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# THE BASIS OF ANAXAGORAS' COSMOLOGY<sup>1</sup>

No pre-Socratic philosopher, perhaps, has caused more disagreement, or been more variously interpreted, than Anaxagoras of Clazomenae. Among recent attempts to reconstruct his system some of the more notable are those of Tannery,<sup>2</sup> Bailey,<sup>3</sup> Cornford,<sup>4</sup> Peck,<sup>5</sup> and Vlastos.<sup>6</sup> Each of these reconstructions, and especially that of Tannery, has its adherents; and since none of them (with the possible exceptions of the first and last) has much in common with any other, a universally acceptable solution to the fundamental problems involved may well by now seem unattainable. It is my belief, however, and it is the object of this paper to try to prove, that all these modern reconstructions have at least one quality in common, namely an undue complication. The actual system of Anaxagoras was, I believe, considerably simpler than any reconstruction yet forthcoming. Unfortunately what I take to be the basis of the whole system, Anaxagoras' reaction to his Eleatic predecessors, is by no means easy to convey in brief and simple terms. But if I should succeed in conveying it, then it will, I hope, be seen in itself to possess such a simplicity and neatness that my contention will carry with it a fair warrant of its own truth. I shall, for convenience, divide my argument into ten sections, to which I shall append a brief summary of my conclusions.

## I

The first point on which I wish to lay the greatest possible stress is the extreme thoroughness of Anaxagoras' reaction against Parmenides. Instead of the One Being, the existence of which excludes the existence of anything else, Anaxagoras starts his cosmogony from a universal mixture. Indeed, if we are to trust Simplicius, to whom we owe the preservation of most of the fragments, his book actually opened with the statement: *ὅμοῦ πάντα χρήματα ἦν, ἀπειρα καὶ πλῆθος καὶ σμικρότητα· καὶ γὰρ τὸ σμικρὸν ἀπειρον ἦν.* In one breath three of the Parmenidean tenets have been flatly contradicted. Whereas Parmenides had written:<sup>7</sup>

οὐδέ ποτ' ἦν οὐδὲ ἔσται, ἐπεὶ νῦν ἔστω ὅμοῦ πᾶν,  
εὖ, συνεχέσ·

Anaxagoras first substitutes *όμοῦ πάντα χρήματα* for *όμοῦ πᾶν, εὖ*, then admits the forbidden *ἦν*, and finally, in the latter half of the sentence, denies also the implications of Parmenides' *συνεχέσ*. It is a platitude that in Fr. 17 (*τὸ δὲ γίνεσθαι καὶ ἀπόλλυσθαι οὐκ ὄρθως νομίζουσιν οἱ "Ἐλληνες"* οὐδὲν γὰρ χρῆμα γίνεται οὐδὲ ἀπόλλυται, ἀλλ' ἀπ' ἔοντων χρημάτων συμμίσγεται τε καὶ διακρίνεται. . . . κ.τ.λ.) Anaxagoras is accepting, even while twisting to his own ends, a Parmenidean principle. Hardly less striking is the vigour with which he rejects these others. Nor is his acceptance of the one principle unconnected

<sup>1</sup> This paper owes its main thesis to a suggestion of Mr. D. W. Lucas, for which I here make the most grateful acknowledgement. I am also deeply indebted to Mr. G. S. Kirk, both for a number of very valuable positive suggestions and for the elimination of some at least of the paper's errors.

<sup>2</sup> Pour l'*histoire de la science hellène*, 2nd ed.

(Paris, 1930).

<sup>3</sup> Greek Atomists and Epicurus (Oxford, 1928), Appendix I.

<sup>4</sup> C.Q. xxiv (1930), 14 ff. and 83 ff.

<sup>5</sup> C.Q. xx (1926), 57 ff.

<sup>6</sup> Philosophical Review, lix, No. 1 (1950), 31 ff.

<sup>7</sup> Fr. 8. 5.

with his rejection of the rest. It is, as the ancient commentators saw, simply and solely to eliminate becoming and perishing that he includes in his original mixture, not merely a limited plurality of opposites or elements, but literally *all things* that are ultimately to emerge from it.

## 2

This original mixture is further described both in the rest of Fr. 1 and in the latter half of Fr. 4.

Fr. 1: . . . καὶ πάντων ὁμοῦ ἔόντων οὐδὲν ἔνδηλον ἦν ὑπὸ σμικρότητος· πάντα γὰρ ἀήρ τε καὶ αἰθῆρ κατεῖχεν, ἀμφότερα ἄπειρα ἔόντα· ταῦτα γὰρ μέγιστα ἔνεστιν ἐν τοῖς σύμπασι καὶ πλήθει καὶ μεγέθει.

Fr. 4: . . . πρὸν δ' ἀποκριθῆναι ταῦτα πάντων ὁμοῦ ἔόντων οὐδὲ χροιὴ ἔνδηλος ἦν οὐδεμίᾳ· ἀπεκάλυψε γὰρ ἡ σύμμαξις πάντων χρημάτων, τοῦ τε διεροῦ καὶ τοῦ ἔχοντος καὶ τοῦ θερμοῦ καὶ τοῦ ψυχροῦ καὶ τοῦ λαμπροῦ καὶ τοῦ ζοφεροῦ, καὶ γῆς πολλῆς ἐνεούσης καὶ σπερμάτων ἀπείρων πλῆθος οὐδὲν ἔοικότων ἀλλήλοις. οὐδὲ γὰρ τῶν ἄλλων οὐδὲν ἔοικε τὸ ἔτερον τῷ ἔτέρῳ. τούτων δὲ οὕτως ἔχοντων ἐν τῷ σύμπαντι χρῆ δοκεῖν ἐνείναι πάντα χρῆματα.

For those who, like myself, are unable to accept Tannery's view that it is only of the opposites that everything contains a portion, this latter quotation provides, I suppose, the strongest of all arguments. Why, if *πάντα* means nothing more than all the opposites, does Anaxagoras add to this list of opposites 'much earth' and 'numberless seeds'? Whatever the nature of the 'seeds', earth is emphatically not an opposite; and once earth is admitted to the ingredients of the mixture, then why stop there? This sentence in fact is obviously crucial. There is, on the one hand, no denying that the opposites do figure very prominently in the list of ingredients; but then there is equally no denying that there are other ingredients besides. If, on the other hand, Anaxagoras did mean to include in his original mixture all forms of natural substance that are to emerge from it, then why does he include in his list only earth (which is in fact, as we shall soon see, not a natural substance at all) and 'seeds'? The list as it stands is, from either point of view, undeniably peculiar.

There is, I believe, a convincing explanation, which seems, however, to have been hitherto hardly appreciated, of the peculiarities of this list. Anaxagoras was at least as familiar with his predecessors' views as was Empedocles. Despite their undoubtedly originality, indeed, there is a sense in which the systems of both alike were predetermined for them by what had gone before. In the case of Anaxagoras the sentence under discussion provides an excellent illustration. Not only is the original mixture, *ἡ σύμμαξις πάντων χρημάτων* as it is here called, in deliberately extreme opposition to the Eleatic One, but the very vigour of the reaction against monism involves a condemnation also of any half-hearted pluralism. Reviewing the doctrines of his pluralist predecessors as a whole, Anaxagoras might very reasonably, I suggest, have been particularly conscious of two main trends. There were first those who, like Anaximander (or, in their different fashions, both Heraclitus and the Pythagoreans), had regarded the world as a battlefield of the opposites. And second, of course, there was Empedocles, who, to avoid the Parmenidean criticisms of that attitude, had solidified the warring opposites into the four eternal and immutable elements. Such, unquestionably, were the two main pluralist tendencies before Anaxagoras; and neither of them, to Anaxagoras' way of thinking, goes nearly far

enough. Since the original state of the universe, the ἀρχή, must give rise to the infinite diversity of the sensible world, it must therefore be σύμμεξις πάντων χρημάτων. Not only, that is to say, must it contain the traditional opposites—τό τε διερὸν καὶ τὸ ξηρὸν καὶ τὸ θερμὸν καὶ τὸ ψυχρὸν καὶ τὸ λαμπρὸν καὶ τὸ ζοφερόν (this last pair surely the Pythagorean φῶς καὶ σκότος); not only again must it contain the Empedoclean elements, here presumably exemplified by earth because two of the others, air and fire, have certainly already been named in Frs. 1 and 2 and have probably also, by this stage in the book, been shown to be not primary elements but (as they were later called) πανσπερμίαι;<sup>1</sup> it must contain also ‘seeds’ (of which more will be said later) ‘infinite in number and in no way resembling one another’. In a word, as the last sentence drives home, ἐν τῷ σύμπαντι χρὴ δοκεῖν ἐνεῖναι πάντα χρήματα.

## 3

If, therefore, the original mixture contains everything that is to emerge from it, the same is true of every portion of the mixture, however large or however small that portion may be, and at whatever stage in the cosmogonic evolution. Anaxagoras himself says the same thing over and over again in different words. Already in Fr. 1 we have met the sentence καὶ γὰρ τὸ σμικρὸν ἀπειρον ἦν. Fr. 3 adds the brief explanation καὶ ὕστοι ἔστι *sc.* τὸ μέγα τῷ σμικρῷ πλῆθος: both great and small, in other words, equally contain everything. Fr. 4 tells us that the same is true at a later stage in cosmogony: τούτων δὲ οὕτως ἔχόντων χρὴ δοκεῖν ἐνεῖναι πολλά τε καὶ παντοῦα ἐν πᾶσι τοῖς συγκριωμένοις. And finally Fr. 6 states the whole case: καὶ ὅτε δὲ ὕσται μοῖραι εἰσι τοῦ τε μεγάλου καὶ τοῦ σμικροῦ<sup>2</sup> πλῆθος, καὶ οὕτως ἀν εἴη ἐν παντὶ πάντᾳ· οὐδὲ χωρὶς ἔστιν εἶναι, ἀλλὰ πάντα παντὸς μοῖραν μετέχει. ὅτε τούλαχιστον μὴ ἔστιν εἶναι, οὐκ ἀν δύνατο χωρισθῆναι, οὐδὲ ἀν ἐφ' ἑαυτοῦ γενέσθαι, ἀλλ' ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα δύον. ἐν πᾶσι δὲ πολλὰ ἐνεστι καὶ τῶν ἀποκρινομένων ὕστα πλῆθος ἐν τοῖς μεζοσί τε καὶ ἐλάσσοσι.<sup>3</sup> The small, just as much as the great, contains an infinite number of μοῖραι: not only the original mixture as a whole, but every minutest portion of it, contains all things. If, therefore, in the case of the original mixture, ‘all things’ include other things than the opposites, it can hardly be disputed that the same must apply to its parts—that, in Anaxagoras’ own words, ὅπωσπερ ἀρχὴν εἶναι καὶ νῦν πάντα δύον.

## 4

It is at this point that we approach the real crux. What Anaxagoras is doing is of course, as is widely acknowledged, to apply to physical matter the arguments that had earlier been employed by Zeno in connexion with mathematical magnitude. But the majority of commentators seem once again, even while observing Anaxagoras’ unmistakable dependence upon Zeno, to have

<sup>1</sup> Cf. Ar. *De Caelo* Γ 3. 3. 02<sup>a</sup>31: τὰ γὰρ ὁμοιομερῆ στοιχεῖα . . . , ἀέρα δὲ καὶ πῦρ μήματα τούτων καὶ τῶν ἄλλων σπερμάτων πάντων.

<sup>2</sup> These genitives are admittedly ambiguous and the sentence has occasionally been misinterpreted to suggest that there are ‘portions of the great and small’ comparable with ‘portions of the hot and the cold’ or ‘portions of flesh and gold’. But that Anaxagoras

means ‘the portions pertaining to the great and small’ is clear both from the context in Fr. 6 and from a comparison with Fr. 3.

<sup>3</sup> Here Burnet (*E.G.P.*<sup>4</sup> 259) is surely right in translating: ‘and an equal number both in the greater and in the smaller of the things that are separated off’, and Peck (*op. cit.*, 58) surely wrong: ‘there is an equal number of the things which separate off in great things and in small things alike’.

overlooked its full implications. There are three fragments of Zeno which are especially relevant, all of which I shall quote in full; for only so, I believe, can we see the full significance of those sentences in which Anaxagoras is most obviously in Zeno's debt. But I shall take the liberty of so rearranging the order of Frs. 1 and 2 as to restore (not for the first time; it was done by Zeller) what seems to have been a complete argument.

Frs. 1 and 2: εἰ μὴ ἔχοι μέγεθος τὸ ὄν, οὐδὲν ἂν εἴη. εἰ γὰρ ἄλλῳ ὅντι προσγένοιτο, οὐδὲν ἂν μεῖζον ποιήσειν· μεγέθους γάρ μηδενὸς ὄντος, προσγενομένου δέ, οὐδὲν οἶόν τε εἰς μέγεθος ἐπιδοῦναι. καὶ οὕτως ἂν ἥδη τὸ προσγυνόμενον οὐδὲν εἴη. εἰ δὲ ἀπογυνομένου τὸ ἔτερον μηδὲν ἔλαττον ἔσται μηδὲ αὖ προσγυνομένου αὐξῆσεται, δῆλον ὅτι τὸ προσγενόμενον οὐδὲν ἦν οὐδὲν τὸ ἀπογυνόμενον.

εἰ δὲ ἔστιν, ἀνάγκη ἔκαστον μέγεθός τι ἔχειν καὶ πάχος καὶ ἀπέχειν αὐτοῦ τὸ ἔτερον ἀπὸ τοῦ ἔτερου. καὶ περὶ τοῦ προύχοντος ὁ αὐτὸς λόγος. καὶ γὰρ ἐκεῦνο ἔξει μέγεθος καὶ προέξει αὐτοῦ τι. ὅμοιον δὴ τοῦτο ἀπαξ τε εἰπεῖν καὶ ἀεὶ λέγειν· οὐδὲν γὰρ αὐτοῦ τοιοῦτον ἔσχατον ἔσται οὔτε ἔτερον πρὸς ἔτερον οὐκ ἔσται.

οὕτως εἰ πολλά ἔστιν, ἀνάγκη αὐτὰ μικρά τε εἶναι καὶ μεγάλα· μικρά μὲν ὕστε μὴ ἔχειν μέγεθος, μεγάλα δὲ ὕστε ἀπειρα εἶναι.

Fr. 3: εἰ πολλά ἔστιν, ἀνάγκη τοσαῦτα εἶναι ὅσα ἔστιν καὶ οὕτε πλείονα αὐτῶν οὔτε ἐλάττονα. εἰ δὲ τοσαῦτά ἔστιν ὅσα ἔστιν, πεπερασμένα ἄν εἴη.

εἰ πολλά ἔστιν, ἀπειρα τὰ ὄντα ἔστιν· ἀεὶ γὰρ ἔτερα μεταξὺ τῶν ὄντων ἔστιν, καὶ πάλιν ἐκείνων ἔτερα μεταξύ. καὶ οὕτως ἀπειρα τὰ ὄντα ἔστιν.

It is by now, I imagine, generally accepted that these arguments of Zeno against plurality are directed not so much (if at all) against pluralists in general as against the Pythagoreans in particular, with their characteristic confusion between the units of arithmetic, the atoms of physics, and the points of geometry. When, in fact, he wrote in Fr. 1: ἀνάγκη ἔκαστον μέγεθός τι ἔχειν, the ἔκαστον in question means not so much ‘every physical body’ as ‘every unit-point-atom’; and it is of these unit-point-atoms that he concludes: ἀνάγκη αὐτὰ μικρά τε εἶναι καὶ μεγάλα. We can, therefore, to quote Cornford,<sup>1</sup> ‘trace two consequences of Zeno’s attack. The first was reflected in the separation of arithmetic from geometry. Arithmetic . . . remained the field of discrete quantity. The arithmetical unit, 1, is essentially indivisible. . . . Every number is divisible into the units whose sum it is, but no farther. . . . The series of numbers is unlimited in one direction only; in the other it terminates in the first unit, 1. . . . Geometry, on the other hand, becomes specially the field of continuous magnitude. Every actual magnitude is infinitely divisible; there is no “least part” (*ἐλάχιστον*). . . . The second consequence of Zeno’s criticisms was the distinction between the geometrical solid and the sensible body, which the Pythagoreans had confused. . . . The atomists, Leucippus and Democritus, saw that, if physical bodies need not have all the properties of geometrical solids, they could elude Zeno’s dilemmas. They could reply: “We grant that all geometrical magnitudes are infinitely divisible and that a geometrical point has no parts or magnitude; but our atoms are not either the points or the solids of geometry, but compact bodies, which, if they were large enough, you could see and touch. . . .” The atom thus ceased to be confused with the unit of number and the point of geometry, and became a purely physical body whose essential property was impenetrability.’

<sup>1</sup> *Plato and Parmenides* (London, 1931), 60–61.

So the unit-points of the early Pythagoreans became, in consequence of Zeno's arguments, the atoms of Leucippus and Democritus. But the answer of Leucippus and Democritus was not, of course, the only one open to them. They could equally have admitted that physical matter, like geometrical magnitude, was infinitely divisible. And that this is exactly what Anaxagoras did is, as I said above, widely acknowledged. What does not seem to have been noticed, however, is how beautifully Anaxagoras thus fits into the pattern of development traced in these sentences from Cornford; and it is that fact which seems to me to provide the vital clue to our understanding of the basis of his system.

Of the two passages from Zeno quoted above the latter is included only for the purpose of establishing an essential preliminary point. It can, I think, be hardly disputed that when Anaxagoras wrote Fr. 5, he must have had this argument of Zeno in mind. Fr. 5, in its context in Simplicius,<sup>1</sup> runs as follows:

ὅτι δὲ οὐδὲ γίνεται οὐδὲ φθείρεται τι τῶν ὄμοιομερῶν, ἀλλ’ ἀεὶ τὰ αὐτά ἔστι, δηλοῦ λέγων “πούτων δὲ οὔτω διακεκριμένων<sup>2</sup> γινώσκειν χρή, ὅτι πάντα οὐδέν ἐλάσσων ἔστιν οὐδὲ πλείω (οὐ γὰρ ἀνυστὸν πάντων πλείω εἶναι), ἀλλὰ πάντα ἵσα ἀεὶ.” ταῦτα μὲν οὖν περὶ τοῦ μύγματος καὶ τῶν ὄμοιομερειῶν.

Now not only is there here an almost precise echo of Zeno's terminology, but also, to enhance the significance of that echo, there is the further consideration that the point which Anaxagoras is making is at once so peculiar and yet, out of its context at least, so platitudinous that, unless there were adventitious motives for making it, he would hardly have deigned to make it at all. He is in fact, I suggest, deliberately replying to Zeno with the assertion that, though things are admittedly (as he has already said at the outset in Fr. 1) *ἀπειρα καὶ πλῆθος καὶ σμικρότητα*, they are yet 'just as many as they are, no more and no less'. And that the 'things' in question are this time no longer unit-point-atoms but *homoeomeries*, which, as I shall be arguing in due time, are what the later commentators called the *σπέρματα* of Anaxagoras himself, follows clearly enough from the words of Simplicius. It is in fact the *σπέρματα* which are at once infinite in number (as again we are expressly told in the words *σπερμάτων ἀπείρων πλῆθος* in Fr. 4) and yet 'no more and no less' than they are.

It was necessary to establish so much first, in order to lend weight to the rest of my argument. For it can hardly be disputed, either, that when Anaxagoras wrote Fr. 3—οὕτε γὰρ τοῦ σμικροῦ ἔστι τό γε ἐλάχιστον, ἀλλ’ ἔλασσον ἀεὶ (τὸ γὰρ ἐὸν οὐκ ἔστι τὸ μῆ [? τομῆ] οὐκ εἶναι)—ἀλλὰ καὶ τοῦ μεγάλου ἀεὶ ἔστι μεῖζον καὶ ἵσον ἔστι τῷ σμικρῷ πλῆθος, πρὸς ἑαυτῷ δὲ ἐκαστόν ἔστι καὶ μέγα καὶ σμικρόν—his words are once again strongly reminiscent of Zeno's. Zeno maintains, as a *reductio ad absurdum* of the Pythagorean unit-point-atoms, that each one of the many must be at once both great and small. Anaxagoras replies, exactly as Leucippus later replied to Melissus, that so far from being a *reductio ad absurdum*, Zeno's statement is an accurate and acceptable description of the real state of affairs. The Pythagorean unit-point-atoms have, of course, been replaced, here as in Fr. 5, by *homoeomeries* or *σπέρματα*, which are infinitely divisible. Each one of the infinite plurality of *σπέρματα* is indeed, at one and the same time (i.e., I take it, *πρὸς ἑαυτό*, 'compared with itself' as opposed to

<sup>1</sup> *Phys.* 156. 9.

<sup>2</sup> This time, as Mr. G. S. Kirk has pointed out to me, Burnet's translation (*ib.*), 'those

things having been thus decided' is surely wrong. *διακρίνω* must bear the sense it bears in Frs. 12, 13, and 17, viz., 'separate'.

'compared with anything else'), both great and small: great, because it is infinitely divisible and therefore contains an infinite number of parts, *μοῖραι* or ingredients; small, because it is composed of parts which are themselves so infinitesimally small as to possess almost (but not, as Zeno maintains, absolutely) no magnitude whatever. Zeno's argument is, in other words (as I take it to be the object of Anaxagoras' parenthesis to say), wholly fallacious. If a body exists and has magnitude, it is inconceivable that its infinite divisibility (Zeller's reading, *τομῆ*, remains attractive, but is not essential, since even without it infinite divisibility is unquestionably in Anaxagoras' mind) should reduce it to sheer non-existence.

It seems, then, that Anaxagoras' reply to Zeno is no less deliberate and explicit than the Atomists'. In place of the Pythagorean unit-points, we find in Anaxagoras what he himself calls *σπέρματα*, the essential property of which, so far from being impenetrability as in the case of atoms, is their infinite divisibility. Each *σπέρμα*, small as it may be, still contains an infinite number of *μοῖραι*. It is, therefore, both great and small. Moreover, although there is an infinite number of *σπέρματα*, they remain for ever just as many as they are, no more and no less. That is more than could be said of *μοῖραι*—which may well have been, I suspect, another of Anaxagoras' motives for making the remark; *μοῖραι*, as it will be the object of the next two sections to show, are infinite in quite a different sense from *σπέρματα*.<sup>1</sup> For whereas the *σπέρματα* with which we have so far been concerned, however small they may be, would still possess a definite and determinable magnitude, the *μοῖραι* which are our next concern possess no such thing.

## 5

Just as Zeno allows no geometrical minimum, so Anaxagoras after him, despite his *σπέρματα*, allows no material minimum either. As the fragment last quoted says (Fr. 3): οὐτε γὰρ τοῦ συκροῦ ἔστι τό γε ἐλάχιστον, ἀλλ’ ἔλασσον ἀεί. So much is again, of course, universally admitted. But the majority of commentators seem once more to have overlooked the consequences of their admission. The principle of the infinite divisibility of matter means, so far as I can see, that the question so often asked: 'Is Anaxagoras' mixture a mixture by fusion or by juxtaposition of particles?' is not really applicable at all. Indeed Anaxagoras' purpose might almost have been to avoid that very question. However far you may subdivide a *σπέρμα*, he says, and however infinitesimally small a portion of matter you may so reach, it will still contain a literally infinite number of smaller portions, most of which may still, of course, be portions in which gold, for instance, predominates, but each of which must still, since it in turn still consists of a literally infinite number of yet smaller portions, contain everything. That such a theory cannot accurately be described as a theory of fusion can hardly need arguing: granted that the results of the two theories may be in practice indistinguishable, yet the two theories, as theories, are widely different. Nor, in my opinion (though I shall be slightly modifying this later), can the term 'particle' be safely used, as it very often is, in connexion with this theory of *μοῖραι*, if only because, rightly or wrongly, it too easily tends to suggest the existence of just such indivisible minima of

<sup>1</sup> This is of course just the point made by *μοῖραι*, in Simplicius' phrase (*Phys.* 460. 10), the ancient commentators from Aristotle οὐδὲ ἄπειρα μόνον ἀλλὰ καὶ ἀπειράκις ἄπειρα. onwards. The *σπέρματα* are *ἄπειρα*, the

matter as Anaxagoras is, at this stage in his argument, elaborately repudiating. There is indeed no analogy in everyday experience to the kind of mixture—a mixture of an infinite number of *σπέρματα* each of which is itself divisible into an infinite number of *μοῖραι*—that Anaxagoras has in mind. The two usual illustrations, namely the mixture of liquids such as water and wine and the mixture of grains such as those of sugar and sand, are alike misleading. The only possible analogy is that which the influence of Zeno clearly suggests, the analogy of the infinite number of points contained in even the shortest geometrical line. Geometrical points, of course, have no magnitude, whereas the *μοῖραι* of Anaxagoras, however far the process of subdivision has been carried, and however infinitesimally small they may therefore be, are proved still at every stage to have *some* magnitude, even though it is indeterminable, by the fact that, as we saw in the last section, they still compose the *σπέρματα* which in turn compose sensible bodies. Again, geometrical points are all alike, whereas there is an infinite variety of *μοῖραι*. But so long as these two important differences are borne in mind, then the only analogy which can help towards a true understanding of Anaxagoras' theory is the analogy drawn from geometry. For it alone stresses the essential point which Anaxagoras was striving to express, that a single *μοῖρα*, though an existing thing, is none the less a thing which it is impossible, either in practice or in theory, ever to apprehend. As Simplicius says,<sup>1</sup> quoting Fr. 7 of Anaxagoras: *μήποτε<sup>2</sup> δὲ τὸ ἄπειρον ὡς ήμūν ἀπερίληπτον καὶ ἄγνωστον λέγει· τούτο γάρ ἐνδείκνυται διὰ τοῦ “ώστε τῶν ἀποκρινομένων μὴ εἰδέναι τὸ πλῆθος μήτε λόγω μήτε ἔργῳ”*. I cannot escape the conclusion that if the context of this detached phrase of Anaxagoras were ever recovered, it would prove to have been concerned with the infinite number of *μοῖραι* in each of ‘the things that are being separated off’. If indeed we append it to the last sentence of Fr. 6, so : *ἐν πᾶσι δὲ πολλὰ ἔνεστι καὶ τῶν ἀποκρινομένων ἵσα πλῆθος ἐν τοῖς μείζοις τε καὶ ἐλάσσοσιν, ὡστε τῶν ἀποκρινομένων μὴ εἰδέναι τὸ πλῆθος μήτε λόγω μήτε ἔργῳ*, we are thereby enabled to see, I believe, if not its exact context, at least its exact purport.

## 6

The word *μοῖρα* occurs for the first time in the extant fragments in a sentence already quoted from Fr. 6: *καὶ ὅτε δὲ ἵσαι μοῖραί εἰσι τοῦ τε μεγάλου καὶ τοῦ σμικροῦ πλῆθος, καὶ οὕτως ἂν εἴη ἐν παντὶ πάντα· οὐδὲ χωρὶς ἔστιν εἶναι, ἀλλὰ πάντα παντὸς μοῖραν μετέχει*. It appears again in Fr. 11 : *ἐν παντὶ παντὸς μοῖρα ἔνεστι πλὴν νοῦ, ἔστιν οἷσι δὲ καὶ νοῦς ἔνι*. It is, however, in Fr. 12 that it first becomes positively obtrusive: *τὰ μὲν ἀλλὰ παντὸς μοῖραν μετέχει, νοῦς δέ ἔστιν ἄπειρον καὶ αὐτοκρατὲς καὶ μέμεικται οὐδενὶ χρήματι, . . . ἐν παντὶ γάρ παντὸς μοῖρα· ἔνεστιν, ὥσπερ ἐν τοῖς πρόσθεν μοι λέλεκται· . . . μοῖραι δὲ πολλὰ πολλῶν εἰσιν. παντάπασι δὲ οὐδὲν ἀποκρίνεται οὐδὲ διακρίνεται ἔτερον ἀπὸ τοῦ ἔτερου πλὴν νοῦ. νοῦς δὲ πᾶς ὅμοιός ἔστι καὶ ὁ μείζων καὶ ὁ ἐλάττων. ἔτερον δὲ οὐδέν ἔστιν ὅμοιον οὐδενί, ἀλλ’ ὅτων πλείστα ἔνι, ταῦτα ἐνδηλότατα ἔνι ἔκαστον ἔστι καὶ ἦν*.

I do not want to suggest more in this section than that the use of the word *μοῖρα* is itself not insignificant. It is not, surely, nearly so natural a word for a fifth-century Greek to have used in the sense of a physical portion of something as would *μέρος* have been. Indeed the only approximate parallels to be found

<sup>1</sup> *De Caelo* 608. 24.

<sup>2</sup> *μήποτε* here of course bears the sense, common in late writers from Aristotle onwards, of ‘perhaps’.

in the extant fragments of the pre-Socratics as a whole are the following two sentences from Democritus :

Fr. 258: . . . καὶ ταῦτα ὁ ποιῶν εὐθυμίης(?) καὶ δίκης καὶ θάρσεος καὶ κτήσεως(?) ἐν παντὶ κόσμῳ μέζω μοῖραν μεθέξει.

Fr. 263: δίκης καὶ ἀρετῆς μεγίστην μετέχει μοῖραν ὁ [τιμᾶς] ἀξίας τὰς μεγίστας τάμνων <τοῖς ἀξιωτάτοις>(?).

And there is, to the modern mind at least, one striking difference between Anaxagoras' usage of the word and Democritus', that whereas the former uses it of concrete physical bodies, the latter uses it of abstract virtues. True, as I shall shortly be arguing in connexion with Anaxagoras' *Noûs*, no pre-Socratic philosopher had yet, at the time of Anaxagoras, succeeded in apprehending the existence of the incorporeal : the only test of a thing's reality, as we can see most clearly from Parmenides, was whether or not it was extended in space. But that is not to say that to the pre-Socratics there was no distinction whatever between, say, cheese and courage. Anaxagoras, though he could not adequately describe the distinction, was himself, as again I shall soon be arguing, clearly aware of it. I believe, therefore, that when he wanted a word to describe his infinitely divisible portions, he quite deliberately selected a word that had not too blatantly corporeal an implication. His point, in fact, is the same as my own in objecting to the word 'particle'. Since his *μοῖραι* are so infinitesimally small as to possess virtually (though not, as I have said, actually) no magnitude at all—since, indeed, a single *μοῖρα* is a thing which does not even in practice exist, because whenever, in the process of subdivision *ad infinitum*, you claim to have arrived at it, Anaxagoras replies that what you have arrived at still consists, on the contrary, of an infinite number of *μοῖραι*—it is clearly incumbent upon him to select a word for his purposes which cannot, or at any rate should not, suggest anything too irreducibly corporeal. For this purpose, but not to signify anything as corporeal as a particle, *μοῖρα* was, I suggest, the best word available.

## 7

There is, however, one major difficulty which Anaxagoras, in spite of (or perhaps rather because of) the ingenuity (or perhaps rather the frivolity) of his reply to the Eleatics, has still to surmount. There is a certain force in Zeno's argument: if indeed matter is infinitely divisible, or if, in other words, a *μοῖρα* is a thing which, neither in practice nor in theory, can ever be actually reached, on what ultimate basis can the sensible world, which undeniably consists of physical bodies of varying magnitude, be ever erected? On the one hand, the infinite regress must be maintained: it is the only way in which all things can be in all things and so coming-into-being can be eliminated. On the other hand, this same infinite regress must somehow and at some point be at least momentarily halted in order that Anaxagoras may start moving in the other direction towards the building up of the sensible world. It is at this point in the argument, I suggest, that the *σπέρματα* are essential. An Anaxagorean *σπέρμα* is, as a *μοῖρα* is not, something not altogether unlike a particle in the true sense. It remains, of course, infinitely divisible; but, as is suggested by the fact that *σπέρματα* are already present in the original mixture, it is evidently the simplest unit into which *μοῖραι* tend naturally to congregate. A *σπέρμα* is in fact, like everything else in the universe except only *Noûs*, an aggregation of an already

infinite number of *μοῖραι*. That is why the *σπέρματα* in the original mixture are described in Fr. 4 as 'in no way like each other': the proportions of *μοῖραι* in the infinitely numerous *σπέρματα* can and do themselves vary infinitely.<sup>1</sup> But at the same time these *σπέρματα*, for the very reason that they are the natural unit of matter, can and do provide, what the *μοῖραι* cannot, a solid basis for the cosmogonic evolution.

## 8

There remain—from our own point of view this time, not from that of Anaxagoras—two important aspects of the theory still to be discussed. In the first place why, if they are not intended to fill the role allotted to them by Tannery and his followers, do the opposites figure so very prominently throughout the fragments? In particular, what is their relation to the *σπέρματα*, with which, along with earth, they are said in Fr. 4 to be associated in the original mixture? There are three other fragments, besides Fr. 4, in which the opposites do bulk very large. There is Fr. 8: *οὐ κεχώρισται ἀλλήλων τὰ ἐν τῷ ἐνί κόσμῳ οὐδὲ ἀποκέκοπται πελέκει οὔτε τὸ θερμὸν ἀπὸ τοῦ ψυχροῦ οὔτε τὸ ψυχρὸν ἀπὸ τοῦ θερμοῦ*. There is the single sentence from Fr. 12: . . . καὶ ἀποκρίνεται ἀπὸ τε τοῦ ἄραιον τὸ πυκνὸν καὶ ἀπὸ τοῦ ψυχροῦ τὸ θερμὸν καὶ ἀπὸ τοῦ ζοφεροῦ τὸ λαμπρὸν καὶ ἀπὸ τοῦ διεροῦ τὸ ξηρόν—where it is to be noted in passing that Anaximenes' pair is added to those of Anaximander and the Pythagoreans. And there is Fr. 15, which seems to me to contain the clue to the answer to the above questions: *τὸ μὲν πυκνὸν καὶ διερὸν καὶ ψυχρὸν καὶ τὸ ζοφερὸν ἐνθάδε συνεχώρησεν, ἔνθα νῦν <ἢ γῆ>, τὸ δὲ ἄραιὸν καὶ τὸ θερμὸν καὶ τὸ ξηρὸν ἐξεχώρησεν εἰς τὸ πρόσω τοῦ αἰθέρου*.

The first point to be noted concerning these opposites is that, while they are not the only ingredients in the original mixture, they do unquestionably provide a better illustration than any of the other ingredients could of Anaxagoras' theory that things 'are not divided nor cut off from one another with a hatchet'. Heraclitus had long ago shown that one of a pair of opposites cannot exist without the other; while the very fact that they are opposites means that the existence of a close relation between them, whatever it may be, is more obvious than in the case of such substances as, say, gold and flesh. Indeed a particular example which Anaxagoras himself is said to have employed, namely the contention that there is some of 'the black' in snow,<sup>2</sup> does provide a particularly striking illustration of the general theory that *ἐν παντὶ παντὸς μοῖρᾳ ἔνεστι*. It might therefore be plausibly maintained that the opposites are to Anaxagoras no more than a favourite illustration. For just as the hot and the cold cannot be cut off from one another with a hatchet, exactly so are flesh, hair, gold, and every other natural substance eternally inseparable one from the other. *πῶς γὰρ ἂν ἐκ μὴ τριχὸς γένοιτο θρὶξ καὶ σάρξ ἐκ μὴ σαρκός;* asks Anaxagoras in Fr. 10, with the obvious implication that, since such coming-into-being is impossible, hair and flesh must already be present in everything that is liable to give rise to them. And since the number of such changes that may take place in the world is far too great to be calculated, it is clearly more economical of effort, if not indeed more characteristic of the pre-Socratic passion for dogmatic generalization, to conclude simply, as Anaxagoras did, that there must already be a portion of everything in everything.

<sup>1</sup> Cf. the other phrase in Fr. 4: . . . *σπέρματα πάντων χρημάτων καὶ ἴδεας παντοῖς*      <sup>2</sup> *Σextus Pyrrh.* i. 33.

There is, I believe, a good deal of force in this argument; it does at least seem to be valid against some of the interpretations of the system of Anaxagoras which have been put forward in modern times. But for all that, I am inclined to believe that it is only a half-truth. It is of course by now almost a platitude that the pre-Socratics' opposites were not so much what we should call qualities as, in Cornford's phrase, 'quality things'. And besides being substantial, they are also, it is said, possessed of the power to affect other things: 'the hot', as Vlastos puts it,<sup>1</sup> 'is that which heats, the moist that which moistens; each is an active tendency to change other things after its own fashion'. That this, if it is true at all, is at least as true of Anaxagoras as of any other pre-Socratic is, I think, evident from the fragments: the very prominence of the opposites does strongly suggest that Anaxagoras did not regard them, even though they are ingredients in the same original mixture, as on an exactly equal footing with the various sorts of natural substance the *μοῖραι* of which are in the *σπέρματα*. And though the relation of the opposites to the other ingredients is, on the basis of the available evidence, very difficult indeed to determine, it is here, I believe, that Fr. 15, especially when it is correlated with Frs. 1, 2, and 4, gives us at least something to go on.

We must start by reminding ourselves of the basis of Anaxagoras' whole system. As Fr. 11 has it: *ἐν παντὶ παντὸς μοῖρᾳ ἔνεστι πλὴν νοῦ*—'in everything there is a portion of *everything except Mind*'. Now if the words italicized mean what they would almost inevitably be taken to mean, they imply that every *σπέρμα* contains a portion not only of all the opposites, nor only of every natural substance, but of both. The opposites to this further extent resemble natural substances, that both alike exist as *μοῖραι* in *σπέρματα*. They are in fact, as I have already suggested, specifically included in the list of the ingredients of the original mixture in Fr. 4 only because they had played so large a part in earlier cosmogonies. It is, therefore, as *μοῖραι* in *σπέρματα* that they act upon the *σπέρματα* in which they are present: if there are more hot *μοῖραι* in a *σπέρμα* than there are cold, just as if there are more of gold than there are of flesh, the whole *σπέρμα* will obviously be hot. With opposites as with substances, *ὅτων πλεῖστα ἔνι*, as the last sentence of Fr. 12 says, *ταῦτα ἐνδηλότατα ἐν ἔκαστον ἔστι καὶ ἦν*.

The first result of the action of the opposites is apparently the emergence from the mixture of the Empedoclean elements. Such at any rate is the suggestion of the following sentences:

Fr. 1: . . . πάντα γὰρ ἀήρ τε καὶ αἰθήρ κατεῖχεν, ἀμφότερα ἅπειρα ἔόντα· ταῦτα γὰρ μέγιστα ἔνεστιν ἐν τοῖς σύμπασι καὶ πλήθει καὶ μεγέθει.

Fr. 2: καὶ γὰρ ἀήρ τε καὶ αἰθήρ ἀποκρίνονται ἀπὸ τοῦ πολλοῦ τοῦ περιέχοντος.

Now the Empedoclean elements, as they figure in Anaxagoras, are not, as I have already said, simple elements at all but collections of *σπέρματα* of every sort, *πανσπέρμιαι*. How, therefore, can they be said to be 'separated off' from the original mixture, which is itself already a collection of *σπέρματα* of every sort? There must clearly be some particular characteristic of both *ἀήρ* and *αἰθήρ* to distinguish them, both from one another, and from the mixture as a whole. In the light of Fr. 15 there can be little doubt what that characteristic is. It is the preponderance in them of one of each pair of opposites over the other, which, once *Noûs* has imparted the original rotation to the mixture,

<sup>1</sup> Op. cit., 42.

determines the direction in which the various *σπέρματα* move. Earth in fact, though still a *παιωνικά*, is none the less, at this early stage of cosmogony at least, earth rather than anything else simply because the *σπέρματα* of which it is composed, however diverse they may be in other respects, are characterized by a preponderance of the dense, the moist, the cold, and the dark over their respective opposites. The opposites are, therefore, in the early stages of cosmogony at least, a sort of secondary agents.<sup>1</sup> True, of course, that in the last analysis there is only one agent, namely *Noūs*: *Noūs* alone, that is to say, works with a conscious knowledge and purpose. In contrast with *Noūs*, the opposites blindly and unconsciously obey those two axiomatic laws, the attraction of like to like, and the tendency of the heavy to the centre and of the light to the circumference.<sup>2</sup> But for all that, once *Noūs* has imparted the original motion, it is the opposites that are responsible for the next stage in cosmogony; and the first result of their secondary and unconscious agency is the emergence of the Empedoclean elements. So, it seems to me, without departing from his principles, Anaxagoras finds an honourable place in his system not only for the traditional opposites but also for those new and influential arrivals on the cosmogonic scene, the four elements. It is, I hope, hardly necessary to add that this is exactly what the well-known passage in the *Phaedo*,<sup>3</sup> which is echoed by both Aristotle<sup>4</sup> and Eudemus,<sup>5</sup> might most naturally have led us to suppose.

## 9

Not very much need be said on the second question that is still outstanding, namely, What is the nature of *Noūs*? For my own view on the subject has already been clearly foreshadowed. Quite the most striking aspect of the whole history of pre-Socratic speculation is, to my mind, just this: that whereas, with the exceptions of the Milesians at one end of the story and the Atomists at the other, every single one of the pre-Socratics was striving after an incorporeal principle, their minds were yet so firmly possessed by the preconception that the only criterion of reality was extension in space that one and all they ended in failure. So the Pythagoreans, for instance, having chosen number as their first principle, proceed to endow their units with corporeality; *οἱ μὲν οὐν καλούμενοι Πυθαγόρειοι*, says Aristotle,<sup>6</sup> *ταῖς μὲν ἀρχαῖς καὶ τοῖς στοιχείοις ἐκτοπωτέροις χρῶνται τῶν φυσιολόγων* (*τὸ δ' αἴτιον ὅτι παρέλαβον αὐτὰς οὐκ ἐξ αἰσθητῶν . . .*), *διαλέγονται μέντοι καὶ πραγματεύονται περὶ φύσεως πάντα*. So Heraclitus, seeking apparently for an immaterial principle or force, proceeds to confound it with fire. So the Eleatics, seeking to describe an intelligible rather

<sup>1</sup> Cf. also Fr. 16: *ἀπὸ τουτέων ἀποκρινομένων συμπήγνυται γῆ ἐκ μὲν γάρ τῶν νεφελῶν ὕδωρ ἀποκρίνεται, ἐκ δὲ τοῦ ὕδατος γῆ, ἐκ δὲ τῆς γῆς λίθοι συμπήγνυται ὑπὸ τοῦ ψυχροῦ, οὗτοι δὲ ἐκχωρέονται μᾶλλον τοῦ ὕδατος*. The phrase *ὑπὸ τοῦ ψυχροῦ* explicitly suggests this secondary agency of the opposites.

<sup>2</sup> It would be reasonable to object that the opposites are therefore no more to be called 'agents' than are the natural substances with which they are mixed in the *σπέρματα*; and it is certainly true that at a later stage in Anaxagoras' system, notably in his physiology, it is the substances—hair, flesh, and so on—which are operative in the attraction of

like to like rather than the opposites. The fact remains, however, that it is evidently the opposites which are *first* operative, in the earliest stages of cosmogony; and that fact, even if it does not entitle them to a real priority of status, does at least account for Anaxagoras' emphasis upon them.

<sup>3</sup> 97 b–98 c, especially the words *ἀναγγηνώσκων ὄρῳ ἄνδρα τῷ μὲν νῷ οὐδὲν χρώμενον . . . εἰς τὸ διακοσμεῖν τὰ πράγματα, ἀέρας δὲ καὶ αἰθέρας καὶ ὕδατα αἰτιώμενον καὶ ἄλλα πολλὰ καὶ ἄποτα*.

<sup>4</sup> *Met. A* 4. 985<sup>a</sup>18.

<sup>5</sup> Fr. 21 *ap.* *Simpl. Phys.* 327. 26.

<sup>6</sup> *Met. A* 8. 989<sup>b</sup>29.

than a sensible reality, end by discussing whether it is spherical or infinite in extent. So Empedocles, complying with Parmenides' demand that motion be accounted for, first invokes as efficient causes the moral and psychological forces of Love and Strife, and then proceeds to define them in terms of spatial extension.<sup>1</sup> So, finally, Anaxagoras himself. That he is trying to describe an incorporeal principle in opposition to matter is clear enough from the greater part of Fr. 12:

τὰ μὲν ἄλλα παντὸς μοῖραν μετέχει, νοῦς δέ ἐστιν ἅπειρον καὶ αὐτοκρατὲς καὶ μέμεικται οὐδεὶν χρήματι, ἀλλὰ μόνος αὐτὸς ἐπ’ ἔωντοῦ ἐστιν. εἰ μη γάρ ἐφ’ ἔαντοῦ ἦν, ἀλλά τεω ἐμέμεικτο ἄλλω, μετέχειν ἀν ἀπάντων χρημάτων, εἰ ἐμέμεικτό τεω... καὶ ἀν ἐκώλυνεν αὐτὸν τὰ συμμεμειγμένα, ὥστε μηδενὸς χρήματος κρατεῖν ὅμοίως ὡς καὶ μόνον ἔοντα ἐφ’ ἔαντοῦ. . . . καὶ γνώμην γε περὶ παντὸς πᾶσαν ἴσχει καὶ ἰσχύει μέγιστον. . . . καὶ τῆς περιχωρήσιος τῆς συμπάσης νοῦς ἐκράτησεν, ὥστε περιχωρῆσαι τὴν ἀρχήν. . . .

And there is plenty more to the same effect: *Nous* not only initiated motion, but knew in advance everything that would result from its initiation, and indeed ordained it so. Yet there are two sentences from the same fragment which show that Anaxagoras, even if he got nearer than his predecessors to his objective, in the last resort failed too. When he writes of *Nous* that *ἐστι* . . . *λεπτότατόν τε πάντων χρημάτων καὶ καθαρώτατον*, and when later he adds that *νοῦς . . . πᾶς ὅμοιός ἐστι καὶ ὁ μείζων καὶ ὁ ἐλάττων*, there can be no doubt that *Nous*, for all its fineness and purity, is still regarded as extended in space and corporeal. For if once we admit the only alternative explanation, that these phrases are merely figurative or metaphorical, then we can hardly refuse a similar concession to Empedocles, Parmenides, and all the rest. Burnet<sup>2</sup> is surely right: 'Zeller holds, indeed, that Anaxagoras meant to speak of something incorporeal; but he admits that he did not succeed in doing so, and that is historically the important point.'

But if therefore everything in Anaxagoras' universe proves in the end to be corporeal, that does not at all mean that Anaxagoras was wholly unaware of any metaphysical distinctions. On the contrary, there is a sort of hierarchy implicit in his cosmology. At the top stands *Nous*, owing its conscious power to its purity: it alone remains eternally unmixed, even when, as it is, it is present in the mixture in the form of the consciousness in living things. Next come the opposites, which, though just as corporeal as the various sorts of natural substance with which they are mixed in the *σπέρματα*, do none the less derive a certain priority of status from the fact that they are responsible for the early stages of cosmogony. And finally come the natural substances themselves, inferior in status to the opposites only in that they do not become operative until a later stage of cosmogony, but inferior none the less. It remains true, in fact, that even at the time of Anaxagoras the notion of the incorporeal or abstract has yet to be clearly apprehended and explicitly expressed; not until the time of Plato was that objective fully attained. But the advance has long ago begun, and by the time of Anaxagoras it is coming within sight of the end. It is for that reason that I wrote with such confidence in an earlier section that Anaxagoras was at least aware of, even if he could not adequately describe, the metaphysical distinction between courage and cheese.

<sup>1</sup> Fr. 17. 19–20.

<sup>2</sup> Op. cit., 268.

No such article on the subject of Anaxagoras would be complete without a section devoted solely to the subject of *homoeomeries*. Once again on this topic, as a matter of fact, my own attitude has already been foreshadowed; and it may also have become evident that I do not regard it as a problem of primary importance. It is, for one thing, very doubtful indeed whether Anaxagoras himself ever used the word *δμοιομερῆ*, and the question, what he would have meant by it if he had, strikes me therefore as somewhat academic. But since there is certainly no denying that the ancient commentators, from Aristotle onwards, do use it very freely in their interpretation of his theory, it is a topic that cannot be altogether omitted.

Whether or not Peck<sup>1</sup> is right in maintaining that the word *δμοιομερῆ* is ambiguous—that besides meaning, as it does in Aristotle, things ‘of which every part was similar to every other part of the same thing’, it could and did mean also ‘things having parts similar to the parts of everything else’—there is fortunately no difficulty in fitting *δμοιομερῆ* in either sense into the system I have reconstructed. It is clear from many passages that the commentators’ *δμοιομερῆ* or *δμοιομέρειαι* are the *σπέρματα* of Anaxagoras himself; the word *σπέρματα*, though it occurs twice in the one fragment of Anaxagoras, occurs very rarely indeed in later writers’ remarks about him. Now a *σπέρμα*, as I have tried to make clear, is an aggregate, still of course very small, of an infinite number of *μοῖραι* of every sort; and though the proportions of those *μοῖραι*, simply because they are infinite in number, can therefore vary indefinitely—and indeed they *must* so vary, because Anaxagoras himself says that the *σπέρματα* are ‘in no way like each other’—yet, since each *σπέρμα* contains literally everything, it follows that not only every *σπέρμα* but everything composed of *σπέρματα* will be homoeomeric in both senses. Every part of every *σπέρμα*, however far we may divide it, will still contain everything, and to that very important extent will resemble every other part; and since all physical bodies are composed of *σπέρματα*, not only will the same be true of them, but also every part of each such body will be, to exactly the same extent, similar to each part of every other such body. To put the matter in a nutshell, in everything there is a portion of everything; and since things that contain a portion of everything do unquestionably contain, in a very real sense, similar portions, the word *δμοιομερῆ*, whichever of the two senses it bears, is not so gross a perversion of Anaxagoras’ doctrine as it is sometimes alleged to be.

A few general remarks by way of conclusion. It may have been noticed that what Cornford<sup>2</sup> regarded as intolerable, the ‘infinite vista’ and the ‘unattainable ideal’ involved in the *μοῖραι* as I have represented them, is the very basis of my whole reconstruction. There may, I fear, be many others who feel as Cornford felt. But what we have to decide is not what *is* intolerable, nor indeed what *was* intolerable to Aristotle and his successors, but—which is quite a different matter—what *would have been* intolerable to Anaxagoras. The notion of an infinite regress was, at the time of Anaxagoras, a very new one: it owed its introduction to the paradoxes of Zeno. I do not think that it ought to surprise us, even before we begin to look at the evidence, that it should have made so deep an impression upon Anaxagoras that, with the perversity to which the

<sup>1</sup> Op. cit., 64–65.

<sup>2</sup> C.Q. xx, 91.

pre-Socratics were so liable, he should have based upon it his whole reply to the Eleatics. He would, after all, have been doing to Zeno only what Zeno himself had done to the opponents of Parmenides' One Being, namely turning against him the weapons he had himself forged. And when we look at the evidence, this *a priori* surmise is, I claim, strongly confirmed. The echoes of Zeno in Anaxagoras are too striking to be dismissed as mere coincidences—and that, it should be noted, from the mere four fragments which survive from Zeno's treatise. But, strong as I believe these arguments are, the strongest argument of all has yet to be named. The interpretation which I have tried to put forward has, to my mind, one very great advantage over any other recent interpretation that I have seen, that it allows Anaxagoras to mean just what he says. I have not attempted here to follow his fundamental theories into their detailed developments: that would demand either a much longer paper than this one or, preferably, a sequel to it. But such a sequel is, I hope, unnecessary. For if once it were agreed that the basis of the whole system is as I have tried to reconstruct it, then it would be found, I believe, that all the doctrines of detail that we are justified in attributing to Anaxagoras spring easily and naturally from that basis.

I will now summarize as briefly as possible the conclusions which this paper has attempted to establish.

1. As with the Atomists, so with Anaxagoras, the basis of his system was suggested to him by the Eleatics. He ingeniously finds in the arguments of Zeno, of which there are significant echoes in two of his fragments, the solution to the problems posed by Parmenides.

2. In place of the Pythagorean unit-point-atoms, which Zeno had especially attacked, he substitutes an infinite number of *σπέρματα* or *homoeomeries*, which, though infinitely divisible, do none the less, since in practice they are the unit in which *μοῖραι* tend naturally to cohere, provide the required basis for the physical world.

3. The world originates from a mixture, in the form of these *σπέρματα*, of everything that it is ultimately to contain. Each *σπέρμα*, however, already contains a *μοῖρα* of everything; at no stage in cosmogony can anything exist in separation from anything else except only *Noῦς*.

4. Anaxagoras probably used the word *μοῖρα*, which normally has an abstract connotation, to avoid the suggestion of anything as corporeal as a particle or atom. However far a *σπέρμα* be subdivided, each resultant portion must still contain a portion of everything; with the result that an ultimate and irreducible *μοῖρα* is something unattainable.

5. The traditional opposites, of which alone it is often claimed that everything contains a portion, are as corporeal as the various sorts of natural substance with which they are mixed in the *σπέρματα*. But since it is the opposites which, once *Noῦς* has originated motion, are responsible for the first stages in cosmogony, they have a certain priority of status over the various forms of natural substance.

6. *Noῦς* too is corporeal, and owes its power over everything else to the fact that, while everything else, substances and opposites alike, is mixed with everything else, it alone remains unmixed. *Noῦς* indeed, in the sense that it alone is conscious and purposive, is the only true agent in Anaxagoras' universe.

7. When, however, *Noῦς* imparts the first rotatory motion to the original mixture, whichever opposites predominate in each of the *σπέρματα* cause that

particular *σπέρμα* to gravitate towards a particular part of the world. Hence emerge the Empedoclean elements, which, though each characterized by a particular combination of the opposites in their constituent *σπέρματα*, are none the less *πανσπέρμια*. In consequence of this doctrine Anaxagoras was frequently blamed in antiquity for making insufficient use of his first principle of *Noûs* and for invoking instead merely mechanistic causes.

8. This interpretation has the three great advantages, at least one of which is lacking to any other recent reconstruction, that:

- (a) it provides a satisfactory basis for the later stages of Anaxagoras' cosmology, including his physiology;
- (b) it allows every single sentence of his that has survived to mean what it appears to say;
- (c) the obvious weakness in the system as reconstructed, namely the difficulty of postulating material masses (i.e. *σπέρματα*) which, though infinitely divisible, are in practice the natural and normal unit of matter, is merely an indication of the impression made on the later pre-Socratics by the arguments of Zeno. Anaxagoras is thus seen to fit as neatly into the pattern of development of pre-Socratic speculation as do his successors the Atomists.

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