determinism but not intentional constraint, see A.J. AYER, *Freedom and Necessity*, in *Id.*, *Philosophical Essays*, London 1965, pp. 15-23; D. DENNETT, *Elbow Room*, Cambridge 1984, pp. 57-61. The now classic, contemporary version of the causal theory of

Bailey wonders at the fact that the question of the compatibility between free will and determinism never occurred to Democritus. A preliminary response to this is that it is not at all surprising that we have nothing explicit, if in fact we do not, since we have very little of what Democritus wrote. There are myriad issues that we would like to have Democritus' accounts of, but they are now lost. Even so, it is clear from what we do have that Democritus was deeply concerned about human freedom, and threats to it from the gods and chance. He was also concerned that responsibility could be undermined by genetic inheritance, rearing, misfortune, ignorance, and tyranny. But if he did try to respond to such threats to human autonomy, did he nevertheless ignore seemingly obvious implications of his theory of causal explanation? Some scholars have been led to that somber conclusion¹⁸.

But what Bailey calls the "great problem" and Barnes after him the "great question" – the incompatibility of causal determinism and free will – is not in fact a timeless or perennial one. In several penetrating studies, this fact has been demonstrated decisively by S. Bobzien¹⁹. But

freedom is D. DAVIDSON, *Freedom to Act*, in *Id.*, *Essays on Actions and Events*, Oxford 1980, pp. 63-81.

¹⁸ J. BARNES, *The Presocratic Philosophers*, cit., pp. 534-5, says: «There is no trace of the scandalous swerve in Democritus: "by the time of Democritus this great question was apparently not even simmering and he proceeds to lay down his directions for the moral life with a simple naïveté, unconscious of the problem which he himself had raised by his insistence on the supremacy of "necessity" in the physical world" [= C. BAILEY, *The Greek Atomists*, cit., p. 188]. But by Democritus' time the "great question" was simmering: the briefest reflexion upon Heraclitus' philosophy would suggest it, and we know that Democritus was a student of Heraclitus; Gorgias had raised it explicitly in his *Helen*; and it was implicit in many of the problems canvassed on the Euripidean stage. Yet no fragment and no doxographical report indicates any discussion of the question by Democritus. He may have held that the emission of moral precepts does not require "free will"; he may, alternatively, have held that determinism and free will were compatible. Both views have, after all been defended by eminent thinkers. But had Democritus sketched such a view, we should surely hear of it; and I incline to the somber conclusion that physics and ethics were so successfully compartmentalized in Democritus' capacious mind that he never attended to the larger issues which their cohabitation produces».

¹⁹ S. BOBZIEN, *The Inadvertent Conception and Late Birth of the Free-will Pro-*

the fact that the argument was formulated after Democritus does not make the problem go away, of course. Similar problems were eventually raised in antiquity, as Bailey and others point out. Since the Epicureans did charge Democritean atomism with being ethically problematic (whether for threatening free will, autonomy, agency, or whatever), it is surely reasonable to ask if Democriteanism has any resources to answer the charge.

More importantly, this investigation promises to shed light on contemporary discussions of freedom and materialism. Even if it is impossible to prove that Democritus intended to defend a certain position, the exercise of finding a solution will be worthwhile nonetheless because it generates an interesting ethical theory of human freedom in relation to naturalistic and materialist physical hypotheses. It has recently been remarked that «the average educated person's causal working assumptions about the cosmos still resemble the Democritean account, and philosophers traditionally rely on nothing more sophisticated when exploring the implications of determinism and indeterminism, causation and probability»²⁰. So an analysis of Democritus' own approach to freedom might be a good place to look for ideas about how to square freedom with our concept of the cosmos.

Bailey buttresses his charge by complaining about Democritus' treatment of chance in physics and ethics. This is an ancient and persistent complaint about Democritus. Democritus' position on chance has been frequently misunderstood, and he has even been accused of making chance the cause of everything at the same time that he makes necessity the cause of everything. The issue will be thoroughly treated below. I will try to show how the confusion originated in the ancient sources, and how it has been continually perpetrated ever since. But Bailey's argument underscores that we have to open the larger issue of Democritus' theory of causes in order to see how it could consistently work in both his physics and ethics.

blem, «Phronesis», XLIII (1998) pp. 133-75; EAD., *Did Epicurus Discover the Free Will Problem?*, «Oxford Studies in Ancient Philosophy», XX (2000) pp. 287-337.

²⁰ D. DENNETT-C. TAYLOR, *Who's Afraid of Determinism?*, in R. KANE (ed.), *The Oxford Handbook*, cit., p. 274.

II

We are fortunate to possess Democritus' advertisement for his own ethical prescriptions.

«Whoever attends to these sayings of mine with intelligence will do many things worthy of a good man and will not do many bad things»²¹.

Apparently, Democritus intends his prescriptions to work by directly influencing any intelligent listener. He frequently refers to teaching and learning, and their products, intelligence and wisdom, as the ramps to human success and happiness. They allow one, in conjunction with effort and hard work, to overcome various obstacles, such as the shortcomings of one's circumstances, inheritance, or fortune.

«The unintelligent are shaped (ῥυσμοῦνται) by profits of chance, but those who know by the lessons of wisdom»²².

It is reasonable to assume that these "lessons of wisdom" include Democritus' own gnomic statements. And the way he describes these affecting the auditor – by shaping them – evokes his atomic theory. Democritus used the cognate term μεταρρυθμίζει in a similar way to refer to reconfigurations of atomic compounds by teaching.

«Nature and teaching are similar. For teaching reshapes (μεταρρυθμίζει) the human being, and in reshaping creates its nature (μεταρρυσμοῦσα δὲ φυσιοποιεῖ)»²³.

Scholars agree that the technical language used here refers to a physical reconfiguration of atoms²⁴. Other ethical fragments have been

²¹ DEMOCRATES 1 (D.-K. 68 B 35), trans. Taylor.

²² DEMOCRIT. *apud* STOB. III 4.71 (D.-K. 68 B 197; cfr. 68 B 54).

²³ DEMOCRIT. *apud* CLEM. AL. *strom.* IV 151 (D.-K. 68 B 33); cfr. STOB. II 31.65; THEODORET. *Graec. affect. cur.* IV 1.

²⁴ G. VLASTOS, *Ethics and Physics*, cit., p. 54; C. FARRAR, *Democratic Thinking*, cit., pp. 228-9; C.C.W. TAYLOR, *The Atomists*, cit., p. 233. Vlastos acutely observes the importance of two Democritean titles in the list of Thrasylus (DIOG. LAERT. IX 47): *On the Differences of the Shapes* (Περὶ τῶν διαφορόντων ῥυσμῶν); and

interpreted along physical lines, including the most extensive and important, Democritus' argument that «deficiencies and excesses tend to change into one another and set up great motions in the soul. Souls moved out of large intervals are neither well settled nor *euthymoi*»²⁵. And several developments among later "Democritean" philosophers may have pushed the connection between physics and ethics, as in Nausiphanes' rhetoric²⁶. Democritus, at any rate, holds that even "human nature" is not fixed, but can be "shaped" and "created" by rearrangement of the atomic configuration. But the focus is almost exclusively on the agent's influence over himself. Several fragments emphasize that, through hard work and learning, humans have the means to overcome not only chance but also their inherited nature.

«More people become good by practice than by nature»²⁷.

«Neither skill nor wisdom is attainable unless one learns»²⁸.

«Men are successful neither because of their bodies nor because of their possessions, but because of correctness and thinking a lot»²⁹.

The good things that come from learning require effort, but bad things can grow of their own accord and choke one's effort.

«Things that are fine learning achieves through effort, but bad things spontaneously blossom without effort. And so even without willing (οὐκ ἐθέλοντα) it often constrains one to being such, † so great indeed is the growth †»³⁰.

On Changes of Shape (Περὶ ἀμειψιρυσμιῶν). The changes of shape in the second title can only refer to changes in the atomic configurations (since the shapes of the atoms do not change).

²⁵ DEMOCRIT. *apud* STOB. III 1.210, ed. and trans. J. WARREN, *Epicurus and Democritean Ethics*, cit., p. 58.

²⁶ J. PORTER, *ΦΥΣΙΟΛΟΓΕΙΝ: Nausiphanes of Teos and the Physics of Rhetoric: a Chapter in the History of Greek Atomism*, «Cronache Ercolanesi», xxxii (2002) pp. 137-86; J. WARREN, *Epicurus and Democritean Ethics*, cit., pp. 174-83.

²⁷ DEMOCRIT. *apud* STOB. III 17.66 (D.-K. 68 B 242), trans. Taylor.

²⁸ DEMOCRATES 25 (D.-K. 68 B 59).

²⁹ DEMOCRATES 6 (D.-K. 68 B 40).

³⁰ DEMOCRIT. *apud* STOB. II 31.66 (D.-K. 68 B 182). Remarkable in this

Fortunately, it is possible to counteract this with yet more effort and learning.

«From that out of which good things come about for us, we could get a share of bad things, but we can also avoid the bad things. For example, deep water is useful in many ways but also bad; for there is a danger of drowning. So a solution has been discovered: teaching to swim»³¹.

«For humans, bad grows out of good, if one does not know how to guide and drive it smoothly. It is not right to judge such things in terms of their bad effects, but in connection with their good ones. And if someone intends (βουλομένῳ), good instruments can be used as a safeguard against bad things»³².

The picture we are presented with is of a struggle to gain and use intelligence to overcome the vicissitudes not only of fortune and chance, but also of inherited or congenital shortcomings, and the difficulties of one's circumstances. It is clearly possible to let these control one's life. In that case one will be, "even unwillingly", determined to act, instead of determining how to act. But Democritus also envisions the possibility of taking control of those circumstances, through effort, learning and intelligence.

For example, consider the causes of a car wreck. Suppose the accident to be the necessary outcome of a series of contingent events, for example a slick roadway, a tight curve, or a drunk driver. The fatal crash caused by these conditions was apparently an accident, a case of bad luck, but that was bound to occur given this conjunction of circumstances. Democritus' point is that it did not have to be that way, because the circumstances could have been changed in a way that would necessitate a different outcome (if the driver had not had so much to drink, or had driven on a sunny morning instead of a foggy night, or the road had

fragment is the appearance of the term "spontaneity" (αὐτόματα). The text is too corrupt to support any stress, but the root metaphor here is a plant choking off and overgrowing someone or something. Evils "blossom" (literally, "produce fruit" – καρποῦται) spontaneously (αὐτόματα), and they can override what you want, your will, because of their great growth (φυτικῆς).

³¹ DEMOCRIT. *apud* STOB. II 9.1 (D.-K. 68 B 172).

³² *Ibid.* II 9.2 (D.-K. 68 B 173).

not been built around a tight curve). The agent to some extent had these circumstances in her control, because she could have avoided alcohol, taken a different road, or waited until the storm passed and it was light out. Similarly, a five year old child could wander down to the pond and fall in and drown, and that would be a tragic accident. But it could have been avoided had the parents built a fence around the pond, hired supervision, or taught the child to swim. Thus one can overcome the effects of bad luck and the vicissitudes of chance by taking control of the circumstances and forcing or necessitating a different outcome.

The possibility of taking control of one's circumstances implies that one has ultimate intentional control, since the failure to exert oneself in this direction can be considered blameworthy. So one must exert control over one's own causal effect and circumstances. And there is nothing in his physics that precludes that possibility. On the contrary, Democritus seemed to hold that by attending to his gnomic wisdom, one's atomic configuration could be rearranged such that the agent will spontaneously commit intelligent and beneficial actions. This was clearly understood not simply as a matter of passive reception of information, but in combination with much hard work and effort on the part of the agent.

The question that remains is how one can be autonomous and hence responsible for what one does and what one becomes, if everything is already causally determined. Does this not mean that it is destined or fated? How can one "make a law for one's soul", or "earnestly seek after the honorable and good", if one is caused to do everything through universal necessitation? In order to see this, we must look more closely and generally at Democritus' concept of necessity and spontaneity. What we will see in doing so is that, although he thinks that spontaneous actions are causally necessary, Democritus constantly emphasizes that human agents should assume responsibility for their actions, and not blame them on external causes (like gods or fate or chance). Again, he can differentiate between causal necessitation, and constraint or compulsion, and hold that causal necessitation is actually a condition for moral responsibility.

III

That Democritus embraced necessity as a universal cause is indicated by the criticisms of Aristotle and Epicurus, as well as those sources dependent on them, such as the doxographer Aëtius and the cynic philosopher Oenomaus of Gadara. Aristotle had famously complained that Democritus “lazily neglected” the whence or how of movement.

«Democritus neglects the cause for the sake of which, leading back all the operations of nature to necessity»³³.

Aristotle consistently holds that Democritus refers natural causes in general, and the cause of motion in particular, to the principle that all things have always been in motion³⁴. A later doxographic report is consistent with this picture, and quite vivid in its own right, in describing Democritus’ cosmogony and cosmology as one of universal necessitation:

«Democritus of Abdera maintained that the universe is infinite because it was not created by anything. Further, he says that it is changeless and sets out an explicit, comprehensive account of the nature of the whole. The causes of the things that now come about have no beginning, but absolutely everything that has come about and is coming about and will come about is totally governed in advance by necessity from eternity»³⁵.

Epicurus adopted Democritus’ physics for his own purposes, occasionally responding to Aristotle’s criticisms of Democritus in so doing, and even possibly modifying the doctrine to avoid them. Epicurus strongly criticized earlier philosophers, evidently including the earlier atomists, for attributing everything to “necessity and sponta-

³³ ARISTOT. *de gen. anim.* E 8. 789 b 2-3; cfr. *metaph.* A 5. 985 b 5-20; *de cael.* Γ 2. 300 b 9-17, 301 a 10 f.

³⁴ ARISTOT. *phys.* Θ 1. 252 a 32-b 2; *de gen. anim.* B 6. 742 b 12-33.

³⁵ PS.-PLUTARCH. *misc.* 7, trans. Taylor p. 94 = D.-K. 68 A 39 (ed. H. DIELS, *Doxographi graeci*, Berlin 1879, p. 581).

neity”. This can be seen in a passage of the partially recovered book xxv of *On Nature*³⁶.

«But those who from the beginning gave sufficient explanations of causes and differed not only from their predecessors but also in many ways from their successors were not aware that although they in many things lifted off great burdens they <contradicted> themselves in this one respect that they claimed that necessity and spontaneity³⁷ are the cause of everything (τὸ τὴν ἀνάγκην καὶ αὐτόματον πάντα αἰτιᾶσθαι)»³⁸.

If it is right to join the consensus of scholars in thinking that Democritus is a target of the criticism of this passage³⁹, then it is also

³⁶ Masi in a recent study summarizes the scholarly consensus that Democritean physics is the target of Epicurus’ criticism in *nat.* xxv: F.G. MASI, *L’antideterminismo di Epicuro e il suo limite: il libro XXV del ΠΕΡΙ ΦΥΣΕΩΣ*, in C. NATALIS. MASO (a cura di), *La catena delle cause: determinismo e antideterminismo nel pensiero antico e contemporaneo*, Amsterdam 2005, pp. 167-95 at 174. As she points out, the issue is what exactly Epicurus objects to: is it determinism, reductionism, eliminativism, or some combination of these? In the interpretation that follows I assume that the core issue is whether necessity and spontaneity are to be considered the cause of everything; whether this counts as determinism or not is a matter of contemporary nomenclature (and I reject below the notion that Democritus can be interpreted as either a reductionist or an eliminativist).

³⁷ Accepting the reading αὐτόματ[ο]ν in lieu of ταυτομεγ[.]ν, as in 20 c 13 of A.A. LONG-D. SEDLEY [L.-S.], *The Hellenistic Philosophers*, Cambridge 1987; cfr. the reading αὐτόμα[α]το]ν of Lucignano “accepted by all later editors” including Gomperz, Diano, and Arrighetti according to Laursen. This conjunction of concepts is strongly supported by the appearance of the phrase κατὰ τὸ αὐτόματον ἀνάγκην at 697,4,1,2,7-8 / 1056,7,1,8-9.

³⁸ EPICUR. *nat.* xxv, 1056 corn. 7 z. 4, lines 3-11. The text and translation (except as noted) follow S. LAURSEN, *The Later Parts of Epicurus, ‘On Nature’, 25th Book*, «Cronache Ercolanesi», xxvii (1997) pp. 5-83; text p. 41, apparatus p. 42, translation p. 54, and commentary p. 72.

³⁹ Among the scholars that have supported the view that Democritus is the target of Epicurus’ attack are the following. D. SEDLEY, *Epicurus’ Refutation of Determinism*, in *ΣΥΖΗΤΗΣΙΣ. Studi sull’epicureismo greco e romano offerti a Marcello Gigante*, Napoli 1983, pp. 11-51; S. BOBZIEN, *Did Epicurus Discover the Free Will Problem?*, cit.; T. O’KEEFE, *The Reductionist and Compatibilist Argument of Epicurus’ ‘On Nature’, Book 25*, «Phronesis», XLVII (2002) pp. 153-86; J. WARREN,

likely that he is in view when Epicurus exhorts that «it would be better to follow along with the myth about gods than be a slave to the fate of the natural philosophers, for the myth suggests an expectation of placating the gods by paying respect, but the other implacable necessity»⁴⁰. Epicurus' argues that the necessary and spontaneous causes embraced by natural philosophers like Democritus commit them to fatalism and to an incoherent view of human agency.

Although Epicurus adopted Democritean atomism for his own physics, it is thought that he radically modified it by introducing a chance element into the theory in order to avoid such problems of strict necessitation (and probably for some cosmogonical purposes as well). So Diogenes of Oenoanda argues.

«If anyone adopts Democritus' theory and asserts that because of their collisions with one another the atoms have no free movement, and that consequently it appears that all motions are determined by necessity, we shall say to him: "Do you not know, whoever you are, that there is actually a free movement in the atoms, which Democritus failed to discover, but Epicurus brought to light, – a swerving movement, as he proves from phenomena?"»⁴¹.

Whatever the merits of Epicurus' proposal, or the strength of his followers' criticisms of Democritus⁴², we can discern from this argument the kinds of causes the earlier atomists were committed to, and see that his concern was specifically to avoid the implications of a physics dominated by the causes of necessity and spontaneity. For our purposes what is important about this position is that it shows that the latter criticisms of Democritean physics and causality, that it

Epicurus and Democritean Ethics, cit., p. 197; F.G. MASI, *L'antideterminismo di Epicuro*, cit., p. 174.

⁴⁰ EPICUR. *ep. Men. apud* DIOG. LAERT. x 134.

⁴¹ DIOG. OEN. fr. 54, ed. and trans. M.F. SMITH, *Diogenes of Oenoanda*, Napoli 1993.

⁴² For a recent overview of the central issues, see T. O'KEEFE, *Epicurus on Freedom*, Cambridge 2005. See also J. WARREN, *Epicurus and Democritean Ethics*, cit., for a study of the relationship between Democritus and Epicurus focusing on their intermediaries.

is committed to universal chance, must be off base, unless Democritus is not among "the first to give a satisfactory account of causes and many times greater than their predecessors".

Epicurus' attack on Democritus' views of necessity are echoed in the polemic of the cynic philosopher Oenomaus of Gadara⁴³.

«For, so far as it depends on the philosophers, there has been lost out of human life, whether one likes to call it a rudder, or ballast, or foundation – there has been lost the governing power of our life, which we suppose to be authoritative over the highest necessity; but Democritus, unless I am mistaken, and Chrysippus think to prove the noblest of man's faculties, according to the former a slave, and according to the latter, a half-slave»⁴⁴.

Oenomaus mounts a criticism that diverse philosophies of universal necessitation ignore the power over necessity that each of us knows we possess through introspection (which he calls τὴν ὑμῶν αὐτῶν ἀντίληψιν), asking:

«Is there some occult power, Fate or Destiny, to tyrannize over it? A power having for each of you a different meaning, proceeding according to one from god, and according to another from those minute bodies which are carried down, and tossed up, and twirled around, and broken up, and separated, and combined by necessity»⁴⁵.

Again, we are not here interested in assessing the criticism, but only in gleaning any evidence about Democritus' views. The first important point is that Oenomaus seems to follow an Epicurean line of attack, by saddling Democritus with fatalism based on his commitment to necessity as a cause of the atomic motions. The second point is that

⁴³ In the following account of Epicurus, Oenomaus, and Aëtius I follow the interpretation of A. BRANCACCI, *La polemica antifatalistica di Enomao di Gadera*, in ID. (a cura di), *Antichi e moderni nella filosofia di età imperiale*, Napoli 2001, pp. 71-110 at 75-8.

⁴⁴ OEONOM. *apud* EUSEB., *praep. ev.* 6.7.2.3-7, transl. E.H. GIFFORD, *Preparation for the Gospel*, Oxford 1903.

⁴⁵ *Ibid.* 6.7.18.1-6, trans. Gifford cit.

Democritus is contrasted with Chrysippus insofar as the stoic identifies universal necessitation with god, while the atomist identifies necessity with the motion of the atoms. Later christian writers denounce Democritus for his denial of providence but change the characterization of his causality so that it is committed not to absolute necessity but rather to pure chance.

Epicurus' attack on Democritean necessity is also echoed in the following doxographical complaint leveled at Anaxagoras and the Stoics by Aëtius.

«Anaxagoras <and Democritus> and the Stoics offer a cause obscure to human reasoning; for things are sometimes in accordance with necessity, but sometimes in accordance with fate, and sometimes in accordance with choice, but at other times in accordance with chance, and at still other times in accordance with spontaneity»⁴⁶.

At some point in the doxography Democritus, Anaxagoras, and the Stoics have been conflated and collectively taken to task for their shared causal assumptions. This should be compared with an earlier and more specific passage in which Aëtius groups Leucippus and Democritus with Parmenides, but is not so polemical and seems, or at least tries, to be more neutral in his reporting.

«Parmenides and Democritus say that everything is in accordance with necessity. And it is the same as fate, justice, providence, and the cosmic creator. Leucippus says that everything is in accordance with necessity, which is the same as fate. For he says in *On Intelligence* nothing happens in vain, but everything for a reason and out of necessity»⁴⁷.

That Democritus held everything to happen in accordance with necessity is as well attested as anything else we know about Democritus. Aëtius later tells us what is the substance of necessity (οὐσία

⁴⁶ AËT. I 29.7, ed. Diels cit. <plus note (p. 326 note) referencing THEODOR. VI 15> = D.-K. 68 A 70; A. BRANCACCI, *La polemica antifatalistica*, cit., p. 76 note 13.

⁴⁷ AËT. I 25.3-4, ed. Diels cit., p. 321.

ἀνάγκη) for Democritus: «Democritus says it is impact and motion and a blow of matter»⁴⁸. This must mean the motion and collision of atoms in the void. But how does the motion and collision of atoms in the void relate to the other items that Aëtius tells us are “the same” as necessity?

If we read the continuation of the passage, we have an indication. Aëtius quotes Leucippus that everything happens for a reason and out of necessity, but has clearly offered his own or someone else's interpretation of this to mean that it is equivalent to fate. If we assume the same pattern for Democritus, it appears that we have an interpretation, by Aëtius, of Democritus' saying that everything is in accordance with necessity: this, according to Aëtius, means that fate, justice, providence, and the creator of the cosmos are all in accordance with necessity. One need not suppose that Democritus actually said this (or is in fact committed to it), or that he believed in fate, or providence, or a creator at all. All that the passage shows is that Aëtius holds that Democritus, by making everything subject to necessity, would have to subject these to necessity as well (or reduce them to necessity, or eliminate them altogether). The logic is similar to that of Oenomaus who groups Democritus with the stoics of all people, on the grounds that both philosophies are committed to universal necessitation and thus fatalism. The earliest version of this argument was apparently the criticism leveled by Epicurus in *On Nature* xxv and the *Letter to Menoecus*.

But apart from these polemics, there is no surviving evidence that Democritus himself used the word εἰμαρμένην (fate or destiny), or any of its dialectical variations⁴⁹. Aëtius himself does not mention Demo-

⁴⁸ AËT. I 26.2, *ibid.*; cfr. CIC. *de fat.* 46.

⁴⁹ Cicero says that Democritus (along with Heraclitus, Empedocles, and Aristotle) was committed to the position that everything occurs by fate (*de fat.* 39). But while Cicero identifies necessity with fate, Democritus himself probably did not see it this way. In an earlier passage (*de fat.* 23), Cicero argues that Democritus is committed to making the mind moved by necessity, because it is moved by atoms and thus is moved in accordance with natural and necessary motions. Lucretius warns that if there is no swerve, then the motion of the atoms will be completely within the fetters of fate (*fati foedera, de rer. nat.* II 254). Although he does not name Democritus in this section, he may have him in mind. But neither

critus in the section of his work entitled Περὶ εἰμαρμένης⁵⁰. The word is particularly associated with the Stoics⁵¹, and the combination of terminology in Aëtius is strongly reminiscent of them, since they positively embraced fatalism and in fact identified all of the causes identified with the so-called “active principle”⁵². Notice that even if we were to accept that Democritus identified (or failed to clearly distinguish) all these things as Aëtius says he did, this would not show that Democritus must have denied human freedom by embracing fate, since we could reject the line of reasoning of Oenomaus that by embracing fate in their physics the Stoics destroy all prospects for freedom. But the truth of the matter is that the stoic terminology is probably anachronistic.

However that may be, the original notion of μεῖρόμαι – to receive as one’s portion, due or lot (μοῖραν), was, however, mentioned by Democritus.

«The man worthy of the greatest responsibilities gets the greatest share (μοῖραν) of justice and excellence»⁵³.

This appears to mean that one’s share is contingent upon being just. One would have to reverse the plain sense of the fragment to suppose that necessity understood as “fate” determined whether a man was just or excellent. Democritus in fact considers precisely these – excellence and justice – to be a matter of effort and hard work, not something given from an external source (like chance or natural endowment). Justice in particular is constantly presented as a matter of choice

Cicero nor Lucretius directly attribute a doctrine of fate to Democritus, though they criticize Democritus’ atomic theory as implying fate. A similar procedure, as we will see, will be used by later ancient writers to saddle Democritus with a commitment to universal chance.

⁵⁰ AËT. I 27, ed. Diels cit., p. 322.

⁵¹ D. FURLEY, *Two Studies in the Greek Atomists*, Princeton 1967, p. 174; P. HUBY, *The First Discovery*, cit., p. 360.

⁵² S. BOBZIEN, *Determinism and Freedom in Stoic Philosophy*, Oxford 1998, pp. 46-58.

⁵³ DEMOCRIT. *apud.* STOB. IV 5.45 (D.-K. 68 B 263).

and effort, and injustice is clearly represented as an alternative possibility in any choice involving justice⁵⁴. Consider two related fragments.

«The gods give to humans all good things both of old and now. But not bad things and harms and disadvantages; these neither of old nor now do the gods give, but such things humans bring upon themselves through mental blindness and not thinking»⁵⁵.

«The gods love only he to whom injustice is repugnant»⁵⁶.

The gods love and thus give good things to humans who hate injustice. This is clearly incompatible with the notion that humans are fated by necessity to hate or not hate injustice. Those who do not hate injustice bring upon themselves their own harm and disadvantages. Those who hate injustice accomplish this themselves, and are therefore rewarded by the gods. This is the traditional view about providence (also used by Alexander of Aphrodisias’ *De fato* XVII as an endoxic argument against the elimination of human autonomy). Democritus further argues that humans bring on the bad things themselves, even though they attribute these to the gods, or look to the gods to deliver them from evils. Humans must choose the more divine things for themselves:

«The one choosing the goods of the soul chooses the more divine things; the one choosing the goods of the body chooses the human things»⁵⁷.

This implies that humans, not the gods, have ultimate intentional control over their own choices.

Aëtius also said that Democritus’ necessity is “the same as” πρόνοιαν (“providence”, “forethought”). It is not at all obvious what he means by this, unless we should read it as part of the formulaic Stoi-

⁵⁴ See the fragments on justice attributed to DEMOCRIT.: D.-K. 68 B 174, 215, 256, 38, 193, 261.

⁵⁵ DEMOCRIT. *apud.* STOB. II 9.4 (D.-K. 68 B 175).

⁵⁶ *Ibid.* III 9.30 (D.-K. 68 B 217).

⁵⁷ DEMOCRATES 3 (D.-K. 68 B 37).

cizing identity claims. We do have Thrasyllus' record of a title written by Democritus: Περὶ εἰδώλων ἢ Περὶ προνοίας⁵⁸. This was evidently a theological work⁵⁹. The details of Democritean theology are obscure and controversial, but a plausible interpretation⁶⁰ holds that Democritus provided a naturalistic account of humans' belief in gods. Belief in gods is caused, on the one hand, by attributing meteorological regularities and irregularities to personified powerful forces and, on the other hand, by subjective religious experience. Humans supposed celestial and meteorological events like thunder, lightning, and eclipses to be caused by the agency of powerful beings, the gods⁶¹. They also attributed the phenomena associated with the seasons to divine agency⁶². In fact, Democritus argues, such events, both beneficial and harmful, are accountable for by natural, not supernatural, events, on the basis of the atomic theory⁶³. Since Democritus did not hold that celestial and meteorological and seasonal events were caused by divine agency, he did not hold that they were the result of divine providence.

As for subjective religious experience, several sources attest to Democritus' having made the gods out to be images⁶⁴, in human shape, that bring either benefit or harm to humans⁶⁵. Sextus says that they «foretell future events to people by appearing to them and speaking. It was from the appearance of these very things that the ancients came to believe in the existence of gods, though apart from these there is no god possessing an immortal nature»⁶⁶. So again, while Democritus

⁵⁸ DIOG. LAERT. IX 47.

⁵⁹ L. MABILLEAU, *Histoire de la Philosophie Atomistique*, Paris 1895, p. 159.

⁶⁰ W. BURKERT, *Greek Religion*, Harvard 1985, pp. 315-6; cfr. A. HENRICH, *Two Doxographical Notes: Democritus and Prodicus on Religion*, «Harvard Studies in Classical Philology», LXXIX (1975) p. 103.

⁶¹ CLEM. AL. *protr.* 68.5 and *strom.* v 102 (D.-K. 68 B 30); SEXT. EMP. *adv. math.* IX 24; LUCR. *de rer. nat.* v 1186-93.

⁶² PHILOD. *de piet.*, PHerc. 1428 fr. 16 = A. HENRICH, *Two Doxographical Notes*, cit., p. 96.

⁶³ This is attested by LUCR. *de rer. nat.* v 621-36.

⁶⁴ CIC. *de nat. deor.* I 12, I 43.120, II 30.76; AUGUST. *ep.* CXVIII 27-8.

⁶⁵ Images in human shapes, SEXT. EMP. *adv. math.* IX 42; bringing benefit or harm, *adv. math.* IX 19; CIC. *de nat. deor.* I 43.120; PLUTARCH. *de def. orac.* 17.419 A.

⁶⁶ SEXT. EMP. *adv. math.* IX 19, trans. Taylor fr. 175b.

attempted to account for the existence of beliefs about the interventions of the gods in human affairs, he probably did not argue that actual gods intervene in the world, much less that they providentially maintain it⁶⁷. Democritus in fact decries people's tendency to place responsibility for their own well being in hands of the gods.

«They pray to the gods to give them health, but that they have the power for this in themselves they do not realize. And doing the opposite through weakness (ἀκρασίη) they betray their health themselves to their desires»⁶⁸.

So the only sense in which providence is for the atomist “the same as” necessity is this. The impact and blow of matter causes both the events attributed to the gods and through atomic “images” the beliefs by humans in the gods themselves. The images confer benefit through advice to those who because of their justice the gods love, and they haunt those who are unjust, constituting a kind fantastical conscience⁶⁹. But humans retain ultimate intentional control, not the gods, over whether or not to give in to their own desires.

Given that gods do not literally intervene in the world, it is *a fortiori* implausible that they created the world. Thus Aëtius' remark that Democritus considered necessity to be the same as κοσμοποιόν must be understood similarly to his identification of this with πρόνοια. The atomic theory offers a comprehensive cosmogony, and so the impact and blow of matter will play the role of cosmic creator, not the gods.

In an intriguing study, Jonathan Barnes has argued that the saying of Leucippus (quoted by Aëtius) indicates that, in his book *On Intelligence*, Leucippus endorsed a global teleology of an Anaxagorean

⁶⁷ E. SPINELLI, *On Using the Past in Sextus Empiricus: the Case of Democritus, «Hyperboreus»*, III (1997) pp. 151-74 at 169, argues that the Democritean context was probably the explanation of dreams according to the atomic theory, but that Sextus or his source has misused this to try to pin «actual positive theological doctrines on Democritus».

⁶⁸ DEMOCRIT. *apud* STOB. III 18.30 (D.-K. 68 B 234).

⁶⁹ Cfr. DIOG. OEN. fr. 9, 10, 43 (Smith).

sort, in which everything is ordered in accordance with "the purpose of the cosmic mind"⁷⁰. Interesting as this proposal is, it would be highly unlikely even if we had any other sources to support it. As for Democritus, his appeal to the Cynics seems to have been his staunchly anti-teleological orientation, which in later polemics put him in a sort of coalition with Skeptics, Cyrenaics, and Epicureans as over against Plato, Aristotle and the Stoics⁷¹. Without a doubt, Democritus was represented in antiquity as the type of philosopher who denies divine providence, as Lactantius attests.

«To begin with that question which seems essentially basic, whether there is any providence which looks after everything or whether everything happens or comes about by chance. The latter opinion was introduced by Democritus and upheld by Epicurus»⁷².

Lactantius probably rightly represents Democritus as denying providence. But in doing so Lactantius surely wrongly attributes to Democritus the view that all things happen by chance. Providence or chance: this is clearly a false dichotomy. Lactantius' attribution of chance to Democritus is a "polemical and strategic" extrapolation from the fact that Democritus denied providence and embraced universal necessity⁷³. As we will see in the next section, the saddling of Democritus with a view about universal chance has long had a perverse influence on the interpretation of Democritus.

⁷⁰ J. BARNES, *Reason and Necessity in Leucippus*, in L.G. BENAKIS (ed.), *Proceedings of the 1st International Congress on Democritus*, I, Xanthi 1984, pp. 141-58. Barnes' point that teleology and determinism are not incompatible is well taken; it is certainly possible to require functional explanations even in atomist, materialist or mechanistic physical systems, for example, or to maintain a voluntarist theology in conjunction with a corpuscular philosophy. Almost no one doubts that teleology is appropriate at least in a discussion of intentional action and deliberative thought, subjects proper to a discussion of mind. See further U. HIRSCH, *Was Demokrits Weltbild mechanisch und antiteleologisch?*, «Phronesis», xxxv (1990) pp. 225-44.

⁷¹ Z. STEWART, *Democritus and the Cynics*, cit., pp. 179, 184; cfr. A. BRANCAGGI, *Democrito e la tradizione cinica*, cit., p. 415.

⁷² LACTANTIUS, *inst. div.* I 2.1-2, trans. Taylor p. 93.

⁷³ P.-M. MOREL, *Democrite et la recherche des causes*, Paris 1996, p. 25.

Democritus' denial of providence is perfectly consistent with his intense commitment to ultimate human agency. For if providence implies that the fortunes of humans are to an important extent determined by external things or controlled by the gods, then ultimate intentional agency, and hence responsibility, may rest with them as well. If Democritus can be defended against the charge that his denial of providence implies universal chance, that would avoid another threat to human freedom as well.

IV

Doxographers and commentators have criticized Leucippus and Democritus for not making clear what the necessity is that they make the cause of everything. The complaint occurs particularly in cosmological contexts⁷⁴. This obscurity is possibly the reason that Lactantius considered it to amount to chance. At any rate, there is considerable confusion in our sources. For example, Dionysius of Alexandria is quoted by Eusebius to have complained:

«Democritus said "I would rather discover a single causal explanation than become king of Persia". And though he says these things, his etiology is in vain and causeless, starting from an empty principle and shifty hypotheses, and does not see the root and common necessity of the nature of things, but considers the greatest wisdom the understanding of events which occur unwisely and randomly, and though he makes chance the mistress and queen of the universal and divine

⁷⁴ AËT. I 29.7, ed. Diels cit., plus p. 326 note, see note 46 above. The same argument is leveled against Leucippus. «Just like the coming into being of worlds, so do their growth, decay, and destruction occur according to a certain necessity, the nature of which he [Leucippus] does not explain» (DIOG. LAERT. x 33, trans. Taylor p. 94). «[Leucippus says that] worlds come into being in this way; when many bodies are collected out of the surroundings and flow together into a great void, in their collisions those of the same and similar shapes get entangled, and from these entanglements stars come into being and grow and decay through necessity. But what this necessity might be he does not explain» (HIPPOCRATES, *philosoph.* I 12, trans. Taylor p. 95).

things, and explains that all things are generated in accordance with it, still he banishes it from the life of humans and refutes as fools those who honor chance. At the beginning of his *Precepts* he says, "People have fashioned an idol of chance as an excuse for private failure. For in a few cases wisdom conflicts with chance, but in most things in life clear and quick sightedness succeeds. For by nature judgment and chance conflict. And this very enemy of intelligence itself they say to be in control. Moreover, repudiating and erasing intelligence, they install chance in its place. For they do not sing the praises of intelligence as good chance, but of chance as the most intelligent of things"»⁷⁵.

This passage contains the best available kind of evidence for Democritus: a marked quotation naming not only a specific text, but a specific location within a text. In fact, this is the clearest piece of evidence we have on Democritus' view of chance. Chance has been falsely blamed by people in order to avoid accepting responsibility, when they themselves, not chance, are the cause of their own failure. An immediate implication of this passage is personal responsibility.

But despite this explicit denial of chance as an excuse (or a "cause" in the original sense of what is blameworthy and responsible), Eusebius decries Democritus' etiology as amounting to chance, following a procedure similar to Lactantius. Other ancient writers also contended that Democritus recognizes no other cause than chance⁷⁶, and several modern commentators have attributed to Democritus the view that chance is a cause on a par with or identical to necessity⁷⁷. When

⁷⁵ EUSEB. *praep. ev.* XIV 26.4-5 (D.-K. 68 B 118-9). Several briefer fragments on chance also represent it as an excuse of the unintelligent, whose influence should be reduced or replaced as far as possible (68 B 197, 54, 176, 210).

⁷⁶ Themistius says that «[Democritus and others] assign the greatest effects to it [chance] but have provided for people not even the slightest account of it, though they assign the infinite worlds and the swirl and the all-embracing order to no other cause, but merely mention chance and spontaneity» (THEMIST. *in Aristot. phys.* 49.13-16, trans. Taylor p. 92).

⁷⁷ P.-M. MOREL, *Democrito e il problema del determinismo*, in C. NATALI- S. MASO (a cura di), *La catena della cause*, cit., pp. 21-35 at 24 is led to this conclusion by a consideration of Aristotle's argument at *Physics* B 4. A similar position is arrived at, and by a similar method, by D. ZUCCA, *Il caso e la fortuna sono cause?*

Dionysius of Alexandria said that Democritus explained everything with reference to chance, he was referring to the motion of atoms, and so he also said:

«These atoms travel by chance (ὡς ἔτυχεν) in the void. In their disorderly rush they collide spontaneously (αὐτομάτως), get entangled through their variety of shapes and latch on to one another, thus making the world and the things in it, or rather, infinitely many worlds»⁷⁸.

But how could chance have such a role if Democritus follows Leucippus and chalks everything up to necessity, as all the earlier reports testify?

The answer is that these sources are confused, in part by Aristotle's highly nuanced treatment of the subject of spontaneity (αὐτόματον) and chance (τύχη) in *Physics* B. That there is confusion is evident from the fact that Dionysius of Alexandria complains that Democritus makes chance the cause of both everything and nothing. Confusion is evident also in Aëtius who complains, as we saw, that it is unclear whether Democritus' causal principle amounts to necessity, fate, choice, luck, or spontaneity⁷⁹. We see the same confusion in later commentators, like Simplicius and Philoponus.

The train of thought is instructive to follow in a little detail. What has happened in all cases is that people have conflated spontaneity and chance. Since Democritus did attribute certain cosmic events to spontaneity, people assumed that this committed him to chance, even though he explicitly made all causes necessary, and attacked the idea of chance as an excuse for individual failure.

Aristotle begins his treatment of chance and the spontaneous by

Aristotle, Phys. II 4-6, ibid., pp. 75-97 at 84 and note 47, who offers the following translation: "Il caso (*automaton*)". D. KONSTAN, *Democritus the Physicist*, «Apeiron», xxxiii (2000) p. 132, says that: «reason, necessity, and also chance were interchangeable terms for the atomists». Cfr. P. HUBY, *The First Discovery*, cit., p. 361; L. EDMUNDS, *Necessity, Chance and Freedom*, cit., pp. 349-50.

⁷⁸ EUSEB. *praep. ev.* XIV 23.2, trans. Taylor p. 89, modified.

⁷⁹ AËT. I 29.7.

pointing out that some people deny the existence of chance altogether, saying that:

«nothing comes about by chance, but that there is some definite cause of everything that we say comes about spontaneously or by chance. For example, of someone coming into the shop by chance, and encountering there someone he wanted but did not expect to find: they say that the cause was his wanting to go shopping. And similarly with other things which are said to be by chance, they always take there to be something that is the cause of it»⁸⁰.

Simplicius comments that «even if the natural scientists say nothing about them [chance and spontaneity], they do treat them and name them as if they did exist»⁸¹. This in itself is an odd statement. They both say nothing about them, and they treat them and name them. Simplicius is unsure of both Democritus and Anaxagoras: «When Democritus too says “the swirl was separated off from the whole, of all sorts of shapes” (how and by what cause he does not say) he seems to be generating it from the spontaneous and chance (ἔοικεν ἀπὸ ταυτομάτου καὶ τύχης γεννᾶν αὐτόν). And although Anaxagoras grants the existence of intelligence, according to Eudemus, he thinks that most things result from chance»⁸². It is clear that Simplicius is foisting chance upon both Democritus and Anaxagoras here since, as he himself says, Democritus mentions no cause, and Anaxagoras mentions intelligence, not chance (according to Eudemus, a pupil of Aristotle). That Democritus at least did not explicitly make chance a cause is clear also from Simplicius' own commentary on Aristotle's discussion of «the old argument which does away with chance»⁸³ according to which everything which comes to be can be led back to some cause.

«The words “as the old argument goes, which does away with chance”

⁸⁰ ARISTOT. *phys.* B 5. 196 a 1-6.

⁸¹ SIMPL. in *Aristot. phys.* 327.15-6, trans. B. FLEET, *Simplicius: On Aristotle's 'Physics' 2*, London 1997.

⁸² *Ibid.* 327.24-7, trans. Fleet.

⁸³ ARISTOT. *phys.* B 4. 196 a 14-6.

seem to refer to Democritus, for even if he seems to have used chance (ἔδοκει τῇ τύχῃ κεχρηῆσθαι) in his cosmogony, in particular instances he denies that chance is the cause of anything, leading things back to other causes (οὐδενός φησιν εἶναι τὴν τύχην αἰτίαν ἀναφέρων εἰς ἄλλας αἰτίας); for example, he says that the cause of finding treasure is digging or olive planting, or that the cause of the bald man's fractured skull is the fact that the eagle dropped a tortoise so that the shell should smash. That is Eudemus' account»⁸⁴.

It is clear, then, that, far from making chance the cause of everything, Democritus led even accidents back to necessary and definite causes. This fits well with his and Leucippus' views on universal necessitation discussed above. Chance events occur only when two lines of causality incidentally intersect, but “for a reason and out of necessity”.

Simplicius still wants to saddle Democritus with chance as a cosmogonical cause. To see why he insists on this we must consider yet another passage of Aristotle.

«There are others who make the spontaneous the cause of the heaven and the cosmic systems. For they say that spontaneously the swirl comes to be as well as the motion which separated out and established everything in the present order. And this is itself really incredible. For they also say that the animals and the plants neither come to be nor exist by chance, but rather nature or intelligence or something like that is their cause. For it is not just as chance has it that each thing of these comes to be out of a seed, but out of this one an olive and out of that one a human. But the heaven and the most divine things that we see they say to have come to be spontaneously, without the sort of cause of the animals and the plants. Indeed, if things are this way, this itself would be worth knowing, and it would have been good to say something about it. In other respects what they say is absurd, yet it is even more absurd to say these things when nothing we observe in the heavens comes about spontaneously, and many things that do not come about by chance, they say incidentally do come about by chance. Indeed the opposite of this should be the case»⁸⁵.

⁸⁴ SIMPL. in *Aristot. phys.* 330.14-20; cfr. 328.1-5, 338.3-7.

⁸⁵ ARISTOT. *phys.* B 4. 196 a 24-b 5.

We cannot, on the basis of these arguments, attribute to Democritus the view that chance is a cause, as have so many interpreters of the passage⁸⁶. Initially we have the statement that the spontaneous (not chance) was made the cause of the swirl and the worlds. Next it is pointed out that those who posit the spontaneous as a cause deny that animals and plants are generated by chance, attributing the cause instead to nature or mind. *Prima facie* this applies to Anaxagoras, who argues that intelligence separated out and ordered the natures. But even if it applies to Democritus and Leucippus (perhaps on the basis of an extrapolation from Leucippus' assertion that everything happens for a reason and out of necessity), it is important to keep in mind that the statement denies chance a causal role in the formation of plants and animals. Next comes the remark that "they" made the heaven to be the outcome of the spontaneous (not chance), and that they said nothing further about this cause. Finally, we have Aristotle's own assertion that the heavens do not come about spontaneously, with the addition that the same things do not come about by chance either. When Aristotle adds that «many things [...] they say incidentally do come about by chance», he is arguing by means of his own technical terms, not attributing the view to Democritus or anyone else, which is clear since he has just said that "they" (evidently Anaxagoras and Democritus) say nothing further about these causes beyond naming the spontaneous. Further, we know that Aristotle considered Democritus to have referred all the causes of nature to necessity. But consider Simplicius' commentary.

«Those who follow Democritus appear to be guilty of a double absurdity. First, although they say that it is the cause of this world, they fail to tell us just what the spontaneous is. Why do I say "this world", since according to them it is the cause of many or even an infinite number of universes? For they say: "the swirl and the movement which separated out and established the universe in its order are the

⁸⁶ Most recently P.-M. MOREL, *Democrito e il problema del determinismo*, cit., and D. ZUCCA, *Il caso e la fortuna*, cit. See also: W.D. ROSS, *Aristotle: Physics*, Oxford 1936, *ad loc.*, and W. CHARLETON, *Aristotle's Physics: Books I and II*, Oxford 1970, *ad loc.* Both refer to C. BAILEY, *The Greek Atomists*, cit. for support.

result of the spontaneous" (ἀπὸ ταῦτομάτου γὰρ φασὶ τὴν δίνην καὶ τὴν κίνησιν τὴν διακρίνασαν καὶ καταστήσασαν εἰς τήνδε τὴν τάξιν τὸ πᾶν). Secondly it is the cause of some surprise how it is that they maintain that animals and plants neither exist nor come to be as the result of chance, but are caused by nature or intelligence or something like that, a cause which is determined and neither irregular nor irrational [...] while in the case of the greatest and most divine of natural phenomena, viz. the heavens and the dance of stars, in which there is nothing irregular and irrational, they trace the cause back to chance and the spontaneous, claiming that in this case there is no such cause as the one they posit for animals and plants, where it is determined and operates rationally and with regularity. Even so, they say nothing about chance and the spontaneous»⁸⁷.

Here Simplicius is careful, at least initially, not to say chance but to attribute to Democritus the view that spontaneity is the cause of the infinite worlds, the swirl or cosmic vortex, and our own world. He even seems to quote Democritus to this effect. He further reports that Democritus would deny that chance is a cause of animals or plants, although he is sketchy on this, claiming that such philosophers mention "intelligence or nature or something like that". When he finishes off the argument by comparing their denial of chance as a cause for animals with their use of the spontaneous as a cause for the heavens, he uses the words "chance and the spontaneous". But chance has been illegitimately tacked on to the spontaneous. Once again he makes it clear that "they" actually said nothing about chance⁸⁸. Even if our sources, going back to Aristotle, are right to complain that he did not

⁸⁷ SIMPL. in *Aristot. phys.* 331.16-332.1, trans. Fleet, modified.

⁸⁸ Philoponus is similarly ambiguous, but it is nevertheless possible to glean from him the truth that Democritus attributed cosmogonical events to spontaneity, not chance. «[Aristotle] blames Democritus [for this] too, that among particulars he says that nothing arises by chance (for not just any chance thing arises from anything), and in giving particular [causes], such as what distinguishes hot things or white things, or why honey is sweet, he ascribes [these things to] the position and order and shape of the atoms, but of the generation itself of the star-systems he says the cause is the spontaneous» (PHILOP. in *Aristot. phys.* 262.16-20, trans. A.R. LACEY, *Philoponus: On Aristotle's 'Physics' 2*, Ithaca 1993, modified).

sufficiently explain his cause, it is clearly not justified to join Dionysius and Eusebius in complaining that Democritus outright contradicted himself by making chance the preeminent cause and yet banishing it from human life. For it is at least clear that Democritus sought to banish chance by referring its effects to the same necessary and spontaneous causes that operate in his cosmogony.

V

Let us consider further the fact that Democritus attributed cosmogonical processes to spontaneity, and that this is not equivalent to chance. Aristotle himself is of course very careful to distinguish chance and the spontaneous in *Physics B*⁸⁹. They differ, he says, in that the spontaneous is much broader than chance. Chance applies only to rational activity involving choice. The spontaneous, on the other hand, extends to brutes, plants, and inanimate objects. A horse goes away from the camp to drink water, and the camp is raided; the horse is spontaneously saved. A tripod falls from a roof, but lands straight up suitable for sitting on – the tripod spontaneously fell straight up⁹⁰. The distinction is Aristotle's, not Democritus'⁹¹. But we can assume that

⁸⁹ Aristotle often speaks more casually, grouping chance and the spontaneous; it is this tendency that has encouraged those dependent on him to equate spontaneity with chance. (See, e.g., *an. post.* B 11. 95 a 4; *de cael.* A 12. 283 a 31-2, 287 b 25; *metaph.* K 8. 1065 b 3; *pol.* H 1. 1323 b 28.)

⁹⁰ Aristotle summarizes the view as follows: «So it is clear that in the case of things that without qualification come about for the sake of something, when they come about by an external cause and not for the sake of what incidentally benefits, this we say to come about spontaneously (ἀπὸ ταῦτομάτου); but it is by chance (ἀπὸ τύχης) if it comes about spontaneously among things chosen by those who have choice» (*phys.* B 6. 197 b 18-22).

⁹¹ Aristotle says elsewhere that «things come to be either by art or nature or by chance or by the spontaneous (τῶ αὐτομάτῳ). Now art is a principle of movement in something other than what is moved, nature is a principle in the thing itself [...] and the other causes are privations of these two» (*metaph.* A 3. 1070 a 6-9). This suggests the following analogy: nature : art :: spontaneity : chance. Chance outcomes are for the sake of something like art, but without the intentionality, spon-

Aristotle was accurate in reporting that Democritus assigned the spontaneous as a cause in cosmological contexts (such as the formation of worlds and vortices), which are by their nature devoid of choice. In cases involving choice or objects of choice (like finding a buried treasure or having a tortoise dropped on your head), he seems to have viewed chance as an eliminable cause, which could be traced back to necessary causes. Humans can avoid or eliminate the influence of chance on their lives through intelligence and carefulness.

So Democritus refers the creation of the worlds to spontaneous causes, the necessary outcomes of the impact and blow of matter. This is not in fact an unreasonable idea. Even Aristotle's pupil and successor Theophrastus considered it plausible that the spontaneous is a cosmic cause of natural forms: «the account that it is by the spontaneous (τῶ αὐτομάτῳ) and through the rotation of the whole that these things acquire certain forms or differences from one another seems to have some plausibility»⁹². Democritus also refers the formation of natural things, like plants, animals, and humans, to natural and spontaneous causes. But he also goes much further, attributing apparently chance events in the human sphere to necessity, and, in an acute and widely influential anthropological theory of civilization, attributed the invention of the arts to necessity⁹³.

taneous outcomes are for the sake of something that does not possess reason, but without the internal principle that Aristotle calls "nature". Briefly, chance and spontaneity are external causes of that of which art and nature are the internal causes, respectively.

⁹² THEOPHR. *metaph.* 10 b 26-11 a 1, trans. M. VAN RAALTE, *Theophrastus: Metaphysics*, Leiden 1993.

⁹³ According to PHILOD. *mus.* 4, 108.29 (D.-K. 68 B 144), the newer arts like music grow out of an abundance of leisure, after material necessities have been met. In a recent insightful discussion of Democritus' theory of music in the context of his wider theory of the development of human arts, Brancacci observes that «the progressive acquisition of skills and arts leaves some room for an element of 'spontaneous' development, but, as Steckel noted, this viewpoint is perfectly reconcilable with the determinism (correctly understood) of the atomist theory» (A. BRANCACCI, *Democritus' Mousika*, in A. BRANCACCI and P.-M. MOREL (eds.), *Democritus: Science, the Arts, and the Care of the Soul*, Leiden 2007, pp. 181-205 at p. 194). See further: G. VLASTOS, *Ethics and Physics*, cit., p. 53; L. EDMUNDS, *Necessity, Chance,*

Exactly what the spontaneous or “automatic” is, Democritus stands accused of failing to elaborate. But the basic idea is not particularly hard to grasp. In fact, the term is not uncommon in archaic Greek. In Homer, the tripods of Hephaistos «of their own accord (αὐτόματοι) entered the assembly of the gods”, and the gates of Olympus open spontaneously⁹⁴, apparently much like our automatic doors. Hesiod speaks of the spontaneous in natural contexts: diseases spontaneously (αὐτόματοι) come upon humans; «the fruitful earth of itself (αὐτομάτη) bares fruit abundantly»⁹⁵. Thus the basic idea is of things happening of their own accord, without external causes or cultivation.

In fact, the spontaneous shows up quite early and quite frequently, from Democritus’ predecessors (poets, historians, medical writers) and peers (Anaxagoras, Plato, Xenophon), to his successors (Aristotle, Theophrastus). It has many and diverse applications in the areas of meteorology and geology and ecology⁹⁶, medicine⁹⁷, botany, and

and Freedom, cit., p. 355; T. COLE, *Democritus and the Sources of Greek Anthropology*, Cleveland 1967, p. 107.

⁹⁴ HOM. *Il.* 18.376; 5.749.

⁹⁵ HES. *Op.* 103; 117-8.

⁹⁶ THUCYD. *hist.* 2.77.4.4, trans. R. WARNER, London 1954, describes «forest fires on the mountains which have broken out spontaneously through the branches of trees being rubbed together by the wind». Notice that the idea is not that the fires were uncaused or random (for Thucydides gives the cause); they are spontaneous because they happen due to the collision of the trees themselves, not external agency. Herodotus says that the Egyptians «wait for the river spontaneously (αὐτόματος) to flood their fields» (2.14.13-4). The flooding is a regular and natural, not random occurrence. Herodotus also uses the term to refer to salt which is regularly formed by “natural processes” (αὐτόματοι) at the mouth of the river (4.53.11-2). For Aristotle too, waters of springs and rivers flow of their own accord (*meteor.* 353 b 28).

⁹⁷ Plato has Socrates refer to death by natural processes: «If you had waited a little while this would have happened from natural causes (ἀπὸ τοῦ αὐτομάτου). You see my age, that I am already advanced in years and close to death» (*apol.* 38 c 5-6, trans. G.M.A. GRUBE, Indianapolis 1997; cfr. HEROD. 2.66.15-6). Theophrastus also describes the death of plants by natural causes as automatic: «withering from old age and weakness is natural, when the tree dissipates its fluid and lets its heat die down spontaneously, whereas death coming from the outside is unnatural» (*de caus. plant.* v 11.1.3-6, trans. B. EINARSON-G. LINK, *Theophrastus: De causis plan-*

biology⁹⁸. Even Aristotle continued to hold that, as a matter of biological fact, some plants and even higher organisms are generated spontan-

tarum, London 1976, modified). The term appears over a hundred times in the corpus of Hippocrates, often in the context of the controversy over “spontaneous recovery” from disease. «What need is there for further assistance when nature neutralizes the effect of such an agent spontaneously?» (*VM* 16.37, trans. J. CHADWICK-W.N. MANN, *Hippocratic Writings*, London 1950). The doctor’s intervention is unnecessary when natural processes cure the ailment. But compare: «no patient who recovers without a physician can logically attribute the recovery to τὸ αὐτόματον. Indeed, under a close examination τὸ αὐτόματον disappears; for everything that occurs will be found to do so through something, and this “through something” shows that τὸ αὐτόματον is a mere name, and has no reality» (*medic.* 6.10-2, trans. Chadwick and Mann; cfr. *artic.* 46.27-49). The regularity with which spontaneous processes can be thought to work is clear from the following: «people of the constitution mentioned above, that is athletic people who have got soft, generally recover of their own accord within forty-five days of the wasting beginning. If such a period be exceeded, natural (αὐτόματοι) recovery takes a year» (*nat. hom.* 12.33-5, trans. Chadwick and Mann). Frequently, the spontaneous refers to a cause which has not yet been discovered: «spontaneous weariness indicates disease» (*aph.* trans. Chadwick and Mann, 2.5; cfr. 1.2.1; 4.2.2; 4.21.1; 4.78.1; 6.15.1).

⁹⁸ Herodotus mentions several plants that grow not by cultivation but “wild” (αὐτόματα) (2.94.5; cfr. 3.100.5; 4.74.3; 8.138.11). Plato uses spontaneity in the same way (*pol.* 272 A 2-5), but also to refer to natural processes such as the generation of plants and brute animals. He asks, «does nature generate them [e.g. animals and plants] by some spontaneous cause and grow them without thought, or are they generated by a god following reason and divine knowledge?» (*soph.* 265 c 7-9). Theophrastus represents the spontaneous as coordinate with the natural in the study of plants, as opposed to the cultivated and artificial: «these constitute two divisions of the subject, the one as it were natural and αὐτόματον, the other belonging to art and preparation, which intends the good. But the account is not the same for both, the first is what we might call an account from nature, the other from inventiveness, nature doing nothing in vain, and intellect proposing to help nature» (*de caus. plant.* II 1.1.6-11, trans. Einarson and Link); «The study of plants pursues two different investigations in two different fields. The first investigation deals with plants that grow αὐτομάτως, and here the starting point belongs to their nature; whereas the other starting point is that which proceeds from human ingenuity and contrivance, which we assert helps their nature to achieve its goal» (*ibid.* III 1.1.1-5; cfr. *hist. plant.* II 1.1.1-10). Theophrastus is even willing to state that the spontaneous is equivalent to the natural principle, in contrast to art: «the nature contains the starting points in itself, and we speak here of the natural, and what we see in plants that grow ἐκ τῶν αὐτομάτων is of this description» (*ibid.* I

taneously, out of inorganic matter⁹⁹. What Aristotle could not accept – and this is precisely the point on which he disagrees with Democritus – is that all plants and animals, all the arts, all the heavenly bodies, and in general the entire cosmos could come to be spontaneously¹⁰⁰.

16.10.8-10). Changes in qualities are said to arise spontaneously: «changes also occur in odor; they mostly arise αὐτομάτως because of the air and the country» (*ibid.* II 16.1.1-2); «savours are found in things mixed by some procedure of art, or else in things that alter αὐτομάτως, sometimes for the better, sometimes, as in decomposition, for the worse» (*ibid.* VI 3.3.3-5).

⁹⁹ Aristotle discusses the spontaneous generation of plants (*hist. anim.* E 1. 539 a 18; *de gen. anim.* A 1. 715 b 27) and some animals (*de an.* B 4. 415 a 28; *hist. anim.* E 1. 539 a 22, b 7; *de gen. anim.* B 6. 743 a 35, Γ 9. 759 a 7; [Aristot.] *probl.* I 65. 898 b 5), specifically some insects (*hist. anim.* E 19. 551 a 1; *de gen. anim.* A 16. 721 a 2-10; B 1. 732 b 12; Γ 9. 758 a 30, b 7), shellfish as a kind (*hist. anim.* E 15. 547 b 19, 548 a 11; *de gen. anim.* Γ 11. 761 a 18, b 24, 26, 762 a 1, 9, 762 b 18, 763 a 25-6), and some fishes (*hist. anim.* E 1. 539 b 3; Z 15. 569 a 25; Z 16. 570 a 16). Also, the spontaneous is invoked in the explanation of reproductive processes (*hist. anim.* E 33. 558 a 16; Z 2. 559 b 1, 6; K 6. 637 b 18; *de gen. anim.* Γ 1. 749 a 35; Γ 5. 756 a 19) and deformities (*hist. anim.* H 11. 587 b 26; *de gen. anim.* Δ 4. 773 a 18). Here is a general account of spontaneous generation of animals: «All things composed in this way [*scil.* spontaneously], both in earth and in water, appear to come to be by fermentation and being mixed with rain water [...] animals and plants come to be in earth and liquid because in earth there is water, and in water air, and in all air is vital heat, so that in a sense all things are full of soul. That is why they are easily composed whenever it is enclosed» (*hist. anim.* Γ 11. 762 a 9-22, trans. Platt).

¹⁰⁰ Aristotle treats aporetically the possibility that various kinds of things could be generated spontaneously, among products of art and nature (*metaph.* Z 9. 1034 a 9-10; cfr. *an. post.* B 11. 95 a 4; *de part. anim.* A 1. 640 a 27-31). When he considers the aporia with respect to the spontaneous generation of animals, he treats it as an issue not of chance but of necessary causes; in the following passage the term necessity repeatedly occurs, but the word chance does not appear at all: «There is a difficulty: What prevents nature creating neither for the sake of something, nor the better, but as Zeus rains, not in order to make the crops grow, but out of necessity? For what rises up must be cooled, and what is cool becomes water to fall down. The crop growth results when this happens. Similarly, if the crop is destroyed on the surface where the grain is separated, it rained not for the sake of this destruction, though this resulted. What then prevents the parts being like this in what is natural? For example, the teeth out of necessity coming up sharp in the front suitable for dividing, but the molars broad and so useful for chewing the food. Suppose it didn't happen for the sake of this, but coincidentally. And similarly even

It is safe to assume that Democritus used the notion of spontaneity, much like his predecessors and successors, in his many books on the causes of natural things. But the term also had important applications in the sphere of human behavior. Homer used it to describe voluntary action: «Of his own accord (αὐτόματος) Menelaos came to him»; he was followed in this by the comedians Eupolis and Aristophanes¹⁰¹. Xenophon uses it to convey the absence of compulsion: «Thereupon various speakers arose, some of their own accord (ἐκ τοῦ αὐτομάτου) to express the opinions they held, but others at the instigation of Clearchus»¹⁰². Plato puts the term into Socrates' mouth to mean "freely": «The young men who follow me around of their own free will (αὐτόματοι), those who have most leisure, the sons of the very rich, take pleasure in hearing people questioned»¹⁰³.

It would have not been at all extraordinary or unreasonable for Democritus to call spontaneity a cause, whether of worlds, plants and animals, or even human activities. In so doing he would not be claiming, despite the polemics of his later critics, that these things were caused by chance. On the contrary, he would be saying – in accordance with both popular and philosophical usage – that they were caused by their own natural powers or agency, without external influence or motivation¹⁰⁴.

with the other parts, whenever they seem to exist for the sake of something. Wherever they resulted as if happening for the sake of something, these things survived because they fittingly adapted due to spontaneity (ὑπὸ τοῦ αὐτομάτου συστάνα ἐπιτηδείως). But wherever they were not so adapted they perished and are perishing, just as Empedocles says the "cow progeny with human faces" were. So this argument, and others like it if there are any, may present difficulties» (*phys.* B 7. 198 b 16-34).

¹⁰¹ HOM. *Il.* 2.408. See also the commentary on this line by Demetrius of Phaleron *apud* ATHEN. v 4, 177 c-178 a; «Zeus is here; he came of his own accord (αὐτόματος)» (ARISTOPH. *Pl.* 1190); «Good men go of their own accord (αὐτόματοι) to a Goodman's party» (= EUPOLIS fr. 289 in PLAT. *symp.* 174 b 4-5).

¹⁰² XENOPHON. *an.* 1.3.13.1-14.1, trans. Brownson.

¹⁰³ PLAT. *apol.* 23 c 2-4, trans. Grube. Several times Plato contrasts the spontaneous, in the sphere of human behavior, with learning thorough instruction (*Alc.* 118 c 3-4; cfr. *Euthyphr.* 282 c 2; *Prot.* 320 a 3, 323 c 6; *Men.* 93 e 8).

¹⁰⁴ Lucretius uses *sponte* for this concept in Latin, in a passage that subtly

This obviously does not require a total elimination of chance. Democritus held that the invention of words was not by nature but by chance, meaning what other parties to this dispute would call "convention"¹⁰⁵. He even says that «the effects of chance are suffered by all»¹⁰⁶. Indeed, he offers advice on how to avoid the pitfalls of chance.

«He who is going to be cheerful must not do too many things, either in private or in public, and must not choose what exceeds his own nature and ability, but must be careful, so that even when chance seizes him and urges him further in his imagination, he sets it aside and does not attempt more than he is able»¹⁰⁷.

The passage shows yet again that Democritus argues for individual responsibility, and denies that chance should be an excuse for one's personal failures. Chance is the real threat to personal responsibility, much more so than necessity, and a certain conception of causal necessity can, and arguably must, contribute to a successful theory of human freedom.

VI

I have argued that necessary and spontaneous causes are the fundamental basis of Democritus' system of explanation and, in a word, his atomism. It is obvious that he applied this to a vast array of natural and human phenomena, from the formation of the cosmos and its plant and animal inhabitants to the development of human arts and institutions. But it would appear that the very comprehensiveness

suggests Democritus' commitment to the cause of spontaneity: «Democritus, when ripe old age warned him that the recording motions of his mind were beginning to fail, of his own free will (*sponte sua*) offered his head to death» (*de rer. nat.* III 1039-41, trans. W.H.D. ROUSE, London 1924).

¹⁰⁵ PROCL. *in Plat. Crat.* 16 (D.-K. 68 B 26).

¹⁰⁶ DEMOCRIT. *apud* STOB. IV 48.10 (D.-K. 68 B 293).

¹⁰⁷ *Ibid.* 39.25 (D.-K. 68 B 3); cfr. PLUTARCH. *de tranq. an.* 465 C; SENEC. *de tranq.* 13.1; *de ira* III 6.3.

of this etiology threatens to undermine human freedom by making all events, individual behavior in particular, subject to the necessary impacts and blows of atoms in void. If all the motions of atoms and void that constitute a human being are necessary, then they would seem to be wholly determined, not by the human being itself, but by the previous configurations of its atoms. It appears that the movement of the atoms influences the behavior of the individual, but not that the behavior of the individual influences the atoms. What room does this leave for freedom?

As we saw above, Epicurus argued that the Democritean view that everything has a cause threatens the internal coherence of the atomistic philosophy because it advocates both behaving like an agent, and the effective elimination of agency through necessary and spontaneous overdetermination. In the more familiar terms of Cicero:

«If the atom were always carried along by the natural and necessary force of gravity, we should have no freedom whatever, since the movement of the mind was controlled by the movement of the atom. The author of the atomic theory, Democritus, preferred to accept the view that all events are caused by necessity, rather than to deprive the atoms of their natural motions»¹⁰⁸.

The point of these arguments is that if you make the causes of everything atoms and the void, and say that the causes of the atomic motions and changes are necessary and spontaneous, then you will not be able to claim responsibility for your actions, including the very argument you are making. For neither do you really exist (since "you" are not an atom or void), nor do you have any choice to pursue or avoid anything, including your argument (since your "choice" would be determined by necessary and automatic causes). Thus when you act as if you exist, and you make choices and pursue and avoid things (or make ethical pronouncements about what should be chosen or avoided), then you will be contradicting yourself. This an-

¹⁰⁸ CIC. *de fat.* 23, trans. H. RACKHAM, London 1942.

cient argument is essentially the same criticism that Bailey and his successors have made of Democritus.

The argument assumes that Democritus would hold that people are eliminable, temporary or arbitrary arrangements of constituent atoms whose motions are necessary and spontaneous; and that as such people cannot possibly influence their own atomic makeup. Essentially, their atomic configuration is real, but they (and with it their choices and avoidances, their freedom) are not. The following famous quotation of Democritus has been thought to support such an eliminativist view.

«By convention sweet and by convention bitter, by convention hot and by convention cold, by convention color; but in reality atoms and void»¹⁰⁹.

If qualities and their perception are conventional, but the only reality is atoms and void, then other aspects of an individual, including consciousness and volition, would appear to be conventional, reducible in reality to the atoms and void of the individual, and perhaps eliminable altogether. On the basis of this statement, Democritus is thus supposed to be an eliminativist, holding that nothing is real but atoms and void¹¹⁰, or a radical reductionist, holding that everything is actually reducible to microscopic particles and the space they move in. After Epicurus the argument was made not only by the cynic Oenoandus of Gadara, as we saw, but also by the epicureans Diogenes of Oenoanda and Colotes.

«Colotes says that Democritus' words "color is by convention, sweet by convention, a compound by convention", and so the rest, "what is real are the void and the atoms" are an attack on the senses; and that

¹⁰⁹ Versions of the passage are attributed to Democritus in all of the following: SEXT. *EMP. adv. math.* VII 135 (D.-K. 68 B 9); DIOG. LAERT. IX 72 (68 B 117); and GALEN. *med. exp.* 15.7 (68 B 125), *elem.* I 2 (68 A 49).

¹¹⁰ D. SEDLEY, *Epicurus' Refutation of Determinism*, cit., p. 33; ID., *Epicurean Anti-reductionism*, in J. BARNES-M. MIGNUCCI (eds.), *Matter and Metaphysics*, Napoli 1988, p. 301.

anyone who abides by this reasoning and puts it into practice could not even conceive of himself as a man or as alive»¹¹¹.

The criticism is that, if only the atoms are real, then nothing is really alive (since no atom is alive), and nothing is really a human, since no atoms are human (and everything that is real is an atom or is void). Further, no one is really an agent, since agents are macroscopic beings, but macroscopic beings do not really exist. What's more, no perceptible thing is real, since microscopic beings are imperceptible, but microscopic beings are the only things that are real. David Sedley has endorsed a reading of Democritus more extreme than this kind of reductionism.

«All the colors, states of mind, etc. prove to not be real (ἐτεῖη), but just arbitrary (one of the implications of his contrasting the term νόμος) constructions placed by the experiencing subject on atomic aggregates which in the last analysis are quite devoid of such properties. In current jargon, Democritus is an eliminative materialist, who holds that the phenomenal states are nothing over and above physical states, and infers that they are unreal»¹¹².

The immediate implication of this, obviously, is extreme skepticism about the senses, but a more threatening implication is, arguably, an absurd view about agency, especially human agency. A powerful argument if it can be made to stick. But despite such arguments¹¹³ the evidence for the attribution to Democritus of a view like eliminative materialism is thin.

Although not often quoted with enough context, each of the ancient authors that preserve the crucial statement go on to qualify it in ways that argue against interpreting it as eliminative materialism. Consider first Galen.

¹¹¹ PLUTARCH. *adv. Col.* 1110 E, trans. Einarson-De Lacy.

¹¹² D. SEDLEY, *Epicurean Anti-reductionism*, cit., pp. 298-9.

¹¹³ DIOG. OEN. fr. 7, trans. Smith, had also written: «Even Democritus erred in a manner unworthy of himself when he said that atoms alone among existing things have true reality, while everything else exists by convention. For according to your account, Democritus, it will be impossible for us even to live».

«When Democritus was attacking the appearances with the words “By convention sweet [...] in reality atoms and the void” he made the senses reply to thought as follows: “Wretched mind, you get your evidence from us, and yet you overthrow us? The overthrow is a fall for you”»¹¹⁴.

Galen has preserved this Democritean dialogue between the senses and the mind, but most commentators since antiquity have selectively quoted only one half of it. Surprisingly, the senses appear to have the last word, exposing the mind's position as untenable. The result is a *reductio ad absurdum* of radical skepticism about the senses and, at the same time, of radical reduction of reality to the atoms and void, and a *fortiori* of eliminative materialism. If the mind considers the sensory qualities to be conventional and essentially unreal, then *ipso facto* it has no grounds on which to found its view of reality, that there are minute and invisible entities that deterministically cause our perceptions. For it is exactly the necessity that a certain perception is caused by a certain interaction of atoms with the sense organs of a certain subject that grounds atomistic psychology, allowing it to account for differences in perception of similar objects by different subjects.

Sextus is the other source for the famous quotation. Like Galen, what he goes on to say – but is rarely quoted to say – is important not only for the assessment of the reductionist interpretation the fragment, but also in general for the interpretation of Democritus' conception of human freedom.

«Democritus at times eliminates the sensory appearances, and says that none of these appears truly but only in opinion, and that the truth in the things that are is that atoms and void exist. For, he says, “by convention sweet and by convention bitter, by convention hot, by convention cold, by convention color. In reality atoms and void”. That is, perceptibles are objects of belief and opinion, and they do not exist truly, but only atoms and void do. In his *Confirmations*, despite having professed to ascribe command over evidence to the senses, he nonetheless is found condemning them. For he says: “We

¹¹⁴ GALEN. *med. exp.* 15.7, trans. Taylor p. 143 (D.-K. 68 B 125).

in reality have no reliable understanding, but one which changes in accordance with the state of the body and of the things which penetrate and collide with us”. And again he says: “That in reality we do not understand what each thing is or is not like, has been shown in many ways”. And in his *On Ideas*: “man must know by this yardstick: that he is cut off from reality”, and again “this argument too shows that in reality we know nothing about anything, but seeming for each of us is a reshaping (ἐπιρυσμῆ)” and also “And yet it will be clear that to know what each thing is in reality is beyond us”.

Now in these he is virtually rejecting all cognition, even though it is only the senses that he attacks specifically. But in his *Canons* he says that there are two kinds of knowledge, the one through the senses, the other through the mind. Of these, he calls the one through the mind “genuine”, ascribing to it reliability for judging the truth, while the one through the senses he names “obscure”, depriving it of infallibility for the discernment of truth. His precise words are: “Of knowing there are two forms, the one genuine, the other obscure. And of the obscure kind this is the complete list: sight, hearing, smell, taste, touch. The other is genuine, but separated from this one”. Then, by way of judging the genuine one superior to the obscure one, he adds these words: “When the obscure one is no longer able either to see smaller, nor to hear nor to smell nor to taste nor to sense by touch, but finer”. Therefore according to Democritus too reason is the criterion: he calls it “genuine knowing”»¹¹⁵.

Detailed studies have shown the difficulties of using Sextus as a source for Democritus and the complexities of this passage in particular¹¹⁶. Nevertheless, it is invaluable, conforms with other things we know about Democritus' ethics, and sheds light on some obscurities. First we are given part of the famous dialogue between the senses and the mind quoted above. Then we have a representation of the senses' reply to the mind, quoted more completely by Galen, which I have

¹¹⁵ SEXT. *EMP. adv. math.* VII 135-40, trans. D. SEDLEY, *Sextus Empiricus and the Atomist Criteria of Truth*, «Elenchos», XIII (1992) pp. 27-56 at 35-6, modified.

¹¹⁶ *Ibid.*; and especially E. SPINELLI, *Sextus Empiricus: the Case of Democritus*, cit., who summarizes as follows: «this long testimony is a typical example of Sextus' method of work. Next to precious literal quotations which are worthy and even unique, one is able to identify traces of a deep reworking» (p. 158).

already discussed¹¹⁷. This leads to the skeptical conclusion that what each thing is in reality is beyond us. At least part of what this means is that reality consists of atoms and void, and these are beyond the direct apprehension of our senses. Finally we learn of the opaque distinction between "legitimate" and "obscure" knowledge. The point here is not that the senses do not lead to knowledge, but that they leave off at a certain point (e.g. with respect to magnitude: they cannot see things on the atomic level), and must be supplemented by the intellect.

VII

What Sextus says confirms that the famous quotation about the reality of atoms and void and the conventionality of everything else is a partial quote, and that Democritus offered the senses a response that undermines or overthrows potentially radically skeptical implications. A similar move, also highly pertinent to the reductionist interpretation – and indeed to the whole issue of Democritus' conception of moral responsibility – is the charming story that Democritus tells about the body bringing suit against the soul.

«If the body brought a suit against it for all the sufferings and ills it had endured throughout its whole life, and one had oneself to judge the case, one would gladly condemn the soul for having ruined certain features of the body through carelessness and made it soft through drink and brought it to rack and ruin through love of pleasure, just as if a tool or a utensil were in bad shape, one would blame person who used it carelessly»¹¹⁸.

The passage is striking because it reverses the familiar platonic-aristotelian priority of soul to body, and holds the soul responsible for corrupting the body. The soul is responsible not only for the actions

¹¹⁷ Discussion of the reply can be found in E. ASMIS, *Epicurus' Scientific Method*, Ithaca 1984, p. 345; D. SEDLEY, *Sextus Empiricus and the Atomist Criteria*, cit., p. 37.

¹¹⁸ DEMOCRIT. *apud* PLUTARCH. *anim. an corp. affect. sint peion*. 2, trans. Taylor p. 17; cfr. *de tuend. san. praec.* 24, 135 E; STOB. III 1.27 (D.-K. 68 B 187).

that bring ruin to the body, but for having the desires and wishes that lead to those actions. This requires that the soul have effective agency over the atomic configuration of the body. Democritus in fact holds that a human is composed not just of bodily atoms, but of both body and soul atoms, and that the soul atoms are the cause of motion for the individual as a whole. This fact about atomistic psychology is not addressed by Cicero, who seems to assume that for Democritus the mind can only be passive and subject to the necessary blows of other atoms (in the body, especially in perception). But one of the few things we know for sure about Democritus' psychology was that he made the soul a principle – a starting point – of action.

«Some say that the soul is chiefly and primarily the cause of motion, and as they believed that what is not in motion could not move anything else, they conceived of the soul as something in motion. Which is why Democritus says that it is hot, a sort of fire; for while there are infinitely many shapes, i.e., atoms, he says that spherical ones compose fire and the soul (like the so-called motes in the air, which are seen in sunbeams through windows); the total collection of atoms he calls the elements of the whole of nature, as does Leucippus, but the spherical ones compose the soul, because such rhythms [= shapes] can most easily penetrate through everything and move the others, being themselves in motion. They conceive that it is the soul which gives motion to animals»¹¹⁹.

Despite his Epicurean critics, Democritus did not eliminate everything but atoms and void. Instead, he considered atoms and void to be fundamental to reality, and argued that apprehensions, conceptions, and feelings should be adjusted accordingly. This theory allowed him, in the physical realm, to account for facts that other contemporary theories positing subjective and sensual qualities as fundamental realities could not; to wit, that the same object is perceived differently (and sometimes oppositely) by different subjects. In so doing, Democritus no more eliminated or denied the reality of sensual qualities than contemporary atomic physicists reduce or deny the reality of colors or tastes¹²⁰. On the

¹¹⁹ ARISTOT. *de an.* A 2. 403 b 28-404 a 9, trans. Taylor p. 103.

¹²⁰ D. SEDLEY, *Anti-reductionism*, cit., p. 299, points out: «we are all atomists

contrary, he argued that the qualities were necessary, given the interaction between certain atoms and certain organs of sense.

Democritus could not accept eliminative materialism, and in fact had to repudiate it¹²¹. Although he seems aware of the possibility, he does not commit to the position that all reality and causality is reducible to the atomic level, such that automatic changes in the arrangement and positions of atoms necessitate all changes in mental states or secondary qualities, in effect undermining agency and freedom. Certainly some atomic level rearrangements can and do have such effects – even to the point of undermining our will. But it does not follow that everything is controlled by the microscopic configurations. Something is not controlled in the relevant sense just because it has an explanation, or is causally necessary. Just as changes in atoms might cause me to stand up, so I might stand up and be the cause of atoms being reconfigured, repositioned, and rearranged in certain ways. There seems to be nothing absurd, from the point of view of atomic physics, in my saying that I move my hand, and that in so doing I necessitate certain atomic rearrangements.

In the terms of Greek physiological psychology, this is no more mysterious than the notion that the soul moves the body – an ancient position according to Aristotle, and one that Democritus held as well. The difficulties with this view were confronted with extreme seriousness by Aristotle and his successors. In particular, Epicurus seems to

of a sort nowadays, yet by no means all of us find that this commits us in advance to thinking of beauty, love, or freedom as identical to physical states of a thing's or people's constituent particles [...] even without any injection of vitalism or of Cartesian dualism, there are those, philosophers and non-philosophers alike, who think of such things as belonging to an irreducibly different level of reality from the atomic one». Sedley makes this point in order to show that Epicurean atomism is not necessarily committed to reductionism; the same should hold, I think, for Democritean atomism. For other arguments to the effect that Democritus is not a reductionist, see C. FARRAR, *The Origins of Democratic Thinking*, cit., pp. 200-2.

¹²¹ For a further defense of the eliminativist position, see: T. O'KEEFE, *The Ontological Status of Sensible Qualities for Democritus and Epicurus*, «Ancient Philosophy», xvii (1997) pp. 119-134. For arguments against interpreting Democritus as a reductionist about sensible qualities, see T.S. GANSON, *Democritus against Reducing Sensible Qualities*, «Ancient Philosophy», xix (1999) pp. 201-15.

have grappled with the problem in *On Nature* xxv, and possibly led to a view that permits psychological causation independent of the atoms¹²². The text is notoriously difficult and its interpretation hotly disputed, and it is unclear how any of this might relate to the swerve. The further myriad difficulties in the interpretation of the Epicurean swerve cannot be discussed here, but Carneades' suggestion that the swerve is unnecessary because the voluntary motions of the mind could be invoked in parallel to the natural motions of the atoms shows that various materialist and anti-materialist positions on psychological causation had already been staked out and had dialectical plausibility in antiquity¹²³. It seems likely that Democritus advanced a materialist theory of psychological causation, according to which the "self-driven" or "spontaneous" activity of one's soul atoms can influence or even control the arrangement or rearrangement of one's other bodily atoms. It is certainly true that the simple substances – the atoms – have spontaneous motions. But this is no reason to believe that soul atoms and further soul-body atomic compounds made out of them do not. On the contrary, the spontaneity of atomic motion suggests the spontaneity of natural atomic aggregates.

What causes, i.e. necessitates certain impacts and blows of matter are certain shapes, and shapes certainly exist in both the microscopic and macroscopic worlds. Part of the reason this sounds so odd to modern ears is that we are conditioned to think of causes, not as the earlier Greeks did, as things, but instead as events that are constantly conjoined in a temporal sequence often referred to as a "causal chain". It is not surprising that this conception should be perceived as a threat to freedom – chains and freedom are antithetical. But to most 5th century thinkers, things were paradigmatically causes, things such as atoms,

¹²² EPIC. *nat.* xxv, pp. 51-2 of S. LAURSEN, *The Later Parts*, cit.; cfr. L.-S. 20 B 5-6. Sedley's interpretation has it that Epicurus countenances «a causal efficacy distinct from the atoms» (A.A. LONG-D. SEDLEY, *The Hellenistic Philosophers*, cit., pp. 109-10; D. SEDLEY, *Epicurus' Refutation of Determinism*, cit., pp. 38-9). S. LAURSEN, *Epicurus on Nature XXV (Long-Sedley 20, B, C, and j)*, «Cronache Ercolanesi», xviii (1988) pp. 7-18 rejects this interpretation and attempts to restore the familiar "materialist" reading of Epicurus.

¹²³ CARNEAD. *apud* CIC. *de fat.* 23-5.

seeds, stones, spears, dogs, and people. Ayer argued, rightly I think, that the antithesis between freedom and causality is largely due to «the survival of an animistic conception of causality, in which all causal relationships are modeled on the example of one person's exercising authority over another. As a result we tend to form an imaginative picture of an unhappy effect trying vainly to escape from the clutches of an overmastering cause»¹²⁴. This clearly applies to the very ancient idea of the personified fates and chance causing many things, fortunate or unfortunate, to happen to people. But this was exactly the story of causal responsibility that Democritus was trying to replace with an account of natural and spontaneous and necessary causes, including impersonal and inanimate atoms and void, but also including things in one's own power.

What is so different and interesting about Democritus' philosophy is that instead of assuming that physical determinism is a threat to freedom, he uses the principle that "all things happen out of necessity and for a reason" to show that we determine our actions and character, and thus we are responsible for them. He makes a virtue of causal necessity, and it is undeniable that on some level a theory of causal necessitation is needed to overcome the threat of chance to personal responsibility. It seems to me that his view is perfectly described as a causal theory of freedom¹²⁵ because Democritus holds that humans can spontaneously be necessary causes of their own intentions, actions, and characters. In so being, they are responsible for their intentions and character. This accords with the original Greek notion of cause as that which is responsible or blameworthy for something happening. Free human behavior can in this way be incorporated into a general theory of explanation, since the agent cannot be eliminated as a personally responsible cause in the explanation of some events and actions.

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¹²⁴ A.J. AYER, *Freedom and Necessity*, cit., p. 283.

¹²⁵ This is the terminology of D. DAVIDSON, *Freedom to Act*, cit., pp. 63-81.