EPICURUS' REFUTATION OF DETERMINISM

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1. *The Swerve*

A few facts are, I hope, uncontroversial enough to be set out without defence. Epicurus inherited Democritus' atomic system, but modified it in a number of respects. In particular, he so vehemently objected to its rigidly deterministic laws as to postulate a minimal 'swerve' (παρέγκλισις) in the motion of atoms, occurring at no fixed place or time — a doctrine which does not feature in his meagre surviving writings but is nonetheless amply attested as his; and defended on his behalf by Lucretius (II 216-93). The swerve (a) enables atoms falling through space at equal speed in parallel lines to collide occasionally and initiate cosmogonic patterns of motion; and (b) somehow or other serves as a necessary condition for the behavioural autonomy of animate beings — a power often identified as 'free will'.

The latter function of the swerve has been widely debated, but no general agreement has been reached on its interpretation.[1] The overriding puzzle is perhaps this. The swerve is

[1] Notably J.M. GUYAU, *La morale d'Epicure* (Paris 1886); C. GIUSSANI, *Studi lucreziani* (Torino 1896), pp. 125-69; C. BAILEY, *The Greek atomists and Epicurus* (Oxford 1928); C. DIANO, articles collected in his *Scritti epicurei* (Firenze 1974), pp. 129-280 (orig. publ. 1939-42); D.J. FURLEY, *Two studies in the Greek atomists* (Princeton 1967), 'Second study'; E. ASMIS, *The Epicurean theory of free will and its origins in Aristotle* (Ph. D. dissertation, Yale University, 1970); A.A. LONG, *Hellenistic philosophy* (London 1974), pp. 56-61; I. AVOTINS, *Notes on Lucretius 2.251-293*,

a minimal degree of indeterminism, and indeterminism is the negation of determinism, which is widely held to be incompatible with the existence of free will.[2] Yet it is unclear *how* the cause of free will can be benefited by the introduction of indeterminism. A random element in the behaviour of our constituent atoms might make us all thoroughly eccentric, but random eccentricity is hardly the same thing as free will or self-determination, and might even be held to militate against them.

The puzzle is of more than antiquarian interest, for as luck would have it Epicurus was more or less right. Since 1927, when Heisenberg published his Uncertainty Principle, most physicists have accepted that there is an element of indeterminacy in the behaviour of sub-atomic particles. The innovation was welcomed by some as eliminating the clash often felt to exist between Newtonian physics and the widespread belief in free will. Yet it has become no clearer in the subsequent half-century just *how* the champions of free will are supposed to exploit this windfall. Epicurus certainly had some ideas on the matter, and one of our tasks will be to hunt them out.

«HSCP» 84 (1980), pp. 75-9; K. KLEVE, *Id facit exiguum clinamen*, «SO» 15 (1980), pp. 27-31; W.G. ENGLERT, *Aristotle and Epicurus on voluntary action* (Ph. D. dissertation, Stanford University, 1981); P. A. CONWAY, *Epicurus' theory of freedom of action*, «Prudentia» 13 (1981), pp. 81-9; D. FOWLER, *Lucretius on the clinamen and 'free will' (II 251-93)*, in this volume. I should also mention the highly unorthodox interpretation of M. BOLLACK, *Momen mutatum: la déviation et le plaisir* (cf. appendix, *Histoire d'un problème*, by J. and M. BOLLACK and H. WISMANN), in J. BOLLACK and A. LAKS (eds.), «Cahiers de philologie» 1 (Lille 1976), pp. 161-201. FURLEY's interpretation has won little support, and the upshot of this paper will be a vindication of his basic hunch of the separateness of the swerve from volition, but on rather different grounds from those which he offered. ENGLERT's dissertation should be consulted as an outstandingly impressive defence of the main opposing line of interpretation.

[2] To avoid possibly misleading implications, I shall where possible exclude the expression 'free will' from discussion of the ancient debate. For differences between 'free will', τὸ παρ' ἡμᾶς and τὸ ἐκούσιον, see ENGLERT, op. cit., chapters 5-6. But I shall not follow ENGLERT's attempt to distinguish between Epicurus' treatments of the latter two notions. ENGLERT separates Lucretius II 251-93 (and perhaps also Plut., *Stoic. repugn.* 1050 c) as concerned with the use of the swerve to explain τὸ ἐκούσιον. My own reading is that the primary emphasis there, as in the other passages, is the denial of determinism.

It would of course be far-fetched to give Epicurus much credit for anticipating 20th-century quantum physics. On the other hand, he deserves more admiration than he usually receives for arriving at the possibility of physical indeterminism within atomism on purely a priori grounds. During the long reign of Newtonian physics only one thinker, C.S. Peirce, had the wisdom to point out that its overwhelming predictive success did not, and indeed never could, rule out the existence of indeterminism at a level below the range of the most accurate measuring instruments.[3] Epicurus' insight was a comparably bold one when he reasoned, in defence of the swerve, that no amount of observation of falling objects' trajectories could establish that they were perfectly rectilinear to *any* degree of accuracy (Lucretius II 246-50).

I do not propose to expend much discussion on the swerve's cosmogonical function (Lucretius II 216-42), which I suspect to be a problem dreamed up with a preconceived solution in mind. Chains of atomic collisions in extra-cosmic space could have quite adequately been explained by the lateral intrusion of one or more atoms from elsewhere, despatched, say, by the break-up of a nearby world. The question of how such collisions ever started in the first place would not arise, given the infinity of past time and past worlds. That is, indeed, the view strongly implied by the *Letter to Herodotus* and the *Letter to Pythocles*,[4] the physical epitomes which Epicurus wrote when he had already worked out his main cosmological views in Books I-XIII of his *On nature*. Since these two works also contain no hint of the swerve doctrine, the likelihood is that it was his later work on psychology, apparently in the closing books of the thirty-seven book magnum opus, that led him to the innovation, and that it was only then grafted onto the existing cosmological scheme.[5]

[3] C.S. PEIRCE, *Collected papers* 6 (1935), esp. p. 35, 37.

[4] *Ep. Hdt.* 44; *Ep. Pyth.* 89.

[5] See my *The structure of Epicurus' On nature*, «CErc» 4 (1974), pp. 89-92, and *Epicurus and the mathematicians of Cyzicus*, «CErc» 6 (1976), pp. 23-54, note 73, for this chronology.

That it should occur to him to kill a second bird with the same stone, by invoking the swerve in explanation of cosmogony, is not in itself surprising. Anaxagoras, whom Epicurus pronounced his favourite Presocratic,[6] had similarly postulated Mind (*Nous*) (a) as the initial cause of cosmogony, and (b) as a factor still present as the controlling power in all ensouled beings,[7] presumably to account for the autonomy which distinguishes them from inanimate objects. It is not inconceivable that Epicurus thought of the swerve as an atomistic substitute for Anaxagorean Mind. I say 'substitute' and not 'equivalent' because no interpretation of the swerve can make it do the *entire* job envisaged by Anaxagoras. The possession of Mind, 'the most powerful of all things', appears to be intended not just as a necessary but also as a sufficient condition of autonomy; at any rate, it is not clear what further conditions Anaxagoras might require. But the swerve, which may occur unrestrictedly in any atom at any time, and hence presumably in tables and stones as much as in animals, can hardly be thought of as a sufficient condition of autonomy, but at best as a necessary condition.

What sort of necessary condition? Is there a direct causal connexion between individual swerves in the soul atoms and individual autonomous acts, or some more tenuous relation? It is customary at this point to turn to detailed analysis of Lucretius' defence of the swerve. My proposal is to leave Lucretius till last. For one thing, his account belongs to a discussion not of psychology or ethics but of atomic motion. The existence of psychological autonomy is his premiss, the existence of the swerve his conclusion. It is not clear that we should *expect* in this context any explanation of how the swerve functions in animal and human psychology — indeed, Lucretius' immediate source may not even have supplied the answer to that question. For another thing, excessive concentration on the Lucretius text has tended to exaggerate the centrality of the swerve and to obscure the fact that Epicurus had a great deal more of interest to say in opposition to determinism. I prefer therefore to examine the other evidence first,[8] starting with Epicurus' own writings. If an adequate interpretation can be arrived at in this way, it will then be enough if Lucretius' text proves able to bear a reading consistent with it.

[6] D.L. X 12.

[7] 59 B 12 DIELS-KRANZ.

[8] Unlike a number of recent studies, I do not propose to approach this question via Aristotle. I have no doubt whatsoever that many of Epicurus' adjustments to earlier atomism arose in response to Aristotle's criticisms of Leucippus and Democritus in the *Physics*, which Epicurus clearly studied with care (see especially FURLEY, *Two studies*, 'First study'; ID., *Aristotle and the atomists on motion in a void*, in P.K. MACHAMER and R.G. TURNBULL (eds.), *Motion and time, space and matter: interrelations in the history of philosophy and science* (Columbus 1976), pp. 83-100; Brad INWOOD, *The origin of Epicurus' concept of void*, «CP» 76 (1981), pp. 273-85, at pp. 282-4; ENGLERT, op. cit., pp. 64-71. But I am quite out of sympathy with one current tendency, that of picturing Epicurus, and Hellenistic philosophers in general, as so in awe of Aristotle that they never dared put a foot forward without looking up and taking account of the great man's views on the topic in question. This approach seems to me not only to be unwarranted by the evidence but also to kill most of the excitement that can be found in Hellenistic philosophy. There is still a serious question outstanding about which of Aristotle's school treatises were even readily available in the third and second centuries B.C. And at all events there is little to suggest that Aristotle was as widely discussed as Socrates, Plato, the Cynics, or even Heraclitus. Of course Aristotle wrote on many of the same topics as the Hellenistic philosophers, and their ideas can often be fruitfully compared. Once in a while it may be right to suspect direct or indirect influence. But we must also make *some* allowance for the possibility of two philosophers' arriving at similar views independently — the history of philosophy is full of such coincidences. When it comes to the swerve, I do not believe that there are in Aristotle any suitable criticisms of Democritean necessity to which it is likely to be a response (but for an interpretation along these lines, see ASMIS, op. cit.), and I hope to show that on this occasion Epicurus' own criticisms of the Democritean tradition were the decisive factor. FURLEY and ENGLERT, in particular, have made interesting attempts to relate the swerve to certain positive views of Aristotle's, but while the connexions they draw are often enlightening I am not persuaded that they are enough to establish a direct influence.

2. *Epicurus on Determinism*

In the *Letter to Menoeceus* (133-5)[9] Epicurus stresses the need to be aware of the difference between necessity, chance, and τὸ παρ' ἡμᾶς. What characterises the third of these is that it has no master, and that the blameworthy and the praiseworthy go naturally hand in hand with it. This suggests that παρά carries something not unlike the causal sense, 'due to', found frequently in the *Letter to Pythocles*, so that the class of things picked out as παρ' ἡμᾶς is whatever results from our own individual agency, that for which we are responsible, that which depends on us.[10] Far from connecting it directly with the swerve 'at no fixed place or time', Epicurus emphasises, through the contrast with 'unstable' chance, the reliability of τὸ παρ' ἡμᾶς. That which depends on us is reliable precisely, one supposes, because it lies within our power to bring it about.

The same notion, more commonly under the designation τὸ δι' ἡμῶν αὐτῶν, 'our own agency', recurs in the text which will be central to my discussion. It is a passage which, although available to scholars for thirty-five years, has never yet been read in a textually accurate form or recognised as containing a continuous and coherent argument. It comes from a book — possibly Book XXXV[11] — of Epicurus' major work, *On nature*. The book was apparently one held in particular esteem, because the library of carbonised papyri found at Herculaneum in the 18th century has provided no fewer than three copies of it

[9] I propose ἂν γελῶντος for ἀγγελῶντος in *Ep. Men.* 133 and accept the need for some supplement immediately after it. I suggest ⟨εἱμαρμένην, ἀλλ' ἃ μὲν κατ' ἀνάγκην ὄντα συνορῶντος⟩,which would match lines 49-50 of the *On nature* text discussed in section 2 below and would make the omission readily explicable through homoioteleuton.

[10] Cf. Philod., *Sign.* 36.14. The usage is already in Aristotle, cf. *EN* 1114 b 17.

[11] So I argue in *The structure of Epicurus' On nature*, «CErc» 4 (1974), pp. 89-92.

(*PHerc.* 697, 1056 and 1191). Sadly, they are such damaged copies that even when combined they leave many gaps and uncertainties. Diano's 1946 edition[12] was based not on a personal autopsy of the papyri but on readings passed on to him by Vogliano, augmented by the sometimes inaccurate facsimiles ('apographs') made in the early 19th century. Since Vogliano did not use a microscope, I have had to re-read the papyri from scratch. This has led to corrections and additions to Diano's text which, though fairly few in number, often have far-reaching consequences for the interpretation. My text amalgamates the readings of the three papyri, a fact which explains among other things the curious vagaries of the spelling, for which each of the three scribes had his own system.

The book from which the text comes is normally said to be about free will, but this could be misleading. The overall topic seems to be human psychological development, and according to the final column the book has set out to handle the topic at two successive levels of analysis, first the παθολογικὸς τρόπος and then the αἰτιολογικὸς τρόπος. The first of these is, I suppose, an approach in terms of pleasure and pain, the primary πάθη. But this is speculative, the first part of the book having perished. The surviving portion seems to be devoted entirely to the αἰτιολογικὸς τρόπος, and discusses human behaviour in terms of causes, stressing the relative roles of external influences, reasoning about the goal in life, moral guidance, the self, our congenital make-up, and lastly something which he calls τὰ ἀπογεγεννημένα, and which I take to be 'developments' subsequent to birth.

It is in the course of this account that he finds occasion to argue for human self-determination, and this leads him into a digression devoted to the refutation of determinism. This is the passage which we will be examining, and its status as a digression is made explicit in its closing lines. Its being a digression by

[12] C. DIANO, *Epicuri ethica* (Firenze 1946), pp. 24-51.

no means impairs its intrinsic interest as a piece of philosophical reasoning. It offers a fascinating opportunity to see Epicurus' mind at work on the philosophical challenge of determinism, and his ability at every stage to anticipate and counter his imaginary opponent's next move. However, allowance must be made for the fact that the *On nature* is no polished handbook of doctrine but an exploratory work, written for oral delivery in a loose and colloquial style which Epicurus himself is honest enough to call ἀδολεσχία.[13]

In my discussion I shall try to exploit a striking parallel with a passage in Book IV of Lucretius (469-521), whose source can hardly be doubted to be Epicurus. In the first part of Book IV Lucretius gives the Epicurean's own positive account of sense-perception. His entitlement to do so presupposes that the sceptic's doubts about knowledge of the external world are invalid. But his actual refutation of scepticism is reserved for a digression comparatively late on in the discussion. So too in the *On nature* book Epicurus' refutation of determinism comes in a digression slotted in near the end of a positive causal account of human motivation. It is striking, too, that both digressions seek to refute the offending doctrine by showing it to be inherently self-defeating and untenable. Indeed, both run through more or less the same sequence of tactics: first a self-refutation argument, then a linguistic argument, and finally a pragmatic argument. All this will be developed shortly. Here, first, is the text:[14]

[13] Epic., *Nat.* XXVIII, fr. 13 col. XIII 1, 9-10 sup. (in my edition, «CErc» 3, 1973, pp. 5-83).

[14] The corresponding text in the standard edition of Epicurus' papyrus fragments, ARRIGHETTI's *Epicuro. Opere* (Torino 1973²; references in ed. 1, 1960, do not correspond), is 34.26-30. But a proper comparison can only be made with DIANO's text (*Epicuri ethica*, pp. 39-47), whose readings ARRIGHETTI follows in the main, or with that of H.J. METTE, *Epikuros 1963-1978*, «Lustrum» 21 (1978), pp. 45-116, 63 f., since ARRIGHETTI himself does not amalgamate the readings of the three papyri but simply switches from one to another, so that many letters inside his square brackets are in fact attested in one or both of the other papyri. I plan in time to produce a complete new edition of the book, and hope that I may be forgiven on this occasion for failing to supply an exhaustive *apparatus criticus* or adequate linguistic commentary (e.g. for ἐὰν + indicative, at 43 f. on which see art. cit. note 13 above, p. 69 f.).

I should note that, in addition to the columns printed by DIANO, my text incorporates three portions of P 1191 missing from his edition.

ἔχ] τε [τῆς πρ]ώτης ἀρχῆς σπέρμ[ατα ἡμῖν ἀ]γωγὰ τὰ μὲν εἰς
τάδ[ε] τὰ δ' εἰς τάδε τὰ δ' εἰς ἄμφω [ταῦ]τά [ἐ]στιν ἀεὶ
[κα]ὶ πρά[ξ]εων [καὶ] διανοήσεων καὶ διαθέ[σε]ων καὶ
πλεί[ω] καὶ ἐλάττωι. ὥστε παρ' ἡμᾶς π[ρῶτον] ἁπλῶς τὸ ἀ-
πογεγεννημένον ἤδη γείνεσθαι, [τ]οῖα ἢ τοῖα, καὶ τὰ ἐκ τοῦ
περιέχοντος κ[α]τ' ἀνάγκην διὰ τοὺς πό[ρους] εἰσρέο[ν]τα
παρ' ἡμᾶς π[ο]τε γε[ίνε]σθαι καὶ παρὰ τ[ὰς] ἡμε[τέ-
ρα]ς [ἐ]ξ ἡμῶν αὐτ[ῶν] δόξ[ας ...]ει [π]αρὰ τὴν φ[ύ]-
σι[ν]α[...]υσ[.....]υκ[...]θ[.....]ει [....]
ετησ[.....]τα[....]α[.]χε[.....]ν[.]υ[..]ωσε[.....]
νεκε[(LACUNA APPROX. 60 WORDS)]τα τὸμ φυσικὸγ
χα[ρα]κτῆρα ὁμοίως καὶ τοῖς τ[.....]οις κε[νο]ῖς πόροις
[...τ]ῶν αὐ[τ]ῶν ἰδιοτή[των...]ο[...ἐ]πὶ πάν[τ]ων
[.....]ντω[.....] ἐπειδ[(LACUNA APPROX. 12 WORDS)
]εστήκει, ὧν οὐ[... ἀ]πολείπει τὰ πάθη τοῦ γίνε[σθαι ..]
νουθε[τ]εῖν τε ἀλλήλους καὶ μάχε[σ]θαι καὶ μεταρυθμίζειν ὡς
ἔχοντας καὶ ἐν ἑαυτοῖς τὴν αἰτίαν καὶ οὐχὶ ἐν τῆι ἐξ ἀρχῆς
μόνον συστάσει καὶ ἐν τῆι τοῦ περιέχοντος καὶ ἐπεισιόντος κατὰ
τὸ αὐτόματον ἀνάγκηι. εἰ γάρ τις καὶ τῶι νουθετεῖν καὶ τῶι νου-
θετεῖσθαι τὴν κατὰ τὸ αὐ[τό]μα[τ]ον ἀνάγκην προστι[θείη]
ἀεὶ τοῦ [τό]θ' ἑαυτῶ[ι] ὑπάρχο[ντος], μὴ οὐ[χ]ί πο[τε]
δύν[ηται ταύτ]ηι [συ]νιέναι [.....]αλλ[.....]ή-
μεῖ[ν .....]πονε[(LACUNA OF A FEW WORDS)
μεμ]φόμενος ἢ ἐπαινῶν· ἀλλ' ε[ἰ] μὲν τοῦτο πράττοι, τὸ
[αὐτὸ] ἔργ[ο]ν ἂν εἴη [κ]ατα[λεί]πων ὃ ἐφ' ἡμῶν
αὐτῶν [ποιεῖ] τὴν τῆς αἰτίας πρό[λη]ψιν, ἐν ὧι οὐ μὲν
τὸ δό[γμα ...] μετατεθε[ι]μένο[ς ...] μὴ πρ[..
.....]π[..]τ[.....]ο[(LACUNA APPROX. 45 WORDS)]
τοι[αύτ]ης πλάνης. περικά[τω] γὰρ ὁ τοιοῦτος λόγος τρέπε-
ται, καὶ οὐδέποτε δύναται βεβαιῶσαι ὡς ἐστὶν τοιαῦτα πάντα
οἷα τὰ κατ' ἀνάγκην καλούμενα· ἀλλὰ μάχεταί τινι περὶ αὐτοῦ
τούτου ὡς δι' ἑαυτοῦ ἀβελτερευομένωι. κἂν εἰς ἄπειρον φῆι πάλιν
κατ' ἀνάγκην τοῦτο πράττειν ἀπὸ λόγων ἀεί, οὐκ ἐπιλογίζε-

ται ἐν τῶι εἰς ἑαυτὸν τὴν αἰτίαν ἀνά[π]τειν τοῦ κα[τὰ τ]ρόπον
35 λελογίσθαι εἰς δὲ τὸν ἀμφισβητοῦντα τοῦ μὴ κατὰ τρόπον. εἰ
δὲ μὴ ἃ πο[ιεῖ] ἀπολήγοι [ε]ἰς ἑαυτὸ[ν] ἀλλ' εἰς τὴν [ἀ]νάγ[κην]
τ[ι]θείη, [ο]ὐδ' ἂν ε[..]κα[.....]επ[(LACUNA APPROX.
30 WORDS) εἰ τὸ δι' ἡμῶν] αὐτῶγ καλούμενον τῶι τῆς ἀνάγκης
ὀνόματι προσαγ[ο]ρεύων [ὅ]νομα μό[ν]ομ μετατίθετα[ι]⌈μη⌉δ'
40 ἐπιδίξει ὅτι τοιοῦτό τι ᾧ μοχθηρο[ί εἰσι τύ]ποι προειλ[η]φό-
τες τὸ δι' ἡμῶ[ν αὐ]τῶν αἴτιογ καλ[οῦμεν], οὔτ' ἰδ[ι.....
(LACUNA APPROX. 25 WORDS)] γενέσθαι, ἀλ[λὰ κε]νὸν [καὶ]
τὸ δι' ἀνάγκην καλ[εῖ]ν πρ[ὸ]⌈ς⌉ ὧν φάτε. ἂν δὲ μ[ή] τις τοῦτο
ἀποδείξει, μηδ' ἔχει ἡμῶν [τ]ι συνεργὸν μηδ' ὅρμημα
45 ἀπο[τ]ρέπειν ὧν καλοῦντες δι' ἡμῶν αὐτῶν τὴν αἰτίαν συντε-
λοῦμεν, ἀλλὰ πάντα ὅσ[α] νῦν δι' ἡμῶν αὐ[τῶ]ν ὀνομάζον-
τες τὴν αἰτίαν [εἶναι διαβ]ε[βα]ιούμεθα πράττε[ιν] κατὰ μώ-
ραν ἀνάγκην προσαγορεύων, ὄνομα μόνον ἀμείψει· ἔργον δ' οὐ-
θὲν ἡμῶν μετακοσμήσει, ὥσπερ ἐπ' ἐνίων ὁ συνορῶν τὰ ποῖα
50 κατ' ἀνάγκην ἐστὶν ἀποτρέπειν εἴωθε τοὺς προθυμουμένους
παρὰ βίαν τι π[ρ]άττειν. ζητήσει δ' ἡ διάνοια εὑρεῖν τὸ ποῖον
[ο]ὖν τι δεῖ νομί[ζ]ειν τὸ ἐξ ἡ[μ]ῶν αὐτῶ[ν π]ως [πρ]αττόμε-
νον [μ]ὴ προθυμ[ουμένων πράτ]τειν. οὐ γὰρ ἔχει ἄλ[λο τι οὐ-
θὲν] εἰ μὴ φά[ναι τὸ] ποῖον [κατ' ἀνάγκην] ἐσ[τὶ... (LACUNA
55 APPROX. 12 WORDS)]ξ[..... το]ῦ ὀνό[ματος .... (LA-
CUNA APPROX. 25 WORDS)] μάλιστα ἀδιανοήτων. ἂν δέ τις
τοῦτο μὴ παραβιάζηται, μηδ' αὖ ὃ ἐξελέγχει τε ἢ ὃ εἰσφέρει
πρᾶγμα ἐκτιθεῖ, φωνὴ μόνον ἀμείβεται, καθάπερ πάλαι θρυ-
λῶ. οἱ δ' αἰτιολογήσαντες ἐξ ἀρχῆς ἱκανῶς, καὶ οὐ
60 μ⌈ό⌉[ν]ον [τ]ῶν πρὸ αὐτῶν πολὺ διενέγκαντες ἀλλὰ καὶ
τῶν ὕστερον πολλαπλ[α]σί⌈ως⌉, ἔλαθ⌈ο⌉ν ἑαυτούς, καίπερ ἐν πολ-
λοῖς μεγάλα κουφίσαντες, ε[ἰ]ς τὸ τ[ὴ]ν ἀνάγκην καὶ
ταὐτόματ[ο]ν πάντα α[ἰτι]ᾶσθαι. ὁ δὴ λόγος αὐτὸς ὁ τοῦτο
διδάσκων κατεάγνυτο καὶ ἐλάνθανεν τὸν ἄνδρα τοῖς ἔργοις
65 πρὸς τὴν δόξαν συνκρού[ο]ντα· καὶ εἰ μὴ λήθη τις ἐπὶ τῶν
ἔργων τῆς δόξης ἐνεγείνετο, συνεχῶς ἂν ἑαυτὸν ταράττοντα· ἧι
δ' ἐκράτει τὸ τῆς δόξης κἂν τοῖς ἐσχάτοις π[ε]ριπείπτοντα· ἧ[ι
δὲ] μὴ ἐκράτει στάσεως ἐμπιμπλάμενον διὰ τὴν ὑπεναντιότητα
τῶν ἔργων καὶ τῆς δόξης. τούτων οὖν οὕτως ἐχόντων δεῖ κα[ὶ]
70 περὶ οὗ λέγων ἐξ ἀρχῆς εἰς τὸ ταῦτα παρεκκαθαίρειν ἀφικό-
μην ἀποδιδόναι, μ[ὴ] κακ[όν τι] τοιοῦτ[ο .....

4 π : γ/ζ/ξ/π/τ 18 μόνον 697: om. 1056 21 τό]θ' ἑαυτῶ[ι] ὑπά[ρχοντος] μ[ὴ] ο]ὐ[χ][ὶ 697: [ὑ]πάρχο[ντος..]τη[...μ]ὴ οὐ [± 23]η 1056 (but τη only in *O*) 29 ὁ 1191 : om. 1056 30 f. πάντα οἷα τὰ κατ' ἀνάγκην καλοῦμεν 1056: παν⌈τ⌉' ἀνάγκηγ καλ[ού]μενα 1191 35 f. ἃ πο[ιεῖ] 1056 : om. 697 39 ⌈μή⌉ : δει *O* 1191 43 ⌈ς⌉ : ε *O* 1056

SIGLA

P	=	papyrus Herculanensis (697, 1056, or 1191)
O	=	apographum Oxoniense
N	=	apographum Neapolitanum
αβγ	=	letters read in P, *O*, or *N* of at least one papyrus
⌈αβγ⌉	=	letters no longer legible in any P, but given in *O* or *N* and altered by editor

Other sigla as in Leiden system

«(1-19) From the very outset we always have seeds directing us some towards these, some towards those, some towards these *and* those, actions and thoughts and attitudes, in greater and smaller numbers. Consequently that which we develop — characteristics of this or that kind — is at first absolutely dependent on us; and the things which of necessity flow in through our passages from that which surrounds us are at one stage dependent on us and dependent on beliefs of our own making [.....] of which we never cease to have experiences [...] to rebuke, oppose and reform each other as if the responsibility lay also in themselves, and not just in their congenital make-up and in the accidental necessity of that which surrounds and penetrates them.

(19-59) For if someone were to attribute to the very processes of rebuking and being rebuked the accidental necessity of whatever happens to be present to oneself at the time, I'm afraid he can never in this way understand [.....] while praising or blaming. But if he were to act in this way he would be leaving the very same behaviour which as far as our own selves are concerned creates the preconception of our responsi-

bility. And in that he would at one point be altering his theory, [at another .....] such error. For this sort of account is self-refuting, and can never prove that everything is of the kind called 'necessitated'; but he debates this very question on the assumption that his opponent is himself responsible for talking nonsense. And even if he goes on to infinity saying that *this* action of his is in turn necessitated, always appealing to arguments, he is not reasoning it empirically so long as he goes on imputing to himself the responsibility for having reasoned correctly and to his opponent that for having reasoned incorrectly. But unless he were to stop attributing his action to himself and to pin it on necessity, he would not even [be consistent..... On the other hand,] if in using the word 'necessity' of that which we call our own agency he is merely changing a name, and won't prove that we have a preconception of a kind which has faulty delineations when we call own agency responsible, neither his own [behaviour nor that of others will be affected ....] but even to call necessitation empty as a result of your claim. If someone won't explain this, and has no auxiliary element or impulse in us to dissuade from actions which we perform calling the responsibility for them 'our own agency', but is giving the name of foolish necessity to all the things which we claim to do calling the responsibility for them our own agency, he will be merely changing a name; he will not be modifying any of our actions in the way in which in some cases the man who sees what sort of actions are necessitated regularly dissuades those who desire to do something in the face of force. And the intellect will be inquisitive to learn what sort of action it should then consider that one to be which we perform in some way through our own agency but without desiring to. For he has no alternative but to say what sort of action is necessitated [and what is not. .....] supremely unintelligible. But unless someone perversely maintains this, or makes it clear what fact he is rebutting or introducing, it is merely a name that is being changed, as I keep repeating.

(59-69) The first men to give a satisfactory account of causes, men not only much greater that their predecessors but also, many

times over, than their successors, turned a blind eye to themselves (although in many matters they had alleviated great ills) in order to hold necessity and accident responsible for everything. Indeed, the actual account promoting this view came to grief when it left the great man blind to the fact that in his actions he was clashing with his doctrine; and that if it were not that a certain blindness to the doctrine took hold of him while acting he would be constantly perplexing himself; and that wherever the doctrine prevailed he would be falling into desperate calamities, while wherever it did not he would be filled with conflict because of the contradiction between his actions and his doctrine.

(59-71) It is because this is so that the need also arises to explain the matter which I was discussing when I first embarked on this digression, lest some similar evil [befall us ...».

I have started my quotation of the text at what I take to be a point shortly before the digression begins. Epicurus is arguing (1-8) for our ability to shape our lives. At birth we have a wide range of alternative potentials ('seeds')[15] for character development; *therefore* the way we do in fact develop is dependent on us. The point is no doubt that our future development is not already built into our initial make-up, so that nothing prevents us from determining it ourselves. We are able, particularly by the beliefs which we form, to control the impressions that our immediate surroundings make on us:[16] it is not the surroundings that control us.

[15] It may be suggested that the σπέρμ[ατα (a new reading of the papyri) are atoms. I do not myself believe that prior to Lucretius' poetic use of *semina* any Epicurean or other Greek philosopher (including Anaxagoras: see e.g. M. SCHOFIELD, *An essay on Anaxagoras* (Cambridge 1980), p. 121 ff.) can be shown to use the word in the sense 'elements' or 'elementary particles'. (Epicurus' use of it at *Ep. Pyth.* 89 carries some biological connotation, as his use of ἐπαρδεύσεις in connexion with it shows: he must mean either literally 'seeds' or at any rate complex seedlike particles of some sort: cf. BAILEY, *The Greek atomists and Epicurus*, Oxford 1928, p. 343 f.; A.A. LONG, *Chance and natural law in Epicureanism*, «Phronesis» 22, 1977, pp. 63-87, esp. 77 f.). The one possible exception is Plato, *Tim.* 56 b.

[16] For the technical Epicurean explanation of our power to control our intake of *simulacra*, see Lucretius IV 777 ff. (on the correct order of the lines, see E. ASMIS, *Lucretius' explanation of moving dream figures at 4.768-76*, «AJPh» 102, 1981, pp. 138-45).

It is clear that the deterministic challenge is already in Epicurus' sights, and presumably the determinist's countermove was envisaged in the lines lost between 8 and 15, since Epicurus is replying to it when the text resumes. The determinist was perhaps made to object that we in the end develop in only one direction, and that there must be some cause, either present from the outset or imposed by our environment, to steer us that way. Epicurus' reply (16-19) is that every time we treat others as answerable for their behaviour we imply that they themselves, and *not* their congenital make-up or the constraint of their environment, are responsible. It is an implicit premiss of this that we would not blame others for any characteristic already ineradicably built into their congenital make-up,[17] and this is in fact a point brought out slightly earlier in the text, where Epicurus exploits a contrast between moral agents and wild animals.[18] The reason we do not reprove wild animals for their behaviour, he says, is that we draw no distinction between their congenital make-up and their subsequent developments — meaning, presumably, that their entire future character is determined at birth and therefore beyond their control.

The appeal to praise and blame as conflicting with determinism is a familiar one,[19] and Epicurus is ready for the determinist's reply: yes, of course we rebuke miscreants, but that is because the rebuking process is itself necessitated (19-21).[20] The beginning of Epicurus' next move is lost in the ensuing lacuna, and the fragment at 24-28 is too short to give us much help. It appears to be re-applying the earlier point (16-19) that to issue praise or blame is to imply that the recipient is responsible for his behaviour.[21] I suspect that he is already here embarking upon a self-refutation argument: the determinist cannot indulge in philosophical debate without apportioning the credit between himself and his opponent, and in doing so he will be adopting precisely the kind of critical attitude which leads us to conceive of the self as responsible.

At any rate, from 29 the self-refutation tactic become explicit. This is the earliest survivor in a long line of Hellenistic περιτροπή arguments. Their character has been explored in a pioneering study by Myles Burnyeat,[22] to which my discussion is deeply indebted. The starting point (29-32) is that the determinist refutes himself by arguing his case, since to do so presupposes what he seeks to deny, that his opponent is an autonomous agent responsible for his own foolish views. The determinist of course has an easy retort to this — that his own action in arguing with his opponent is itself causally necessitated. But Epicurus is ready for him (32-35). He envisages an infinite regress in which the determinist, challenged once again for continuing to argue, goes on to explain away his new retort as being itself causally necessitated; and so too with *that* retort, etc. Epicurus' point is not that there is anything vicious about the regress — indeed, there is not — but rather that the determinist

[17] Cf. Arist., *EN* 1114 a 23-5.

[18] ἔτι μᾶλλον ἐνίοτ[ε κ]ακίζομεν, ἐν νουθετητ[ικ]ῶι μέντοι μᾶλλον τρόπω[ι], καὶ οὐχ ὥσπερ [τ]ὰ ἄ[γ]ρια τῶν ζώιων [καθ]αίρομεν μὲν ὁμοίως αὐτὰ τὰ ἀπογεγε[νν]⌈η⌉μένα [κ]αὶ τὴ[ν] σύστασιν εἰς ἕν τι συμπ[λέ]χοντες, οὐ μὴν ο[ὔ]τε τῶι νουθε[τ]ητ[ι]κῶι τρόπωι καὶ ἐπανορθωτικῶι οὔτε τῶι ἁπλῶς ἀ[ντι]ποι[η]τικῶι χρώμεθα [...] (= [34.25] 21-34 Arr. = Diano, p. 38 f.).
«We sometimes vilify it [sc. a self-determining animal] all the more, but more in an admonitory way — and not in the way in which we exonerate those animals which are wild by conflating their developments and their make-up alike into a single thing, and indeed do not use either the admonitory and reformatory mode or the simply retaliatory mode». Three passages in particular have blocked the recognition of τὰ ἀπογεγεννημένα as 'developments'. One is [34.17] 1-3 Arr.; but there I have found that the termination -ων in line 3 has been corrected by the scribe to -α. The other two are *ibid.* 20.11-12 and 24.4-5, on which see Arrighetti's commentary, p. 269; but I do not believe that we are obliged to construe the genitives there as Arrighetti does. Fuller discussion of this must await my planned edition of the book.

[19] Cf. *Ep. Men.* 133; Diogenes of Oenoanda 32.3.9 ff.

[20] Alternatively, the determinist may be arguing that he blames people in order to *necessitate* certain changes in their behaviour. The drawback of that interpretation is that 'accidental' necessity would be a rather inappropriate expression. Cf. also R. Sorabji, *Necessity, cause and blame* (London 1980), p. 87.

[21] The fragment, omitted altogether from previous editions, contains a new instance of πρόληψις, on whose use as a criterion see below. αἰτίας must, I suppose, be closely linked in sense with ἐφ' ἡμῶν αὐτῶν (= *our own* responsibility).

[22] M.F. Burnyeat, *Protagoras and self-refutation in later Greek philosophy*, «Philosophical Review» 75 (1976), pp. 44-69.

cannot save himself by resorting to it, since *at every step* it is contradicted by his behaviour: at every step he is both asserting universal necessitation and apportioning the philosophical credit between himself and his opponent, as if both were agents capable of making up their own minds. Hence he fails to use empirical reasoning (ἐπιλογισμός, 33 f.);[23] his account *never* finds empirical confirmation in his own practical attitudes. The final sentence of this section (35-37) seems to be embarking on the argument that if the determinist is to restore consistency he must eventually halt the regress and cease to claim the credit for reasoning correctly. And once he does that it is indeed hard to see what grounds he could have left for believing his thesis to be correct.

The opening challenge, περικάτω ... ὁ ... λόγος τρέπεται, is peculiar Epicurean jargon for what other philosophers came to express as περιτρέπεται. Determinism 'refutes itself'. As Burnyeat has beautifully demonstrated, there is a close parallel at the start of Lucretius' anti-sceptic argument, where the sceptic who claims that nothing is known is a man who (IV 472) «has stood with his own head where his feet belong» — clearly Lucretius' imaginative rendering of περικάτω τρέπεται.[24] Indeed, 'turn a somersault' could conceivably be the metaphor underlying Epicurus' choice of term. In both passages it is a pragmatic self-refutation that is envisaged.[25] There is no internal logical inconsistency in either the sceptic or the determinist position. But to *defend* scepticism is to presuppose that the premisses of one's arguments are known; and to defend determinism is to treat the parties to the debate as undetermined agents.

[23] For the meaning of this term, see my *Epicurus, On nature, Book XXVIII*, «CErc» 3 (1973), pp. 5-83, pp. 27-34.

[24] M.F. BURNYEAT, *The upside-down back-to-front sceptic of Lucretius IV 472*, «Philologus» 122 (1978), pp. 197-206.

[25] I once felt that for this reason the anti-determinist passage would work better if the self-refuting λόγος were not just a thesis, as BURNYEAT takes it, but an 'argument'. Arguments in Hellenistic philosophy do not just exist, they 'are asked', so that an argument which could not be argued — dialectically maintained — would indeed be a contradiction in terms. But at *SV* 40 our passage is pithily summarised as follows: ὁ λέγων πάντα κατ' ἀνάγκην γίνεσθαι οὐδὲν ἐγκαλεῖν ἔχει τῷ λέγοντι μὴ πάντα κατ' ἀνάγκην γίνεσθαι. αὐτὸ γὰρ τοῦτό φησι κατ' ἀνάγκην γίνεσθαι. Here λέγων, which corresponds to λόγος, indicates mere assertion and not argument. (Epicurus' is the first in a long line of self-refutation arguments against determinism: for a critique, see P.S. CHURCHLAND, *Is determinism self-refuting?*, «Mind» 90, 1981, pp. 99-101).

The next stage of the argument runs from 38 to 59. Once again it has a close parallel in Lucretius, who at IV 473-7 asks of the sceptic, «Given that he has never before seen anything true in the world, how does he know what knowing and not knowing are? What created his preconception of true and false, and what proved to him that the doubtful differs from the certain?». Here we have an appeal to the two closely related standards of preconception (πρόληψις, Lucretius' *notitia*) and word meaning. The sceptic's ability to use the words 'know' and 'not know' significantly presupposes that he possesses the preconceptions of 'true' and 'false', 'doubtful' and 'certain', since 'true' and 'certain' feature in the definition of 'know'. This conflicts with his claim to have had no experience of truth and certainty, for without that experience he could not have acquired the preconceptions.

The *On nature* argument also appeals to preconception and word meaning (38-41), but on different grounds. One is reminded of the Epicurean dictum that some inquiries are about things while others are about mere words.[26] Since the determinist refuses to behave in accordance with his doctrine, Epicurus now feels entitled to conclude that he is not making any claim about the world but is merely renaming as 'necessity' the very same thing which we normally call 'our own agency'. This is then expressed in terms of preconception. Our preconception of our own agency is of something with its own causal efficacy. The determinist, to make his claim a substantive one, would have to show that the preconception is a faulty one.

This is an excellent new example of the Epicurean appeal to preconception as a criterion. Underlying our use of each word is a preconception, embodying a generic delineation (τύ-

[26] D.L. X 34.

πος, D.L. X 33) of the type of thing named, and, being the cumulative product of experience of things of that kind, a prime source of empirical information about them. If, then, the determinist is to succeed in altering our preconception of our own agency, he is obliged to show us precisely how its delineation has failed to convey the facts. Elsewhere (*Ep. Men.* 123-4) Epicurus himself undertakes a similar task in arguing that the alleged preconception of the gods as concerned with human affairs is defective, and this requires (a) showing that it conflicts with some more fundamental or secure preconception, that of the gods as blessed (*Ep. Hdt.* 76-7; Plutarch, *Stoic. repugn.* 1051 e, *Comm. not.* 1075 e), and (b) explaining how the faulty conception arose (Lucretius V 1183 ff.). No doubt the point of Epicurus' remark in 39-41 is that the determinist has no comparable arguments at his disposal.

In the next stage (43-51), I take it that the «auxiliary element or impulse in us» (44) is the «cause within us» (17) which Epicurus upholds but the determinist denies. By denying it, the determinist gives up the hope of ever dissuading us from any of our actions, and so once again his argument is about mere words, without any hold on reality. In this he is contrasted with someone who makes the correct distinction between necessitated and unnecessitated actions, and who consequently *can* dissuade us from resisting compulsion. An example may make some sense of this. It is necessary that everybody should die, and someone who understands this can dissuade an old man from vainly seeking immortality. But he can only do this because he appreciates that certain other things are up to us. If he attributed everything to necessity, he could not consistently even try to dissuade the old man, since he would have to regard his desire for immortality as itself necessitated and not up to him at all.

In this argument Epicurus underestimates the resilience of the determinist, who might regard his fellow men as automata and still, without inconsistency, try to modify their behaviour, regarding his own exhortation as just another in the set of causal factors that will determine it. But the next point is a rather

more penetrating one (51-54). The determinist's blanket application of 'necessity' to all kinds of event leaves him unable to characterise those 'mixed' actions which we reluctantly choose to perform in avoidance of some greater evil. These, he seems to mean, can only be understood by someone able to distinguish the voluntary from the compulsory elements in them. Here, as in the preceding lines, we can glimpse Epicurus' reasons for stressing in the *Letter to Menoeceus* (133-5) the ethical value of properly grasping the differences between necessity, chance, and 'that which depends on us'.

After a brief reiteration of the second section's main point (56-59),[27] the third section opens (59-63) with a most interesting comment on the founders of atomism, Leucippus and Democritus.[28] They are revered as the greatest exponents of αἰτιολογία,[29] but are nevertheless criticised for their thesis of universal necessitation, which they were only able to maintain by turning a blind eye to themselves. This last phrase implies a recognition on Epicurus' part of the value of introspection as a counterweight to determinism. It is perhaps comparatively easy to

[27] τε in line 57 looks indefensible, and should probably be emended to γε (which has hitherto been reported as P's actual reading). In line 58, where I read φωνή, Marcello GIGANTE, who presents a section of this text at p. 58 f. of his important new book *Scetticismo e epicureismo* (Napoli 1981), reads φων[ῆ]ι, and translates «risponde solo a parole». Both restorations, according to my notes on the papyri, are palaeographically possible (although I would print φων[ῆ]ι), but my own choice is governed by Epicurus' comment that this is a point he has already made more than once — an allusion to lines 39 and 48.

[28] There is a longstanding debate as to the correct construal of 61-63; see now A. LAKS, *Une légèreté de Démocrite*, «CErc» 11 (1981), pp. 19-23. In my translation I follow the entirely convincing interpretation of G. ARRIGHETTI, *Un passo dell'opera Sulla Natura di Epicuro, Democrito e Colote*, «CErc» 9 (1979), pp. 5-10. For the absolute use of λανθάνειν ἑαυτόν he cites Plato, *Philebus* 19 c. My only alterations to the current readings of the text are πρὸ αὐτῶ[ν] for προ[τέ]ρω[ν] (60) and ε[ἰ]ς for ἐν/ ἓν (101). The latter renders GIGANTE's very ingenious handling of the text (op. cit., p. 56 ff.) unnecessary; a final choice between the two readings cannot, in the present state of the papyrus, be made on palaeographical grounds alone, but I hope that my version will commend itself on linguistic grounds too.

[29] Cf. Democritus' remark (68 B 118 DIELS-KRANZ) that he would rather find one αἰτιολογία than win the kingdom of the Persians.

think of others as automata, but our power to control our next action and to falsify predictions about our behaviour makes it hard to see how determinism can be true of ourselves.[30]

Leucippus and Democritus are certainly not spared altogether. But neither do they bear the full brunt of the attack. The main target down to 59 has been an unspecified determinist who consciously places all human behaviour, his own included, within the scope of his theory. Leucippus and Democritus are mentioned in primarily historical terms as great forerunners who unfortunately failed to notice their deterministic theory's implications for their own conduct.

As the argument proceeds (63-69), the spotlight falls more directly onto Democritus, for it must be he who is meant by τὸν ἄνδρα in 64. There is a well established Epicurean use of ἀνήρ (or *vir*) in the sense 'great man'. Epicurus uses it of his philosophical predecessors,[31] though not of contemporary opponents, and later Epicureans extended its application to the founders of the Epicurean school.[32] Democritus appears as 'Democritus vir' both times that his views are cited by Lucretius.[33] So the singular τὸν ἄνδρα appears to indicate that he now has Democritus principally in mind (after all, he is supposed to have doubted Leucippus' existence).

In what follows, the practical consequences of seriously maintaining the determinist doctrine are spelt out: a clash between theory and practice, leading to continual perplexity. Once again there is a close parallel in Lucretius IV 500-21, where the disastrous practical consequences of scepticism for everyday life are spelled out. Similarly here, obedience to the doctrine would have led Democritus into one calamity after another (no doubt because he would have given up making decisions and let

[30] Cf. G. RYLE, *The concept of mind* (1949), p. 196 f.

[31] [26.44] 22; [29.18] 1 (?), [26] 14 ARR.

[32] See Francesca LONGO AURICCHIO, *La scuola di Epicuro*, «CErc» 8 (1978), pp. 21-37.

[33] Lucr. III 371; V 622. Cf. A.E. HOUSMAN, *Classical papers* (ed. J. DIGGLE and F.R.D. GOODYEAR, Cambridge 1972), III, p. 906.

necessity have its way), while disobedience to it would have left him bewildered by his inability to match the deed to the word (63-69).

In Book XXVIII of the *On nature* Epicurus had outlined his ideas for a brand of empirical reasoning (ἐπιλογισμός) not entirely unlike some modern pragmatist theories of truth, whereby the truth or falsity of a doctrine was to be established by examining its practical consequences. Our passage could be seen as an application of this method, with the peculiarity that the consequences listed are purely hypothetical. Democritus, as he stresses with two uses of λανθάνειν and one of λήθη, was unaware of the conflict because he conveniently forgot the doctrine when it came to acting.

We are now ready to turn to the all-important question: who is Epicurus' target? I have spoken throughout of the 'determinist' opponent, who is said to hold that all things are necessitated. But that might, on the face of it, be interpreted as a physical, a logical, a psychological, or even a theological thesis, or as some combination of these. Indeed, the determinism which Chrysippus later developed on behalf of the Stoics amalgamated all four types. Hence there has been a frequent tendency to see the early Stoics as Epicurus' determinist target. But I think this must be mistaken. Zeno and Cleanthes were certainly enthusiastic partisans of 'destiny' (εἱμαρμένη), but there is no evidence that to them this was ever anything more than the popular view of destiny as a divine force predetermining the eventual outcome of every story, while leaving it up to the individual whether to resist or submit. They viewed the scheme as a providential one which supplied the proper context for man's exercise of his moral faculties. And Cleanthes, at least, was a declared opponent of the Master Argument, which was being used in his day as a formal proof of universal necessitation.[34] Even allowing for the possibility of misrepresentation

[34] *SVF* 1.489. Zeno's simile of man as the dog tied to a cart who must follow willy-nilly (*SVF* 2.975), later adopted by Chrysippus, implies the view of destiny as determining outcomes alone. So does Cleanthes, *SVF* 1.527. It was Chrysippus

on Epicurus' part, there seems no way that he could have conjured up out of the Stoa his hard determinist foe who is ready to attribute everything, his own states of mind included, to 'accidental' or 'foolish' necessity. The thesis envisaged is clearly one based on physical causation;[35] and when Epicurus attacks 'destiny' in the *Letter to Menoeceus* (134) he specifies it as the doctrine not of the Stoics but of the 'natural philosophers'.

The sort of determinism best suited to be his target is the kind of thesis sometimes called 'mechanism', the entirely serious view that human behaviour can, like everything else, be exhaustively accounted for in terms of material changes (chemical and neurophysiological changes in the modern theory, atomic changes in the ancient), and that talk of 'intention', 'desire', etc. is superfluous, with no additional descriptive or explanatory force. Norman Malcolm[36] has criticised such theories as self-refuting with considerations very like those advanced by Epicurus, for example that a mechanist would have to deny that he had any rational grounds for asserting anything, including his own theory. Such a doctrine seems to be exactly what Epicurus himself is grappling with, especially in his own self-refutation argument, in 44 f. where he takes it for granted that the opponent has denied himself the right to appeal to any purposive element within us, and in his disparaging talk of 'accidental' and 'foolish' necessity (18-20, 47 f., cf. 62 f.).

Who could be the perpetrator of this mechanistic theory? We have seen Democritus exonerated from the main burden of guilt. Reading between the lines, one might take the real opponents to be the later followers with whom the first atomists are favourably contrasted in 59-61.[37] The same possibility seems implicit in some remarks of Diogenes of Oenoanda, who attacks not Democritus himself but those who adopt Democritus' thesis of universal necessitation unmodified by the Epicurean swerve.[38]

In confirmation of this, we can return to the close and apparently conscious parallelism between Epicurus' treatments of determinism and scepticism. The sceptics refuted in Lucretius IV must be, or prominently include, those fourth-century Democriteans like Metrodorus of Chios, Anaxarchus, and even Epicurus' own reviled teacher Nausiphanes, who had played up the sceptical side of Democritus' thought, and against whom Epicurus was eager to marshall the positive empiricist arguments which Democritus had also bequeathed.[39] This scepticism was the result of what I shall call *reductionist* atomism. Because phenomenal objects and properties seemed to reduce to mere configurations of atoms and void, Democritus was inclined to suppose that the atoms and void were real while the phenomenal objects and properties were no more than arbitrary constructions placed upon them by human cognitive organs.[40] In his more extreme moods Democritus was even inclined to doubt the power of human judgment, since judgment was itself no more than a realignment of atoms in the mind (ἐπιρυσμίη).[41]

who at some stage added to this picture a theory of internal causal determination of attitudes (and even he may have hesitated to call this destiny — Cicero, *Fat.* 41-3). Ancient doxography makes Chrysippus the author of Stoic determinism, and as far as I can tell it is right. Cf. the material collected by R.W. SHARPLES, *Necessity in the Stoic doctrine of fate*, «SO» 56 (1981), pp. 81-97.

[35] An explicit allusion to the self-refutation argument, in an unnumbered book of *On nature* ([35.11] 1-5 ARR.), has the opponents «making everything be caused by the preceding motion».

[36] N. MALCOLM, *The conceivability of mechanism*, «Philosophical Review» 77 (1968), pp. 45-72.

[37] The comment has a very close parallel at Lucr. I 734 ff., where the great Empedocles is contrasted with his 'inferior' pluralist successors. The parallel confirms that the inferior successors of Leucippus and Democritus are their philosophical heirs, not just later philosophers in general.

[38] Diogenes of Oenoanda 32.2.3 — 3.9. I mean that Diogenes' Epicurean source may well have been attacking specific Democritean philosophers, not that Diogenes himself is consciously doing so. FURLEY, *Two studies* (see note 1 above), p. 174 f., has already suggested that Nausiphanes rather than Democritus may be Epicurus' target.

[39] Especially Democritus 68 B 125 DIELS-KRANZ.

[40] Id. *ap.* Plut., *Adv. Col.* 1110 e (cf. 68 B 9, 125 DIELS-KRANZ).

[41] Id. 68 B 7; cf. B 9. The argument is essentially that of J.B.S. HALDANE, *Possible worlds* (London 1927), p. 209: «If my mental processes are determined wholly by the motion of atoms in my brain, I have no reason to suppose that my beliefs are true ... and hence I have no reason for supposing my brain to be composed

Epicurus' response to this is perhaps the least appreciated aspect of his thought. It was to reject reductionist atomism. Almost uniquely among Greek philosophers he arrived at what is nowadays the unreflective assumption of almost anyone with a smattering of science, that there are truths at the microscopic level of elementary particles, and further very different truths at the phenomenal level; that the former must be capable of explaining the latter; but that neither level of description has a monopoly of truth. (The truth that sugar is sweet is not straightforwardly reducible to the truth that it has such and such a molecular structure, even though the latter truth may be required in order to explain the former). By establishing that cognitive scepticism, the direct outcome of reductionist atomism, is self-refuting and untenable in practice, Epicurus justifies his non-reductionist alternative, according to which sensations are true and there are therefore *bona fide* truths at the phenomenal level accessible through them. The same will apply to the πάθη, which Epicurus also held to be veridical. Pleasure, for example, is a direct datum of experience. It is commonly assumed that Epicurus must have equated pleasure with such and such a kind of movement of soul atoms; but although he will have taken it to have some *explanation* at the atomic level, I know of no evidence that he, any more than most moral philosophers or psychologists, would have held that an adequate *analysis* of it could be found at that level. Physics are strikingly absent from Epicurus' ethical writings, and it is curious that interpreters are so much readier to import them there than they are when it comes to the moral philosophy of Plato or Aristotle.[42]

of atoms». (I think it was Bob Sharples who first drew my attention to this passage).

[42] Put technically, the point is that pleasure is a σύμπτωμα of a person's constituent atoms (Demetrius Lacon ap. Sext. Emp., *Adv. Math.* X 225-6), and that συμπτώματα themselves exist only at the phenomenal level, not at the microscopic (Epic., *Ep. Hdt.* 70-1). Cf. LONG, art. cit. (note 15 above), for an objection to physical interpretations of *Ep. Men.* 133-5.

The metaphysical status of phenomenal properties, states of mind, etc. is that of accidental properties of groups of atoms.[43] That is, they cannot exist independently of the atoms. But the common assumption that they *are* just patterns of atomic motion does not follow from this, and is ruled out by Epicurus' epistemology. Sensations, which come out always true on his account, never report patterns of atomic motion, since atoms are imperceptibly small.

Cognitive scepticism is not the only outcome of reductionist atomism. Another is determinism. If human judgments, impulses and emotions just *are* the mechanical bouncing around of atomic billiard balls in the mind, there seems no room for individual self-determination or responsibility. This is precisely the mechanistic brand of determinism which we have already seen reason to identify as Epicurus' target. And his treatment of it, we have also seen, consciously parallels his treatment of scepticism. By showing it to be both self-refuting and untenable in practice, he justifies the level of description used elsewhere in the same book of *On nature*, one which allows for a rational autonomous self with its own judgments and impulses, none of these being straightforwardly reducible to motions of a person's constituent atoms.

This parallelism makes the conclusion irresistible that Epicurus' primary motivation was in both cases the need to rescue the atomistic tradition with which he had aligned himself from the internal rot of reductionism. I know of no direct evidence for mechanistic determinism in fourth-century Democriteans, but it is only too easy to see how, as reductionist atomists, they would have arrived at it, and an argument from silence is hardly admissible when dealing with men whose voluminous writings have left scarcely a trace in our sources. It is indeed possible that the view was still maintained by some of Epicurus' own disciples. For in one unfortunately fragmentary passage of the anti-determinist argument (42 f.) he can be seen using the

[43] Lucr. I 449-58; Epic., *Ep. Hdt.* 68-73.

second person plural, 'you say'.[44] The *On nature* was a school lecture course,[45] in which Epicurus sometimes sorted out differences with his own pupils. We have an example in Book XXVIII, in whose fragments Metrodorus is directly addressed in the second person, and gently criticised for his earlier views, in terms which show how much debate within the school was contributing to the evolution of Epicurus' own ideas.[46] If mechanistic determinism had found a foothold inside Epicurus' own school, his concern to repudiate it becomes all the more understandable.

I have mentioned that the *On nature* book does in fact employ a non-reductionist psychology. There is no room here for a general examination of the book's content (indeed, I have not yet quite completed my reading of the papyri). But one stretch of the text can be quoted for its quite explicit assertion of non-reductionism.[47]

γί]νεσθαι κατὰ τὸν π[ρ]οειρημένον τρόπον καὶ τῶν [α]ὐτῶν ἀπ-
εργαστικὰ εἶναι· πολλὰ δὲ καὶ τῶνδε καὶ τῶνδ[ε φ]ύσιν ἔχοντα ἀ-
περγαστικὰ [γί]νεσθαι δι' ἑαυτὰ οὐ γίνεται ἀπ[ε]ργαστικὰ οὐ
διὰ τὴν αὐτὴν αἰτία[ν] τῶν τε ἀτόμων καὶ ἑαυτῶν· οἷς δὴ καὶ
μάλιστα μαχόμεθα καὶ ἐπιτιμῶμεν, μ[ι]σοῦντες κατὰ τὴν ἐξ
ἀρχῆ[ς] ταραχώδη φύσιν ἔχοντα καθ[ά]περ ἐπὶ τῶν
πάντων ζώιων. οὐθὲν γὰρ αὐτοῖς συνήργηκεν εἰς ἔνια ἔργα
τε καὶ μεγέθη ἔργων καὶ διαθέσεων ἡ τῶν ἀτόμων φύσις, ἀλλ'
αὐτὰ τὰ ἀπογεγεννημένα τὴν πᾶσα[ν ἢ] τὴν πλε[ίσ]την
κέ[κτ]ητ[αι] αἰτίαν τῶνδέ [τι]νων. ἐκ δ' ἐκ[ε]ίνης [ἔν]ιαι τῶν
[ἀ]τόμων κινήσεις ταραχώδε[ις] κ[ινο]ῦνται, οὐχὶ δὲ τὰς ἀτ[ό-
μου]ς [.] πάντως [.....]ν[.....] πιπτον [.....
.....]έχοντος [(LACUNA APPROX. 45 WORDS)]σεσθαι μαχό-
μεν[οι πο]λλοῖς ἅμα τῶν ἀν[θρώ]πων καὶ νουθε[τοῦν]τες, ὃ

[44] ὑμε[ῖς also occurs in the fragmentary final sentence of the book (not reported in DIANO's text).

[45] *Nat.* XXVIII, fr. 13 col. XIII 7-8 sup. (in ed. cited note 23 above).

[46] See op. cit. (note 23 above), p. 43, 45 f., 48, 56. For other cases of Epicurus' pupils stepping out of line, see my *Epicurus and the mathematicians of Cyzicus*, «CErc» 6 (1976), pp. 23-54, pp. 27 f., 46.

[47] = [34.21-2] ARR. (DIANO, *Epicuri ethica*, pp. 31-3).

τῆι τοῦ αὐτο[ῦ τρό]που κατ' ἀνάγκην α[ἰτ]ία[ι] ὑπεναντίον ἐσ- 15
τίν, οὕτως ἐπειδὰν ἀπογεννηθῆ τι λανβάνον [τι]νὰ [ἑ]τε-
ρότη[τα τῶν] ἀτό[μ]ων κατά τινα τρόπον διαληπτικόν, οὐ
τὸν ὡς ἀφ' ἑτέρου δ[ι]αστήματος, ἰσχάνε[ι] τὴν ἐξ ἑαυ[τοῦ] αἰ-
τίαν, εἶτα [ἀν]αδίδ[ωσι] εὐθὺς μέχρι τῶν [πρ]ώτω[ν] φύσεων
καὶ [κ]αν[όνα π]ᾶσαν αὐτὴ[ν] ποιεῖ. ὅθεν δὴ καὶ οἱ μὴ δυνά- 20
μενοι κατὰ τρόπον τὰ τοιαῦτα διαιρεῖν χειμάζουσιν αὐτοὺς
περὶ τὴν τῶν αἰτιῶν ἀπόφασιν· καὶ τού[των ἐ]π' αὐτῶν τοῖς
[μ]ὲν μᾶλλο[ν τοῖς δ' ἧ]ττον μαχ[όμε]θα καὶ ἐ[πιτιμ]ῶ-
μεν κα[.....]εννο[

16 τι : [τ]ι P 697 : [..] P 1056 : το *O* 1056 17 f. [ἑ]τερότη[τα - τινα 697 : om. 1056

«(2-12) But many naturally capable of achieving these and those results fail to achieve them, because of themselves, not because of one and the same responsibility of the atoms and themselves. And with these we especially do battle, and rebuke them, hating them for a disposition which follows their disordered congenital nature[48] as we do with the whole range of animals. For the nature of their atoms has contributed nothing to some of their behaviour, and degrees of behaviour and attitudes, but it is their developments which themselves possess all or most of the responsibility for certain things. It is as a result of that nature that some of their atoms move with disordered motions, but it is not on the atoms that all [the responsibility should be placed for their behaviour].

(16-22) ... thus when a development occurs which takes on some distinctness from the atoms in a transcendent way — not in the way which is like viewing from a different distance — he acquires responsibility which proceeds from himself; then he straightaway transmits it to his primary substances and makes the whole of it into a yardstick.

[48] Taking ἔχοντα as the verbal counterpart of ἕξις, «being disposed (in such and such a way)». But other construals are possible, and one may also share DIANO's suspicion that σύστασιν has fallen out after ἀρχῆ[ς].

That is why those who cannot correctly make such distinctions confuse themselves about the adjudication of responsibilities».

This passage seems to be using Epicurus' contrast between wild animals, whose misbehaviour we hate but do not blame, and self-determining animals (including humans), whose misbehaviour we both hate and blame.[49] The latter's failures are caused by themselves — selves which are *not* identical with their constituent atoms (2-4).[50] Or, as he puts it in the next sentence, the nature of their atoms does not contribute to certain of their actions and dispositions: rather, these are caused mainly by certain characteristics which they develop (7-10). Atomic make-up may be responsible for disorderly motion in their mind atoms (10-11),[51] but it does not follow that they cannot make decisions which override those motions. One is reminded here Lucretius' insistence that even though the atomic composition of the mind at birth determines an animal's natural temperament, nothing prevents our learning to overcome that temperament.[52] Even the natural coward, Epicurus would say, can use his rationality to learn courage.

Shortly after the lacuna, the relationship of 'developments' to the self's responsibility is amplified. Implicitly, at birth we *are* just atomic mechanisms. The self becomes responsible as soon as the animal develops a certain type of characteristic

[49] Cf. text quoted in note 18 above. It is not clear what the hallmark of a 'wild' animal is, but it is a good bet that the term covers the same ones as are picked out in *RS* XXXII as incapable of forming a social contract and hence beyond the realm of justice and injustice. The comparison with *RS* XXXII (as also that with Lucretius II 251-93) supports my assumption that ζῷα are the unspecified neuter subject. Cf. also P.M. Huby, *The Epicureans, animals, and freewill*, «Apeiron» 3 (1969), pp. 17-19.

[50] For another Epicurean appeal to the non-identity of our conscious selves with our constituent atoms, see Lucretius III 847-61.

[51] Glenn Most has persuaded me that it is more natural to take ἐκ[ε]ίνης (10) as referring back to φύσις (8) than to αἰτίαν (10), as I originally thought. (On the latter reading 10-12 would be making almost the same point as 18-20).

[52] Lucr. III 288-322.

over and above his atomic make-up (16-19). The distinction between the characteristic and the atoms must be of a 'transcendent' (literally 'separative') kind, not just a difference of scale. The point, I think, is that all things have certain phenomenal properties, for example colours, over and above their constituent atoms, but that that kind of difference is primarily one between microscopic and macroscopic analysis; whereas the sort of moral characteristics required in a responsible agent over and above his constituent atoms are ones which differ from the underlying atomic configurations in a much more radical way. No doubt the nature of this difference was more fully discussed in the earlier, lost part of the book. But it seems clear that what is envisaged has much in common with the modern notion of 'emergence'. In Epicurus' view matter in certain complex states can take on non-physical properties which in turn bring genuinely new behavioural laws into operation.

Once the agent has achieved responsibility, he adds (19 f.), this does then leave its mark upon his constituent atoms, and becomes a 'yardstick' (the reading is very conjectural, however). This, I suppose, would be a pattern of atomic motion regulating his future behaviour. When the natural coward learns through rational reflexion to adopt brave attitudes, this will in turn have a stabilizing influence on his disorderly soul atoms, and he may no longer even suffer the physical sensations of fear.

Many details remain obscure, but the non-reductionist approach is both plain and deliberate. The developed self is not the plaything of its constituent atoms, but a power capable of controlling them. And as he says (20-22), without this distinction between atomic and psychological levels of truth the issue of responsibility becomes hopelessly confused.

It may be objected that the self and its mental states, being secondary properties parasitic on configurations of atoms, could not possibly control the motion of those configurations. Epicurus might offer two answers. The first is that somehow his thesis must come out true, because its negation is mechanistic determinism, which is self-refuting. The other is that there is no reason in principle why secondary properties of configurations

of atoms should not affect their motions. After all, the density of a stone is a mere secondary property of its constituent atoms, yet is capable of determining that the stone will move down when it is dropped in water, where a leaf or a piece of wood would remain at the surface. Although the motion of a single atom is fully accountable for in terms of primary physical laws, it seems perfectly correct to invoke secondary properties as causes of the corporate behaviour of atomic compounds.

3. The Swerve Again

The swerve is not mentioned in the surviving fragments of the *On nature* book. And, given the above understanding of Epicurus' purpose in that book, it is easy to see why. The swerve, if established, could not so much as dent the armour of the reductionist atomist. Even if he *were* persuaded to reduce human behaviour to the undetermined, instead of the determined, motions of atoms, there would be no more room for an autonomous self over and above a person's constituent atoms than there had been on the fully deterministic account.

Indeed, the standard reductionist interpretation is precisely what has always made it hard to see how Epicurus expected the swerve to help him. But once the self is recognised to be, for Epicurus, an independent causal factor, it is possible to re-examine the evidence with new insight. According to Cicero, Epicurus introduced the swerve

> «because he feared that, if an atom was always carried along by natural and necessary weight, nothing would be up to us, since the mind would be moved in whatever way it was compelled by the motion of atoms» (*Fat.* 23).

On the old reductionist assumption this contrast between 'us' and the mind's atoms must have looked misconceived. But now Cicero can be seen to be stating a thoroughly plausible explanation of the swerve. The stone analogy offered above fails to deal with one crucial feature of Epicurus' doctrine, that the causal influence which emergent properties, like the self and its volitions, exert upon the atoms of which they are properties should be one which can transcend the purely physical laws of atomic motion and bring about motions which these atoms would probably not have followed if left to their own devices. Yet that is what Epicurus appears to hold when he drives a wedge between causation by the self and causation by the atoms, and indeed any weaker interpretation of the doctrine will reduce psychological states to supervenient consequences of atomic motions and return Epicurus to the clutches of mechanism. The difficulty about seeing how the laws of atomic motion could be so transcended arises from the supposition that they are all-embracing laws sufficient in themselves to determine the outcome of any process, thus rendering extraneous explanatory factors powerless to intervene and threatening to make us helpless spectators of our bodies' actions. What more natural, then, than that Epicurus should conclude that physical laws are *not* in themselves sufficient to determine outcomes? And the swerve is just the most economical realisation of that conclusion, a minimal factor of absolute chance,[53] introducing too little indeterminacy to upset the observed regularities of natural processes, but enough to prevent the mind's atoms from moving along predetermined grooves from which our volitions would be powerless to dislodge them.

It will not be so much the actual occurrence of swerves that matters as the mere possibility of their occurrence. A free-moving atom at any given moment has several possible trajectories to follow — one being the continuation of its current trajectory, the others being immediately adjacent parallel trajectories.[54] This might at first appear merely to widen the pre-

[53] I am fully persuaded by LONG (art. cit., note 15 above) that the swerve has no important macroscopic 'chance' effects outside cosmogony and volitional acts. The association of it with chance in Philodemus, *Sign.* 36.7-17, and possibly in Plutarch, *Soll.an.* 964 c, may simply be an overinterpretation of the fact that it *is* a kind of chance.

[54] For the mathematics of the swerve, see my article cited in note 46 above, p. 25 f., and ENGLERT, op. cit. chapter 2.

determined groove within which the atom must move. But all the way along each of the possible trajectories further possible trajectories will branch out, owing partly to the possibility of further swerves and partly to the various possibilities for collisions, themselves partly dependent on the unpredetermined behaviour of other atoms. The effect is an indefinite proliferation of possible trajectories which does not just widen but totally erases the deterministic grooves, yet still leaves an overwhelming probability that the atom's actual trajectory between one collision and the next will be a close approximation to a rectilinear one.

It might be wise to stop there, and to say that once the deterministic grooves have been obliterated our volitions are free to redirect our mind atoms as they choose. But are they then free to exceed the rules for swerves, for example by diverting an atom at an angle of ninety degrees from its original path? There is no need to suppose so. It is sufficient that a volition should obtain its leverage on a mind atom by determining whether the atom goes straight ahead or adopts one or other of the available swerve trajectories. This may at first sight appear to be ruled out by the tradition that swerves are uncaused. In fact, though, causelessness is expressly reported as a feature of the theory not stated by Epicurus but alleged by his opponents to be an unwelcome implication of it.[55] No doubt the implication has some truth in it, for at any rate in the swerve's cosmogonic function (on which these hostile sources usually concentrate) there can be absolutely no cause of the atom's following this rather than that of the available trajectories. But all that Epicurus needs to hold is that there is no *physical* cause of its choice between the possible trajectories. And volitions must be counted as non-physical causes,[56] for they are never listed alongside blows, weight and swerves as causes of atomic motion by the sources on Epicurean

[55] Cic., *Fat.* 18, 22, 46-8; Plut., *An. procr.* 1015 c. Only Cic., *Fin.* I 19 makes causelessness part of Epicurus' own formulation of the doctrine.

[56] Cf. [34.32] 21-5 ARR., where 'our own agency' is implicitly a non-physical cause.

physics. On this interpretation, then, Epicurus would hold that the laws of physics determine no more than the approximate trajectory of an atom. At any given moment it has a number of possible paths to follow, and as far as physics is concerned there is no cause of its following one rather than another. Normally, then, its choice of path will be random. But in the special case of animate beings there are also non-physical causes of motion, volitions, and these operate not by overriding the laws of physics but by choosing between the possibilities which the laws of physics leave open. At an extreme, an atom might in this way be moved far from its original path by a long series of swerves, or a large number of atoms might be simultaneously diverted — statistically improbable events according to the laws of physics alone, but still intrinsically possible ones, which volition could therefore be held to bring about.

There are enough modern parallels to show that, right or wrong, such theories are tempting to adopt. The basic idea that physical indeterminism somehow removes an obstacle to the exercise of free will has had many advocates,[57] and has at times looked like acquiring the status of a 'safe' position. For example:

«The bearing of this [physical indeterminism] on the problem of freewill has been widely and rather confusedly discussed, but perhaps all that can be said with any certainty at present is that there can now be no objection on the part of physics to the belief that human actions are not mechanically determined» (M.B. Hesse, *Science and the human imagination*, 1955, p. 78).

More specifically, the very theory which I have attributed to Epicurus was proposed by the physicist Sir Arthur Eddington within a year of Heisenberg's publication of the Uncertainty Principle:[58]

[57] Notably A.H. COMPTON, *The freedom of man* (1931 lecture, publ. New Haven 1935); K. POPPER, *Of clouds and clocks* (St. Louis 1966); D. WIGGINS, *Towards a reasonable libertarianism*, in Ted HONDERICH (ed.), *Essays on freedom of action* (London and Boston 1973), pp. 31-62, esp. 52 f.

[58] A.S. EDDINGTON, *The nature of the physical world* (Cambridge 1928), p. 311.

«Let us now look more closely into the problem of how the mind gets a grip on material atoms so that movements of the body and limbs can be controlled by its volition. I think we may now feel quite satisfied that the volition is genuine. The materialist view was that the motions which appear to be caused by our volition are really reflex actions controlled by the material processes in the brain, the act of will being an inessential side phenomenon occurring simultaneously with the physical phenomena. But this assumes that the result of applying physical laws to the brain is fully determinate. It is meaningless to say that the behaviour of a conscious brain is precisely the same as that of a mechanical brain if the behaviour of a mechanical brain is left undetermined. If the laws of physics are not strictly causal the most that can be said is that the behaviour of the conscious brain is one of the possible behaviours of the mechanical brain. Precisely so; and the decision between the possible behaviours is what we call volition».

And the same idea was later independently formulated (though not as his own view) by Bertrand Russell:[59]

«And since, according to quantum physics, there are no physical laws to determine which of several possible transitions a given atom will undergo, we may imagine that, in a brain, the choice between possible transitions is determined by a psychological cause called 'volition'».

The interpretation also fits in comfortably with the remaining ancient evidence. It is highly significant that Epicurus adopted, in addition to the swerve, a closely parallel thesis with precisely the object of preventing future outcomes being determined independently of our wishes. Cicero's *De fato* shows that physical determinism was from the start of the Hellenistic age partnered by logical determinism, the thesis that future events are necessitated by its already being true that they will come about. This brand of determinism had first surfaced in Aristotle's celebrated sea-battle argument at *De interpretatione* 9. Diodorus Cronus' Master Argument, which became the chief vehicle of logical determinism in the Hellenistic age,[60] perhaps

[59] B. Russell, *Human Knowledge* (NY 1948), p. 41.

[60] So I maintain in *Diodorus Cronus and Hellenistic Philosophy*, «Proceedings of the Cambridge Philological Society», 23 (1977), pp. 74-120, 96 ff. Diodorus was probably not himself a determinist, but his Master Argument was regularly used as a defence of determinism. (I have now given up the suggestion made in that article that Diodorean arguments prompted the attack in the *On nature* book: even if logical and physical determinism were seen as mutually entailing, there is no evidence that Diodorus himself supplied physical arguments for determinism. But it may still be that the influence of the Master Argument had helped some of Epicurus' pupils develop the full hard determinist consequences of Democritean physics).

originated as an attempt to isolate and defend its several premisses. Now Epicurus, we are told, adopted Aristotle's solution of denying the principle of bivalence with regard to future-tensed statements. No one I imagine will suggest that Epicurus, any more than the many other philosophers from Aristotle on who have felt obliged to resist arguments of the sea-battle type, thought that his chosen logical thesis would have a positive part to play in the analysis of autonomous volition. His object was merely to remove an obstacle to the possibility of self-determination, namely a thesis which would render deliberation about future action null and void. In Cicero's *De fato* the swerve theory is regularly treated as parallel to, indeed as virtually interchangeable with, the logical thesis, and the same negative purpose, the avoidance of necessitation, is specified for both.[61] An equally negative description of the swerve's purpose is offered by Plutarch[62] — «to free the voluntary from everlasting motion, so as not to leave vice irreprehensible», or «so that that which is up to us should not be eliminated». And I know of no other report that implies a more integral role for the swerve in the psychological analysis of volition.[63]

All this evidence supports the following story. Epicurus dismissed the reductionist psychology of earlier atomism as self-refuting, and thus justified a non-reductionist psychology which permitted the attribution of responsibility to an autonomous self with volitions, beliefs, impulses, etc., none of these being straightforwardly reducible to patterns of atomic motion. That was, in my view, his most significant contribution to the

[61] There is never any suggestion in the sources that either of the two theses was subordinated to, or a consequence of, the other. They are treated as parallel at Cic., *Fat.* 21-2 and *Nat. deor.* I 69-70, and as interchangeable at *Fat.* 18-19. Cf. also *ibid.* 37-8, *Acad.* II 97, for the logical thesis.

[62] Plut., *Stoic. repugn.* 1050 c; *Soll.an.* 964 e.

[63] Cf. Philod., *Sign.* 36.7-17; Diogenes of Oenoanda, 32.1-3.

crusade against determinism. But his atomic and logical theories still had to be so constructed as not to preempt the self's decisions by determining the animal's behaviour independently of them. Hence the indeterministic swerve, and, parallel to it in logic, the denial of bivalence — both theories being designed not to explain what volition is but to guarantee its efficacy by keeping alternative possibilities genuinely open.

It remains to ask whether the evidence of Lucretius can be interpreted consistently with this story. It reads as follows (II 251-93):

«*A*. Moreover, if all motion is always linked, and new motion arises out of old in a fixed order, and atoms do not by swerving make a certain beginning of motion to break the decrees of destiny, so that cause should not follow cause from infinity, from where does this free volition exist for animals throughout the world? From where, I ask, comes this volition wrested away from the fates, through which we proceed wherever each of us is led by his pleasure, and likewise swerve off our motions at no fixed time or fixed region of space, but wherever the mind itself carries us?

B. For without doubt it is volition that gives these things their beginning for each of us, and it is from volition that motions are spread through the limbs. Don't you see how also when at an instant the starting gates are opened the eager strength of horses can nevertheless not surge forward as suddenly as the mind itself wishes? For all the mass of matter has to be stirred up throughout the body, so that stirred up through all the limbs it may in a concerted effort follow the mind's desire. Thus you may see that the beginning of motion is created from the heart and proceeds initially from the mind's volition, and from there is spread further through the entire body and limbs.

C. Nor is it the same when we move forward impelled by a blow, through another person's great strength and great coercion. For then it is plain that all the matter of the whole body moves and is driven against our wish, until volition has reined it back throughout the limbs. So do you now see that, although external force propels many along and often obliges them to proceed against their wishes and to be driven headlong, nevertheless there is something in our chest capable of fighting and resisting, at whose decision the mass of matter is also forced at times to be turned throughout the limbs and frame, and, when hurled forward, is reined back and settles down.

D. Therefore in atoms too you must admit the same thing, that there is another cause of motion besides blows and weight, from which this power is born in us, since we see that nothing can come into being out of nothing. For weight prevents all things from coming about by blows, by a sort of external force. But that the thing [or 'the mind'][64] should not itself possess an internal necessity in all its behaviour, and be overcome and, as it were, forced to suffer and to be acted upon — that is brought about by a tiny swerve of atoms at no fixed region of space or fixed time».

This text has been thoroughly ransacked for clues many times in the past. It may well be consistent with a number of interpretations quite different from my own. My only object is to show that it fits in no less comfortably with what I have argued on independent grounds to be Epicurus' view.

The conclusion formally stated in *D* is that since the two previously established principles of an atom's motion, blows and weight, are deterministic, there must be a third, indeterministic principle, the swerve. This conclusion is derived from observed fact — the power of animals to initiate unpredetermined courses of action (*A*), and more specifically, the power of the source of that indeterminacy, volition,[65] to redirect large numbers of atoms in defiance of their purely mechanical patterns of motion (*B*, *C*).

[64] I cannot make up my mind between the *res* of the mss. and the favoured emendation *mens* in 289. I am impressed by the linguistic arguments for *mens* (see D. FOWLER, in this volume), but also by I. AVOTINS' observation that, since the blows and weight in 288 must still be as in 285 those mentioned as causes of atomic motion, the reference in 289 should be to the atom, not the mind (*The question of mens in Lucretius 2.289*, «CQ» 29, 1979, pp. 95-100). On the latter view *res* might be retained, meaning perhaps 'the thing', viz. the atom, but I confess that it makes poor Latin. If *mens* is preferred, the overall structural clarity of the passage suffers, but the point made in 289-91 will fit in closely with Cic., *Fat.* 23 and with my interpretation of the swerve doctrine. However, I prefer not to rest my case on such fragile evidence.

[65] The references to 'the mind' at 260 and 265 must be understood as equivalent to what Lucretius more accurately calls 'the mind's volition' (270) or just 'volition' (261, 276; cf. 268, 281). Strictly, the mind is the corporeal organ of consciousness, volition an emergent property of it. But the precise significance of 'mind' will not be established until Book III. (That volition is not itself straightforwardly analysable in atomic terms explains why it is the one stage left unanalysed in Lucretius IV 877-906, where the mechanics of animal motion are described — an old source of perplexity).

This seems fully consistent with the interpretation offered above, that swerves are not involved in volition itself but are the element of indeterminacy in atomic motion which enables volition, an emergent property of the mind, to exercise control over the mind's physical processes, and thereby over the body, in such a way as to exempt animal behaviour from the lawlike regularity of natural phenomena. *Any* interpretation must face the difficulty that Lucretius nowhere makes the precise contribution of the swerve explicit. (It is enough, after all, in the context of the laws of atomic motion, for him to argue as so many have that the familiar phenomenon of volitional indeterminism could not co-exist with physical determinism; and hence that the swerve *must* exist). But an advantage of the proposed interpretation is that it fully explains why Lucretius should so emphasise in *B* and *C* that the power of volition to act on matter depends on the swerve.

One plainly deliberate effect achieved in this passage is the implicit analogy between *A*, where we «swerve off our motions at no fixed time or fixed region of space», and *D*'s «tiny swerve of atoms at no fixed region of space or fixed time». It might be prudent to grant Lucretius the persuasive force of the echo without squeezing it too hard for precise theoretical content. But for those who feel that the echo is meant to hint at a direct correlation between volitions and swerves,[66] I can point out that on my interpretation there will indeed be such a correlation. It will not be one in which the existence, or the efficacy, of the volition depends on the happy coincidence of an unpredetermined event like the swerve chancing to occur just when and where it is needed.[67] Rather, as explained above, it will be one

[66] ENGLERT (op. cit., p. 104) points out a similar echo of the 'certain beginning of motion' made by the swerve (253-4) at 261-2, where volition gives a 'beginning' to animal motion. If this is thought to be a deliberate ploy on Lucretius' part, my comments apply to it equally.

[67] I offer this as an objection to most of the current interpretations of the swerve theory (but for a counterargument, see ENGLERT, op. cit., pp. 197-9). It may also pose a threat to FURLEY's view that one or more past swerves are needed to break the causal chain which would otherwise make your present character the inevitable consequence of the state of matter at your birth. Perhaps he should have

in which the intervention of volition itself actualises in a group of mind atoms the ever-present possibility of swerving.

It may be suggested that the description of the swerve in *A* and *D*, as that «from which» (*unde*) our power arises to behave in an unpredetermined way, implies a stronger relation between it and volition than I am proposing. But as I observed earlier, no interpretation of the swerve can make it more than a necessary condition of animal autonomy. Once it is granted that *unde* expresses no stronger a relation than that,[68] it becomes hard to see what more the mere use of the word can be expected to reveal. It would, at any rate, be perfectly intelligible to say that our power to determine our own behaviour arises 'from' the fact that the laws of physics leave a large number of alternative possibilities open. And that fact is, on my analysis, just what the swerve doctrine amounts to.

In short, Lucretius' argument can quite coherently be read as an appeal to the evident power of volition to alter mechanical processes as requiring that those processes be less than fully determined by physical laws, and hence as confirming the existence of the indeterministic swerve.

4. *A Criticism*

The Academic sceptic Carneades proposed a highly intelligent and constructive modification to the Epicurean account.[69] Arguing entirely with premisses and analogies which the Epi-

stressed the mere possibility of a swerve's intervention, as being sufficient to render the actual outcome non-necessary: given the completely undetermined nature of swerves, no one could count on actually having had one of his own. But at all events, although I follow FURLEY in assigning a primarily negative role to the swerve, I believe that the precise function which he gives it is now rendered superfluous by the non-reductionist psychology. What makes your present behaviour undetermined is the fact that the self which is responsible for it is more than a mere bundle of atoms, and therefore not reducible to a link in a physical causal chain.

[68] For *unde* expressing a necessary condition, cf. Lucr. I 382.

[69] Cic., *Fat.* 23-5.

cureans could be expected to endorse,[70] he observed that the autonomous character of voluntary motions of the mind need no more have an external antecedent cause that did the downward motion of the atom due to weight. It was the nature of the atom that in itself caused it to move downwards, and likewise the nature of the voluntary motion of the mind that in itself caused it to be 'up to us'. Hence, he maintained, the Epicurean doctrine that there could be a voluntary motion of the mind was quite sufficient to answer determinism, without the swerve theory's implicit abandonment of the principle that every motion has a cause.

It is clear from this that Carneades recognised the Epicurean analysis of the voluntary motion of the mind to be a non-reductionist one. If he had understood it as no more than a chain of atomic motions, he could not have attributed to it a self-determining nature which the mind's constituent atoms themselves lacked. But if my overall interpretation of the Epicurean position is correct, Carneades' advice is very much to the point. Perhaps Epicurus *could* have rested content with his non-reductionist analysis of voluntary motions of the mind as autonomous events capable of initiating new courses of action and thus belying determinism. His addition of the swerve doctrine was a very understandable attempt to ensure that the changes which these volitions were required to bring about in atomic trajectories should be physically possible ones. But why need their being physically possible *results of volitions* require

[70] In particular, the analogy of the causes of atomic motion (*ibid.* 24-5), but also *ibid.* 24, the void example, where *quibus inane esse nihil placet* will mean not «who hold that no vacuum exists» (RACKHAM; likewise YON), but «who hold that the empty is nothing at all» — an attempt to characterise the atomist's technical sense of 'void'. Carneades' dialectical technique required that he use only the premisses of other philosophers, never his own (see, for example, Gisela STRIKER, *Sceptical strategies*, in M. SCHOFIELD et al. [eds.], *Doubt and Dogmatism*, Oxford 1980). His object in this case, as Cicero makes clear, was to strengthen the Epicurean position into an adequate counterweight to Chrysippan determinism. This feature of his method sometimes gave the false impression that he himself endorsed the view that he was defending (Cic., *Acad.* II 78, 139; *Fin.* V 20).

that they also be capable of happening *independently of volitions*? Perhaps here at last the impact of the swerve's secondary role becomes apparent — for Epicurus could not at any cost afford to give volition a causal role in cosmogony. In the context of the ancient debate on determinism, at least, it might have been more politic to insist as a datum of experience that volitions do somehow exert an independent causal influence on matter, and to leave it at that. But from the vantage point of the twentieth century it is still too soon to conclude that Epicurus' more adventurous treatment was altogether wrong.[71]

[71] Ancestors of this paper, and versions of it at various stages of completion, were read to meetings at Lille, Cambridge, Baltimore, Berkeley and Harvard. In addition, the *On nature* text which is central to it was extensively discussed in a series of seminars at Princeton University in 1981-2, and the penultimate version was presented to the Princeton Classical Philosophy Colloquium in December 1981. I am grateful for the enormously helpful comments I received from far more people than I can list here. Among them special mention must be given to Richard Sorabji, Myles Burnyeat, Don Fowler, Walter Englert, Alan Code, Don Morrison, Nicholas White, Tony Long, John Cooper, Glenn Most, Michael Frede, and, above all, David Furley, my commentator at the Princeton Colloquium, whose own work first inspired my interest in this topic and continues to serve as a model. Finally, I owe great debts of gratitude to the Humanities Council of Princeton University for the award of a visiting fellowship in the Fall Semester, and to the Institute for Advanced Study, Princeton, for membership in the second term, of 1981-2, when the current version of the paper was written; and to Marcello Gigante, to whose efforts and personal example it is due that the Herculaneum papyri are at last receiving the serious attention that they deserve.

ΣΥΖΗΤΗΣΙΣ

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