

ALEXANDER OF APHRODISIAS ON VISION IN THE ATOMISTS

In discussing the atomists' theory of vision modern accounts have quite neglected to take into account two sections of Alexander of Aphrodisias on this topic.¹ Nearly identical in length and content, they contain objections to the atomist theory of vision by means of the εἰδῶλα (henceforth 'idols'). In form they consist of a series of questions purporting to contain atomist doctrine. Each question is followed by objections to its subject-matter. Most of the questions contain doctrine known to us already from other sources.² However, one of the questions attributes to the atomists a solution of a problem of vision by idols which has quite escaped all the better-known and more recent accounts of atomist epistemology.³ This solution explains how idols emanating from large objects enter the pupil of the eye and are able to be perceived as wholes. In another question Alexander attributes to the atomists the notion that the idols may have served merely to arouse and make ready the eye for vision. This

¹ P. Wendland (ed.), 'Alexandri in librum de sensu commentarium', *Commentaria in Aristotelem Graeca*, III.1 (Berlin, 1901), pp. 56.6–58.22 (henceforth *De sensu*) and I. Bruns (ed.), 'Alexandri Aphrodisiensis praeter commentaria scripta minora. De anima liber cum mantissa', *Supplementum Aristotelicum*, II.1 (Berlin, 1887), pp. 134.28–136.28 (henceforth *Mantissa*). The *Mantissa* may not be an original part of the work of Alexander going under the title *De Anima* (Bruns, *ibid.*, v). Bruns is nevertheless convinced that most of Book 2 is by Alexander (*ibid.*). In fact, the information in this section is somewhat fuller than that found in the corresponding section in *De sensu*. If its author was not Alexander, he was certainly someone well acquainted with atomist writings. This is suggested, for instance, by his use, in reference to the idols, of the term καταβυσσοῦσθαι (135.19–20). The only other instance of the use of this verb or a related one in a similar context occurs, as far as I know, in a passage attributed by Plutarch to Democritus: . . . ὁ φησὶ Δημόκριτος ἐγκαταβυσσοῦσθαι τὰ εἰδῶλα διὰ τῶν πόρων εἰς τὰ σώματα . . . (*Quaest. Conviv.* 8.10.2, 734 F = Diels-Kranz¹², Democritus A 77).

P. Moraux thinks it very probable that the section of the *Mantissa* considered in this paper was a part of a series of studies on the *De sensu* of Alexander. He makes no firm statement on its authorship (*Alexandre d'Aphrodise* (Paris, 1942), pp. 24–8). P. L. Donini (*Tre studi sull'aristotelismo nel II*

secolo D. C. (Turin, 1974), p. 159) thinks that the author of the *Mantissa*, if not Alexander himself, certainly belonged to his school. Therefore there seems to be no reason why the question of authorship should prevent us from making use of the information contained in this passage. For the sake of convenience I shall use the name of Alexander to refer in the rest of this paper to the author of the *Mantissa*.

² In *De sensu* 56.10–16 Alexander groups Empedocles with Leucippus and Democritus as representatives of the same theory of vision. In consequence, one might consider that he could have attributed the atomist doctrines found in the chapters in *De sensu* and the *Mantissa* also to Empedocles. However, when dealing with some aspects of vision in more detail Alexander clearly separates Empedocles from Leucippus, Democritus, and Epicurus (*ibid.*, 23.5–24.9 versus 24.10–27).

³ This explanation is referred to in the context of vision by A. E. Haas, 'Antike Lichttheorien', *Archiv für Geschichte der Philosophie* 20 (1907), 364, and *passim*, J. Zahlfleisch, 'Die Polemik Alexanders von Aphrodisia gegen die verschiedenen Theorien des Sehens', *ibid.*, 9 (1896), 149–55, A. Koenig, *Lucreti de simulacris et de visu doctrina cum fontibus comparata* (Greifswald, 1914), pp. 91–2, and Ch. Mugler, 'Les Théories de la vie et de la conscience chez Démocrite', *R PH* 33 (1959), 24. However, these scholars make very slight use of it.

theory seems to have escaped scholarship even more completely. For both of these theories Alexander is our only source of information.

Alexander does not mention his sources. Should we believe that all of the doctrine which his questions impute to the atomists was, indeed, theirs? It seems to me that in principle we have no reason to treat Alexander with more suspicion than other evidence. The great majority of the writings of Democritus and of Epicurus is lost. We know very little of the teachings of the later Epicureans and of the possible supplements to their philosophy which they may have excogitated to defend it against the attacks of their Hellenistic competitors. Nor is much Epicurean doctrine found in the writings of men living in the Roman period. Therefore, it is quite possible that atomist doctrine found in Alexander and not attested elsewhere may be genuine. The plausibility of each item has to be considered separately. In general, Alexander's record for veracity and accuracy is rather good. His accounts have been questioned here and there but there appears to be no major scandal.⁴

Because of our lack of information we cannot in most cases determine whether or not the atomist doctrines mentioned by Alexander were held both by Democritus (and Leucippus) and Epicurus.⁵ In our two passages a clear differentiation between Democritus and Epicurus can, it seems, be made on only one point. In the *Mantissa*, 136.24, the idols are said to lack colour. As will be discussed later on, this statement cannot be made of the Epicurean idol. Alexander also does not mention the air-imprint theory of vision attributed to Democritus by Theophrastus.⁶ However, the doxographical tradition attributes the theory of idols also to Democritus.⁷ Therefore the omission of the air-imprints need not mean that specifically Epicurean doctrine was followed by Alexander here.

Alexander himself does not mention Epicurus by name in these two accounts. There is evidence, however, which indicates that he did not differentiate in his mind among the views on this point of Leucippus, Democritus, and Epicurus. In *De sensu* 56.12 ff. he states that he is opposing the theory of vision of those who εἰδῶλα . . . τινα ὁμοιόμορφα ἀπο τῶν ὁρωμένων συνεχῶς ἀπορρέοντα καὶ ἐμπίπτοντα τῇ ὅψει τοῦ ὁράν ἡτιῶντο. As representatives of this theory he mentions only Leucippus and Democritus. No names are given in the corresponding section in the *Mantissa* (pp. 134 ff.) but all atomists appear to be covered by the phrase πρὸς δὲ τοὺς διὰ τῶν εἰδῶλων τὸ ὁράν λέγοντας (134.30). Moreover, in *De sensu* 24.18–21 (= Us. 319) Epicurus is added as a representative of this

⁴ For instance, H. H. Joachim in his commentary to Aristotle's *De Generatione et Corruptione* 328a (Oxford, 1922), pp. 183–4, believes that of the two different doctrines on mixture attributed to Democritus by Alexander and Philoponus respectively we ought to prefer the one reported by the latter. In this Joachim has been supported recently by R. B. Todd, *Alexander of Aphrodisias on Stoic Physics* (Leiden, 1976), pp. 184–5.

D. J. Furley, *Two Studies in the Greek Atomists* (Princeton, 1967), pp. 98–9, believes that in the question on the parts of the Democritean atom the testimony of

Simplicius ought to be preferred to that of Alexander (*Metaphysics* 36.25–7).

A. A. Long, 'Stoic Determinism and Alexander of Aphrodisias De Fato (i–xiv)', *Archiv für Geschichte der Philosophie* 52 (1970), 247–68, states that Alexander's conclusions sometimes involve misrepresentation of Stoics' views (*ibid.*, p. 247).

⁵ Cicero asserts that in vision Epicurus followed Democritus: '... sunt tota Democriti . . . imagines quae εἰδῶλα nominant, quorum incursione non solum videamus, sed etiam cogitemus' (*De fin.*, 1.6.21).

⁶ Theophrastus, *De sensu* 50–1.

⁷ Diels–Kranz 67 A, 29–31, pp. 78–9.

theory: ὅστερον δὲ οἱ περὶ τὸν Ἐπίκουρον . . . Since the *De sensu* is a commentary to Aristotle, it is not surprising that atomist philosophers found in Aristotle himself—Leucippus and Democritus—should be mentioned more frequently by Alexander than Epicurus. Moreover, differences between the views of Democritus and Epicurus on vision need not affect the specific problem discussed by Alexander: how are effluences from large objects—Alexander mentions temples and theatres—able to be perceived in their entirety by the much smaller eye?

Since the Greek of these two passages is not everywhere perfectly clear, I have translated them and discussed the more difficult parts in detail. The rest of this paper will be devoted chiefly to a discussion of those sections which introduce atomist doctrine not encountered in other sources.

This is the Greek text as found in the CAG editions and a translation of the two passages:

De sensu 56.6–58.22

p. 440^a 15 Τὸ μὲν οὖν ὥσπερ οἱ ἀρχαῖοι λέγειν ἀπόρροιαν εἶναι τὴν χροιάν.

- Ἐκθέμενος τὰς δόξας τὰς δύο, καθ' ὅς αἱ τῶν πλειόνων χρωμάτων φαντασίαι κατὰ μῆκρ τῶν ἐναντίων, τοῦ τε λευκοῦ καὶ τοῦ μέλανος, γίνεσθαι † δοκεῖ ἐν ἡ τὴν δόξα προκαταβεβλημένη περὶ τοῦ ὁρᾶν ὑπὸ τῶν ἀρχαίων, ὥς ἄρα τοῦ ὁρᾶν κατὰ τὴν ἀπὸ τῶν ὁρωμένων ἀπόρροιαν γινόμενον· εἶδωλα γάρ τινα ὁμοίμορφα ἀπὸ τῶν ὁρωμένων συνεχῶς ἀπορρέοντα καὶ ἐμπίπτοντα τῇ ὄψει τοῦ ὁρᾶν ἡτιώωντο. τοιοῦτοι δὲ ἦσαν οἱ τε περὶ Λεύκιππου καὶ Δημόκριτον. οἳ καὶ ἐκ τῆς τῶν ἀοράτων διὰ μι- 10
κρότητα παραθέσσεως τὴν μεταξὺ χρωμάτων φαντασίαν ἐποιοῦν· ἀλλὰ καὶ Ἐμπεδοκλῆς οὕτω τὸ ὁρᾶν γίνεσθαι λέγει, ὥς πρὸ ὀλίγου ἐμνημόνευσεν. 118
ὅτι δὲ μὴ ὑγιᾶς ἡ δόξα μηδὲ οὕτως οἶδν τε τὸ ὁρᾶν γίνεσθαι, ἀλλ' ὥς αὐτὸς ἔδειξεν, ὑπομνήσκει ἡμᾶς καθόλου δεικνὺς ὅτι μὴ κατὰ τὰς ἀπορροίας τὰς ἀπὸ τῶν ὁρωμένων τὸ ὁρᾶν γίνεσθαι οἶδν τε. εἰ γὰρ οὕτω, δι' 5
ἀφῆς ἡ ἀντίληψις τῇ ὄψει ἔσται, εἴγε τὰ ἀπορρέοντα σώματα ὄντα τῷ ἐμπίπτειν αὐτὰ † ἡ ὁραθεῖσιν * * * οὐκέτι προσέθηκεν τὸ ἐπόμενον ἄτοπον. εἴη δ' ἂν, εἰ εἴη δι' ἀφῆς, δεῦν αὐτὴν ψυχροῦ θερμοῦ, ὕγρου <ξηροῦ> καὶ τῶν ἀπῶν ἐναντιώσεων ἀντιλαμβάνεσθαι· οὐδενὸς δὲ τούτων ἀντίληπ- 10
τική. ἔτι εἰ συνεχῆς ἀπὸ τῶν ὁρωμένων ἀπόρροια, πῶς οὐκ ἀναλίσκεται ταχέως τοσαύτης σωματικῆς ἀποκρίσεως ἀπ' αὐτῶν γινόμενης; εἰ δὲ ἀντιπροσκρίνεται αὐτοῖς ἄλλα, πρῶτον μὲν διὰ τί | τοῦτο οὐκ αἰεὶ γίνεται ἐπ' αὐτῶν, 119
ὥστε ἴσα [τε] αὐτὰ διαμένειν; τίς τε αἰτία τοῦ ὠρισμένως αὔξεσθαι καὶ πάλιν ὠρισμένως μειοῦσθαι; ἔπειτα πῶς ὁμοιοσχέμονα διαμένει; τὰ μὲν γὰρ ἀπορρέοντα ὁμοίμορφα (διὰ τοῦτο γοῦν καὶ χρωμάτων ἡ ὄψις ἀντιλαμβάνεται)· τὰ δὲ προσκρινόμενα διὰ τί τοιαῦτά ἐστι; καὶ εἰ συνεχῆς 5
ἡ ἀπόρροια ἀφ' ἐκάστου καὶ κατὰ πάντα τὰ μόρια, πῶς οὐκ ἐμποδίζει τὰ ἀποκρινόμενα τοῖς φερόμενοις, ἵνα <μὴ> προσκριθῇ, ἡ ἐκεῖνα τούτους, ἵνα μὴ φέρεται; πῶς δὲ λεπτά ὄντα οὐ σκεδασθήσεται ἀνέμων ὄντων; ὁρῶμεν γάρ, 10
κἂν ἄνεμος ᾗ μεταξὺ. ἔτι πῶς διαστήματος ἀντίληψις γινεταί, εἰ τὰ ἐμπίπτοντα ὁ ὀφθαλμὸς ὁρᾷ; πῶς δὲ καὶ μόντες οὐκ ὀφόμεθα, εἰ οὕτως ἐστὶ τὰ φερόμενα λεπτά; δυνήσεται γάρ καὶ μόντων διὰ τῶν πόρων εἰσὼ χωρεῖν. διὰ τί δὲ καὶ ἐπιτεθέντος τοῦ ὁρωμένου <τοῖς ὀφθαλμοῖς> οὐχ ὀφόμεθα; καὶ γὰρ τότε ἀπορρεύσεται τὰ εἶδωλα καὶ δέξεται αὐτὰ ὁ ὀφθαλμὸς. 15
ἡ διὰ τί φωτὸς χρεῖα πρὸς τὸ ὁρᾶν, δεχομένου τὸ ὁρῶμενον τοῦ | ὀφθαλμοῦ, γίνεταί; ἔτι ἦτοι τὰ ἀπορρέοντα παράκειται τῷ ὀφθαλμῷ ἡ τότε φέρεται, ὅταν εἰς αὐτὰ ἐπιστραφῇ. εἰ μὲν οὖν παράκειται, οὐδ' ὅπως διαστήματος ἀντίληψις ἔσται· εἰ δὲ τότε φέρεται, πρῶτον μὲν ἐν πλείονι 120
χρόνῳ τὰ πλείον ἀφροσύνητα ὀφόμεθα, ὅπερ οὐχ οὕτως γινόμενον ὁρῶμεν· 5
εἴτα εἰ τῷ τοῦ ἁέρος τοῦ πρότερον ἀπορρέοντος τε καὶ ἐμπίπτοντος τοῦ

- ειδώλου τῇ ὕψει ποσῶ, ὃς καὶ αὐτὸς ἐμπίπτει τῇ ὕψει, κατ' αὐτοὺς τὸ
διάστημα ὁραθήσεται, πρῶτον μὲν πῶς τοσοῦτον ἄερα ἡ ὄψις δέχεται (καθ'
25 ἐκάστην γὰρ φορὰν εἰδώλου τοσοῦτον ἄερα δέχεται, ὅσος ἐστὶν ὁ μεταξὺ 10
αὐτοῦ τε καὶ τοῦ ὁρωμένου); εἴτα ἐξεῖ τῷ ἰσχύει τὰ ἀπορρέοντα εἰδῶλα,
ὡς τοῦτον προωθεῖν δύνασθαι; εἴτα πῶς, ὅταν ἄνεμος ᾗ, τοῦτο ἔτι σωθήσεται;
ὁ γὰρ ἄνεμος ὁράται παρασύρων τὸν μεταξὺ ἄερα. εἰ δὴ τὰ εἰδῶλα λεπτό-
τερα ὄντα διαδύεται τὴν τῶν ἀνέμων βίαν, πῶς οὐχὶ διὰ τοῦ ἀέρος δια- 121
δύσεται; τί δὲ ἔσται καὶ τὸ ἀναμετροῦν τὸν εἰσιόντα εἰς τὴν ὄψιν ἄερα; πῶς δὲ 121
καὶ τὸ μέγεθος καὶ τὸ σχῆμα τοῦ ὁρωμένου ἡ ὄψις κρνεῖ, κατὰ τὸ τῆς κόρης
μέγεθος δεχομένη ἀπὸ τοῦ φερομένου εἰδώλου μόριον; καὶ γὰρ εἰ πολλάκις 5
καὶ οὐχὶ ἀεὶ τὸ αὐτὸ καὶ ἐκ διαστημάτων; εἰ δὲ καὶ ἀεὶ τὸ παρακείμενον,
τίς ἡ σύνθεσις τούτων ἐν τῇ ὕψει, ὡς θέατρον ἢ ναὸν δοκεῖν ἑωρακέναι διὰ
οὕτω μικρῶν μορίων τῶν ἐμπίπτόντων ἀπὸ τοῦ ἀπ' αὐτῶν εἰδώλου φερομένου;
πῶς δὲ οὐ μεταξὺ ἀπ' ἄλλων τῶν εἰδῶλων ἐμπίπτόντων τῇ ὕψει τινὰ 10
διασπάσει τὴν τῆς ὄψεως τῆς τοῦ πρῶτου συνέχειαν, εἰ δεῖ τοσαντάκις καὶ
10 τοσαῦτα εἰδῶλα ἐνεχθῆναι ἀπὸ τῶς πρὸς αὐτήν, ὡς κατὰ τὸ τῆς κόρης
μέγεθος δεχομένη ἀπ' αὐτῶν τι ὅλον ἀεὶ δέξασθαι, ἄλλο ἀπ' ἄλλου εἰδῶ-
λου μέρος λαμβάνουσιν; πῶς δὲ καὶ ἀπὸ τῶν λείων ὡς ἐσχηματισμένα 122
τὰ εἰδῶλα λαμβάνει, οὐκ ἐχόντων ἐξοχάς; ἢ πῶς ἀπὸ τῶν κατόπτρων;
ἢ πῶς αἱ ἐξοχαὶ ἂψ ὧν δύναται φέρεσθαι μένουσιν ἐν τῇ ὕψει, εἰ οὕτως
15 ἐστὶ λεπτά καὶ ἀσθενῆ τὰ εἰδῶλα, καὶ οὐ συγχέονται; διὰ τί δὲ κἂν ὀλίγον
ἀπελθόντος τοῦ ὁρωμένου, ταῦτα μένει † ἢ ἐξ ὧν ἐν τῇ ὕψει; τὸ δὲ λέγειν
μυωπίξασθαι τὴν ὄψιν ὑπὸ τῶν φερομένων ἐπ' αὐτὴν εἰδῶλων καὶ διο- 5
ρίζεσθαι καὶ πρὸς τὸ ὁρᾶν παρασκευάζεσθαι οὐκέτι τηρούντων ἐστὶ τὸ διὰ
τῶν εἰδῶλων γίνεσθαι τὸ ὁρᾶν. δῆλον γὰρ ὅτι μυωπισθεῖσα ἡ ὄψις ὑπὸ
20 τοῦ εἰδώλου ἄλλο τι ὕπεται, εἰ μὴ τὸ εἰδῶλον. τί οὖν ταῦτα καὶ πῶς;
καὶ ταῦτα μὲν καὶ τοιαῦτα λέγειν ἔστι πρὸς τοὺς ἀπὸ τῶν ὁρατῶν ἀπορρεῖν 10
τι λέγοντας καὶ οὕτως ὁρᾶσθαι τὰ ὁρώμενα.

To assert as the old philosophers did
that colour is an emanation

7

After setting forth the two doctrines according to which the appearance of the majority of colours occurs through mixing the opposites <the colour> black and <the colour> white . . . ,⁸ there was an earlier⁹ doctrine about vision <propounded> by the ancients; it asserted that vision took place by means of emanation from the things seen. They attributed vision to certain idols, similar in shape <to these objects>, emanating from them continuously and striking the eye. This opinion was held by Leucippus and Democritus and their followers¹⁰ who were also attributing the appearance of the intermediate colours to the juxtaposition of particles too small to be seen. Empedocles, too, explains vision in this way as he (sc. Aristotle) recalled shortly before. He also mentions that this doctrine is unsound and that vision cannot come about in this way but rather in the manner demonstrated by himself when he showed in a general way that vision could not occur by emanations from things seen. For if it did, perception by vision would be by touch if, indeed, the emanations being

⁸ The text is corrupt here but does not bear directly on the main topic of this paper.

⁹ The verb προκαταβάλλω with reference to doctrines has in Alexander frequently the meaning 'earlier', 'previous'. See, e.g. in his *In meteorologicorum* . . . 114.7 ff. (M. Hayduck): πρῶτον . . . κατὰ τὸ σύνθετος αὐτῶ, τὰς προκαταβεβλημένας τε καὶ προειρημένας ὑπὸ τῶν περὶ τῶν σεισμῶν δόξας τίθησιν τε καὶ ἐξετάζει. For other examples see 37.6, 40.23, 67.24, and his *De sensu* 67.18 (P. Wendland).

This meaning is not given clearly in LSJ.

¹⁰ The phrase οἱ . . . περὶ Λεύκιππου καὶ Δημόκριτου could also refer to Leucippus and Democritus alone. On this usage see LSJ s.v. περὶ C I.2 where the earliest example given is one from Plutarch. However, this idiom is found at least as early as Polybius (F. Krebs, *Die Präpositionen bei Polybius* (Würzburg, 1882), p. 103), and probably in Demosthenes (Ps.?) 56.8: ὅθεν . . . συνετιμήθη τὰ περὶ τὸν σίτον . . . As far as we can tell from the context τὰ περὶ τὸν σίτον is a circumlocution of σίτος.

bodies, by impinging . . . (text corrupt here) . . . he failed to add the consequent absurdity. If it were touch, it (sc. vision) would necessarily have perception of cold, hot, wet, <the dry>¹¹ and the <other>¹² tactile opposites; but it perceives none of these.

Moreover, if emanation from the things seen took place continuously, why does not the detachment of so much bodily substance from them lead to their rapid disappearance? But if other bodily substance is added to them in exchange, first of all why does this <exchange> not accrue to them in perpetuity so as to preserve them in the same state? Why do they increase and, then, decrease in a regular manner? Secondly, how do they maintain the same shape? Although the emanations are of the same shape (it is for this reason that eyes perceive colours, too) why is the replacement matter of the same kind? Furthermore, if the emanation from each object is continuous and with respect to all of its parts, how will the effluences not get in the way of the arriving replacements? Or the replacements hinder the motion of the effluences? Or, how will they (sc. the idols), being fine, not be scattered if there are winds? For we see even if wind is between (sc. the eye and the external object).

Moreover, how is distance perceived if the eye sees those (sc. idols) which strike it? If the moving <idols> are so fine, why do we not see even with our eyes shut? For they will be able to enter through the pores even if we close our eyes. Also, why do we not see if the thing seen is placed on our eyes? For then, too, the idols will emanate and be received by the eye. Or, if the eye receives the thing seen, why is light needed for vision?

Furthermore, the effluences are either adjacent to the eye or move when the eye is turned towards them (sc. the external objects). If they are adjacent there will be no perception of distance whatsoever. If on the other hand they move at that moment, then first of all more time will be required for us to see the more remote objects; we are aware that this is not the case. Next, if according to them distance will be perceived by the amount of air which, too, enters the eye—<this air> belongs with the idol which emanates before (sc. the air) and enters the eye¹³—first of all, how will the eye be able to accommodate so much air? The travel¹⁴ of each idol¹⁵ will bring as much air as there is between it¹⁶ and the thing seen. Secondly, will the emanating idols have any strength to push forward this air? Next, how will it (sc. idol) survive in wind? For we see that wind displaces the in-between air. If, indeed, being finer, the idols evade the force of the winds how will they avoid slipping through the air (sc. the air's particles)? Also, what will measure the air which enters the eye?

Moreover, how will the eye distinguish the size and the shape of the object seen if it receives a section of the moving idol corresponding to the size of the pupil? For even if the eye receives many (sc. such sections) repeatedly, how and why will it receive a different section of the idol¹⁷ at different times rather than always the same section or one that is

¹¹ ξηροῦ added by Thurot (Charles Thurot, 'Alexandre d'Aphrodisias. Commentaire De Sensu et Sensibili', *Notices et Extraits des Manuscrits de la Bibliothèque Nationale* 25 (1875), 118, n. 15.

¹² ἄλλων plausibly suggested by Wendland.

¹³ τοῦ . . . ἀπορρέοντος, despite its position, cannot refer to the air because the term ἀπορρεῖν is used in Alexander only of emanations from an external object. Nowhere else is air mentioned as an emanation from an object. Therefore, the construction must be: ὁ ἀήρ τοῦ . . . ἀπορρέοντός τε καὶ ἐμπίπτοντος τοῦ εἰδώλου.

¹⁴ Usener's emendation φοράν of the MSS διαφοράν seems advisable. If διαφοράν is retained, the text would be stating that the quantity of air pushed forward by an idol depended not only on the distance covered by the idol but also on its size and shape. Since larger external objects emit larger idols, this notion is, of course, entirely

reasonable. However, other sources do not mention it. Whichever text we prefer, the remaining part of this sentence cannot be literally true. The air pushed by an idol cannot be *all* the air ὅσος ἐστὶν ὁ μεταξύ . . . It would have to be a column of air of the same frontal area as that of the idol. To what extent the atomists were aware of all these considerations is not known. For the singular εἰδῶλου see n. 15.

¹⁵ The singular εἰδῶλου must be a generalization. Strictly speaking, the plural εἰδῶλων is required because a single idol cannot make more than one φορά or have διαφοραί with respect to its own shape. This use of the singular is found also in *De sensu* 58.4: ἄλλοτε ἄλλο μέρος τοῦ εἰδώλου δέξεται . . .

¹⁶ Since αὐτοῦ must refer to ὅψις in 57.23 Wendland conjectures αὐτῆς. However, Alexander may have had the gender of ὀφθαλμός in his mind here.

¹⁷ For the singular εἰδῶλου see n. 15.

not contiguous?¹⁸ Even if it receives each time the adjoining (sc. part), how can they be joined together in the eye so that we seem to have perceived a theatre or a temple as a product of the entrance (into our eyes) of such small sections of the idol travelling from them (sc. from the theatre or the temple)? When (or 'if') parts of some other idols fall into our eyes in the intervals, how will some of them (τωά) not disrupt the continuity of the vision <in the eye> of the first (sc. external object)¹⁹ if it is necessary for so many idols to be carried for so many times from some (sc. object) to it (sc. the eye) in order that the latter, as it keeps receiving something from them (sc. from each idol) corresponding in size to the size of the pupil, always receives an idol in its entirety²⁰ although (or 'as') it (sc. the eye) keeps obtaining a different part from a different idol?

Why does sight receive idols even from smooth <objects> as though they had shape although they have no protuberances?²¹ Why do (sc. idols) from mirrors? Also, if the idols

¹⁸ As becomes clear later in these passages, Alexander assumes that in the atomist doctrine the small parts of each successive idol emanating from an object and entering the pupil are somehow recombined in the eye to form a likeness of the external object. In order for such a recombination to be successful Alexander assumes that those parts of successive idols which (sc. parts) enter our pupils must correspond to successive contiguous parts of the external object. If we were to receive the same section of each successive idol—for instance, the upper left-hand corner of a house—obviously no truthful reconstruction of the likeness of the external object could occur. This last notion is referred to in the Greek by . . . οὐχὶ αἰεὶ τὸ αὐτό. With respect to the meaning of καὶ ἐκ διαστημάτων the context indicates that Alexander is here holding against the atomist doctrine the possibility that those parts of successive idols which (sc. parts) enter our pupil will not necessarily be parts representing contiguous parts of the external object. For instance, when looking at a man, the pupil could from the first idol receive part of an eye, from the second a part of the big toe, from the third a small wart, and so on. In such a case the reconstructed likeness of the man would have all the parts, but in monstrous disarrangement. That this is the meaning of ἐκ διαστημάτων is indicated by *Mantissa* 135. 12–14: ἀλλὰ πόθεν γε ὅτι τὸ ἐξῆς λήψεται (sc. ὁ ὀφθαλμός or ἡ κόρη, τοῦ εἰδώλου, καὶ <οὐχὶ> πολλάκις τὸ αὐτὸ ἢ ἄλλο τι μόριον πόρρω τούτου κείμενον καὶ διεσπασμένον εἶτα συντιθέμενον;

In the phrase καὶ ἐκ διαστημάτων the sense requires ἢ rather than καί: ἢ ἐκ διαστημάτων. However, the substitution of καί for ἢ in comparable contexts is attested, e.g. in *Soph. Phil.* 1081: ὦ κολας πέτρας γυάλον θερμὸν καὶ παγετώδες . . .

¹⁹ Alexander assumes here that while the representation of one external object is being built up in the eye by the addition

of parts of successive idols from that object, parts of idols from other objects will be entering the eye as well (μεταξύ). How will these other parts be kept from being integrated into the reconstruction of the idol of the first object? That this is the correct interpretation of the words of Alexander seems clear from *Mantissa* 135.14–16: πῶς οἶόν τε τὸ σῶμα σωθῆναι τοῦ ὁρωμένου; πῶς δὲ τὸ μέγεθος τὸ οἰκεῖον ἐκάστου; δύναται γάρ καὶ τὰ τῶν ἄλλων τοῖς πρώτοις προστιθεσθαι τε καὶ μίγνυσθαι . . .

²⁰ The Greek here is not quite clear. In 58.11 both δεχομένην and δέξασθαι should have a direct object. I have taken ἀπ' αὐτῶν τι as the object of δεχομένην and ὅλων as the object of δέξασθαι. The ὅλων, a plausible emendation of Usener for the MSS ὅλων, refers, I think, to an idol: ὅλον εἶδωλον. In *De sensu* 60.3–7 Alexander observes that although the pupil may be admitting only parts of idols of an object at one time, we nevertheless feel that we are beholding the same object at once in its entirety rather than part by small part: ἵνα μὴ κατὰ μικρὰ ἀλλ' ἅθροον αὐτὸ (sc. τὸ ὁρῶμενον, the external object) ὁρᾶν δοκῇ (sc. ἡ ὕψις). The ἅθροον here corresponds exactly to the ὅλον.

²¹ ἐσχηματισμένα here has a peculiarly narrow meaning. Obviously, smooth objects like water or mirrors are perceptible and do have a shape. However, here and in Alexander, *Mantissa* 135.24 ff. ἐσχηματισμένα and σχῆμα are defined as idols displaying to our eyes protuberances and hollows. On the other hand, in 135.22 ff. *ibid.*, Alexander seems to be separating them: πῶς . . . μένει αὐτῶν τὸ σχῆμα καὶ ἡ ἐξοχή καὶ εἰσοχή . . . Perhaps one could translate here: 'the shape with its convexity and concavity' . . . In other contexts Alexander uses σχῆμα in a more general way, for instance, in 136.26: πῶς δὲ τῶν σχημάτων (sc. ἀντιλαμβάνεται) . . .? Here he is talking about any external object.

are so fine and so weak, why do the protrusions from those objects from which idols with protrusions can emanate²² remain in the eye and not be obliterated? Why even for a short time, with the thing seen removed, do they remain . . . (text corrupt here) from which in the vision?²³

Those who assert that the eye is being stimulated by the idols moving towards it and roused²⁴ and prepared for vision may no longer maintain that vision is brought about by idols. For it is obvious that if the eye is stimulated by the idol it will see something else if not the idol.²⁵ What, then, are these things (sc. the 'something else') and how (will they be seen)? These are the types of arguments available against those who maintain that something emanates from the objects of vision and that the things seen are seen in this manner.

De Animi Mantissa 134.28–136.28

Πρὸς τοὺς διὰ τῆς τῶν εἰδώλων ἐμπτώσεως τὸ ὁρᾶν λέγοντας
γίνεσθαι.

- 30 Πρὸς δὲ τοὺς διὰ τῶν εἰδώλων τὸ ὁρᾶν λέγοντας γίνεσθαι πρῶτον μὲν
προσαπορήσειεν ἄν τις, πῶς οὐκ ἀναλίσκεται τοσοῦτων ἀπορρεόντων ἔκα- 45
στον τῶν ὁρωμένων ταχέως, εἰ δὲ λέγοιεν ἀντιπροσκρίνεσθαι αὐτοῖς ἄλλα,
ἀλλ' οὖν τῶν ἀπορρεόντων καὶ τῶν προσκρυσσόμενων οὐκ ὄντων ἀλλήλοις
35 ὁμοιοσχημόνων (τὰ μὲν γὰρ ἀπορρέοντα εἰδῶλα καὶ ὁμοιόμορφα, τὰ δὲ
προσκρυσσόμενα οὐχ οὕτως προσκρύνεται) οὐκ ἔδει τὰ ὑποκείμενα καὶ ὁρώ-
μενα ὁμοιοσχημόνα μένειν, ἀλλὰ ἄλλοτε ἄλλοιόν ἴσχειν σχῆμα. ἔτι πῶς
συνεχοῦς τῆς ἀπορροίας γνομένης καὶ πανταχοῦ καὶ πανταχόθεν οἶόν τε
τὴν πρόσκρισιν γίνεσθαι; ἀλλήλοις γὰρ ἂν τὰ ἀποκρυσσόμενα τοῖς προσκρυσ- 50
σόμενοις ἐμποδίζοι ἀδιαλείπτου ἀμφοτέροις τῆς φορᾶς οὕσης. ἔτι πῶς οἶόν
τε τοῦ διαστήματος ἀντίληψιν γίνεσθαι, εἰ τὰ εἰδῶλά ἐστι τὰ ὁρώμενα;
ἀνεπαίσθητος γάρ, ὃν λέγουσιν προεμπίπτειν, ὃ ἀήρ, οὗ τῇ ποσότητι τὸ
5 διάστημα ἀναμετρεῖσθαι, καὶ τί τὸ μετροῦν τὸν ἀέρα τούτων; | καὶ πῶς 150ν
ἔτι εὐθὺ τῷ ἀναβλέψαι καὶ τὰ πόρρωθεν ὁράται; πῶς δὲ οἶόν τε καὶ τῶν
σχημάτων καὶ τῶν μεγεθῶν ἀντίληψιν γίνεσθαι διὰ τῶν εἰδώλων (ἃ βου-
λόμενοι σώξω τὰ εἰδῶλα ποιῶσιν), εἴ γε κατὰ βραχὺ ἢ ἐμπτωσιν εἰς τὸν
ὀφθαλμὸν αὐτῶν γίνεσθαι; οὐ γὰρ δὴ μεῖζόν ἐστι τὸ τῆς κόρης, ἢ ὁρῶμεν,
10 μέγεθος τοῦ εἰδώλου, ὃ δεχόμεθα κατ' αὐτοὺς εἰς τὴν κόρην. εἰ γὰρ
καὶ συγχωρήσειέ τις αὐτοῖς διὰ τὸ τάχος συνεχῶς ἄλλο καὶ ἄλλο δέχε- 5
σθαι, ἀλλὰ πόθεν γε ὅτι τὸ ἐξῆς λήψεται τοῦ εἰδώλου, καὶ <οὐχι> πολλάκις
τὸ αὐτὸ ἢ ἄλλο τι μῖον πόρρω τούτου κείμενον καὶ διεσπασμένον εἶτα
συντιθέμενον; πῶς οἶόν τε τὸ σῶμα σωθῆναι τοῦ ὁρωμένου; πῶς δὲ τὸ
15 μέγεθος τὸ οἰκεῖον ἐκάστου; δύναται γὰρ καὶ τὰ τῶν ἄλλων τοῖς πρῶτοις
προστίθεσθαι τε καὶ μίγνυσθαι καὶ μὴ κατ' οἰκεῖαν περιγραφὴν ἕκαστον
αὐτῶν ὁρᾶσθαι, μηδὲ σημείον τοῦ ταῦτα μὲν τούτου τὰ εἰδῶλα, ταῦτα δὲ
μη τούτου εἶναι. ὅλως δὲ τί γίνεσθαι τὰ προεισελθόντα; τὸ γὰρ φυλάσσε- 10
σθαι αὐτὰ λέγειν καταβυσσοῦμενα καὶ συντιθέσθαι ἐν τῷ ὀφθαλμῷ λίαν
20 ἐστὶ μυθώδες. ποῦ γὰρ καταβυσσοῦται ἢ μένει, τίς δὲ ὁ οἰκοδομῶν αὐτὰ
ἐμβαδὸν καὶ συντιθεῖς; ἢ πῶς ἐκάστου αὐτῶν κατ' ἰδίαν κεμμένου ἢ συν-
έχεια καὶ τὸ μέγεθος καὶ τὸ σχῆμα φαίνεται; πῶς δέ, εἰ οὕτως ἐστὶ τὰ
εἰδῶλα εὐπαθῆ, τῇ ἐμπτῶσει τῇ εἰς τὸν ὀφθαλμὸν μένει αὐτῶν τὸ σχῆμα
καὶ ἡ ἐξοχή καὶ εἰσοχή καὶ οὐ συγχεῖται; πῶς δὲ καὶ ἀπὸ τῶν λείων
25 τοίχων ὥς ἐσχηματισμένα λαμβάνει τὰ εἰδῶλα οὐχ ἔχοντων ἐξοχὰς καὶ 15

²² The Greek here appears to be, in less concise form: ἢ πῶς αἱ ἐξοχαὶ τούτων τῶν εἰδώλων ἃ φέρεται ἀπ' ἐκείνων ἀπ' ὧν δύναται φέρεσθαι . . . i.e. idols from those external objects which, unlike mirrors, etc., do have protuberances.

²³ Because of the corruption in the last part of the sentence the meaning is confused but is probably the same as in Alexander, *Mantissa* 135.30: διὰ τί . . . οὐχι

καὶ ἀπελθόντος τοῦ ὁρώντος αὐτὰ κἂν ἐπ' ὀλίγον μένει;

²⁴ διορίζεσθαι, the reading of the MSS, does not seem to have any meaning appropriate to this context. Wendland suggests διεγείρεσθαι from *Mantissa* 136.10.

²⁵ This sentence assumes that if the idol acts as a stimulus it cannot be seen (so *Mantissa* 136.9–11).

- εἰσοχάς; πῶς δὲ ἀπὸ τῶν κατόπτρων ὑδάτων ἐμφαυομένων ἐκείνους τὰ
 σχήματα λείων ὄντων; πῶς δὲ εἰδῶλου ὄντος τοῦ ἐν τῷ κατόπτρῳ εἶδωλα
 ἄλλω ἀπορρεῖ τοσαῦτα, καὶ διὰ τί ἐν τοῖς κατόπτροις εἶδωλα παχύτερα,
 30 ὥς τοσαύτην ἀπ' αὐτῶν ἀπορροὴν γίνεσθαι; διὰ τί δὲ καὶ μένει ταῦτα καὶ
 οὐ κρεῖται; διὰ τί δὲ καὶ μένοντα οὐχὶ καὶ ἀπελθόντος τοῦ ὁρῶντος αὐτὰ
 κἂν ἐπ' ὀλίγον μένει; διὰ τί δὲ οὐκ ἐπὶ τῆς ἐπιφανείας τῶν κατόπτρων τὰ 20
 εἶδωλα, ἀλλὰ ἐν βάθει; πῶς δὲ οὐχὶ καὶ, εἰ οὕτως ἐστὶν εὐπαθὴ καὶ
 εὐκίνητα, ἀνέμου πνέοντος οὐ παρασύρονται τῷ ἀέρι ἐν ᾧ εἰσω; τὸ γὰρ
 λέγειν διεκπίπτειν δι' αὐτῶν τὰ ἄλλα φερόμενα οὐ σωζόντων ἐστὶ τὴν
 συνέχειαν τοῦ εἰδῶλου, προσέτι δὲ καὶ στερεότητά τινά καὶ ἀντιτυπίαν
 καταλιπόντων. οὕτως γὰρ αὐτὰ μέντοι, διεκπίπτει δὲ διὰ τῶν κενῶν τὰ
 φερόμενα, εἰ δὲ ἐστὶν εὐκολος αὐτῶν ἡ κίνησις ἐκ φλοιωδῶν καὶ ὑμε- 25
 νωδῶν, ὥς φασιν, καὶ πᾶσα ῥοπή ἱκανὴ παρασύρει αὐτὰ, ἔδει μὴ ὁρᾶν
 5 τοὺς κατὰ τὸν ἄνεμον βλέποντας. ἔτι εἰ τὰ εἶδωλά ἐστιν αὐτὰ τὰ ἐμπίπ-
 τοντα καὶ ὁρώμενα, διὰ τί τὰ ὁρώμενα πόρρω ὄντα φαίνεται; τὸ γὰρ μυω-
 πιζεσθαι λέγειν <τὴν ὕψιν> ὑπὸ τῶν εἰδῶλων οὐ τῶν εἰδῶλων ἐστὶ τὸ ὁρᾶν
 ποιεῖν, ἀλλὰ ἄλλον τινὰ χρὴ τρόπον ζητεῖν αὐτούς, δι' οὗ μυωπισθεῖσα
 ἡ ὄψις τὸ ὁρατὸν ὀψεται κακείνῳ προσβαλεῖ· πῶς γὰρ ὁρατὸν ἔτι τὸ εἶ-
 10 δῶλον γίνεται, εἰ γε μόνον πρὸς τὸ παρασκευάσαι τὴν ὕψιν αὐτὴν καὶ διε-
 γεῖραι τὸ εἶδῶλον χρήσιμόν ἐστιν; τὸ δὲ λέγειν τῷ ποσῷ τοῦ ἀέρος τοῦ
 μεταξὺ τοῦ τε ὁρωμένου, ἀφ' οὗ τὰ εἶδωλα, καὶ τοῦ ὀφθαλμοῦ τὴν ἀντί-
 15 ληψιν γίνεσθαι τοῦ διαστήματος (τοῦτο γὰρ ὑπὸ τοῦ εἰδῶλου προωθούμενον
 προεμπίπτει τῇ κόρῃ πρὸ τοῦ εἰδῶλου) ἀτοπίαν οὐδεμίαν υπερβάλλει.
 πῶς γὰρ τὸ εἶδῶλον δύναται τὸν πρὸ αὐτοῦ προωθεῖν ἀέρα, ὃν οὕτως εὐ-
 παθές; καὶ πῶς τοῦτον ἡ κόρη δέχεται, προσέτι τε πολλάκις τοσοῦτον δέξε-
 20 ται; οὐ γὰρ ἐνὸς εἰδῶλου ἐμπῶσει τὸ ὁρᾶν· ἕκαστον οὖν τῶν ἐμπιπτόν-
 των τοσοῦτον ἀέρα προπέμψει αὐτοῦ εἰς τὴν κόρην, εἰ μὴ ἄρα τὰ φερό-
 μενα εἶδωλα ἀπὸ τοῦ ὁρωμένου οὐχ ὅτε βλέπει τότε φέρεται, ἀλλὰ
 παρακείμενα τῷ ὀφθαλμῷ· οὐ γὰρ δὴ, ὅτε ὁρᾷ ὀφθαλμός, τότε ἀπορρεῖ
 25 τὰ εἶδωλα. πῶς οὖν τὰ παρακείμενα ἔτι προώσει τὸν μεταξὺ ἀέρα; ἔτι
 εἰ ὑπὸ τῶν ἀνέμων μὴ σκίδναι τὰ εἶδωλα διὰ τὸ ὑποκάτω καὶ λεπτό-
 τερα καὶ ἀραιώτερα τὴν φύσιν εἶναι τοῦ φερομένου ἀέρος ὑπὸ τῶν ἀνέμων.
 πῶς ἅμα τὸν ἀέρα τοῦτον οἷον τε ἐστὶν προωθεῖν; ἔτι εἰ ἀχροῶ ἐστὶ τὰ
 25 εἶδωλα καὶ τοιαῦτα αὐτὰ δέχεται ἡ ὄψις, πῶς χρωμάτων ἀντιλαμβάνεται;
 πῶς δὲ τῶν σχημάτων κατ' ἐλάχιστον αὐτὰ δεχομένη; ὥστε οὔτε χρω-
 μάτων οὔτε σχημάτων ἂν γίνοιτο ἡ ὄψις, εἴ τις ἀκριβῶς ἐξετάξῃ καὶ μὴ
 πάντα αἰτουμένους αὐτοῖς διδοίη· τίνος οὖν ἔτι ἡ ὄψις ἐσται;

Against those who maintain that vision
comes about by the impact of idols

Against those who say that vision occurs by means of idols one could start by adducing another difficulty: with so many <idols> emanating why is each thing seen not used up quickly? Should they answer that they assimilate other <material as replacement>, nevertheless what emanates, and what is added are not of similar shape; what emanates is idols and of a shape similar (sc. to the objects) whereas the additions are not added in the same form. Therefore, the underlying objects of vision ought not to have kept the same shape but rather a different one at different times. Also, if the emanation goes on continuously, everywhere, and from all quarters how can addition take place? Since the motion of both the separating and the accreting matter is continuous one would expect the two to interfere with each other.

Moreover, how can the perception of distance take place if what is seen is the idols? The air which they say falls (sc. into our eye) in advance (sc. of the idol) and the quantity of which is supposed to serve as the measure of distance cannot be perceived. Also, what is it that does the measuring of that air? Also, how do we see things even far away immediately upon beginning to look up?

Moreover, how is it possible to obtain perception of shapes and sizes by means of the idols (it is in order to account for them (sc. shapes and sizes) that they manufacture their

idols) if they enter the eye a small section at a time?²⁶ For the size of the pupil, by means of which we see, is surely not larger than the idol which according to them (sc. the atomists) we receive into the pupil.²⁷ Even if one should concede to them (sc. the atomists) that because of their speed successive particles are received without interruption what will bring it about²⁸ that it (sc. the eye) will receive the contiguous part²⁹ of an idol and not repeatedly the same part or a different part situated far from it (sc. from the part received before it) yet subsequently added on (*συντιθέμενον*), misplaced (*δισπασμένον*) though it be?³⁰ How is it possible to preserve³¹ the body of the thing seen? How the size peculiar to each of them? For it is also possible for idols of other things to be added to the first ones and to be commingled with them so that none of them is seen in its peculiar outline and there is no distinguishing mark of the fact that these idols belong to this object, but those do not.³² In general, what happens to those³³ which entered first (sc. the pupil)? To say that they sink in and are preserved and combined in the eye is very fanciful. Where do they sink or remain? Who is the one who steps in to build them up and to put them together?³⁴ Or, if each of them lies by itself, how can continuity, size, and shape appear?

Also, if the idols are so easily affected why, when they enter the eye, do they retain their shape, convexities, and concavities³⁵ rather than have them obliterated? How does <the eye> perceive idols as though they had shape³⁶ even when they <arrive> from walls smooth

²⁶ This meaning of *κατὰ βραχύ* is confirmed by *Dē sensu* 58.2-3: *κατὰ τὸ τῆς κόρης μέγεθος δεχομένη* (sc. ἡ ὄψις) *ἀπὸ τοῦ φερομένου εἰδῶλου μόριον* . . . and by *Mantissa* 136.25-6: . . . ἡ ὄψις . . . *κατ' ἐλάχιστον αὐτὰ* (sc. τὰ σχήματα δεχομένη) . . .

²⁷ Alexander here seems to be assuming tacitly that if the idol is to enter the eye entire, the pupil must be larger than the idol. But, says Alexander, the pupil is not larger than the idol. Therefore the idol which, according to the atomists, does enter the pupil must be reconstructed in the eye out of the parts of successive idols which have entered *κατὰ βραχύ*. If the entire idol is not seen at once, how can its shape and size be established, objects Alexander.

²⁸ With *πόθεν γε ὅτι* I understand *ἔσται* or *γενήσεται* or something similar.

²⁹ *ἐξῆς* here cannot govern *τοῦ εἰδῶλου* because the meaning 'what is next to the idol' is not at all appropriate here. I take *τὸ ἐξῆς* as a noun here. If the correct reproduction of the external object is to be reconstructed in the eye from the successive pupil-sized sections of the idols given off by the object, the sections must presumably enter the eye in the correct order (see n. 18 for more detail). In other words, if of idol A the pupil receives part 1, then of idol B it should receive and retain a part which in the external object is situated next to part 1 of idol A rather than another part 1 or a part not situated next to part 1 in

the external object.

³⁰ I have taken *δισπασμένον* closely with *συντιθέμενον*, as though the word-order were *εἶτα δισπασμένον συντιθέμενον*.

³¹ Preserve in our perception, of course.

³² Alexander here seems to be picturing the representations of several external objects built up in the eye and each consisting of a mixture of parts derived from the idols of all these external objects. The result, of course, will be representations bearing no certain and perceptible relationship to the external objects.

³³ The reference is to the parts of the idol entering the pupil.

³⁴ According to the dictionaries the adverb *ἐμβαδόν* is found only in *Iliad* 15.505 and in Pausanias 10.20.8. In both cases it refers to wading. In the *Iliad* the word is used in a sarcastic reproach. Ajax asks the Argives whether they expect to return home by wading if they now permit Hector to burn their ships. A sarcastic meaning is quite possible in our passage, too: Alexander may be conjuring up a man who *ἐμβαίνει* into the eye to deal with the *καταβυσσούμενα*. The storage place of earlier idols seems to have been a problem already to Euclid: *καὶ τίς αἰτία τοῦ ἀποκληρούσθαι τὰ εἰσικρῶμενα* (I. L. Heiberg (ed.), *Euclidis opera omnia*, v. VII, 'Opticorum recensio Theonis' (Leipzig, 1895), 150.7-8 and 150.21-7.)

³⁵ See n. 21.

³⁶ See n. 21.

and devoid³⁷ of convexities and concavities? How <does it> perceive the shapes <of objects> visible³⁸ in mirrors and water although <the latter> are smooth?

Also, how do so many idols emanate in turn (or: back) if what is (sc. visible) in the mirror is an idol? Why are the idols in the mirrors thicker so that so much can emanate from them? Why do they stay <still> and not move? Since they stay why don't they remain, even if for a short time, after the departure of the beholder?³⁹ Why are the idols in the back of the mirrors rather than on their surface?

If <the idols> are so easily affected and moved why are they not, when wind blows, displaced by the air in which they are situated (or, perhaps: why are they not displaced together with the wind in which they are . . .). Those who profess to maintain that the idol stays together and, in addition, have it retain its certain solidity and unyieldingness may not assert that the others (sc. the idols) as they move, pass between them (sc. between the particles of the air and the wind). In such a case it would be they, (sc. the air and the wind) that stood firm and it would be the objects in motion that passed through the void passages (separating the particles of air and wind). Also, if they (sc. the idols) are easily moved <consisting as they do> of⁴⁰ bark-like and membranaceous <material>, (or: if they are easily moved by <things> bark-like and membranaceous), as they say, and if any impulse is sufficient to displace them, those looking downwind⁴¹ should be unable to see.

Moreover, if what strikes the eye and is seen is the idols why do the things seen appear to be at a distance? Those who say that <the eye> is stimulated by the idols are not making

³⁷ The smooth walls must be thought here to be functioning, like water and mirrors, as reflecting surfaces. This follows from Alexander's interpretation (p. 141.30–5, *In meteorologicorum* . . . (Hayduck)) of Aristotle's reference to smooth surfaces: ὄψις ἀνακλᾶται . . . ἀπὸ . . . πάντων τῶν ἐχόντων λείαν τὴν ἐπιφάνειαν . . . (Aristotle, *meteorologicorum* 372^a29). Aristotle repeats this *ibid.*, 373^a35: ἀνακλωμένη . . . ἡ ὄψις ἀπὸ πάντων φαίνεται τῶν λείων . . . Plato, too, associates smoothness and reflection: . . . τὴν τῶν κατόπτρων εἰδωλοποιῶν καὶ πάντα ὅσα ἐμφανῆ καὶ λεία . . . (*Tim.* 46A).

³⁸ For κατόπτρων ὁδᾶτων ἐμφαινόμενων Bruns adduces *Mantissa* 62.13–14 and suggests <ῆ> ὁδᾶτων ἐμφαινόμενα. It seems easier to posit <τῶν> ἐμφαινόμενων with τῶν omitted because of haplography. The omission of <ῆ>, too, could have occurred because of haplography, the scribe pronouncing ῆ and ὅ alike. A case of possible double haplography is reported by Robert Renehan, *Greek Textual Criticism* (Cambridge, 1969), pp. 94–5.

³⁹ The beholder here must be looking in the mirror at his own image.

⁴⁰ The interpretation of ἐκ here is not quite straightforward. If the ἐκ φλοιωδῶν . . . is causal and explains why the κίνησις of idols is easy, one would expect the presence of a participle in the prepositional phrase: ἐκ φλοιωδῶν καὶ ὕμεινωδῶν <πεποιημένων>. Causal force is given to the ἐκ by H. Lackenbacher, *WS* 32 (1910), 229. He does not, however, discuss the awkwardness of the Greek.

It would be rather more natural to

assume that ἐκ φλοιωδῶν . . . here is the equivalent of ὑπὸ φλοιωδῶν . . . and refers to agency. The Greek would then be stating that the idols are easily moved by things bark-like and membranaceous. These latter objects would have to be other idols. In other words, Alexander would be saying that idols are so light that they are easily moved even by objects as light as other idols. (The idols are referred to as ὕμεινες in a new fragment of Diogenes of Oenoanda, discovered and published by M. F. Smith, *AJA* 74 (1970) N. F. 1, Col. 3.2–3, 57. The connection between idols and bark is found in some MSS of Plutarch, *Non posse suaviter* . . . 1106 A: μὴ δυναμένους ἀπορρίψαι τὰ εἰδωλα πάντα καὶ τοὺς φλοιούς . . . Lucretius likens the simulacra to membranæ in 4.31 and 4.51 and to cortex in 4.51).

The notion that one idol may be moved by another may be present in Lucretius 4.183–98, esp. 193–4. A. Barigazzi has argued strongly that the *parvola causa* . . . *quae provebat* . . . should refer not to πάσις in a physical object but rather to one idol's striking another from behind (*PP* 13 (1958), 269–73). It is essential to add to Barigazzi's argument that *procul* in Lucret. 4.194 must be taken with *provebat* *atque propellat* rather than with a *tergo*. This syntax was defended already by F. Susemihl and A. Brieger, *Philologus* 29 (1870), 433.

⁴¹ κατὰ τὸν ἄνεμον could also mean: in the wind, when wind is blowing. However, idols would not necessarily be lost to the beholder if he were walking *against* the wind.

the idols the cause of vision; they must search for some other process by which the eye, after being stimulated, will see the external object and take notice of it. How can the idol still be visible if it is useful only for making the eye itself ready and for rousing it?

But to assert that it is through the quantity of air located between the thing seen, from which the idols come, and the eye, that distance is perceived (they say that this quantity is pushed ahead by the idol and strikes the pupil before the idol) surpasses no other absurdity.⁴² If the idol is so easily affected how can it push forward the air situated in front of it? How can the pupil accommodate it? Rather, how will it accommodate many times that amount? For seeing requires the entrance of more than one idol. In consequence, each of the entering <idols> will send ahead of itself⁴³ this amount of air to enter the pupil unless it be true that the moving idols are carried from the thing seen⁴⁴ not at the moment when one looks (sc. at the object) but rather are adjacent⁴⁵ to the eye. For, indeed, the idols do not emanate when the eye looks <at them>. If so, how will the adjacent (sc. idols) still be able to push forward the air between (sc. the eye and the object of vision)? Moreover, if winds do not scatter the idols because they are in nature below (sc. in size or perceptibility),⁴⁶ finer, and thinner than the air blown by the winds, how will they at the same time be able to push that air ahead?

Also, if the idols are colourless and are perceived as such by the eye, how does it perceive colours? How does it perceive shapes if it receives them (sc. the idols) in the form of very small particles? In consequence, if one questioned them closely and did not grant them all their postulates, there could be vision neither of colours nor of shapes. What, then, will remain to be seen?

Although there are not a few differences in detail between the two passages, the chief questions addressed to the atomists are the same in both passages:

a) If the emanation of the idols is incessant why are the external objects not used up (*De sensu* 57.1–57.10; *Mantissa* 134.30–135.2)?

b) How can distance perception be explained if vision takes place by idols (*De sensu* 57.11–12, 57.17–58.1; *Mantissa* 135.2–6, 136.11–24)?

c) How can the eye perceive the size and shape of the external object if from each idol reaching it the pupil can receive only a section no larger than the pupil itself (*De sensu* 58.1–12; *Mantissa* 135.6–22)?

d) Problems connected with the reflection of idols from mirrors and other smooth surfaces (*De sensu* 58.12–13, 58.15–16; *Mantissa* 135.24–32).

e) Is the role of the idols merely to prepare the eye for vision (*De sensu* 58.16–20; *Mantissa* 136.6–11)?

In *De sensu* an introduction precedes the questions (56.8–23). This introduction is lacking in the *Mantissa*. On the other hand, the *Mantissa* alone attributes lack of colour to the idols (136.24–5). In general, the numerous differences in the wording and the more minor points of content show that neither passage is a direct copy of the other. On the other hand, their similarities are so noticeable that they cannot fail to be very closely related. Perhaps they both share a

⁴² From the context one would expect not ἀτοπίαν οὐδεμίαν ὑπερβάλλει but rather ἀτοπίαν πάσαν ὑπερβάλλει.

⁴³ For the MSS αὐτοῦ Wendland suggests τὸν πρὸ αὐτοῦ. However, αὐτοῦ could be governed directly by the preposition πρὸ in προπέμψει. This construction became rather common in post-Classical Greek prose (W. Schmid, *Der Atticismus in seinen Hauptvertretern*, IV (Stuttgart, 1896), pp. 97 and 623).

⁴⁴ ἀπὸ τοῦ φερομένου could also depend on τὰ φερόμενα. The meaning remains the same.

⁴⁵ After παρακείμενα I supply ἐστι. φέρεται is excluded by the sense.

⁴⁶ ὑποκάτω in roughly the same meaning is now attested in an Epicurean source. In a new fragment of Diogenes of Oenoanda we read: τὰ μὲν οὖν, φημί, ἄκρα συμπτώματα, καὶ τὰ ὑποκάτω δ' αὐτῶν οὐ πολλῶν . . . (M. F. Smith, *Cahiers de Philologie* 1 (1976) N. F. 44, Col. II, lines 5–8, p. 303). Taking ὑποκάτω in a local sense (the idols being finer . . . underneath) does not seem to make good sense because as far as we know the idols were of equal fineness throughout.

common source. If the passage in the *Mantissa* was written by some follower of Alexander it is reasonable to surmise that he used the passage in *De sensu* as his model.

At first sight it may be surprising to notice that in his refutations Alexander fails to make use of some of the stock difficulties aimed at the theory of idols: the apparent roundness of the square tower at a distance, the bent oar, the use of images in thought (how can we think of Britain?), etc. However, in his questions Alexander appears to be interested chiefly in demonstrating that ocular vision by means of idols cannot account for the observable facts and, therefore, vision is not caused by idols. We do see distance, shape, size. External objects are not being quickly worn down. The difficulties with the tower and the oar concern more the trustworthiness of information derived from the idols than the question of their very existence. Alexander wants to prove that idols play no part at all in vision rather than that we cannot always trust them.

As mentioned above, the account of Alexander attributes to the atomist doctrine of vision features not known to us from other sources. It also states that the idols are colourless. As far as I know, this is the only passage which explicitly predicates lack of colour in the idols. I shall now examine these novelties in greater detail and discuss what in them may modify or improve our understanding of some passages of Epicurus and Lucretius.

The most striking and important of the new doctrines attributed by Alexander to the atomists is the one which explains how the eye deals with large idols (*De sensu* 58.1–12; *Mantissa* 135.6–22). Those from certain external objects—Alexander mentions theatres and temples—cannot enter the pupil entire. However, experience shows that such objects are nevertheless perceived by us. The atomist explanation, according to Alexander, stated that part of each successive idol emanating from such objects entered our eyes and that these parts were recombined in the eye in the form of a complete idol. (Although Alexander is silent on idols smaller than the pupil, they must have been able sometimes to enter the eye entire and, therefore, did not always need to be reconstructed.)

This doctrine is in several aspects strikingly different from views universally held on vision in the atomists. There seems, for instance, to be near-unanimous agreement in modern scholarship that in order to be perceived, idols from the outside had to enter the pupil entire, i.e. they had to be smaller than the pupil. Large objects give off large idols, yet are capable of being perceived. If they enter the pupil entire they must, therefore, somehow have shrunk in transit from the external object to the eye. This view has been held by nearly every scholar.⁴⁷ Several of them believe they have found support in the texts for this reduction. Alexander's account, on the other hand, does not involve the requirement that idols, in order to be perceived, be reduced to the size of the pupil in their travel to the eye.

Since Alexander was more or less a contemporary of Diogenes of Oenoanda and a capable philosopher and historian of philosophy, his account of the idols

⁴⁷ Explanations not involving reduction in the size of the idols were attempted by C. Giussani, T. Lucreti Cari *De Rerum Natura*, Excursus I to Book IV, p. 285 n. 1 (Turin, 1897) and M. Conche, *Lucretius et l'expérience* (Paris, 1967), p. 102. C.

Bailey in his commentary on Lucretius thought that this problem was never faced by Epicurus (III, p. 1208). In this he was followed by J. M. Rist, *Epicurus* (Cambridge, 1972), p. 85.

deserves to be examined. Should it indeed conflict with earlier atomist sources, we would have to assume that there had been divergences or later developments in the school despite the fact that Alexander appears to consider it valid for all the atomists. However, it seems to me that there is no good evidence in the sources in support of a uniform reduction of the idols. I shall now examine the opinions in favour of the reduction theory in detail.

References to the reduction of idols have been discerned in Epicurus, in Sextus Empiricus, and in Democritus. Koenig, perhaps following a remark made by Woltjer, suggested that the phrase *κατὰ τὸ ἐναρμόττον μέγεθος εἰς τὴν ὄψιν* (*Ep. Hdt.* 49) may have been intended by Epicurus to refer to an accommodation of the idol to the size of the eye.⁴⁸ In this he was followed by De Witt,⁴⁹ Diano,⁵⁰ Westman,⁵¹ Arrighetti,⁵² and Barigazzi.⁵³ These scholars have disregarded here the significance of the context. The fuller sentence runs: *τύπων τινῶν ἐπεισιόντων ἡμῖν ἀπὸ τῶν πραγμάτων . . . κατὰ τὸ ἐναρμόττον μέγεθος εἰς τὴν ὄψιν ἢ τὴν διάνοιαν . . .* The mention of the entrance of the idols either into the eye or the mind immediately calls to mind the distinction between the mind- and the eye-idols found in Lucretius 4.722 ff., especially 4.752-6. Lucretius there distinguishes between two classes of idols on grounds of their fineness rather than of their size (4.726-9, 747, and 752-6). Epicurus, too, when introducing the idols in *Ep. Hdt.* 46 and 47 refers to their *λεπτότης* but not to their size. However, De Witt and his followers contend that when using the word *μέγεθος* in the phrase *κατὰ τὸ ἐναρμόττον μέγεθος* Epicurus intended to refer to the reduction in size in transit rather than the fineness (*λεπτότης*) of the arriving idols. It seems to me that the context is entirely against their view. If the word *μέγεθος* referred to the size of the idols, then the larger idols would presumably be entering the eye, the smaller the mind. Now, there is evidence that the mind idols could be very large. For instance, the idols of the gods were perceived by the mind.⁵⁴ Nevertheless, they were not small but rather of great size.⁵⁵ It is generally recognized that the term *κατὰ τὸ ἐναρμόττον μέγεθος* in Epicurus points to the theory of perception by means of effluences and pores developed by Empedocles. This theory postulated different sizes of pores for different effluences. Difference in the size and shape of *foramina* and the corresponding *semina* in the process of taste is mentioned by Lucretius (4.648 ff.). There is no hint in this theory of any reduction of the size of the effluences to suit the pores. When we find in Epicurus the concepts and vocabulary attributed to Empedocles we would be very rash to detect behind them the radically new and unattested concept of reduction of idols to scale. All that we can reasonably infer from Epicurus here is that the idols which entered the mind were different in size in some unspecified way from those which entered the eye. They had to be different in size because, apparently, the pores of the body differed from those of the eye (Lucretius 4.728-31). In other words, the statements of Epicurus

⁴⁸ Koenig, above, n. 3 and J. Woltjer, *Lucretii philosophia cum fontibus comparata* (Groningen, 1877), p. 87.

⁴⁹ 'Epicurus, Περὶ Φαντασίας', *TAPA* 70 (1939), 417.

⁵⁰ 'La psicologia d'Epicuro e la teoria delle passioni', *Giornale critico della filosofia italiana* 9 (1941), 12.

⁵¹ *Plutarch gegen Kolotes*, *Acta Philosophica Fennica*, Fasc. vii, 1955 (Helsingfors, 1955), pp. 165 f.

⁵² Epicuro, *Opere*² (Turin, 1973), p. 500.

⁵³ 'Sui nuovi frammenti di Diogene d'Enoanda', *Prometheus* 3 (1977), 6.

⁵⁴ Lucret. 5.1171, Cic. *N. D.* 1.49, Sext. Emp. *Adv. math.* 9.25 (= Us. 353).

⁵⁵ Sext. Emp., above, n. 54: *μεγάλων γὰρ εἰδῶλων . . . προσπιπόντων ὑπέλαβον . . . ὑπάρχειν τινὰς τοιούτους θεοὺς ἀνθρωπομόρφους.*

and Lucretius can be explained perfectly along traditional lines. Nothing in them justifies the assumption that by *κατὰ τὸ ἐναρμόττον μέγεθος* was meant, as asserted by De Witt and his supporters, 'according to the proportionate size, that is reduced to scale'.

Another supposed reference to the diminution in size of idols in Epicurus has been found in a papyrus of Book 2 of his *Peri physeos*.⁵⁶ It was suggested by Bailey⁵⁷ that the term *συνίησις* in the phrase *διὰ τὰς* [σ]υνίησε[ις] τὰς εἰς κ[ε]ν[ό]τητα καὶ λεπ[τό]τητα καὶ μικρότητα referred to the gradual collapse of the hollow idol in transit as it was beaten upon on all sides by atoms or compound bodies. This meaning of *συνίησις* was adopted with a somewhat different interpretation by K. Kleve.⁵⁸ However, the meaning of the entire column is quite obscure. The work done on it has been discussed by Arrighetti (above, n. 56), who cannot see how the interpretation of Kleve can fit into the context. Certainly, it seems to me that this obscure passage cannot override the explicit statements of Alexander, i.e. it does not establish against him that the idol of a large object shrank in transit to the size of the pupil.

A third supposed proof in favour of the reduction of idols was found in Epicurus by De Witt.⁵⁹ He asserts that the idea of reduction to scale is explicitly stated in *Ep. Hdt.* 50: *κατὰ τὸ ἐξῆς πύκνωμα ἢ ἐγκατάλειμμα τοῦ εἰδῶλου*. According to De Witt, the meaning of this phrase is made clear by a passage in Sextus Empiricus who 'explains the reduction of images according to Epicurus as being effected by the detrition of the edges of the idols during their transit from the object to the eye'.⁶⁰ De Witt understands the *ἐγκατάλειμμα* as the idol worn down in transit. The phrase *τὸ ἐξῆς πύκνωμα* refers, he says, to 'the orderly reduction or the reduction to scale'.

First of all, it seems to me that the example of Sextus cannot possibly refer to orderly reduction, the kind of reduction that is indispensable if the reduced idols are to give us truthful information about the external world. The verb *ἀποθραύειν* refers to breaking rather than to gradual wear. Moreover, Sextus himself uses it to refer to a deformed idol, one that does not give us true information about its source. In any case, wear no more than breakage will preserve a correspondence between most large external objects and their pupil-sized remains. In general, changes in idols due to damage—wear, breakage, etc.—must be kept strictly apart from the notion of orderly, to-scale reduction.

Also, the term *ἐγκατάλειμμα* is used frequently as a technical term in the theory of perception by the commentators on Aristotle and refers usually to an impression or memory left in one's mind by an earlier sense perception.⁶¹ This well-attested use of *ἐγκατάλειμμα* seems appropriate in this passage of Epicurus and must be preferred to the unsupported interpretation of De Witt.⁶²

⁵⁶ See (24.43) in Arrighetti, above, n. 52, pp. 207 f. and 584 ff.

⁵⁷ *The Greek Atomists and Epicurus* (Oxford, 1928), pp. 412–13.

⁵⁸ *Gnosis Theon, Symb. Osl. Supplet. XIX* (Oslo, 1963), pp. 16–18.

⁵⁹ Above, n. 49, 417–18.

⁶⁰ *Adv. math.* 7.208 f. (= Us. 247). In this passage Sextus explains why a square tower appears round if seen from far away: *ἐκ μακροῦ μὲν διαστήματος μικρὸν ὄρα τὸν πύργον καὶ στρογγύλον . . . τῇ διὰ τοῦ*

ἀέρος φορᾷ ἀποθραυομένων τῶν κατὰ τὰ εἰδῶλα περάτων . . .

⁶¹ See discussion and references in R. B. Todd, 'Lexicographical Notes on Alexander of Aphrodisias' Philosophical Terminology', *Glotta* 52 (1974), 210 f.

⁶² The commentators' meaning of *ἐγκατάλειμμα* is also adopted for Epicurus by D. J. Furley, 'Knowledge of Atoms and Void in Epicureanism', *Essays in Ancient Greek Philosophy*, ed. John P. Anton with George L. Kostas (Albany, 1971), pp. 610 f.

With Sextus Empiricus and the *ἐγκατάλειμμα* eliminated, De Witt's theory is now supported only by his interpretation of *τὸ ἐξῆς πύκνωμα . . . τοῦ εἰδῶλου*.⁶³ Although De Witt is wrong in trying to foist the meaning of 'wearing away' on *πύκνωμα*, a meaning inappropriate both to the idiomatic range of the word and to the notion of proportionate reduction of the idol, he could nevertheless be thought to be on the right track. The phrase *τὸ ἐξῆς πύκνωμα* could perhaps refer to the collapse theory of Bailey⁶⁴ and his predecessors who also postulated gradual reduction but, like Bailey, were unable to supply good evidence from the texts.⁶⁵ In this difficult passage of Epicurus this interpretation does not seem to be any less plausible than the others so far offered. However, it is obviously incompatible with the doctrine explicitly attributed to the atomists by Alexander. The best and most plausible interpretation of this Epicurean passage would be the one which could harmonize it with the text of Alexander. I shall propose such a harmonization later in this paper. If I am successful, my interpretation should from the point of view of method be preferred to those which cannot coexist with the evidence of Alexander.

Recently Burkert has brought forward a passage on Democritus from Theophrastus which in his opinion refers to the reduction of the idol, or its equivalent in Democritus, in the air.⁶⁶ Theophrastus says of the theory of vision of Democritus: *ὁρᾶν μὲν οὖν ποιεῖ τῇ ἐμφάσει . . . τὴν γὰρ ἐμφασιν οὐκ εὐθὺς ἐν τῇ κόρῃ γίνεσθαι, ἀλλὰ τὸν ἀέρα τὸν μεταξὺ τῆς ὀψέως καὶ τοῦ ὁρωμένου τυποῦσθαι συστελλόμενον ὑπὸ τοῦ ὁρωμένου καὶ τοῦ ὁρώοντος*.⁶⁷ Burkert believes that in this passage the verb *συστελλέσθαι* refers to the reduction in size of the air-imprint as it is being transported toward the eye. It seems to me that Burkert's proposal cannot be right. In the phrase *τὸν ἀέρα . . . τυποῦσθαι συστελλόμενον* the Greek means that the air is being imprinted as it is being *συστελλόμενον*. The two actions are coextensive in time. If we accept Burkert's interpretation that the air-imprint keeps being reduced in its path up to the eye then the Greek forces us to assume that the action of *τυποῦσθαι*, too, continues until the imprint reaches the eye. This is unlikely to be the theory of Democritus. Theophrastus tells us that Democritus compared the imprinting of the air to an imprint made in wax (ibid., 51): *τοιαύτην εἶναι τὴν ἐντύπωσιν οἷον εἰ ἐκμάξειας εἰς κηρὸν*. It seems that the act of imprinting wax by means, for instance, of a signet ring would normally be pictured by Democritus and his audience as a

⁶³ De Witt's theory has been supported with some changes by R. Westman, above, n. 51, 165–6. Westman differs from De Witt in not mentioning the passage of Sextus Empiricus and in suggesting that *τὸ πύκνωμα* refers not to the process of reduction in size of the idol but rather to the end product, i.e. *τὸ πύκνωμα* is the reduced idol.

⁶⁴ Above, n. 57.

⁶⁵ The need for gradual reduction was stated by P. Natorp, *Forschungen zur Geschichte des Erkenntnisproblems im Altertum* (Berlin, 1884), p. 226: 'Dass es (sc. das Bild) der Grösse nach mit der Entfernung abnimmt, ist klar', and by H. Schütte, *Theorie der Sinnesempfindungen bei Lucretz* (Danzig, 1888), p. 10: 'dann

können wir uns vorstellen dass alle dicht vor einander stehenden und bis an die Pupille unsers Auges reichenden Bilder beständig sich verkleinern, bis das erste Bild an der Pupille einen Durchmesser haben muss, der gleich ist demjenigen der Pupille selber.'

⁶⁶ W. Burkert, 'Air-Imprints or Eidola: Democritus' Aetiology of Vision', *ICS* 2 (1977), 99–101.

⁶⁷ *Sens.* 50 (= D–K, A 135, vol. 2, pp. 114.28 ff. or H. Diels, *Dox. Graeci*, p. 513). That *συστελλόμενον* in this passage of Theophrastus referred 'to the decreasing size of the image on its way to the eye' was already asserted, although without argument, by R. E. Siegel, *Galen on Sense Perception* (Basel, 1970), p. 18 n. 22.

momentary act rather than one signifying extended continuous pressure. If so, *ουστελλόμενον* is better envisaged as front-to-back rather than uniform all-round compression of the section of air involved.

Furthermore, there is evidence that Theophrastus did not attribute any reduction to the air-imprints of Democritus. He states that Democritus attributed vision to reflection: *ὁρᾶν μὲν οὖν ποιεῖ τῇ ἐμφάσει* (ibid., 50). Earlier in his treatise he had criticized the *ἐμφασίς*-theory because it did not explain why the size of the external objects was not commensurate with their reflection in the eye: *τοῦτο δὲ οὐκ ἐτι συνείδον ὥς οὔτε τὰ μεγέθη σύμμετρα τὰ ὁρώμενα τοῖς ἐμφαινομένοις . . .* (ibid., 36). Democritus must obviously have been included in this criticism. Theophrastus also stated that Democritus had not been successful in explaining the problem of how the true sizes of external objects were reflected: *τὰ δὲ μεγέθη . . . πῶς ἐμφαίνεται, καίπερ ἐπιχειρήσας λέγειν οὐκ ἀποδίδωσκ* (ibid., 54). If the answer of Democritus to this problem had been given in the verb *ουστέλλεσθαι* one would expect Theophrastus to have known this. If he believed it, he would not have lumped all the reflection theories together as defective; if he did not, one would expect him to have delivered a refutation. The most reasonable explanation of this evidence indicates that Theophrastus was not aware at the time of any shrinkage of the imprints of Democritus.

A further objection to Burkert's theory seems to be found in a passage of Plotinus not adduced either by Diels-Kranz or by Luria.⁶⁸ In 4.5.3.27-32 Plotinus refers to a theory of vision which appears to be that attributed to Democritus by Theophrastus: *Εἰ γὰρ δὴ πάσχοι τὸ τοῦ ἀέρος, σωματικῶς δῆπουθεν ἀνάγκη πάσχειν · τοῦτο δὲ ἐστὶν οἷον ἐν κηρῷ τύπον γενέσθαι. μέρος δὲ δεῖ τοῦ ὁρατοῦ καθ' ἑκάστον μόριον τυπούσθαι · ὥστε καὶ τὸ συναφές τῇ ὀψει μόριον τοσοῦτον, ὅσον καὶ ἡ κόρη τὸ καθ' αὐτὸ μόριον τοῦ ὁρατοῦ δέχοιτο ἄν. νῦν δὲ πᾶν τε ὁρᾶται . . .* (text of Henry-Schwyzler). Plotinus here states that if the air-imprint theory were true our eye could not perceive the whole of the *ὁρατόν* but only a portion of it not larger than the pupil. But, objects Plotinus, we actually see the entire object: *νῦν δὲ πᾶν . . . ὁρᾶται . . .* Therefore, the air-imprint theory cannot be true. If Plotinus had known that the imprint was supposed to shrink in transit, his refutation would not have been valid.

It appears, then, that none of the references in the sources so far adduced by scholars convincingly supports the belief that in the atomist doctrine a large idol, if it was to be perceived entire, was assumed to have shrunk in transit to the size of the pupil. On the other hand, statements by ancient authors from Theophrastus onward clearly imply that they were unaware of any such theory. Theophrastus reproached Democritus for not explaining the tiny reflection of an external object in the eye. The other authors criticized the atomist theory of vision on the grounds that idols of large objects seen by us could not possibly enter the small pupil.⁶⁹ If they had been aware of a hypothesis of reduction, one

⁶⁸ *Democritea* (Leningrad, 1970).

⁶⁹ For the criticism of Theophrastus see above, n. 67, *Sens.* 36, 50, and 54. The other type of criticism may have begun with Cicero, who jokingly mentioned to Atticus the difficulties which the atomist *εἰδῶλα* might experience in trying to squeeze through the small windows of his house (*Ad Att.* 2.3.2). He may have been alluding

here to the problem of the large idols and the small pupil. An even earlier objection to a similar theory of vision is attributed by Plutarch to Hieronymus of Rhodes (*Quaest. Conviv.* 1.8.3, 626 A-B). It is rather certain, however, that the doctrine attacked by Hieronymus could not have been that of any known atomist. Other objections are found in Galen, *Plac.*, pp. 615-16 Mueller

would expect them to have mentioned it, if only in rebuttal. As far as I know, the only theory apart from that of Alexander which attempts to explain how we can perceive objects too large to be taken in by one glance appears in Nemesius.⁷⁰ It makes no mention of any reduction in size and although not based on the theory of idols, has some similarity to that attacked by Alexander of Aphrodisias. According to this theory, we see objects which are too large to be taken in by one glance piece by piece (*κατὰ μέρος* or *κατὰ μετάβασιν*). The pieces seen in temporal succession are preserved by memory and then put together by the mind: *τοῦ μὲν οὖν μεγέθους διχῶς ἀντιλαμβάνεται* (sc. ἡ ὄψις), *ποτὲ μὲν μόνῃ, ποτὲ δὲ μετὰ μνήμης καὶ διανοίας* (*De nat. hom.* 184). The two theories share the basic notion that when perceiving a large object as a whole we perceive it by means of a mosaic built up of pieces of the size of our pupils. Of course, neither of these two theories explains how we can judge the true size of an external object. The difficulty is especially acute for the atomists because their theory, as given by Alexander, would seem to entail the physical reconstruction in the eye of an idol of the same size as its external object. If a large idol need not be reduced to the size of the pupil before it enters the eye then we would expect reduction in its reconstruction. The idol of the temple or of the theatre could obviously not be restored to its original size within the largest head. However, Alexander strangely does not seem to have noticed this obvious weakness in the theory which he was demolishing.

At this point it seems clear that we have no evidence for a consistent and thought-out hypothesis of an orderly reduction in transit of the idols. The account of Alexander must now be recognized as the only extant explicit atomist theory of how large idols were dealt with by the eye.⁷¹ It must be remembered here that Alexander's account is restricted to ocular vision and does not mention at all the entrance of the idols directly into the mind. There seems to be no explicit information on how large-sized idols were supposed to enter the mind.

If we start from the assumption that Alexander's atomist doctrine on large idols was, as he asserts, held by all the atomists, some new interpretations seem advisable. For instance, a unanimously held view on atomist perception may have to be reconsidered. In *Mantissa* 136.17 Alexander states that the entrance of a single idol is not sufficient to cause vision: *οὐ γὰρ ἐνὸς εἰδῶλου ἐμπῶσει τὸ ὁρᾶν*. This is a doctrine familiar to us from Lucretius, who asserts several times that eyes are unable to see an isolated *simulacrum* (4.89, 4.105, 4.256 ff.).

(v. p. 618 Kühn) and p. 639 Mueller (v. p. 639 Kühn), in Plotinus, 4.5.3 and, possibly, 4.6.1, in St. Basil, *Against Eunomius* 3.6, in Macrobius, *Sat.* 7.14.11, in St. Augustine, *Ep.* 118.29 (*P. L.* 33, p. 446), and in Nemesius, *De nat. hom.*, p. 180 Matthaei, who explicitly quotes from Galen.

⁷⁰ Above, n. 69, 184–5. W. W. Jaeger argues that the source of Nemesius here was Galen (*Nemesius von Emesa* (Berlin, 1914), p. 32). Galen, however, when mentioning the inadequacy in this area of Aristotle, Epicurus, and some unnamed philosophers (above, n. 69, pp. 638–9) suggests nothing better. If he had had a theory of his own,

one would expect him to mention it here.

⁷¹ It is very interesting to notice that the brilliant Giussani (above, n. 47), although ignorant of the passages in Alexander, offered a tentative atomist solution for the large-idol problem which is precisely that given by Alexander. Giussani, of course, saw its weak spot and thought that the required reduction of the large idol took place during its rebuilding in the eye. On this point he went beyond our evidence. It is relevant to the discussion on the reduction in size of idols to note that in Giussani's opinion the reduction of entire large idols to the size of the pupil was inconceivable in Epicurean doctrine (*ibid.*).

However, neither he nor any other source gives an explicit reason for this assertion. Scholars as a rule assume that a steady stream of idols is required because the thinness of a single idol prevents it from being perceived by itself. This is a reasonable explanation and is, perhaps, supported by the rather unclear examples in Lucretius 4.259–68. However, if we now take into account the new information from Alexander there is a different explanation possible for the need of a steady stream of idols. As was discussed earlier in this paper, a steady stream of idols is required in the account of Alexander because, of each idol which approaches the eye, only a section the size of the pupil can enter. A stream of them is needed to supply all the pieces required to reconstruct in the eye an idol representing the entire external object. Alexander makes no mention whatsoever of the interpretation prevalent today, the one that maintains the need of a steady stream of complete and undivided idols if vision is to take place. What is more, his account definitely suggests that as soon as they are reconstructed in the eye, we see the idols singly (i.e. a single idol is not too thin to be perceived by itself). Therefore, his statement οὐ . . . ἐνὸς εἰδώλου ἐμπτώσει τὸ ὅρᾶν cannot be explained in the traditional fashion.⁷² In its context it can only mean that vision cannot occur at the entrance of one idol because one idol leaves behind only one piece of itself whereas we become conscious of seeing only after the eye has reconstructed the entire idol (*De sensu* 60.5–6). If we continue to accept the prevalent explanation of the Lucretian passages, then we have to assume that there were two distinct steps in the atomist theory of vision, each warranting the statement ‘we cannot see an idol in isolation.’ It is, of course, not utterly impossible that two, not one, series of idols were required in the atomist doctrine of vision. The first series, the one mentioned by Alexander, could have consisted of idols each supplying one piece towards the reconstruction of one complete idol. The second series, the one encountered in Lucretius, could consist of the reconstructed idols; these reconstructed idols would convey a perception to the eye only if being incessantly added to. The rate of production of the idols was so rapid—γένεσις τῶν εἰδώλων ἅμα νοήματι (*Ep. Hd.* 48)—that there could have been an adequate supply of idols to carry out all these manoeuvres that preceded vision. Although the two-series hypothesis may seem to explain some parts of Lucretius better, its complexity is against it. Also, it is difficult to believe that identical-sounding statements in Lucretius and in Alexander should each refer neatly and exclusively to only one series of the two-series hypothesis. On balancing the probabilities, it seems to me much more likely that the relatively crude system of vision of the atomists would be satisfied with the single-series doctrine. After all, it would seem utterly indispensable for the atomists to provide a detailed explanation of the large-idol problem. Nevertheless, there seems to be no evidence that they had any theory of reduction whatsoever.

If we incline to believe that the atomists held a single-series doctrine, then the account in Alexander is superior with respect to detail and explicitness. It seems to me not possible to subsume it under the theory developed by scholars to

⁷² *De sensu* 60.3 ff.: although the eye receives only a piece of each idol, it nevertheless *δοκεῖ* . . . ὡς ἅπαξ καὶ μιᾷ προσβολῇ καὶ ὡς ἐν ὅρᾶν τὸ ὁρώμενον. In this passage an object is said to be seen as soon as

one idol has been reassembled. Mugler (above, n. 3, 24–5) uses the text of Alexander as support for the traditional explanation, but the context is against him.

interpret the statements in Lucretius. On the other hand, it seems to me that the passages in Lucretius can be interpreted in the same way that the statement οὐ . . . ἐνὸς εἰδώλου ἐμπύσσει τὸ ὄραν must be interpreted in Alexander. When Lucretius says that a steady stream of idols is needed for vision to be possible, he may mean, like Alexander, that a stream of *simulacra* is necessary to build up piece by piece a single complete idol in the eye. If this is true, then we may also assume that when Lucretius states that we cannot see an idol in isolation, he is referring, like Alexander, to those idols which each supply only one piece of the mosaic. Like Alexander, he must be assumed to believe that, when rebuilt, each single idol can be perceived by our eyes in isolation. No steady stream of such complete idols needs to be postulated for Lucretius any more than for Alexander.

The three passages where Lucretius asserts that eyes are unable to see an isolated *simulacrum* (4.89, 4.105, and 4.256 ff.) seem to me to offer no obstacle to this new interpretation. The wind-example in 4.259–64 can easily be explained to support the theory in Alexander. Each imperceptible puff of wind and cold can correspond to the single and unperceived piece left behind by each idol. The total and perceived effect of the breeze, made up as it is of the separate puffs, corresponds to the idol perceived when reconstructed. In fact, this explanation of the breeze seems to me to be smoother and more pertinent than those attempted on the old interpretation of the stream of *simulacra*.

The knocking-on-the-stone example remains somewhat obscure on either hypothesis. If we assume, as does Bailey in his commentary, that the impression of hardness conveyed by the stone comes about by the combined effect of many imperceptible *πάσεις*, then each *πάσις* could equally well represent the whole idol of the traditional theory or the piece of an idol of the new one.

An objection to the new hypothesis might be detected in Lucretius 4.745–7:

quae (sc. simulacra) cum mobiliter summa levitate feruntur, 745
ut prius ostendi, facile uno commovet ictu
quae libet una animum nobis subtilis imago;

It could be assumed that when the poet writes *quae libet una*, he may here be opposing a mind-*simulacrum* to those which enter the eyes, the latter being perceived only in a stream, the former also in isolation. However, the context indicates that Lucretius is stressing here not an opposition of one to many, but is rather asserting that because of the speed of these images and the receptivity and fineness of our minds any one (*quae libet una*) of these idols, even though very light, can easily (*facile*) move our minds. In other words, having earlier in this passage stressed repeatedly the fineness of the mind-idols, Lucretius is now forestalling the possible objection that these idols could be too fine to be perceived by the mind. To sum up, it seems to me that all references in Lucretius to the need of more than one idol for vision to be produced can also be explained along the lines of the theory found in Alexander. It is the better method to prefer a hypothesis that has a single explanation of identical statements in both Lucretius and Alexander to one that requires a separate explanation for each.

It has been said that the need in vision for a steady stream of complete idols is also hinted at by Epicurus.⁷³ Although this passage in Epicurus, like the passages

⁷³ See, for instance, Bailey (above, n. 57, 410), who detects the hint in *Ep.*

Hdt. 50: τοῦ ἐνὸς καὶ συνεχοῦς τὴν φαντασίαν ἀποδιδόντων (sc. τῶν τύπων).

in Lucretius discussed above, can offer certain support to that hypothesis, its acceptance would involve us in the same double explanation of the series of idols that the retention of this traditional explanation required in the case of Lucretius and Alexander. Also, it seems to me that the Epicurean passage can be explained even more smoothly on the hypothesis that a stream of idols was required not because the thinness and lightness of the idols made them imperceptible separately, but rather because the stream of idols served to supply pieces needed to build up the mosaic of a complete idol. These are the pertinent lines of *Ep. Hdt.* 49–50: we are said to be able ὁρᾶν . . . καὶ διανοεῖσθαι . . . τύπων τινῶν ἐπεισιόντων ἡμῖν ἀπὸ τῶν πραγμάτων ὁμοχρόων τε καὶ ὁμοιομόρφων κατὰ τὸ ἐναρμόττον μέγεθος εἰς τὴν ὄψιν ἢ τὴν διάνοιαν, ὡκέως ταῖς φοραῖς χρωμένων, εἴτα διὰ ταύτην τὴν αἰτίαν τοῦ ἐνός καὶ συνεχούς τὴν φαντασίαν ἀποδιδόντων . . . καὶ ἣν ἂν λάβωμεν φαντασίαν ἐπιβλητικῶς τῇ διανοίᾳ ἢ τοῖς αἰσθητηρίοις εἴτε μορφῆς εἴτε συμβεβηκότων, μορφὴ ἐστὶν αὕτη τοῦ στερεμνίου, γνωμένη κατὰ τὸ ἐξῆς πύκνωμα ἢ ἐγκατάλειμμα τοῦ εἰδώλου (text of Arrighetti).

Some changes in the traditional explanations are required to interpret this passage in the light of the atomist doctrine found in Alexander. In the phrase εἴτα . . . ἀποδιδόντων, τοῦ ἐνός καὶ συνεχούς must be completed by τύπου or εἰδώλου. Because of their speed (διὰ ταύτην τὴν αἰτίαν) those idols which each supply a piece destined for the reconstructed mosaic are not perceived separately. With the help of Alexander, then, we can give a more precise meaning to the phrase τοῦ ἐνός καὶ συνεχούς. In *De sensu* 60.3–7 Alexander declares that when the pupil receives fragments of idols, the viewer does not perceive them but rather the reconstructed idol ἅπαξ καὶ μιᾷ προσβολῇ καὶ ὡς ἓν and also not κατὰ μικρὰ ἀλλ' ἁθρόον. The evidence from Alexander thus suggests a new and different interpretation of these lines of Epicurus: for this reason (sc. the rapidity of the τύποι) they (sc. the τύποι) provide the φαντασία of a single idol, i.e. the constituent particles of which remain unnoticed.⁷⁴ The two terms ἓν and συνεχές seem to be here practically synonymous. The ἓν stresses, it appears, the aspects of singleness and completeness of the reconstructed idol; the συνεχές may refer to the notion that the rapidity with which the successive parts arrive prevents us from perceiving the time intervals between the arrivals.

If we use Alexander as our guide, a new interpretation can be offered also for parts of the much-disputed section from ἣν ἂν λάβωμεν τοῦ εἰδώλου. In Alexander's account vision is provided by the reconstruction of the idol. In *Mantissa* 135.12 Alexander asks how on the atomist account the parts involved in the reconstruction will be conveyed to the idol in their proper sequence: πόθεν γε ὅτι τὸ ἐξῆς λήψεται τοῦ εἰδώλου . . . In the Epicurean passage, too, we encounter the expression τὸ ἐξῆς and in a similar context. The μορφὴ which constitutes the φαντασία is stated to come about (γνωμένη) κατὰ τὸ ἐξῆς πύκνωμα. In both passages, then, the topic would be the construction within us of something to be perceived. The language of Alexander is quite clear whereas that of Epicurus is difficult. With the aid of Alexander an elucidation of Epicurus

⁷⁴ Essentially the same meaning is obtained if we keep the singular ἀποδιδόντος, the reading of all the manuscripts. On this reading we translate: 'for this reason it is an idol which is ἓν and

συνεχές that presents us with a φαντασία (sc. of itself).' The sequence of thought is less smooth; on the other hand the reading of the MSS is kept.

can be attempted. τὸ ἐξῆς πύκνωμα could refer to the reconstruction (σύνθεσις) of an idol in the eye out of the pieces left there in succession (τὸ ἐξῆς) by the arriving idols. The meaning of πύκνωμα seems to be appropriate to the building up of a mosaic.⁷⁵ It is at this point that one is most tempted to discover in Epicurus a reference to the much sought-after reduction in area of a large idol.⁷⁶ However, the apparently total silence of the sources on the notion of a to-scale reduction of idols seems to me a sufficient objection to this supposition.⁷⁷

Much has been written about the possible meanings of the word ἐγκατάλειμμα. In view of the widespread and consistent use of this term in the commentators on Aristotle we must agree with Todd that it must in Epicurus, too, refer to something left in us by sense perception.⁷⁸ The same notion, if not precisely in the same language, is common also in Aristotle.⁷⁹ In Aristotle an impression may be left both in the αἰσθητήρια and in the mind. Therefore it may be supposed that in Epicurus, too, the ἐγκατάλειμμα refers to such an impression, whatever its physical manifestation, left in the sense organs (αἰσθητήρια) or in the mind (διάνοια) by an earlier idol or idols.⁸⁰ τὸ ἐξῆς πύκνωμα may, then, refer to the perception by the eyes or the mind of an idol freshly reconstructed in the eye or the mind. There is, of course, no evidence in Alexander or elsewhere on how idols entering the mind may have been handled. Therefore we cannot prove directly that the process referred to by τὸ ἐξῆς πύκνωμα also applied to the mind. However, in *Ep. Hdt.* 49–50 the reception and perception of the sight- and mind-idols are treated together in the same terms.⁸¹

If it is thought that the evidence for the presence in Epicurean philosophy of τὸ ἐξῆς πύκνωμα of an idol in the mind and of the ἐγκατάλειμμα of an idol in the eyes is lacking, we can also assume that τὸ ἐξῆς πύκνωμα and ἐγκατάλειμμα refer only to the eyes and the mind respectively. On either hypothesis τὸ ἐξῆς will, of course, go only with the πύκνωμα.

The pertinent passages in Lucretius and Epicurus can thus offer support both to the traditional and the new interpretation of the statement found in Lucretius and Alexander that our eyes cannot see a single idol. However, it seems preferable to adopt the interpretation derived from Alexander. First, it allows us to explain some parts of Epicurus' *Ep. Hdt.* 49–50 less vaguely than they had been explained before. Secondly, the traditional explanation was developed without

⁷⁵ For occurrences see the index in Arrigh.², above, n. 52, 779 and H. Usener, *Glossarium Epicureum* (Rome, 1977), pp. 591–2.

⁷⁶ This was suggested by Giussani, above, n. 71.

⁷⁷ This objection applies also to De Witt's hypothesis, mentioned above, that τὸ ἐξῆς πύκνωμα referred to the to-scale reduction of the idols in their transit from the object to the pupil.

⁷⁸ Above, n. 61.

⁷⁹ For instance, in *De insomn.* 459a24 ff.: τὰ γὰρ αἰσθητὰ καθ' ἕκαστον αἰσθητήριον ἡμῶν ἐμποιοῦσιν αἴσθησιν, καὶ τὸ γινόμενον ὑπ' αὐτῶν πάθος οὐ μόνον ἐνυπάρχει ἐν τοῖς αἰσθητηρίοις ἐνεργουσῶν τῶν αἰσθήσεων, ἀλλὰ καὶ ἀπελθουσῶν. The ὑπ' αἰσθητῶν πάθος can leave its impress also in the mind:

ἀπορήσειε δ' ἂν τις πῶς ποτε τοῦ μὲν πάθους παρόντος τοῦ δὲ πράγματος ἀπόντος μνημονεύεται τὸ μὴ παρόν. δῆλον γὰρ ὅτι δεῖ νοῆσαι τοιοῦτον τὸ γινόμενον διὰ τῆς αἰσθήσεως ἐν τῇ ψυχῇ . . . —οἷον ζωγράφμα τι [τὸ πάθος] οὐ φάμεν τὴν ἔξω μνήμην εἶναι· ἢ γὰρ γιγνομένη κίνησις ἐνσημαίνεται οἷον τύπον τινὰ τοῦ αἰσθήματος, καθάπερ οἱ σφραγιζόμενοι τοῖς δακτυλίοις (*De mem.* 450a 25 ff., Ross's text).

⁸⁰ Such impressions either in the eyes or in the mind could be referred to elsewhere in Epicurus by the ἐναποσφραγίσαιτο in *Ep. Hdt.* 49.

⁸¹ C. Diano states of Epicurean perception: 'identica alla percezione degli occhi è quella della mente' ('La psicologia d'Epicuro e la teoria delle passioni', *Giornale critico della filosofia italiana* 20 (1939), 133.

knowledge of the account of Alexander. It explained the available information as well as could be expected, but it is not satisfactory for Alexander, whereas the explanation derived from Alexander is satisfactory also for Lucretius and Epicurus.⁸²

Another novelty attributed by Alexander to the atomists is the idol-as-stimulus theory (*De sensu* 58.16–20; *Mantissa* 136.6–11). In this theory the idols are used as spurs, as it were, to prepare the eye for vision.⁸³ In the *Mantissa* 136.10 Alexander states also that the idol is, in this theory, useful only to prepare the eye and is itself not perceived. In the *Mantissa* this strange doctrine is adduced as one of the atomist arguments meant to explain why physical objects are seen to be far away. However, in *De sensu* it is not connected with distance perception but rather, it appears, with problems presented by mirrors.

The closest parallels to this doctrine are found, as far as I know, in Lucretius 4.962–85, esp. 975–7, and in one of M. F. Smith's new fragments of Diogenes of Oenoanda, *AJA* 75 (1971), N. F. 5, Col. III, lines 3–14, 359–60). In the Lucretian passage the poet states that if we had earlier concentrated on watching a festival, we might still, even when wide awake, continue seeing the festival after it is over:

cum iam destiterunt ea sensibus usurpare,	975
relicuas tamen esse vias in mente patentis,	
qua possint eadem rerum simulacra venire;	
per multos itaque illa dies eadem obversantur	
ante oculos, etiam vigilantes ut videantur	
cernere saltantis et mollia membra moventis.	980
(Martin's text, 5th edn.)	

Although several difficulties remain, the main idea seems clear enough. Prolonged concentration on eye-idols may allow the same idols (*eadem rerum simulacra*) to enter our mind (*vias in mente patentis*) even after the physical objects are no longer close enough to be seen in the normal fashion by the eye. This picture has some resemblance to the theory of Alexander. The idols received by the eye during the games have imparted a type of disposition to the beholder which permits him to see the same objects under radically changed conditions. To that extent the idols received during the games can be said to have prepared the eyes. Apparently the same situation is present in the fragment of Diogenes of Oenoanda (loc. cit.): τὰ ὑπὸ τῶν ὀψεων βλέπομενα ἡ ψυχὴ παραλαμβάνει. μετὰ

⁸² As mentioned above, I have assumed throughout this paper that Alexander's knowledge of the atomists' doctrines attacked by him was indeed accurate. However, it is somewhat disturbing that neither, for instance, Theophrastus in his account of Democritus, nor Galen, when he demands how large Epicurean idols could enter the pupil (above, n. 69, 639 Mueller and Kühn), mentions the theory found in Alexander. Various answers are possible. Theophrastus may have omitted it in his brief account or found it unsatisfactory. Galen may have been ignorant of it or, also, found it an unsatisfactory answer for his problem.

Alternatively, Alexander's theory may have arisen after the death of Epicurus and may not have found entry into the Epicurean orthodoxy. It may even have been excogitated after the death of Galen. However, I felt that it was worth while methodologically to take Alexander's assertions at face value in order to see what new light they could, on that assumption, shed on Epicurean philosophy.

⁸³ Mugler, disregarding the context, wrongly renders *μωπιζεσθαι* here by 'to be shortsighted' (*Dictionnaire historique de la terminologie optique des grecs* (Paris, 1964), p. 264).

δὲ τὰς τῶν πρώτων ἐμπτώσεις εἰδώλων ποροποιεῖται ἡμῶν οὕτως ἡ φύσις ὥστε, καὶ μὴ παρόντων ἔτι τῶν πραγμάτων ἃ τὸ πρῶτον εἶδεν, τὰ ὅμοια τοῖς πρώτοις τῇ διανοίᾳ δεχθ[ῆ]ναι . . .

The lack of sufficient context does not allow us to determine whether this *ποροποιεῖσθαι* (a notion quite similar to the *viae patentēs* in Lucretius) also requires intensive and prolonged previous concentration on the same eye-idols. Nevertheless, there is again present a certain similarity to the doctrine of Alexander: idols have served to prepare the beholder to see in a different manner.

Obviously, the parallelism is rather incomplete. In Diogenes of Oenoanda eye-idols have prepared the beholder to receive similar idols into the mind. In Alexander the mind is not mentioned. Also, Alexander states that idols serve to prepare the eye and cannot themselves be seen. Both in Lucretius and Diogenes the first set of idols is seen in its own right. Also, in Lucretius and Diogenes the first set of idols is succeeded by more idols. Alexander, on the other hand, intimates that if the idols serve only to rouse vision, vision itself must occur by means of something other than idols. Various hypotheses can be proposed. It could be assumed that the accounts differ because Alexander (or, less likely, Lucretius and Diogenes) had misunderstood their common source. Or, Alexander's account is different because in discussing eye vision only he is talking about a related, but not identical, aspect of atomist vision. However, without more information nothing conclusive can be said.

Some other similarities to Alexander's account can be found. For instance, *μυωπιζεσθαι* reminds one of Lucretius' use of *laccessere* with reference to the *simulacra* (e.g. 4.729, 4.731, 4.753, 4.758, and elsewhere). The idols exert *ἐπέρειους* and *νύξις* in Sextus Empiricus (*P.H.* 3.51). However, these similarities appear to be accidental.

Another similarity is found in Theon's account of Euclid's *Optics*: πρὸς δὲ τὸ τῇ ὄψει μὴ προσπίπτειν τι εἶδωλον ἀπὸ τοῦ ὁρώμενου εἰς τὸ κινήσαι αὐτὴν πρὸς τὸ καταλαβεῖν τὸ ὁρώμενον ἔφερον (sc. Euclid) αἰτίας τοιαύτας.⁸⁴ Taken in isolation this sentence could mean that, just as in Alexander, the idol serves to prepare the eye for seeing the external object. The context shows, however, that it is the idols here that are seen. Again, one could speculate that Alexander or his source had drawn unwarranted conclusions from this type of imprecise Greek.

To sum up, Alexander's doctrine is without a really close parallel in the atomist system. Moreover, it is quite unlikely that any atomist could have propounded it in all the detail found in Alexander. The notion that idols could in some way serve to prepare vision is found in Lucretius and Diogenes and, therefore, need not be disbelieved if encountered in Alexander. It is less likely but not impossible that these preparatory idols were themselves not seen. Lucretius states that if we do not concentrate on an object our eyes do not see it well (4.811–14). Unperceived preparatory idols could possibly have been justified along these lines. The least credible part of Alexander's account is the one which contemplates vision without idols among the atomists. It is true that in the air-imprint theory of Democritus effluences from the physical object do not seem to enter directly the eye of the beholder. However, it is unlikely that Alexander had this theory in mind because it is implausible, as well as completely

⁸⁴ Above, n. 34, p. 148.20–2.

unattested, that the arrival of the Democritean air-imprint was preceded in the eye by expergefactory idols. Moreover, Alexander himself attributes to Democritus vision by idols rather than by air-imprints. Now, it is inconceivable that an atomist who adhered to an Epicurean type of idol theory of vision could have held that anything but idols could convey to us visual information of an external object. Also, when Alexander insinuates no-idol vision into the doctrine of atomists, his language suggests that he could be drawing his own conclusions from the notion that idols may serve as stimuli rather than supplying attested atomist doctrine. It seems likely that at least on this topic Alexander's account is inaccurate.

When dealing with mirrors Alexander appears to be attributing to the atomists a theory which disagrees with information found in Lucretius. In the *Mantissa* 135.27–30 he assumes that, when an object is seen in the mirror, vision occurs because an idol of the object remains stationed in the mirror and emits other idols. Lucretius, of course, explains mirrors differently. According to him idols, when hitting a shiny surface, are bounced back by it undeformed (4.98–109).

It is certainly the account of Lucretius which agrees better with the teachings of Epicurus. According to the latter, the images are characterized by motion and speed: τάχῃ ἀνυπέρβλητα ἔχει (*Ep. Hdt.* 47) and ὠκέως ταῖς φοραῖς χρωμένων (ibid., 49). Lucretius, too, in contexts not dealing with mirrors, lays lengthy emphasis on the speed of *simulacra* (e.g. 4.176–209). Since the theory of Lucretius allows *simulacra* to remain in motion it must be given preference over that found in Alexander.

Our third source of information, the doxographical tradition, is couched in uncertain Greek. Depending on interpretation, it could support either Alexander or Lucretius.⁸⁵ It reads: τὰς κατοπτρικὰς ἐμφάσεις γίνεσθαι κατ' εἰδώλων ὑποστάσεις (Plut.) (ἐμφάσεις (Stob.), ἐπιστάσεις (Gal.)) ἅτινα φέρεσθαι μὲν ἀφ' ἡμῶν, συνίστασθαι δὲ ἐπὶ τοῦ κατόπτρου κατὰ ἀντεπιστροφὴν (Plut.) (ἀντεπιστροφὴν (Stob.), ἀντιστροφὴν (Gal.)). The terms ὑποστάσεις and ἐπιστάσεις could refer to stationary idols, but also to the fact that idols are, or seem, to be in some way in, or on, mirrors without implying that they remain there for an extended period. The phrase συνίστασθαι . . . ἐπὶ τοῦ κατόπτρου κατ' ἀντεπιστροφὴν is not quite clear but seems to favour the doctrine found in Lucretius. It is true that συνίστασθαι ἐπὶ τοῦ κατόπτρου by itself points towards idols stationary, if only for a short time. On the other hand, the term ἀντεπιστροφὴ (no doubt synonymous with the ἀντιπεριστροφὴ and ἀντιστροφὴ found in the other two passages) is connected, a few lines down, with the rebound of the ὄψις after hitting bronze or a mirror (in a theory attributed to Pythagoras).⁸⁶ If this meaning is adopted the phrase συνίστασθαι τὰ εἶδωλα κατ' ἀντεπιστροφὴν could mean that the idols appear (are found) on the mirror in order to be thrown back.⁸⁷ Another meaning for ἀντεπιστροφὴ etc. is suggested by that Lucretian passage in which the poet explains why in mirrors the right side appears on the left:

⁸⁵ Accounts are found in Plutarch, *Epit.* 4.14–15, Stobaeus, *Ecl.* I. 52 (44), and Galen, *Hist. Philos.* 95; the first two are subsumed by H. Diels, *Dox. Graeci* under Aetius 4.14 (p. 405); the third is found ibid.,

pp. 636–7.

⁸⁶ *Dox. Graeci*, p. 405.15–22.

⁸⁷ For this meaning of κατὰ + acc. see LSJ B III: κατὰ λήϊον ἐκπλῶσαι, κατὰ θέαν ἤκειω, etc.

planitiem ad speculi veniens cum offendit imago,
non convertitur incolumis, sed recta retrorsum 295
sic eliditur . . .

(4.294–6 Martin's 5th edn.)

The *recta retrorsum* appears to be a perfect translation of the Greek *κατ' ἀντεπιστροφήν*. If this interpretation of *κατ' ἀντεπιστροφήν* is adopted, the phrase *συνίστασθαι κατ' ἀντεπιστροφήν* could mean that the idols are found (συνίστασθαι) on the mirror turned around (in the Lucretian sense). Although this second interpretation seems to do better justice to the Greek, the first must be preferred on grounds of content. The three doxographical passages seem to have as their purpose to explain not why in mirrors right and left appear reversed but rather why objects are seen in mirrors at all. Whichever of the two interpretations of *κατ' ἀντεπιστροφήν* we may prefer, neither of them requires the notion of idols standing still in mirrors. Therefore these doxographical passages need not support the account of Alexander. However, some connection between the doxographers and Alexander cannot be excluded. Therefore we must not necessarily assume that the account of Alexander, even though it posits stationary idols, represents invention or distortion by Alexander himself.⁸⁸

Finally, the colourless idols. In the *Mantissa* (136.24–5) but not in *De sensu* Alexander attributes them to the atomists. Now, in no other source is the term 'colourless' applied explicitly to the atomist emanations. Epicurus certainly believed that the idols possessed colour: οὐ γὰρ ἐναποσφραγίσαιτο τὰ ἔξω (sc. external objects) τὴν ἐαυτῶν φύσιν τοῦ τε χρώματος καὶ τῆς μορφῆς . . . οὕτως ὡς τύπων τινῶν (sc. the idols) ἐπεισιόντων ἡμῖν ἀπὸ τῶν πραγμάτων . . . εἰς τὴν ὄψιν . . . (Ep. Hdt. 49). Lucretius, too, gives colour to the idols themselves: *ab rebus . . . rerum simulacra feruntur . . . simili forma atque colore* (4.163–7). Therefore it is likely that here Alexander has followed a Democritean source. Although there is disagreement on the precise nature of Democritus' epistemology, some sources, at least, state that Democritus attributed colour not to anything outside us but rather considered it a product of our senses due to changes in them caused by the impact of external matter.⁸⁹ This subjectivist view inevitably necessitates that idols (or air-imprints), too, be without colour. Whether the term *ἄχρους* was first applied to idols by Alexander or his sources cannot be established and is not important. The importance of this passage lies elsewhere. It is the only one in the two accounts which contains matter not only not found in Epicurean sources but also probably assignable to Democritus. The other novelties—the reconstructed idols, the stationary idols, and the stimulus-idols—cannot, because of lack of evidence, be assigned with any confidence to any particular atomist school or epoch. Can we assume on the strength of this one passage that the source or sources of both accounts of Alexander may have been writings owing nothing to doctrines peculiar to Epicurus? It seems that this hypothesis cannot be proved. It is true that in the two accounts of Alexander there is no doctrine, as far as I can see, which on available evidence

⁸⁸ The passage containing the stationary idols does not appear in *De sensu*. What conclusions can be drawn from this fact is uncertain.

⁸⁹ The most famous of these expressions of subjectivity is *νόμῳ γὰρ χροῦσθαι, νόμῳ*

γλυκύ, νόμῳ πικρόν, ἔτετ' δ' ἄτομα καὶ κενόν (D.-K., v. 2, 68 A 49.8–9, p. 97). For a general account see W. K. C. Guthrie, *A History of Greek Philosophy*, II (Cambridge, 1965), pp. 454–65.

must be Epicurean and could not have been held by Democritus. On the other hand, we possess too little of Democritus in this area for us to be certain, despite Cicero,⁹⁰ that nothing in the two accounts was excogitated by Epicurus or by another atomist.

In conclusion, a more general question. In his two accounts Alexander has supplied us with material partly attested elsewhere, partly found only in him. In view of scholars' interest in Alexander's reliability,⁹¹ what can be said about the over-all accuracy of his testimony on atomist philosophy? Wherever we can test him against other material he, or his sources, cannot be accused of outright error or gross distortion. The one possible exception seems to be his intimation that there were atomists who believed that vision of external objects could occur without idols. One could wish that Alexander had introduced atomist doctrine in the form of statements rather than obliquely by questions because in the latter case it is more difficult for the reader to decide whether a doctrine is being asserted or only inferred. In our two accounts it cannot be clearly demonstrated whether or not the question form has impaired Alexander's veracity or accuracy.

To sum up, the examination of the content and method of presentation of these two accounts shows that Alexander's evidence can neither be accepted nor discarded *a priori*. Each datum has to be scrutinized separately.

University of Western Ontario

IVARS AVOTINS

⁹⁰ Above, n. 5.

⁹¹ Above, n. 4.