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The Origin of Atomism

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Classical Review (The), vol. XXX. N° 1. L'origine de l'atomisme [R. G. Bury]. 1-4. Les doctrines atomistiques ont des rapports étroits avec le système de Pythagore plus qu'avec tout autre système; si elles se rapprochent des doctrines des Eléates, c'est dans la mesure où ces dernières ont elles-mêmes des rapports avec le système pythagoricien. On a la preuve de cette assertion dans un texte d'Aristote (de Caelo III, 303^a 8) qui compte les Atomistes parmi les philosophes qui rattachent tout aux Nombres; la terminologie des théoriciens de l'atomisme en est une autre preuve. De plus, Atomistes et Pythagoriciens se distinguent également des partisans du monisme et du pluralisme; ils adoptent également la dualité des principes et le caractère invariable des monades primitives qui se combinent non pas chimiquement mais mécaniquement. Il est vrai qu'ils conçoivent différemment les monades; pour les Pythagoriciens, les points, tous identiques, ne sont différenciés qu'en formant des figures; pour les Atomistes, les atomes diffèrent dès le début, mais cette divergence de vue ne paraît pas irréductible. ¶

3568. BURY R.G., *The origin of Atomism*: PCPhS 100-102 1915 17-18.

Bury défend la thèse de Gomperz selon laquelle il faudrait probablement faire dériver l'Atomisme du Pythagorisme ancien, et non de l'Éléatisme comme on le croit encore. Un examen des principales doctrines et de la terminologie des Atomistes cherche à démontrer le bien-fondé de cette position.



The Origin of Atomism

R. G. Bury

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The Classical Review

FEBRUARY, 1916

ORIGINAL CONTRIBUTIONS

THE ORIGIN OF ATOMISM.¹

FOR a variety of reasons it is not altogether easy to make out the origin and filiation of the Atomic theory. For one thing, although we know pretty definitely the main tenets of the doctrine of Democritus, Leucippus, 'the white horse,' remains a dark horse. The standard authorities are divided among themselves, so that while we have Windelband, on the one hand, declaring that 'Atomism is an offshoot of Eleaticism' and that 'Leucippus stands in the most marked dependence on the Eleatic teaching,' on the other hand we have writers like Gomperz and Mr. A. W. Benn protesting against this derivation of Atomism from Eleaticism. Briefly put, Gomperz² maintains (a) negatively that Leucippus was not really 'a pupil of Parmenides,' and that the points of contact between the two were mainly points of contradiction; and (b) positively, that 'the raw material for the Atomistic theory, namely the twin conception of invisible moving particles and invisible vacant interstices, is derived partly from the older Ionians (Heraclitus, Anaximenes, and Anaxagoras) and partly from the Pythagoreans.' Mr. Benn³ agrees with Gomperz on the negative side, in so far as he lays stress on the way in which Leucippus 'seems to contradict Parmenides at every point,' and argues that the progress of thought 'does not pro-

ceed either by antithesis or by synthesis, but by almost insensible transition and suggestion.' But (b) on the positive side Mr. Benn stands by himself in his view that the atoms were first suggested to the scientific imagination of Leucippus by the observation of clouds of dust; and that, dust being earth in its finest form, Leucippus is the one and only philosopher who chose earth as his primary substance (and eluded Aristotle, we may add, in doing so).

I will not stop to criticise Mr. Benn's view, but pass on at once to the constructive part of my observations.

What I shall endeavour to show—in so far as so highly speculative a matter is capable of demonstration—is that Atomism is more closely allied to the Pythagorean than to any other system, and that, if Leucippus is to be labelled at all or grouped at all, he should be labelled as an independent Pythagorean rather than grouped with Pluralists or Conciliationists. The usual methods of placing him seem to me, as to Mr. Benn, examples of the 'post hoc, ergo propter hoc' fallacy.

To begin with Aristotle—whatever he may say elsewhere, to suit his book, here is what he says about the Atomists in *de Caelo* III. 303^a 8—*τρόπον γάρ τινα καὶ οὗτοι πάντα τὰ ὄντα ποιοῦσιν ἀριθμὸς καὶ ἐξ ἀριθμῶν*. I.e. the Atomists may themselves be numbered amongst the number-philosophers; they are Pythagorisers of a sort, if not actual Pythagoreans. Let us see how far this

¹ A paper read to the Camb. Philol. Soc. in November, 1915.

² *Greek Thinkers*, E. Tr., vol. I, pp. 316 sqq.

³ *The Greek Philosophers*, ed. 2, pp. 31 sqq.

is supported by the terminology of Atomism.

Take first the term *εἶδος* or *ιδέα*. A work *περὶ ἰδεῶν* is ascribed to Democritus, and it seems quite likely that the term goes back to Leucippus. Prof. A. E. Taylor (*Var. Socr.*, p. 248) would render the Democritean title, *Concerning Primary Bodies*, and he argues at length that '*εἶδος* and *ιδέα*, wherever they appear as technical terms, alike in rhetoric, in medicine, and in metaphysics, have acquired their technical character under Pythagorean influence' (p. 257).

The term *ὄγκος*—which is certainly Epicurean in the sense of 'atom'—may probably go back to Democritus and Leucippus. To the Atomists a 'magnitude' can only have meant an atom or glomeration of atoms. I conjecture also that the use of the term was common with the mathematical philosophers, from its occurrence in *Theaet.* 135 A, *Parmen.* 164 A, and in Zeno's arguments on motion as reported by Aristotle.

'*Ανάγκη* as applied to the atomic law of motion—the *δίνος* or *δίνη* of atoms spinning *in vacuo*—is another conception which seems to link Atomism with Pythagoreanism. We find this combination of Necessity with rotatory motion in the Platonic Myth of Er, where the spindle with its whirling *σφόνδυλοι* revolves *ἐν τοῖς τῆς Ἀνάγκης γόνασιν* (*Rep.* 617 B). Adam, in his note *ad loc.*, says 'the notion is probably Pythagorean, for Parmenides, who attaches himself to the Pythagoreans in this part of his system, speaks of a central *Ἀνάγκη* as the cause of all movement and birth.'

We may note also *ἀποτομή* as an Atomistic term, and compare it with the technical use in geometry to denote 'section,' or cutting off of segments (*Meno* 85 A), and with *Parmen.* *Fr.* 3 *οὐ γὰρ ἀποτμήξει τὸ ἐὼν τοῦ ἐόντος ἔχουσθαι*, where it is natural to detect a controversial reference to Pythagoreanism.

Another term which, to my mind, has a Pythagorean flavour is *σκήνος*, which Democritus is fond of using for *σῶμα*. Where was he more likely to pick up the expression 'earthly taber-

nacle' than from those precursors of Paulinism, the *σῶμα-σῆμα* sect?

A curious word of the Atomists is *περιπάλαξις*, in the sense of *συμπλοκή*, denoting the 'embrace' or mutual entanglement of atoms—a word which, by the way, is not given in Liddell and Scott, though *ἐμπάλαγμα* is quoted. I conjecture that it too may have Pythagorean associations, although I admit that my ground is not of the most solid. In *Phaedo* 82 D we have the phrase *ἐκεῖνοι οἷς τι μέλει τῆς ἐαυτῶν ψυχῆς ἀλλὰ μὴ σώματι πλάττοντες ζῶσι* in a passage which savours strongly of Orphicism or Pythagorism (preaching *κάθαρσις ψυχῆς*, and the body a dungeon). Here the right reading is *παλάττοντες* (Diels), which combines the sense of close contact and contagion (*αἵματι* Hom.).¹

I may add here two further notes on Atomistic terminology which are not strictly relevant to my main contention.

One of the three differentiae of the Atom, as given by Aristotle, is *διαθιγή*, which is explained to mean *τάξις*. I am inclined to think that the word (inappropriate in itself)² is a blunder for *διαθήκη* (= *διάθεσις*), since in *Met.* 4. 19 *διάθεσις* is defined as *ἡ τοῦ ἔχοντος μέρη τάξις*, and Democritus *Fr.* 9 (Diels) uses *διαθήκη* for *διάθεσις* in the phrase *κατὰ σώματος διαθήκην*. Moreover there are variants for *διαθιγή* in the MSS.³ and *Aet.* 1. 15. 8 calls the same differentia *διαταγή*. Further, the examples given of the differentiae in *Met.* 1. 4 run thus—*διαφέρει γὰρ τὸ μὲν Α τοῦ Ν σχήματι* (= *ῥυσμῶ*), *τὸ δὲ ΑΝ τοῦ ΝΑ τάξει*, *τὸ δὲ Ζ τοῦ Ν θέσει*. That, at least, is the reading formerly current; but later editors seem to favour Diels's correction *τὸ δὲ Ξ τοῦ Η θέσει*. Here the question that suggests itself is—why are these particular letters chosen rather than any others? I have never seen this question put or answered; and even to attempt an answer is perhaps super-audacious. However, what I venture to suggest is

¹ Cp. Aelian *V.H.* 3. 11, οἱ περιπατητικοὶ φασιν μεθ' ἡμέραν θηπεύουσιν τὴν ψυχὴν τῷ σώματι περιπλέκεσθαι.

² Ar. uses the vb. of 'continuous touch' (see L. and S.).

³ *διαθηγή*, see L. and S.

this—that the letters here used form part of a familiar term of the Atomistic School, a term connected with the matter illustrated, viz. *ναστόν* = *πλήρες* (of which more presently). Admitting this, how does it bear on the textual question? Obviously, all the illustrative letters will most naturally be taken from the same word, so that H, whether upright or on its side, cannot be right, and the letter most likely to be right is the N which appeared in the old text, and which is often confused with H in uncials.

My second note concerns another technical term, which may, I think, fairly be ascribed to the earliest Atomists. Aristotle, *de An.* I. 2 (compare *de Caelo* III. 4) uses the word *πανσπερμία* with reference to Leucippus. Does this imply that Leucippus spoke of his atoms as *σπέρματα*? I think it may, since Lucretius is evidently Latinising an original Greek Atomistic phrase when he calls the atoms *semina rerum*. Moreover, we may discern a Platonic pun on *σπέρματα* in the description of the Atomists (*Soph.* 247 D) as *αὐτόχθονες τε καὶ σπαρτοὶ ἄνδρες*—‘seedsmen.’

But this is by way of digression. To return now to the main track. There is, I would contend, something of truth in what Diogenes Laert. says (Diels, *Vorsokr.*, p. 366) of Democritus that he *Πυθαγορικῶν τινος ἀκοῦσαι* and *Φιλολάφ συγγεγονέναι*.¹ For besides the verbal connexions which I have tried to trace, it is fairly clear that in their main tenets the two schools, Atomists and Pythagoreans, agree. Firstly, as distinct alike from monism and pluralism, both are essentially dualistic—each assuming the reality of a pair of concrete opposites, Solid and Void, or Figure and the Figureless. And, secondly, both agree in the invariable character of their primary monads, which do not alter chemically, but only combine mechanically: both alike reduce quality to quantity, and build the world of *ιδέαι* or *σχήματα*, compounding masses out of concrete minima. There remains, however, a characteristic difference in the conception of the monads; for

while the Pythagorean units, or points, were all alike, and only when pluralised into triangles, squares, circles, etc., acquired shape-variety, the unitary atoms possessed shape-variety from the start; so that the atomic unit might be described as a kind of telescoped or compressed form of the geometric *σχῆμα* or multiplied unit of the Pythagoreans.

What is the explanation of this characteristic difference? I suggest that it is to be explained in connexion with the term *ναστόν*, as part of a larger fact. The peculiarity of the word *ναστόν* caught the attention of Galen, who writes (viii. 931) *ἄρτον μὲν γὰρ τινα ναστόν ἐκάλουν, οὐ μὲν ἄλλο γέ τι σῶμα πρὸς αὐτῶν (i.e. τῶν Ἑλλήνων) οὕτως ὀνομασμένον ἐπίσταμαι*. Without going so far as to say that Leucippus was originally an *ἄρτοκόπος*—familiar with grains and floating motes of meal, and sieves, and threshing-floors, and whirling mill-stones and kneading-troughs (all which seem to figure in Atomistic literature)—I would suggest that *ναστόν* really does convey the central notion around which the whole doctrine of Atomism was built up. The real, *τὸ ὄν*, presented itself to the scientific imagination of Leucippus as primarily ‘the kneaded.’ I.e. he derived his physical theory in the first instance from a study of the phenomena of compression and of porous or spongy matter. It is the study of porosity that gets us at once to the double notion of ‘the Full and Empty,’ and it is because these two seem equally fundamental in Leucippus’ theory, and because also he, as an Ionian (whether of Miletus or Abdera), must be presumed to have been primarily occupied with the study of physical phenomena, that I suggest this as the origin of his view. In support of this suggestion I may again quote Aristotle, *Phys.* IV. 6, where among various Democritean arguments in favour of the existence of Void he mentions this—*ὅτι φαίνεται ἓνια συνιόντα καὶ πιλούμενα*. My supposition, based on the term *ναστόν*, is that this argument from *πίλῃσις* was the original argument of Leucippus, and that it was in this way—from these physical studies—that he first arrived

¹ Cp. Iambl. *ap.* Diels 54⁵.

at what Gomperz calls the 'twin conception of invisible moving particles and invisible vacant interstices.' Then, having once got this twin conception, he expanded and developed it under the influence of the kindred dualism of the Pythagoreans. But with this notable difference, that he applied his *ναστόν*-idea afresh to the *σχήματα* of the Pythagoreans, 'kneading' them into impermeable solids, while retaining the characteristic shapes (triangle, polygon, etc.) in the solid form: *i.e.*, briefly, he telescoped or stereoscoped them.

In conclusion, what I would emphasise is this—that Atomism in its origin had probably little or nothing to do with any 'metaphysical conflict,' and

nothing to do with Eleaticism, except in so far as Eleaticism itself may be termed an offshoot of Pythagoreanism. The only dependence of the Atomists on Parmenidean proper is, as Mr. Benn and Gomperz urge, the dependence of contradiction; which means that if the Eleatics had never existed, Leucippus might equally well have preached his Atoms and his Void; and if, as tradition states,¹ 'he listened to Zeno,' this argues no more dependence than may be ascribed to Sir Edward Carson when he listens to John Redmond in the House.

R. G. BURY.

¹ Cp. Galen *ap.* Diels 54⁵.

THE HOMERIC HYMNS.

I.

THE emendation of the Homeric Hymns with their manifold and manifest errors of tradition, often defended by dull and foolish scholars with the pretentious dogmatism that one corruption of the text is proved sound by the production of another equally bad; or, in other words, that two blacks make one white, continues to attract periodically the efforts, the praiseworthy efforts, of active and inquiring minds. It is well that it should be so, and therefore I welcome with both hands the paper on this subject by Mr. R. J. Shackle in the September number of the *Classical Review* of this year and the earlier one by Mr. Evelyn White (*C.R.* Nov. 1914).

It is now nearly twenty years since I wrote a review of Monro's *Homeri Opera et Reliquiae* (*C.R.* Nov. 1896), and there suggested a great many textual changes in the Hymns that might with advantage be adopted. One or two of these I would now revise, and notably one that called forth a considerable amount of discussion of what is called Wernicke's law. The passage is *Hymn. Dem.* 268:

εἰμὶ δὲ Δημήτηρ τιμάοχος, ἥ τε μέγιστον
ἀθανάτοις θνητοῖσί τ' ὄνειαρ καὶ χάρμα
τέτυκται.

To make a tolerable scansion for the degenerate second line I proposed to read

ἀθανάτοις θνητοῖσί τ' ὄνειαρ καὶ πολὺ
χάρμα,

with possibly ἀθανάτων (Stoll) for a linguistic and metrical reason.

Prof. Platt courteously enough raised the question whether ὄνειαρ could rightly stand in this position. I took the opposite view, and suggested that the objection was based on a later metrical usage imposed on Homer. Mr. A. Shewan (*C.R.* Sept. 1915) perhaps goes too far in treating this suggested explanation as absolute dogma. May I refer him to remarks on this question in my review of Leaf's *Iliad*, xiii.-xxiv. (*C.R.* 1902)? In any case I would now treat this passage somewhat differently. The objection to τέτυκται is certainly valid. It will be good Greek here, when 'I who is' is good English and not before. The bit of black with which this is whitewashed is the very flagrant and obvious interpolation P. 249-51 q.v. Of xxix. 4 nothing need be said.

It may be observed first of all that in the early epic period a verse could not begin with ἀθανάτοις θνητοῖσί τε. If the tradition be right as to first word, then it must be in the form ἀθανάτου-