

EPICUREAN SIGNS*

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I The debate

A HERCULANEUM papyrus preserves part of a work by Philodemus on the theory of signs.¹ The title at the end of the roll almost certainly reads: 'Philodemus: On Appearances and Sign-Inferences'.² The inner portion of the roll—and hence the second half of the work—has survived in relatively good condition. There are a few fragments from the earlier part. Even where the papyrus is in good condition there are gaps and fractures which make the text uncertain. Even where the text is fairly certain the interpretation of Philodemus' difficult Greek is frequently unsure.³ Even where the literal interpretation of the text is safe the course of the philosophical argument often remains obscure. Yet despite these difficulties

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¹ *Herculaneum Papyri (PHerc)* 1065: I follow, except where indicated, the most recent text established by P. H. and E. A. de Lacy, *Philodemus: On Methods of Inference* (Naples, 1978) (hereafter: de Lacy). English translations are always my own. For bibliography see M. Gigante, *Catalogo dei Papiri Ercolanesi* (Naples, 1979), 251–4; A. Angeli, 'Filodemo: le altre opere', in *Συζήτησις: studi ... offerti a Marcello Gigante* (Naples, 1983), 612–16; add D. Sedley, 'On Signs', in *Science and Speculation*, ed J. Barnes, J. Brunschwig, M. F. Burnyeat, M. Schofield (Cambridge/Paris, 1982) (hereafter: Sedley); E. Asmis, *Epicurus' Scientific Methods* (Ithaca, NY, 1984), 175–224 (hereafter: Asmis). *PHerc* 671 apparently also contains fragments of a work on signs, possibly part of the same text. See M. Capasso, 'PHerc. 671: un altro libro "de signis"?', *Cronache Ercolanesi (Cron Erc)*, X (1980), 125–8.

² The title at the end of the papyrus reads:

Φιλοδήμου περὶ
ΦΑ[...]Μ[...]ΝΚ[...]ΣΗ[...]ΙΩΣΕΩΝ

There is no doubt about *σημειώσεων* and little about *καί*. The remaining letters presumably represent some cognate of *φαίνεσθαι*. Of various possibilities (see de Lacy, 12; Sedley, 240 n 2) Phillipson's *φαντασιῶν* fits the traces least ill. I use the ugly term 'sign-inference' for *σημειώσεις* (and 'make a sign-inference' for *σημειοῦσθαι*). Anything else is even worse.

³ But see Sudhaus's sensible comments in the preface (p VI) to vol III of his Teubner edition of Philodemus' *Rhetorica*. Note too that Zeno of Sidon and *καὶ νοῆσαι καὶ ἐρμηνεύσαι σαφῆς* (Diogenes Laertius (DL) VII.35 = fr 1.A–C (see below, n 5); cf. Cicero, *de Natura Deorum (ND)* I.xxi.59 = fr 6.A–C).

Philodemus' work provides copious—and unique—evidence for a remarkable episode in the history of ancient logic and epistemology.

The *de Signis*—to use the standard Latin title—is neither treatise nor textbook. It is more like a notebook or commonplace book—a source-book of Epicurean doctrines and arguments. And it is plausible that it was penned not for public enlightenment but for Philodemus' private use.

The extant text divides into four parts of unequal length but comparable content. Each part lists and discusses a sequence of objections to the Epicurean theory of sign-inference. The first and longest part (ia.1–xix.9)⁴ contains Philodemus' own account of the views of his revered teacher Zeno of Sidon.⁵ Zeno, who lived from about 155 to about 75, was scholarch of the Garden and one of the two leading Epicureans of his generation. The second part (xix.9–xxvii.28) offers another account of Zeno's views,⁶ taken from a contemporary of Philodemus called Bromius.⁷ After a transitional paragraph, the brief third part (xxviii.13–xxix.16) reports the ideas of Demetrius of Laconia,⁸ Zeno's coeval and match. The fourth part (xxix.20–xxxviii.22) gives a further set of

⁴ All references to the work are by column and line of the papyrus.

⁵ In his *πρὸς τοὺς [σοφιστὰς]* Philodemus says: *Ζήνωνος ἐγεν[ό]μην περιώ[το]ς [οὐκ] ἀπιστ[ὸς] ἐραστής καὶ τ[ε]θνη[κ]ότος ἀκοπίατος ὑμνητής* (*PHerc* 1005, xi.6–9 = fr 11.A–C). For Zeno see A. Angeli and M. Colaizzo, 'I frammenti di Zenone Sidonio', *Cron Erc*, IX (1979), 47–132. There is a puzzle about the structure of Part 1. The Part begins with a sequence of objections to the Epicurean theory (ia.1–v.36) and ends with a corresponding sequence of replies (xi.27–xix.9). In between comes another set of objections and replies (v.37–xi.26). De Lacy (97 n 12) says that the interpolation was 'apparently taken from the lectures of Zeno of Sidon'. No doubt; but a strange comment, since the whole of Part 1 comes from Zeno. I cannot explain why the interpolation was inserted into the text.

⁶ *Βρόμιος δὲ τοιαῦτ' ἔφασκε πιστώματ' [αὐτῶν καὶ συνατημάτων] ἐκτίθεσθαι* (xix.9–11). I suppose that *ἐκτίθεσθαι* is passive rather than middle (cf. [ἐξ]εθήκαμεν, xxvii.38; ἐξέ[θη]κε, xx.10)—Bromius said that the following arguments were set out'. But were the arguments, as reported by Philodemus, set out by Bromius or by Zeno (cf. Angeli/Colaizzo, 58–9)? Since *Βρόμιος δὲ* answers *ἡμῖν μὲν . . . δ[ι]αλεγόμενος ὁ Ζήνων* (xix.4), the most plausible view of Philodemus' meaning is this: 'Thus far, what Zeno said in conversation with me: next, the way he stated the matter to Bromius'. Thus Part 2 rehearses Zeno's views as they were explained to Bromius (so e.g. de Lacy, 110–11; Sedley, 240)—and the subject of ἐξέ[θη]κε (xx.10) and of *φησὶν* (xx.32) is probably Zeno rather than Bromius.

⁷ Bromius is known otherwise only from Philodemus' *Rhetorica* (see the edition by F. Longo Auricchio, in F. Sbordone (ed), *Ricerche sui Papiri Ercolanensi*, III (Naples, 1977)). There the reference is to ὁ *φίλτατος Βρόμιος* (*PHerc* 1674, xxxiv.13–15). But Bromius is then vigorously and sarcastically attacked for disagreeing with *οἱ ἄνδρες*, and elsewhere he is implicitly accused of parricide (cf. *PHerc* 1427, vii.18–29). Is *φίλτατος* ironical?

⁸ For bibliography see de Lacy, 119 n 90; C. Romeo and E. Puglia, 'Demetrio di Lacone', in *Συζήτησις*, 529–51. His dates are controversial. He refers to Zeno as ὁ *φίλτατος Ζήνων* (*PHerc* 1012, xxi.2 = Zeno, fr 13. A–C), perhaps in connection with Zeno's view on *σημείωσις*.

arguments and replies: the author of these thoughts is unknown,⁹ his name having perished with the lost transition from the third part of the work.

It is evident even from this bare outline that there had been a lively and prolonged debate over Epicurean signs.¹⁰ At vii.5–7 Philodemus introduces a new point in the argument by remarking that:

Dionysius attempts to bring technical objections against the replies which our people offer.¹¹

It is generally supposed that Dionysius is the Stoic Dionysius of Cyrene, a pupil of Diogenes of Babylon and Antipater of Tarsus (*Ind. Stoic.* lii.6) and an elder contemporary of Zeno.¹² Dionysius, to whom Zeno was replying, was bringing objections against certain Epicureans—‘our people’—who in turn were offering ‘replies (ἀντιρρήσεις)’. These replies evidently presuppose earlier objections, which in turn presuppose a still earlier Epicurean exposition. The sentence at vii.5–7 thus points to six distinct phases in the history of the debate: an Epicurean account of the theory of signs; objections to the theory; replies offered by ‘our people’;

⁹ De Lacy says that the fourth author ‘may again be Demetrius’, and refers to Robert Philippon, ‘Philodemus’, Pauly–Wissowa *RE*, XIX (1938), 2444–82, at col 2451 (repr in Philippon’s *Studien zu Epikur und den Epikureern* (Hildesheim, 1983)). But Philippon offers no argument for the identification, which Sedley (240 n 3) has convincingly rejected.

¹⁰ At the end of the work Philodemus says that he has given τὰ ... εἰρημμένα τοῖς ἡμετέροις κατ[ὰ] το[ῦτο] πλεῖστον γεγονόσαι (xxxviii.22–4), and he gives a guarded promise to consider the views of ‘some of the doctors’ on the subject ‘in the final parts of the exposition’ (xxxviii.25–32). (Note the reference to medical σημείωσις in *Lib Dic* at *PHerc* 1471, fr 63.3–11; and on medical signs, and in particular medical μετάβασις ἀπὸ τοῦ ὁμοίου, see most recently R. J. Hankinson, ‘Causes and Empiricism: a problem in the interpretation of later Greek medical method’, *Phronesis*, XXXII (1987).) Hence *de Signis* (*Sign*) did not end with the end of *PHerc* 1065, just as it did not begin at ia.1 of the surviving text. What else did the work contain? xxxviii.22–32 is reticent—but nothing there suggests that *Sign* covered any topic other than sign-inferences. De Lacy conjectures that the lost early part of the work included ‘a general discussion of Epicurean canonic [i.e. epistemology and logic]’ (163). But I cannot see that the few broken fragments of the first half of the roll support the conjecture; and the title of the work (above, n 2) need not be taken to imply that there were *two* subjects, φαντασίαι and σημειώσεις (the work that we possess concerns φαντασίαι in so far as they form the ultimate basis of every σημείωσις).

¹¹ περᾶτα[ί τ]ε Διονύσιος πρὸς ἃς φέρουσιν ἀντιρρήσεις [οἱ π]αρ’ ἡμῶν φιλοτεχνεῖν. I shall usually quote the Greek text for any passages which are made to bear argumentative weight; and I shall indicate gaps and doubtful letters in the usual papyrological way. This procedure takes space, and it is ugly. But in discussing *Sign* it is necessary to keep an eye on the state of the text, and to recognize where a reconstruction is reasonably secure and where it is largely conjectural.

¹² See e.g. de Lacy, 98 n 28; Sedley, 240–1; cf. H. von Arnim, ‘Dionysius (122)’, Pauly–Wissowa *RE*, V (1905), 974. He is usually identified also with the Dionysius attacked by Philodemus in *de Dis* 1 (*PHerc* 26, ixa.25, ixb.7).

Dionysius' technical objections to these replies; Zeno's counter-objections to Dionysius; and finally Philodemus' version of Zeno's views.

We do not know when the debate began. Epicurus himself mentions sign-inferences, and appears to ascribe some considerable importance to them.¹³ It is at least possible that he wrote at length on the subject.¹⁴ Nor can we be sure who originated and who continued the attack on the Epicurean theory. The only named opponent is Dionysius. Scholars have generally assumed that the war was waged between Stoics and Epicureans. But there are difficulties with this view.¹⁵ It has been suggested that there were also Academic opponents: the sceptical Academics attacked Stoic signs—may they not also have attacked Epicurean signs?¹⁶ Perhaps, too, the Peripatetics were involved: we know from Philodemus' *Rhetorica* that they engaged in the disputes over the standing of rhetoric as a τέχνη—did they also engage in the disputes over signs?¹⁷ In sum, the controversy partially chronicled in the *de Signis* may have been multilateral. Yet there are difficulties with this hypothesis too.¹⁸ The Hercula-

¹³ See below, 95.

¹⁴ But it is worth noting that *Sign* never cites or even refers to Epicurus (or to any other of *οἱ ἄνδρες*).

¹⁵ The opponents are associated with the notion of ἀνασκειή (see esp. xvii.8–9; τ[ὼν] . . . κατὰ τὴν ἀνασκε[υ]ήν τρό[π]ω [τε καὶ] ὁδῶ φιλοσοφούντων). We have no evidence which associates the concept of ἀνασκειή directly with the Stoics (see Additional Note C).

¹⁶ See esp. Asmis, who speaks of 'a decidedly Academic perspective on the Epicureans' (198), and who suspects that Zeno, an admirer of Carneades (Cicero, *Academica* xii.46 = fr 7.A–C), may have been stimulated by his criticisms into defending Epicurus' method of signs (211). (See also Cicero, *ND* I.xxi.59 = fr 6.A–C, for Philo as a critic of Zeno.) Scholars have seen affinities between parts of Cicero's *ND* and some of the criticisms discussed in *Sign*. Most of these affinities are imaginary; but *ND* I.xxxv.97–8, on the follies of Epicurean *similitudo*, does at least advert to the theories advocated in *Sign*. The speaker in the passage is Cotta, who is represented as an Academic (I.vii.16; cf. *de Oratore* III.xxxvi.145)—and that may support the suggestion that the Academy attacked the Epicurean sign-theory and hence is to be numbered among the opponents of *Sign*. More generally, *some* of the objections discussed by Philodemus do seem Academic in tone. (And even Pyrrhonian—why not add Aenesidemus as a possible opponent?) But Philodemus speaks as though all his opponents subscribed to a rival theory of signs, and the Academics (and Pyrrhonians) did not do that.

¹⁷ The term ἀνασκειή itself might suggest as much (see Additional Note C), and it might not be wholly fanciful to think that Critolaus, in his discussions on rhetoric, came to talk about sign-inferences. On the debate over rhetoric see J. Barnes, 'Is Rhetoric an Art?', *darg Newsletter*, II (1986), 2–22.

¹⁸ Philodemus *seems* to suggest that his opponents formed a single group, namely the ἀνασκειή men, and one of them, namely Dionysius, was (probably) a Stoic. If that is right, then the opponents were all Stoics—though their arguments may of course have benefited from Academic or Peripatetic ideas. (In the rest of this paper I refer generically to 'the opponents'; but the phrase is not meant to imply that the Epicureans were opposed by a single and unified band of objectors.)

neum papyri may contain the answer to these questions—but we are not yet in possession of it.

One further point deserves mention. We should not assume that there was a single, unitary and unchanging Epicurean theory of signs. The Epicureans were a conservative lot, intellectually speaking; but their conservatism—as Philodemus' *Rhetorica* clearly shows—was perfectly compatible with substantial development and waspish dissent.¹⁹ The theory of signs was contested from without, and it was upheld by a variety of defenders from within. We should not be astonished if we find differences among the views of the defenders. At any rate, we may not suppose, as a rule of interpretation, that the four parts of Philodemus' exposition cannot differ from one another in doctrine and idea.²⁰

II The way of similarity

A sign-inference or *σημείωσις* takes us from a sign to what it signifies: it takes us from the known to the unknown, and in typical cases from the apparent to the non-apparent. Since perception is always true, according to Epicurus, 'we should make sign-inferences about what is unclear from what is apparent' (DL X.32). In Epicurus' own words:

We should preserve everything in accordance with our perceptions . . . so that we may have something from which to make sign-inferences about what is waiting and also about what is unclear. (ad Hdt 38)²¹

Philodemus adds something to this:

⟨one should not limit oneself to what is evident⟩ but make inferences from this about what is non-apparent; nor should one distrust what is shown through the non-apparent by virtue of similarity but trust it as one trusts that from which the sign-inference proceeds. (fr 2.1–6)²²

¹⁹ See D. Sedley, 'Philosophical Allegiance in the Greco-Roman World', in *Philosophia Togata*, ed J. Barnes and M. Griffin (Oxford, 1988).

²⁰ See de Lacy, 121 n 95. When ascribing views or arguments to 'the Epicureans' I shall normally give references to each of the four Parts of *Sign*. I often write 'Philodemus says . . .' and the like: such phrases are brachylogical—I do not mean to ascribe a thought to Philodemus rather than to the Epicurean whose views he is reporting.

²¹ For illustrations see e.g. *ad Herodotum* (ad Hdt) 39; *ad Pythoclem* (ad Pyth) 87, 97, 104; fr [29][25] 15–17 Arr.

²² *ΑΣΩΝ* ἀλλ' ἀπὸ τούτων τεκμηριούσθαι περὶ τῶν ἀφανῶν, μήτ' ἀπιστεῖν τοῖς δι' αὐτῶν κατὰ τὴν ὁμοιότητα παραδεικνυμένοις, ἀλλ' οὕτως πιστεύειν ὡς καὶ τοῖς ἀφ' ὧν ἡ [σημείωσις]. For *τεκμηριούσθαι* see *de Dis* III (*PHerc* 152/157) viii.17–18; Epicurus, *ad Hdt* 39. Aristotle distinguishes between *σημείον* and *τεκμήριον* (e.g. *Analytica Priora* 70b1–6), but I find no similar distinction in Epicurean texts (*pace* Asmis, 176).

The reliability of the conclusion of a sign-inference is as great as the reliability of its premisses: inference preserves not only truth but also certainty.²³

There are different varieties of sign-inference,²⁴ but they are all genuine inferences, *συλλογισμοί*,²⁵ and they thus offer proofs, *ἀποδείξεις*.²⁶ They are usually formulated in what Stoic logicians called ‘quasi-conditionals’ (*παρασυνημμένα*), or propositions of the form: ‘Since (*ἐπεὶ*) . . . , then—’.²⁷ But occasionally Philodemus uses other connectives,²⁸ and the Epicureans were not rigorous formalists.

The *σημείον*, that from which we infer, is sometimes referred to as *τὸ φαινόμενον*, *τὸ φανερόν*, or *τὸ ἐναργές*; but Philodemus usually prefers the phrase *τὸ παρ’ ἡμῶν*, ‘what is by us’.²⁹ In some passages *τὸ παρ’ ἡμῶν* preserves its original topographical sense.³⁰ Normally it adverts to ‘what is in our experience’ and it incorporates whatever we know by *πεῖρα* or *ἱστορία*, by our own or other men’s experiences.³¹ In this way *τὸ παρ’ ἡμῶν* is broader than *τὸ φαινόμενον*, since it may include things learned by proof or argument.³² I suppose that the texts which identify the *σημείον* as *τὸ φαινόμενον* and the like are imprecise and that it is *τὸ παρ’ ἡμῶν* which, properly speaking, constitutes the sign from which the sign-inference proceeds.

²³ In an Aristotelian *ἀπόδειξις* the premisses are *γνωριμώτερα* than the conclusion (*Analytica Posteriora* 71b21): perhaps Philodemus’ assertion in fr 2 reflects, directly or remotely, an explicit disagreement with the Peripatetics?

²⁴ See fr 3.5–9 with xxviii.22–5; and the reference to ‘three kinds of signs’ at xxxii.11, about which we know nothing (cf. de Lacy, 121 n 96).

²⁵ See Additional Note A.

²⁶ See ix.4; xxxi.4–6 (*τὴν γε σύνθεσιν ἐξ ἀνάγκης ἀπολαμβάνει καθ’ ὁμοίότητα πορευομένην εἴπερ ἀποδείξαι μέλλει*).

²⁷ See ii.26, 37; iii.10, 27, 38; v.1, 4, 34; xix.37; xxii.31; xxiii.1; xxxiii.24. On the problems with this formulation see M. F. Burnyeat, ‘The Origins of Non-deductive Inference’, in *Science and Speculation* (hereafter: Burnyeat), at 218–24.

²⁸ *ὅτι*, ia.9, iv.3; *ἐπειδή*, v.31; *ἐπειδήπερ*, xiii.33, 38; *εἴπερ*, xxxviii.2 (cf. xxxvii.37).

²⁹ The following table presents the figures (which, given the state of the papyrus, cannot be exact—it is sometimes unclear what to count as a genuine occurrence of e.g. *φανερόν*):

	Pt 1	Pt 2	Pt 3	Pt 4	Total
<i>τὰ παρ’ ἡμῶν</i>	42	10	1	12	65
<i>φαινόμενα</i>	4	8	—	6	18
<i>φανερά</i>	3	5	—	2	10
<i>ἐναργῆ</i>	4	1	3	1	9

(see also e.g. *de Dis* I (*PHerc* 26), vii.3–4: *μεταβαίνοντας ἀπὸ τῶν παρ’ ἡμῶν*.)

³⁰ E.g. v.30–6, where *παρ’ ἡμῶν* contrasts with *ἐν Λιβύῃ* and *ἐν τῇ Πρεταννικῇ*.

³¹ See xvi.35–7; xx.37–9; xxxii.14–18; cf. e.g. Galen, *Sect Intr* I.68–9K (the distinction is a commonplace among the Empirical doctors: see K. Deichgräber, *Die Griechische Empirikerschule* (Berlin/Zurich, 1965²), index s.vv. *πεῖρα* and *ἱστορία*).

³² See, perhaps, the references to *τὰ προαποδεδειγμένα* at viii.6, xxxii.26, fr 4.1.

Note, too, that the things 'in our experience' need not be items of sense-experience. Sign-inferences may be made about numbers³³—and in principle (I assume) about anything whatsoever which may fall within our experience.

That to which we infer is often characterized as τὸ ἄδηλον or τὸ ἀφανές or the like. Something is 'unclear' if it is not—or not yet—within our experience, if it is not—or not yet—known. (It need not be something *unavailable* to direct experience, since sign-inferences may yield conclusions about αἰσθητά.³⁴) We infer from items of a given kind which we have experienced to items of the same kind which are (thus far or forever) outside our experience. Sometimes we are said to infer to certain particular unknowns,³⁵ more often to unknowns in general; and the conclusion may also refer to what holds 'everywhere' or of 'everything'.³⁶ There is a difference of form between these types of conclusion, but no serious difference of substance. For something holds everywhere or of everything if and only if it holds both of τὰ παρ' ἡμῶν and also of τὰ ἄδελια; and an inference which will take us to *some* unknowns will presumably take us to *any* unknowns, and hence to *everything*.

Here, then, are two simple paradigms of Epicurean sign-inference:

Since men in our experience are mortal, so too are all men. (cf. ii.26–8)

Since animals in our experience are mortal, so too are any animals there may be in Britain. (cf. v.34–6)

In general, a sign-inference may be presented in the following form:

Since all Ks in our experience are F, Ks elsewhere/everywhere are F.

³³ See esp. xv.13–xvi.1; cf. i.30–3; xxv.1–2; xxviii 32.

³⁴ τότε μὲν ἀπὸ αἰσθητῶν ἐπ' αἰσθητὰ τῆς μεταβάσεως γνωμῆνης: xxxvii.24–6. See further Additional Note B.

³⁵ When the conclusion adverts to τὰ ἐν ἄλλοις, it need not refer specifically to *all* other places: see the mention of Libya and Britain at v.32 and 35 (and note also ὅδε τις ἄνθρωπος at i.7).

³⁶	Pt 1	Pt 2	Pt 3	Pt 4	frs	Total
ἄδηλον	8	5	2	3	—	18
μὴ δῆλον	—	1	—	2	—	3
τὰ ἐν τοῖς ἀδήλοις	3	—	—	4	1	8
ἀφανές	3	2	1	4	1	11
ἐν ἄλλοις	3	—	—	—	—	3
κατ' ἄλλους τόπους	2	—	—	—	—	2
πᾶς	5	5	—	—	—	10
πανταχῆ	3	—	—	2	—	5
ὅπουδήποτε	3	2	—	—	—	5

Note also ἀόρατα at xxxvii 12.

(But I shall usually save ink by writing: ‘Since known Ks are F, unknown Ks are F’.)

The schema calls for several comments. First, it is not clear that every sign-inference must start from *all* the Ks in our experience: may not a sample or selection suffice? I shall return to this point.³⁷ Secondly, there is evidence that the Epicureans also allowed sign-inferences about what holds ‘for the most part’. Such inferences would have the form:

Since Ks in our experience are for the most part F, Ks elsewhere/
everywhere are for the most part F.

The relevant texts are difficult,³⁸ and they raise interesting issues; but I shall not pursue the matter further.

Thirdly—and crucially—there is the question: under what conditions are such arguments valid? What validates or justifies or grounds a valid or justified or grounded sign-inference? The Epicurean answer to the crucial question is, in principle, eminently simple: validation is done by similarity, and Epicurean *σημείωσις* proceeds by ‘the way of similarity (*ὁ κατὰ τὴν ὁμοιότητα τρόπος*)’. The noun *ὁμοιότης* and the adjective *ὅμοιος* occur on every page in Philodemus’ work.³⁹ Their occurrences differ triflingly but cohere in sense:⁴⁰ sign-inferences work in virtue of the similarities among the items with which they are concerned.

III The way of rebuttal

Much needs to be said about the notion of similarity and the way in which it was supposed to support *σημειώσεις*. Since ‘the way of similarity’ is revealed to us in Philodemus’ pages not by direct description but by the means with which it is defended from attack, it is best to look next at the attack. And since the attack came from opponents who had a theory

³⁷ See below, n 89.

³⁸ See Additional Note E, and below, 115.

³⁹ I find no *clear* appeal to similarity in connection with *σημεῖα* in Epicurus; but see *ad Hdt* 80, with Asmis, 179. Philodemus once or twice invokes *ἀναλογία* or proportion in lieu of similarity (xxxvii.14, fr 3.1, 4); Epicurus himself may have used the same term in the same context: see fr [137] Arr.

⁴⁰ The Epicureans speak of *ὁ καθ’ ὁμοιότητα τρόπος* (22 occurrences), or of inferring *καθ’ ὁμοιότητα* (9)—the plural, *καθ’ ὁμοιότητας*, is restored by de Lacy at v.38 ([κατὰ] τὰ[s ὁμοιότη]τας); also of *ὁ δι’ ὁμοιότητος τρόπος* (3), or of inferring *δι’ ὁμοιότητος* (5)—the accusative after *διά* is restored by de Lacy at xxviii.20 (*διὰ τὴν ὁμοιότητα*—better *κατά*?). Note also *ἡ κατὰ τὸ ὅμοιον μετάβασις* (4), and once *ἡ καθ’ ὁμοιότητα μετάβασις*; also *ἀπὸ ὁμοιότητος* (v.8). I can see no difference in sense among these various locutions.

of their own, let us start from this rival theory. It is called 'the way of rebuttal (*ἀνασκευή*)'. And the opponents hold that 'since we can show <whatever we want to infer in a sign-inference> by virtue of *ἀνασκευή*, we shall ignore the way of similarity' (iv.11–13); for 'we shall determine the matter if we proceed by *ἀνασκευή*, because it alone is reliable' (vii.3–5).

Philodemus refers to *ἀνασκευή* some thirty times, but it is controversial what *ἀνασκευή* is and how the way of *ἀνασκευή* leads to its goal. Philodemus' most helpful description is this:

If we posit that 'If A, then B' is true whenever 'If not B, then not A' is true, it cannot be concluded from *this* that only the way of *ἀνασκευή* is necessitating. For 'If not B, then not A'⁴¹ is *sometimes* true in so far as when B is, by hypothesis, rebutted (*ἀνασκευασθέντος*) then by virtue of its very *ἀνασκευή* A too is eliminated (*ἀναιρείται*). For example in the case of 'If there is motion, there is void'; for if void is, by hypothesis, eliminated, then by virtue of its very elimination motion too will have been eliminated. So this fits the class of things which hold by virtue of *ἀνασκευή*. But *sometimes* it is not so . . .

(xi.32–xii.14)⁴²

The text begins by alluding to the operation of contraposition. ('If A, then B' contraposes to 'If not B, then not A'.) But it is plain that *ἀνασκευή* itself is not, as some have supposed,⁴³ the logical operation of contraposition (for which the Greek is *ἀντιστροφή*). First, *ἀνασκευή* is an operation on the consequent, 'B', of the conditional 'If A, then B', whereas contraposition operates on the conditional itself. Secondly, Philodemus claims that *ἀνασκευή* only sometimes (*ποτέ*: xii.3) applies in the context of conditionals, and he recognizes that contraposition always holds (xi.32–6).⁴⁴ Other scholars offer 'elimination' or 'removal' as the English for *ἀνασκευή*,⁴⁵ and in so far as *ἀνασκευή* and *ἀναιρέσις* are treated as synonyms, these versions are admirable. I have preferred 'rebuttal'. The origins of the logical use of *ἀνασκευή* are to be found in Aristotle.⁴⁶ *Ἀνασκευάζειν* is common in the *Topics*, where it is paired with *κατασκευάζειν*: '*κατασκευάζειν* that B' means 'to establish that B'; and '*ἀνασκευάζειν* that B'—equivalent to '*κατασκευάζειν* that not B'—means, if I may be allowed the expression, 'to disestablish that B'. There

⁴¹ At xii.2 Bahnsch's emendation (interchanging *δευτερον* and *πρωτον*) is generally accepted and seems inescapable.

⁴² Cf. xiv.11–14; xxviii.17–20.

⁴³ De Lacy translates *ἀνασκευή* as 'contraposition'.

⁴⁴ See further Sedley's conclusive arguments, 245.

⁴⁵ Sedley, *Asmis*.

⁴⁶ See Additional Note C.

is no ideal English verb. I think that 'rebut' is no worse than 'eliminate' or 'remove', and it is useful to have different English renderings for the different Greek terms ἀναίρειν and ἀνασκευάζειν, even if these terms are synonymous.

How, then, does rebuttal apply to some conditionals and not to others? The crucial phrase is παρ' αὐτὴν τὴν ἀνασκευὴν αὐτοῦ (xii.5–6: cf. παρὰ ψιλὴν τὴν ἀναίρεισιν αὐτοῦ, xii.11–12). The conditional 'If A, then B' will be grounded on rebuttal just in case A is rebutted *because of* (παρά) the rebuttal of B, and because of that *alone* (αὐτὴν, ψιλὴν). Compare these two conditionals (see xii.19–21):

- (1) If there is motion, there is void.
- (2) If Plato is a man, Socrates is a man.

According to Philodemus, the truth of (1) may be established by ἀνασκευή, but not the truth of (2). Given (1), then if there is no void, there is no motion. But more: if there were no void, there would be no motion; and the lack of void would, in itself, cause or explain the lack of motion—there would be no motion precisely because there was no void. Given (2), then if Socrates is not a man, Plato is not a man. But we cannot here go further and state that if Socrates were not a man, Plato would not be a man. If Plato is not a man, that fact will, as it were, run parallel to Socrates' lack of manhood, but it will not be caused or explained by it. We will not say: Plato is not a man because Socrates is not a man.

How, then does ἀνασκευή provide, or seem to provide, a method of sign-inference? There are two distinct possibilities. First, we might suppose that, correlated with the conditional (1), there is a sign-inference of the following sort:

- (1a) Since there is motion, there is void.

The thought will be this: (1a) is a valid sign-inference just because its corresponding conditional, (1), holds in virtue of rebuttal. More generally, 'Since A, B' expresses a valid sign-inference only if, were B not the case, A would not be the case precisely because B was not the case. The hypothetical failure of B would explain the consequent failure of A. (Should we further suppose the opponents to have held that 'Since A, B' is valid only if the hypothesis that B explains the fact that A? In that case 'the way of ἀνασκευή' is roughly what modern philosophers call 'inference to the best explanation'.)

The second possibility is a little more complicated. The sign-inference correlated with (1) is not (1a) but rather

(1*b*) Since moving things in our experience move through void, moving things everywhere move through void.

The thought will be this: (1*b*) is a valid sign-inference just because the conditional corresponding to its consequent, namely (1), holds by virtue of rebuttal. (The conditional (1) 'corresponds to' the consequent of (1*b*) in the sense that it is an alternative formulation of it.) More generally, 'Since known Ks are F, Ks everywhere are F' expresses a valid sign-inference only if 'If something is a K, it is F' holds in virtue of ἀνασκευή, only if, were something not F, it would not be a K precisely because it was not F.

Which of these two possibilities gives the right interpretation of the way of rebuttal? Some texts tell, or seem to tell, in favour of the first possibility. But they are not probative.⁴⁷ Inference (1*a*) could be classified as a σημείωσις in a suitably generous sense of the term; but it is plainly not a σημείωσις in the sense in which I have explained the notion; for it is not of the form 'Since known Ks are F, all Ks are F'. Hence I incline to prefer the second possibility. At all events, even if the opponents actually opted for the first possibility (or failed to see that there was a choice to be made), I suggest that they *should* have plumped for the second.

IV Against the way of rebuttal

The proponents of ἀνασκευή reject the way of similarity outright. They do not, of course, deny that there are similarities among things: they urge that these similarities can never ground or validate a sign-inference. We might expect the Epicureans to take a corresponding view. 'Ανασκευή, they should say, is no way of sign-inference at all. Of course, ἀνασκευή does occur, and in some cases the rebuttal of B will *eo ipso* explain why A must be rejected. But ἀνασκευή can never ground or validate a sign-inference.

And we do find such a robust view clearly expressed in Part 4 of Philodemus' work:

In trying to invalidate the similarity method of sign-inference, they bring it about that no non-evident things can be known by way of signs. For apart from this there is no other correct method of sign-inference.

(xxx.32—xxxι.1)

⁴⁷ See Additional Note D.

But the robust view was not the only Epicurean view of *ἀνασκευή*. A few lines later we read:

As for those who say that the *ἀνασκευή* method of sign-inference depends upon the similarity method, even if they are really (*δυνάμει*) saying the same as us, their exposition leaves behind the suspicion that there are two methods of sign-inference intertwined with one another.

(xxx.8–16)

The people who spoke of dependence were surely also Epicureans; and the text here shows that there were differences within the School on this point—for we need not be beguiled by the suggestion that these people ‘really say the same’ as the author of Part 4.

It should not, then, be surprising to find the dependence view expressed in the earlier parts of Philodemus’ work. Nor, when we find it there, need we try to gloss over the difference and produce a unified view applicable to the whole work:⁴⁸ the nature of Philodemus’ compilation, and the clear statement at xxx.8–12, should make us happy to discover different Epicurean views within the same work.⁴⁹ In Part 1 Philodemus records how ‘our people’

say that the way of similarity in fact completely pervades the way of *ἀνασκευή*, and the latter is confirmed by the former.

(vii.8–12)

And lest anyone should object that the view is here ascribed only to those early Epicureans whom Dionysius attacked, the point is soon ascribed to Zeno himself:

If this method [sc. the way of similarity] has no probative force, then the method of *ἀνασκευή*, which is wholly confirmed by and through it, has no necessity either.

(ix.3–8)⁵⁰

Zeno’s claim that the way of *ἀνασκευή* is ‘confirmed’ by the way of similarity is surely to be identified with the view, rejected in Part 4, that the former ‘depends on’ the latter.

⁴⁸ Asmis offers a unifying view (198–201, 208–9) which seems to me to be inconsistent. Sedley (259–63) offers another unifying view: all sign-inferences (according to the Epicureans) must proceed by *ὁμοιότης*, but some sign-inferences are obliged to contain *ἀνασκευή* as a component. I suppose that this may represent the view insinuated by *ταὐτὸ τῆ δυνάμει* (xxx.12), but it seems to me to force the text (and Sedley’s explanation of how *ἀνασκευή* might sometimes be a necessary component in a *σημείωσις* is obscure).

⁴⁹ So de Lacy, 122 n 96.

⁵⁰ For the Greek text see below, n 54.

And there seems also to be a third view on ἀνασκευή in the *de Signis*. For some passages appear to show that some Epicureans were actually prepared to admit the way of ἀνασκευή as the appropriate method of sign-inferences in certain cases. It is false, Zeno argues, that *every* sign relies on ἀνασκευή:

But if what is evident is removed (αἴρηται) by the very removal of the non-evident, then the sign-inference relies on ἀνασκευή; if it is not for this reason but in some other way that the one cannot hold and the other not hold . . . then it is not by ἀνασκευή but by similarity.

(xiv.11–22)

The text is closely related to xii.2–31, which I have already quoted in part. It seems to be echoed by a sentence from the third, Demetrian, section of the work;⁵¹ and what is more, there are two or three texts in Part 4 which appear to express a similar view.⁵²

Thus some Epicureans robustly deny that ἀνασκευή provides a method of σημείωσις at all: Zeno holds that it exists as a method but is strictly subordinate to and dependent upon the method of similarity; others think, more generously, that there are two methods of sign-inference, coordinate with and independent of one another.

Yet all is not satisfactory. For the third view is preserved, inconsistently, in the thought of the upholders of the other two views. (But perhaps it was consistently upheld by Demetrius?) And we might wonder if it is not a phantom. Zeno certainly gives the impression of allowing the view. But what he actually *says*—that there are two methods—is strictly compatible with his view that the one method is subordinate to the other. The impression which the texts undoubtedly give can perhaps be explained—or explained away—by their dialectical context. At xiv.11–22 Zeno is replying to an argument alleging that *only* ἀνασκευή provides a method of σημείωσις. It is enough, *here*, for him to show that there is *also* another method, the way of similarity. He is not obliged, *here*, to show or even to state that this other method is primary, even if he does in fact believe it to be so. (The texts in Part 4 would have to be given a different

⁵¹ καὶ καθό[λ]ου πᾶν τὸ τοιοῦτο γένος οὐκ ἀνασκευῆ πάντως ἀλίσκετ', ἀλλὰ πολλὰ καὶ διὰ τῆς ὁμ[ο]ιότητο[ς] (xxix.10–13). The passage clearly suggests that both ἀνασκευή and ὁμοιότης have a role to play in sign-inference. De Lacy translates καὶ διὰ τῆς ὁμοιότητος as 'also through similarity', thus suggesting that some inferences may be done in *either* of the two ways; but καὶ should rather be translated as 'in fact' or 'actually'—Demetrius, like Zeno, means that only in some cases of the type in question is ἀνασκευή appropriate—in most, ὁμοιότης is required.

⁵² See xxxii.1–7; xxxiii.7–9; xxxv.32–xxxvi.7: cf. Additional Note E.

explanation; for their author does not think that ἀνασκευή provides a method of σημείωσις at all.⁵³)

However that may be, in what way does Zeno think ἀνασκευή depends on similarity? And why does the fourth author think that ἀνασκευή is no form of σημείωσις at all? The second question cannot be answered from the text, which simply makes an unargued assertion that similarity is the one true way. But Zeno gives us an argument of sorts:

That if there is motion there is void we apprehend in no other way than by the method of similarity, establishing that it cannot be that motion is accomplished in the absence of void. Thus having surveyed everything that accompanies moving objects in our experience, in the absence of which we see nothing moving, in this way we claim that everything which moves in any way moves similarly, and by this method we make a sign-inference that there cannot be motion without void. Hence if this method has no probative force, the method of rebuttal, which is wholly confirmed by and through it, has no necessity either.

(viii.26–ix.8)⁵⁴

The details are murky, the general thrust clear. An ἀνασκευή inference connecting motion and void must rely on the conditional:

- (1) If there is motion, there is void.

But in order to establish (1) we must employ the argument:

- (2) Since moving things in our experience require void, moving things everywhere require void.

And (2) depends on similarity. Thus the ἀνασκευή inference depends on the conclusion of a similarity inference: it is ‘wholly confirmed by and through it’.

Zeno’s argument is intended to illustrate a universal thesis. He therefore holds the following view: any valid inference which proceeds by ἀνασκευή must rely on a conditional proposition. But this conditional proposition can only be established by a sign-inference which uses the

⁵³ See Additional Note E.

⁵⁴ The text is lacunose: τὸ γὰρ ὅτι εἰ [ἔστι κίνησις ἔστι] κενόν, οὐ<κ> [ἄλλω]ς κα[τα]λαμ[β]νομεν ἢ [τῶ]ν διὰ τῆ[ς] ὁμοιότη[τος] τρόπῳ [κατα]σ[κευάζον]τες τὸ μὴ δι[ν]ατὸν εἶν[αι] χωρὶς κενοῦ κίνησιν συντελεξ[ίσθη]αι. τὰ γούν παρακολουθοῦντ[α] πάντα τοῖς παρ’ ἡμῖν κινουμέν[οις] ὧν χωρὶς οὐδὲν ὁρώμεν κ[ινουμέ]ει[νον] ἐπιλογι[σάμενοι], [τούτ]ω πάνθ’ ὅσα κινεῖται κατὰ π[ᾶ]ν πρὸς [τὴν] ὁμοιότητ’ ἀξιοῦμε[ν] κινεῖσθαι, [καί] τῶ τρόπῳ τούτῳ τὸ μ[ὴ] δυνατὸν εἶναι κίνησιν ἄνευ κενοῦ γίν[εσθαι] σημει[ο]ύμεθα. διόπερ εἰ βία[ν] ο]ύτος οὐκ ἔχει πρὸς <τὸ> ἀποδειξ[α]ι το]ῦτ’, [οὐ]δ’ ὁ [κ]ατὰ τὴν ἀνασκευ[ὴν] ὑπ’ αὐτ]οῦ [κ]αὶ δι’ αὐτοῦ βεβα[ιο]ύμενος] ὅ[λ]λος οὐδ’ ἐκεῖνος ἔχ[ει] τῆ]ν ἀ[ν]άγκη[ν].

method of similarity. Hence the way of similarity is prior to the way of *ἀνασκευή*—successful use of the latter presupposes successful use of the former.⁵⁵

The argument I have ascribed to Zeno has the merit of being valid. But it is far from plain that it is sound. In particular, it is far from plain that the conditional propositions upon which *ἀνασκευή* depends can be established by the way of similarity and only by the way of similarity. The quoted text offers no argument for or explanation of this large claim. We must expect—or hope—that some aspect of the Epicurean defence of the way of similarity will do something, explicitly or implicitly, to make Zeno's contention at least plausible.

As for the view expressed in Part 4, I have no interesting proposals. There is a boring possibility: perhaps the author of Part 4 accepted Zeno's dependency argument and inferred from it that the way of rebuttal is not really a way of *σημείωσις* at all—the operation of rebuttal is idle in that it cannot be applied in a sign-inference without use of the way of similarity, which is in itself sufficient to ground the *σημείωσις*.⁵⁶

Another possibility is worth airing. Perhaps Part 4 construes the way of rebuttal in such a fashion that its proponents are committed to regarding

Since there is motion, there is void

as a *σημείωσις*. But such inferences—the author of Part 4 may reasonably have thought⁵⁷—are not *σημειώσεις* at all. Hence the way of rebuttal is not in itself a way of sign-inference, even if it may sometimes provide valid inferences which may sometimes contribute to a *σημείωσις*.

V Against the way of similarity

The opponents fired a volley of objections, some subtle and some capricious, against the Epicurean way of similarity. Most of these objections fall into one or the other of two categories.

First, the opponents urged, by a variety of means, that similarity

⁵⁵ Compare the way in which the Peripatetics later claimed that hypothetical syllogisms can be 'reduced' to categorical syllogisms: the former use premisses which only the latter can establish (e.g. Alexander, in *Analytica Priora* 263.15–17, 387.5–11).

⁵⁶ Hence, perhaps, *κἂν ταὐτὸ τῇ δυνάμει λέγωσιν ἡμῖν* (xxx.12–13).

⁵⁷ See above, 101.

inferences—unlike *ἀνασκευή* inferences—must lack *necessity*. At the very beginning of the surviving text we can (just) read this:

Someone who infers from the fact that they are not found by us (*παρ' ἡμῶν*) to the conclusion that they are not found in unclear places either, does not apply any necessitating force.

(ia.12–15)⁵⁸

And a little later:

How, then, can we say that there is no race of men who alone do not die when their hearts are split? Hence you may not necessarily (*κατ' ἀνάγκην*) assume from the fact that men in our experience die when their hearts are split that *all* men do.

(i.33–ii.3)

Take a sign-inference supposedly based on similarity:

Since men in our experience die when their hearts are split, all men die when their hearts are split.

The opponents make a simple point (a point later rediscovered by David Hume): the premiss of the argument does not—or at least appears not to—necessitate its conclusion; it is logically possible for the premiss to be true and the conclusion false. And no appeal to the similarity of men can engender a logical necessity.⁵⁹

Secondly, the opponents pressed the notion of similarity itself: the Epicurean invocation of similarity is crucially indeterminate, they alleged, and we need to know *which* similarities they have in mind:

From which similarity to which should we move? From men to men, say.—But why from them to them rather than from animals to animals?—Then from animals to animals.—And why that rather than from bodies to bodies?

(v.8–15)⁶⁰

The questions are not pedantic. If we choose to argue ‘from bodies to bodies’, that is, if we choose *being corporeal* as the predicate which marks the relevant similarity, then we shall be obliged to accept the following inference:

⁵⁸ ὁ ἐκ τοῦ πα[ρ'] ἡμῶν μ[ὴ εἶναι τὸ] μῆδ' ἐν το[ῖς] ἀδήλοισ [εἶναι συνά]γων τὸ ἀ[να]γκαστ-
εικὸν οὐ προσφ[έ]ρεται.

⁵⁹ See also ia.7 (?) [δέον]; i.13, 15, 21; iii.19, 20; iv.9, 31, 34.

⁶⁰ ἀπὸ ποίας θ' ὁμοιότητος] ἐπὶ ποίαν δεῖ μεταβαίνει;—ἀπ' ἀνθρώπων εἰ[π']
ἀνθρώπ[ο]υς λόγου χάριν.—καὶ τί[ς] μᾶλλον ἀπὸ τοῦ[των] ἐπὶ τούτους ἢ ἀπὸ ζώων ἐπὶ ζῶα;
—ἀλλ[λ'] ἀπὸ ζώ[ω]ν ἐπ[ὶ] ζῶα.—καὶ τί μᾶλλον ἢ ἀπὸ [σωμάτων] ἐπ[ὶ] σώματα; (I have
changed de Lacy's punctuation.)

Since all bodies in our experience possess colour, and the atoms too are bodies, then they too possess colour.

(v.1-4)

The Epicureans do not accept the conclusion—here and elsewhere they posit ‘special cases’ in nature⁶¹—and they must therefore explain why *being corporeal* is not an appropriate sort of similarity.

Again, the opponents urge that the term ‘similar’ is ambiguous, and they require the Epicureans to say which sense they intend (vii.12, 24-6). They ask:

Shall we adopt for the sign-inference what is indistinguishable or what is similar or what has a determinate degree of resemblance?

(vi.1-4)⁶²

Again, they wonder whether, in inferring from the fact that all known Ks are F, we should suppose that the Ks are similar or dissimilar *in respect of F-ness* (ii.25-iii.26). And so on.

In general, the opponents claim that the Epicurean theory is impotently vague—and they imply that no coherent (or at any rate, no non-arbitrary) determination of the theory is possible.

VI Necessity

In reply to the first of the objections, that similarity will not generate necessitation, we might perhaps expect the Epicureans to admit the fact but deny its force. Aristotle himself, devoted to the necessities of the syllogism, had acknowledged the existence of valid arguments in which the premisses do not necessitate the conclusion:⁶³ surely the Epicureans, more ready than he to rely on empirical connections and less committed to the defence of deductive necessity, must have followed Aristotle’s lead? Sign-inferences, they must have said, *support* or *confirm*, but they do not *necessitate*, their conclusions. Their validity rests not on necessity but on a different link between premisses and conclusion. The opponents rightly claim that the way of similarity will not produce necessitating

⁶¹ Cf. x.1-xi.8, where the Epicureans reject an abuse of the way of similarity in connection with the size of the sun, arguing that the sun may have special features which invalidate the inference (below, 118-9); see also xiv.29-xv.13 (below, 115).

⁶² *πότερον τὸ ἀπ[α]ράλλακτον εἰς τὴν [σ]ημείωσιν παραληφόμεθα ἢ τὸ ὅμοιον ἢ τὸ πόσῃν ἔχον προσεμφέρεια[ν];*

⁶³ On this see Burnyeat.

arguments. They wrongly think that this fact constitutes an objection to the Epicurean theory.

There are a few passages in Philodemus' work which seem at first sight to put such a view forward. But on narrow inspection none can be seen to countenance a non-necessitating form of inference.⁶⁴ And on the other hand, there are numerous passages which imply that Epicurean *σημειώσεις* do necessitate.

It must be admitted that all these passages occur in Part 1. (There are later references to necessity, but they are quite different in import.⁶⁵) And it might be imagined that while *Zeno* insisted on the necessitating power of *σημειώσεις*, other Epicureans did not: they, unlike him, may have meant to follow Aristotle's example and countenance non-necessitarian validity.

It must further be admitted that all *Zeno's* references to necessitation occur in dialectical contexts. The opponents had argued, in a variety of ways, that the method of similarity could not necessitate. *Zeno* rejects all these arguments. Sometimes his rejection takes an overtly *ad hominem* form:

Next⁶⁶ we can say this on behalf of our view: if⁶⁷ the method of similarity is not necessitating, then neither will the method of rebuttal apply necessity.

(viii.21–6)

Elsewhere his counterargument takes on a slightly different colouring:

Hence neither their first nor their second argument concludes that the similarity method of sign-inference does not apply necessity.

(xii.32–5)

All the other passages are similar.⁶⁸ The opponents produce an argument to the conclusion that the similarity method does not necessitate. *Zeno* contends that their conclusion does not follow from their premisses, or else that if their argument is sound then it equally unseats their own

⁶⁴ See Additional Note F.

⁶⁵ See xxvi.25; xxxiii.35; xxxiv.1, 26; xxxv.5, 28: here the necessity has a different role to play (I return to the point later). I am unsure how to take *δεῖν* and *δεῖ* at xxiii.1 and 7.

⁶⁶ De Lacy prints *συνεχ[ως δ' ἔστιν] ἐ[ἴπ]εῖν* and translates 'One may say over and over'. This seems odd to me, and I prefer to read *συνεχ[ές]* (for the sense of the word see xvi.5).

⁶⁷ De Lacy prints *ἐπ[εὶ] ὁ*. Gomperz had printed *εἰ ὁ*. Whatever the papyrus may read, *ἐπεὶ* gives the wrong sense: perhaps *εἰπερ*?

⁶⁸ The occurrences of *ἀνάγκη* (or *ἀναγκαστικός*) fall into six groups, each group representing a reply to an objection: (viii.23, 26; ix.8), (x.25, 30), (xi.12, 23, 25), (xii.1, 35), (xiii.1, 27), (xiv.32).

method of rebuttal. He nowhere *explicitly* states that the similarity method does necessitate. Perhaps, then, even Zeno intended to follow Aristotle's example: he rejects the opponents' arguments for dialectical ends, and not because he finds their conclusion unpalatable.

Strictly speaking this view cannot be disproved. But it is incredible. The opponents presuppose that the premiss of a sign-inference must necessitate its conclusion. If Epicurean *σημειώσεις* are not intended to satisfy this presupposition, then the opponents are guilty of *ignoratio elenchi*. Zeno has ample opportunity to point out that the opponents ignore the elenchus. He does not do so. On the contrary, he gives every impression of accepting their presupposition. Again, the idea that sign-inferences may be valid but not necessitating is startling and exciting and liberating. Yet it is never expressed in Philodemus' work. I think we must suppose that Zeno and the other Epicureans—like their opponents—assumed without question that sign-inferences could only be valid if they necessitated, and that they did not even entertain, let alone accept, the thesis that sign-inferences might function on a less powerful fuel than necessity.⁶⁹

Why should the Epicureans—and their opponents—have insisted on necessity? As far as we know, they did not consider the question. 'And had they considered the matter, what would they have said?' The question is idle. But we might—idly—imagine answers. And the answers would surely turn on epistemological considerations. A sceptic like Sextus Empiricus can use the word *εἰκός* to describe the connection between the premisses and conclusion of an argument⁷⁰—but Sextus is a sceptic and he has no desire to step securely from premisses to conclusion. For Dogmatists, sign-inferences are a way of extending our knowledge of the world. Philodemus states expressly that we may trust the conclusions as firmly as we trust the premisses (fr 2.2–6).⁷¹ Were the validating link in the inference anything weaker than necessity, it might seem unjustifiable to repose so much trust in the conclusion. For if the truth of the premisses does not offer a logical guarantee of the truth of the conclusion, how can a firm grasp of the former guarantee an equally firm grasp of the latter? If there is the possibility of logical slippage between premisses and conclusion, surely there will exist epistemic slippage too? In short, if sign-inferences are to fulfil the epistemological task set them by the

⁶⁹ In this I largely follow Burnyeat, 232 n 92.

⁷⁰ E.g. *Outlines of Pyrrhonism (PH)* I.43, 44, 47, 49, 54.

⁷¹ For the Greek text see above, n 22.

Dogmatists, then they cannot be fuelled by anything less powerful than necessity.

And it is now time to mention induction. Most scholars have supposed that Philodemus deals with inductive inferences, and his work has often been hailed as the first serious treatment of inductive logic.⁷² Up to now I have deliberately avoided the word 'induction'. But why not follow the common view? Indeed, why not simply translate *σημειώσις* by 'induction'?

The term 'induction' has been used in two quite different senses by modern philosophers,⁷³ and it is important to decide which sense—if either—is relevant to Philodemus. The first and older sense characterizes an argument in virtue of the logical form of its component propositions. An argument is inductive, in this sense, just in case (to use the traditional jargon) it infers 'from the particular to the general or from the particular to the particular'. More precisely, an argument is inductive if and only if each of its n premisses is a singular proposition of the form ' $\phi(a_i)$ ' and its conclusion is either the corresponding universal generalization, ' $(x)\phi(x)$ ', or else a singular proposition ' $\phi(a_i)$ ' (where a_i is not subject in any of the n premisses.) For example: 'Considering that Dio and Theo and Socrates and in general the individuals like us have died, we infer that we too are mortal—even though death is not yet present for us' (Sextus, *adversus Mathematicos* (*M*) VII.279).

Are Epicurean sign-inferences inductions in *this* sense? Plainly they are not. Many inductions will not be sign-inferences (since nothing is specified in the definition of induction with regard to the epistemic status—clear or unclear, known or unknown—of the component propositions of the argument). And few, if any, sign-inferences will be inductions (since sign-inferences characteristically have one premiss rather than many, and that premiss characteristically has the form 'All known Ks are F', which is a universal proposition and not a singular proposition of the form ' $\phi(a_i)$ ').

These points may seem absurdly pedantic. Surely, it will be said, Epicurean sign-inferences in a fairly obvious way *correspond* to inductions,

⁷² Theodor Gomperz gave his edition of *Sign* (Leipzig, 1865) the title *Philodem: über Induktionsschlüsse*, and claimed (p XI) that the work 'is the first sketch of a logic of induction'. His claim is quoted approvingly by Asmis (197; cf. 179–80). Sedley, 256, contrasts Stoic and Epicurean logic as 'deductive' and 'primarily inductive'—'primarily', because of the auxiliary role which (according to Sedley: above n48) the Epicureans allowed to *ἀνασκευή*.

⁷³ For a clear account see S. F. Barker, *Induction and Hypothesis* (Ithaca, NY, 1957), 3–4.

even if they are not, strictly speaking, to be *identified with* inductions. No doubt this is true, loosely speaking. But in logic it is wise to speak strictly. Moreover, as will later emerge, it is not by mere accident or whim that the premisses of Epicurean sign-inferences are standardly given the form of universal generalizations.

There is a second sense of 'induction'. In this sense the word characterizes an argument in virtue of the link between its premisses and its conclusion. Induction, in this sense, is 'non-demonstrative inference'. More precisely, an argument is inductively valid just in case its premisses support or confirm or 'probabilify' its conclusion but do not entail or necessitate its conclusion. This is the sense of 'induction' relevant to the modern study of inductive logic.⁷⁴

Are Epicurean sign-inferences inductions in this second sense? No. For, as we have just seen, the *σημείον* in a valid *σημειώσις* *necessitates* its conclusion. And it follows that Philodemus' work is not an essay in inductive logic.

But it is an essay in logic; and since all valid inferences are (trivially) either inductive or deductive, it is an essay in *deductive* logic. Modern philosophers may opine that the sign-inferences which concern the Epicureans should properly be examined under the heading of inductive logic: they are *not* deductively valid (it may be claimed), so that they must boast inductive validity or else give up their pretensions to validity altogether. But whatever the merit of this opinion as a piece of logic, it is irrelevant to the task of exegesis—for it is clear that the Epicureans were claiming deductive validity for their sign-inferences.⁷⁵

Evidently, we may not translate *σημειώσις* as 'induction'. Indeed, we shall do well to banish the word 'induction' from discussions of Philodemus. It can only breed confusion, and Philodemus' text is confusing enough without it.⁷⁶

VII Similarity

But how can the Epicureans possibly have thought that their method of similarity produced sign-inferences with necessitating or deductive

⁷⁴ The two senses are not 'chance homonyms': it has seemed true to most philosophers—to most post-Humean philosophers—that if any induction in the first sense is valid, then it must be an induction in the second sense.

⁷⁵ This is why it is not a trifling terminological fact that Philodemus uses *συλλογισμός* and *συλλογίζεσθαι* of the inferential aspects of *σημειώσις*. See Additional Note A.

⁷⁶ Here again I find myself in solid agreement with Burnyeat.

validity? How can they have thought to rebut the first type of objection levelled by their opponents? If there is an answer to this question, we must seek it by tracing out the Epicurean retort to the second type of objection, the objection which alleges that the notion of similarity which they employ is impotently vague.

In Part 3 Philodemus rehearses the views of Demetrius of Laconia. Demetrius accused the opponents of misunderstanding the Epicurean doctrine at five points. He held that once the misunderstandings had been exposed, the objections would disappear and the truth of the Epicurean theory shine through. The five points are of central importance—virtually everything else which Philodemus says in defence of the Epicurean theory can be subsumed under one or another of them. And I think we shall best understand the Epicurean theory and the way of similarity if we examine in turn the five Demetrian points. But for dramatic ends I shall not follow Demetrius' own order of presentation.

(a) *Degrees of similarity*

The opponents frequently observe that sign-inferences cannot be based on any and every similarity, and they imply that the Epicureans overlooked or suppressed this fact. According to Demetrius, however, the opponents

have not taken into account the fact that we do not think one ought to move from *any* similar item to *any* other item but rather from what is most especially similar.

(xxviii.25–9)⁷⁷

Zeno said much the same:

One should move from what is especially near and from what is as most especially similar as possible—one should not use high-level common features while ignoring those that are especially appropriate.

(xviii.17–23)⁷⁸

You are a tiro ornithologist. Every bird you have observed has had white plumage. May you infer that every bird—even those in Australia—has white plumage? No. For you live by the Thames, and all the birds

⁷⁷ τὸ μὴ [ἐπιλε]λογίσθαι ὅτι ο[ὐκ] ἀφ' οὗ ἔτ[υχ]ε[ν] ὁμοίου ἐφ' ὃ ἔτυχεν οἰόμε[θα] δεῖν μεταβαίνειν ἀλλ' ἀπὸ τοῦ μάλιστα ὁμοιοτάτου.

⁷⁸ ἀπὸ [γὰρ τῶν μάλιστα συ]γγιζόντ[ων] καὶ ἀπὸ τῶν ὡς] ἐν μάλισθ' ὁμ[ο]ιοτάτων με[ταβα]τέου, καὶ οὐ τ[αῖς] ἐπ[άν]ω χρησ[τέ]ον κοινότησι, τ[αῖς] μάλιστα κ[ατ]αλλήλ[ου]ς παρέντας.

you have so far observed have been river-birds—in fact, English swans. The most you may infer is that all swans—or perhaps all English swans—have white plumage. You must move from what is ‘most especially similar’.

The premiss of a sign-inference typically has the form ‘All known Ks are F’. The instruction to move from ‘the most especially similar’ is in effect a constraint on the choice of ‘K’. Suppose all observed Ks have in fact been K*s (all observed birds have been swans). Then your premiss should refer to K*s and not to Ks. In general, take the narrowest K you can find, the smallest K to which all observed specimens belong.

The rule will surely eliminate numerous faulty sign-inferences. You will not infer that, since all known birds are white, birds everywhere are white. But as it stands, the rule is unsatisfactory in several ways. In particular—as the opponents will again insist—it is not a precise and determinate rule. Nor indeed is it clear how one might grade or measure similarity⁷⁹ so as to make the rule both determinate and precise.

One possibility imagined by the Epicureans’ opponents⁸⁰ might be developed as follows. Suppose that we have an antecedently given kind K. Consider the set of knowns Ks, each of which has been observed to be F. Collect the properties, F-ness excepted, which all these observed Ks share and call their conjunction *I*. Then let the kind K* be the set of Ks which are *I*. The rule to infer from and to ‘the most especially similar’ is now, and precisely, the rule to infer that all Ks which are *I*, that is all K*s, are F.

There is a sort of precision here. But it hardly helps the Epicureans. It is patently impracticable. We could rarely, if ever, as a matter of fact construct the set *I*, and the ‘precise’ rule would deprive us of any real possibility of producing a valid sign-inference. In any case, the rule would lead to banality. The class K* will be limited in severe, and severely contingent, ways, and the conclusion that all K*s are F will lack any scientific interest or significance. (Moreover, the rule would be incompatible with other aspects of the Epicurean theory.⁸¹)

Perhaps, then, we should rather think of the Epicureans as working within a predetermined structure of kinds. Perhaps we should even talk of ‘natural kinds’; at any rate, there is some indication that the class of Ks about which we infer must have a *φύσις* or nature, and that sign-

⁷⁹ For some reflections on this see D. K. Lewis, *Counterfactuals* (Oxford, 1973), 48–52.

⁸⁰ Note the suggestion that similarity might be construed as τὸ ἀπαράλλακτον: vi.1.

⁸¹ See below, n 87.

inferences refer to the *natural* properties of a kind.⁸² Then the rule of 'most especial similarity' will say this: take the smallest of the given (natural) kinds within which all observed Ks fall.

All the cases observed by the tiro ornithologist fall within the kind of animals; but they also fall within the kind of birds, and within the kind of swans—and perhaps within the kind of English swans or *cycni Anglici*. Hence he may not infer to all animals or even to all birds. He may conclude at most that all swans (or perhaps all English swans) have white plumage.

Of course, this version of the rule raises many questions. For example, where do these 'given' or 'predetermined' kinds come from? Why should sign-inferences find kinds at their disposal in the first place? Again, the rule does little to guarantee the necessity of the inference. However narrowly K may be determined, it still seems (so far as the present argument goes) that even if all observed Ks are in fact F, other and hitherto unobserved Ks may perfectly well fail to be F. Certainly, antipodean swans may turn out to be black—and surely it is coherent to suppose that even on English rivers you may from time to time sight a sport or a freak?

(b) *Similarity and difference*

The opponents indeed were obsessed by freaks and sports, which in their view proved the invalidity of similarity inferences. The Alexandrian dwarf, however like us in other respects, had a head as hard as an anvil (ii.3–9). Among the Ks we have not yet observed there will surely be freaks, and their likely existence blocks any inference made on the basis of similarity.

Demetrius maintained that freaks tell in the opposite direction:

They have not seen that the existence of special (*ιδιάζοντα*) classes of stones and numbers and other such things is shown by the apparent things themselves: special cases do not conflict with inference by similarity but on the contrary strengthen it.

(xxviii.30–7)⁸³

⁸² See xv.11; xviii.1; xxiv.8; xxvii.24. But it must be allowed that these references to *φύσις* are casual. This may indicate that it goes without saying that the Ks involved in a sign-inference have a *φύσις* and form a natural kind—or else that nothing much should be read into the use of the word.

⁸³ τὸ μὴ β[λ]έπειν ὅτι τὸ εἶναι τινα ἰδ[ι]άζ[ο]ντα γένη λίθων καὶ ἀριθμῶν καὶ ἄλλων τινῶν τοιούτων αὐτὰ τὰ φαινόμενα παρέδειξεν, οὐδὲν μαχόμενα τῇ κατὰ τὸ ὅμοιον μεταβάσει τοῦναντίον δ' ἐπισφοδρῦνο[ν]τ' αὐτήν. The class of stones is the magnet (cf. i.23–8; ix.35–8); the number is 4 (cf. i.30–3; xv.13–xvi.1—see above, n 33).

Zeno again makes the same point:

Their inference from unique kinds (*μοναχά*) is also weak—for none of us rejects such special cases (*ιδιώματα*).

(xiv.28–31)⁸⁴

And Zeno connects the point with the need to observe ‘special cases which exhibit great differences’ (xv. 8–9).

How can the Epicureans welcome, or even accommodate, sports and freaks?⁸⁵ We might suppose, in Aristotelian vein, that the existence, actual or potential, of freak Ks should lead us to modify the premisses and conclusions of sign-inferences. Instead of ‘All known Ks are F’ we should say ‘Known Ks are for the most part F’; and our conclusion is not ‘All Ks are F’, but ‘For the most part Ks are F’. As I have observed, there is some evidence that the Epicureans did allow sign-inferences of this modified sort.⁸⁶ But they plainly did not believe that *all* sign-inferences must contain the *caveat* ‘for the most part’. Nor can the need for the *caveat* be what Demetrius has in mind at xxviii.30–7; for he avers that the existence of freaks ‘strengthens’ sign-inferences, not that it leads us to modify them. Thus whether or not Demetrius believed that freaks might sometimes be accommodated by use of the *caveat*, he also believed that the existence of freaks adds power or force to standard *σημειώσεις*.

Throughout Philodemus’ work we find references to the observation of differences and variations.⁸⁷ Varied observations are vital to the way of similarity. And the strengthening power of freaks surely lies in this: they provide the best possible examples of variation and difference.

The logical import of the need for variation emerges most clearly from the following passage:

We grasp that this depends by necessity on that from the very fact that this has been observed to accompany all the cases we have come across—that too when we have encountered a variety of animals from the same kind which are different

⁸⁴ ἀ]σθενής δὲ καὶ ὁ διὰ τῶν μ[ο]ναχῶν συλλογισμός. οὐδε[ῖς] γὰρ ἡμῶν τὰ τοιαῦτ’ ἀναιρεῖ [τ]ῶν ιδιωμάτων.

⁸⁵ There is a distinction between τὰ μοναχά, which are rarities (i.e. *kinds* which, like the magnet, have special properties) and τὰ σπάνια, which are freaks (i.e. *odd members* of some kind—like the Alexandrian dwarf): see e.g. i.20 compared with ii.3. But I have not seen that the distinction plays any important role in *Sign*.

⁸⁶ See above, 98.

⁸⁷ We must observe διαφοραί (xiii.30; xv.9; xxiv.26) or παραλλαγαί (xxi.30; xxiii.10, 38; xxiv.2), or ιδιοτήτες (xxiv.13, 28; xxvi.23). Hence the introduction of Ks which are Γ (above, 113) is incompatible with the developed Epicurean view.

from one another in other respects but which all share common properties of the sort in question.

(xxxv.4–14)⁸⁸

The reference to necessity in the first part of the sentence will occupy us later. Here it is the second clause which matters.

Return to the swans. All observed swans have been found to have white plumage. But what swans have you observed? If they have all been very similar to one another—if they have been, as it were, clones—then you may not properly infer to all swans. Rather, your sample must exhibit a wide diversity, it must contain swans differing widely in age and size and diet and habitat and pedigree—and in particular it would do well to contain a few freaks and sports. If all these varied swans have been found to enjoy white plumage, then the sign-inference to all swans may be legitimate.

More formally, the sign-inference ‘Since all known Ks are F, all Ks are F’ is valid only if the class of known Ks includes a wide diversity of Ks. And if the class also contains freak Ks (a two-headed swan, perhaps), so much the better.

This rule has evident affinities with the method of ‘similarity and difference’ associated with John Stuart Mill. Its merits are evident and familiar. It will surely serve to eliminate some invalid inferences.

But there are problems. First, the rule suggests that we must observe a substantial number of Ks in order to be in a position to construct a sign-inference. And this suggestion is corroborated by several other passages in Philodemus’ work.⁸⁹ But one text tells in the opposite direction:

⁸⁸ καὶ ταῦτα ποικίλοις ἐκ ταύτου γένους ἐντετυχηκότων ζώοις καὶ παραλλαγῶς κατὰ τὰλλα πρὸς ἄλληλ’ εἴ[χουσι] (xxxv.9–12); cf. xx.34–xxi.3; xxxiii.10–15; and perhaps see i.23–5.

⁸⁹ Part 4 indeed claims that we must survey ‘all’ the *φαινόμενα*: xxx.29; xxxv.7, 36; xxxvi.5. This does not entail that we must survey many *φαινόμενα*—since the relevant *φαινόμενα* may in fact be few. But in practice it will require a vast—indeed, an impossibly vast—survey if we are to consider e.g. all men known to us (xvi.17) or all moving objects in our experience (xxxv.36). This objection was made by the opponents. Zeno replied (according to Bromius) by suggesting that:

οὐτε πᾶσι[ν] τὰ ἀναγκαῖά ἐστι[ν] ἐ[κ]περιε[λ]θεῖν τὰ φαινόμενα [παρ’ ἡ]μῖν οὐ[τ]ε μὴν οἷς ἔτυχεν ἐντ[υχ]εῖν, ἀλλ[ὰ] πολλοῖς ὁμογενέσι καὶ ποικίλοις.

(xx.32–6)

There are two ways to take this. (i) Zeno means that the premisses of a *σημείωσις* do not, or do not typically, take the form ‘All known Ks are F’. Rather, they have the indeterminate form ‘Known Ks are F’, and they presuppose that a large and varied sample of Ks has been surveyed. Or (ii) Zeno retains the thought that the premiss must be of the form ‘All known Ks are F’, but he holds that this premiss is itself inferred from the fact that a large and representative sample of known Ks are F.

In some cases, having met with *one* instance you will say that they are such-and-such—often after *two* instances, sometimes after more, taking into account the varied nature of signs. (xxvi.34–9)⁹⁰

What Philodemus says here is surely true. One or two experiments are usually enough to convince us that this or that new substance dissolves in *aqua regia* or combines with hydrogen to form a stable compound. Often we do not need—or do not think we need—to make prolonged and extensive researches or to observe similarities among numerous different cases.

Yet how can Philodemus claim both that we must make observations in a wide variety of circumstances and also that on occasion a single observation will suffice? The sentence at xxvi.34–9 presents a puzzle. (And what is more, it fits ill into its immediate context.⁹¹) There are various ways in which the puzzle might be solved. We might imagine, for example, that a single example will suffice just in case it is made against a background of adequately tested hypotheses. But in the extant part of his work Philodemus does not solve the puzzle for us or indicate how the Epicureans understood and explained the possibility of single-case confirmations.

The second problem is evident: how can the method of similarity and difference in itself guarantee deductive validity? However many and however varied cases of Ks you may have observed to be F, why should you infer that all Ks must be F? Perhaps it is true that the more and the more varied swans you have seen (all of which have been white), the more *likely* it is that all swans are white. But unless you have seen every swan (in which case the inference is trivial), then it is surely possible (as the opponents insist) that some of the unobserved swans should be odd birds and should fail to exhibit the normal white plumage. Necessity still eludes the Epicurean.

⁹⁰ ἐφ' ὧν μὲν ἐνὶ προσπεσῶν ἐρεῖ τόδε τι τοιόνδ' εἶναι, πολλάκις δὲ δυσίν, ἔστιν δ' ὅτε πλείοσιν, τὸ πολὺτροπον τῶν σημείων ἀναλογιζόμενος.

⁹¹ The preceding clause is restored by de Lacy as follows: ὧσ[τε] μὴ πάντως ἐπ' [ἀ]ριθ[μῶν] πολλῶν συμβεβηκότων ἀναιρεῖσθαί τι, δι' ἣν αἰτίαν ἐφ' ὧν κτλ (xxvi.32–4). This presumably means: 'It does not require many cases to reject something—and for that reason you will affirm things sometimes after a single instance'. But the argument then appears absurd: 'We reject a hypothesis after a few counter-examples—therefore we may accept a hypothesis after a few positive examples'. (Can the text rather mean: 'Because a few cases are enough to refute a thesis, people will [sc. *wrongly*] affirm a thesis after a few cases'? The sense is right, but the Greek hardly invites the interpretation.) Perhaps we should emend ἀναιρεῖσθαι to ἀρεῖσθαι and translate 'so that it is not necessarily with respect to many cases that something is inferred' (for this use of ἀρεῖν see xxxiv.29). But the Greek is still desperate (and the preceding lines are too lacunose to give much help).

(c) 'No contrary footstep'

A third rule is expressed by Demetrius in a flurry of mixed metaphors:

They have not taken into account that we do not move generally from what holds in our experience to what is non-apparent; rather we move from what has been tested from every side and presents no footstep and no spark in the opposite direction.

(xxviii.37–xxix.4)

Again, Zeno agrees:

One should not move from *any* common property to *any* common property, but from one which presents no spark in the opposite direction and applies no attraction which pulls against what is evident.

(xiii.1–8)

The same point is frequently made in the same and similar metaphors,⁹² and it is sometimes applied to illustrative examples:

From the fact that all men in our experience are alike in being mortal, we make a sign-inference to the conclusion that all men in general are liable to death, given that nothing pulls in the opposite direction or attracts even a footstep toward the view that they are immune to death.

(xvi.16–25)⁹³

Consider a sign-inference which the Epicureans reject (*I* paraphrase):

Things in our experience which reappear slowly from behind obstructions do so either because they move slowly or because they are very large. Hence the same holds of the sun. But since the sun moves quickly, we can infer that it is very large.

(see x.4–17)

The Epicureans reply by asking (*inter alia*):

May it not be that things which reappear in our experience do so for these two reasons but that the sun does so not for these reasons but for some other reason quite different from those in our experience?

(xi.2–8)

⁹² In addition to the passages cited in the text, see: xviii.30 (αἰθνγμα); xvii.1; xviii.30 (ἀνθέλκειν); viii.2; xxi.13; xxxii.29; xxxiii.13; xxxvi.10 (ἀντιπίπτειν); xxxv.21 (ἐπισπᾶν); xxxii.24 (μάχεσθαι).

⁹³ [ἐκ τῶν τοῦ[ς] παρ'] ἡμῶν ἀν[θ]ρώπο[υ]ς πάν[τ]ας καὶ κ[ατὰ τὸ] θνητοὺς εἶναι παραπλησ[ί]ους ὑπάρχειν ση]μειούμε[θα καὶ ὅλως τ]ο[υ]ς ἀνθρ[ώ]πους πάν[τ]ας εἶναι θανάτου δ]εκτικούς, μ[η]δενὸς εἰς τοῦνα[ντίον ἀντι]πίπτουτος μ[η]δ' ἕως ἔχρονος ἐπισπωμ[ένου] π[ρὸ]ς τὸ τελευτῆς αὐτοῦ[ς] εἶναι.

differ in *some* respects—the Epicureans will reply—and indeed our sign-inferences actually demand that there be some differences among similars. But *these* differences do not block the inference; *they* are not contrary footsteps.⁹⁵

Now the Epicureans may be right here—there surely is a difference between inferences to the mortality of Libyans and inferences to the size of the heavenly bodies or the nature of atoms—or even to the plumage of antipodean swans. But what is this difference and how is it to be characterized and explained? The Epicureans do not say—and to that extent their talk of sparks and footsteps must be reckoned empty rhetoric.

(d) *Qua Truths*

Demetrius objects further against the opponents:

They have not realized that ‘It is so-and-so *qua* this’ (e.g. ‘Man is mortal *qua* man’, ‘Smooth round objects produce pleasure *qua* smooth and round’, and in general everything of this sort) is not necessarily grasped by rebuttal but often in fact by similarity—e.g. that decapitated men die *qua* decapitated . . .

(xxix.4–16)⁹⁵

The opponents had indeed explicitly claimed that such ‘*qua*’ truths could only be grasped by rebuttal (vi.31–vii.5). They had also explicitly argued that sign-inferences must depend on ‘*qua*’ truths:

In general, suppose they argue: ‘Since men in our experience are mortal, then if there are men anywhere they are mortal’: if this is equivalent to ‘Since men in our experience are mortal *qua* men and in so far as they are men, then men everywhere are mortal’, then they will argue correctly; but if this—namely being mortal—holds in some other way of men in our experience, then they will argue in vain.

(iii.26–iv.2)⁹⁶

The Epicureans agreed that valid sign-inferences must somehow rest on

⁹⁵ και τὸ μὴ διειληφέναι ὅτι τὸ ἢ τὸδε τοιόνδ’ ἐ[σ]τί, οἷον τὸ τὸν ἄνθρωπον ἢ ἄνθρωπός ἐστιν φθαρτὸν εἶναι, καὶ τὰ λεία καὶ περιφερῆ [κ]αθὸ λεία ἐστὶν καὶ περιφερῆ ποιητικὰ ἡδονῆς, καὶ καθό[λ]ου πᾶν τὸ τοιοῦτο γένος οὐκ ἀνασκευῆ πάντως ἀλίσκετ’ ἀλλὰ πολλὰ καὶ διὰ τῆς ὁμ[ο]ιότητος[s], ὥσπερ τὸ τὸν ἀπο[κεφ]αλισθέν[τ]α παρόσον ἀπο[κεφ]άλιστ[αι] μηκέ[τι] [φ]υομέν[ης] ἀ[πο]θανεῖν.

⁹⁶ Note that this is presented as the *general* objection (καθόλου: iii.26) to the Epicurean view. The opponents’ objections, I observed earlier, fasten either on necessitation and its absence from Epicurean σημειώσεις or on similarity and its vagueness or debility. In the *qua* objection the two points come together: the way of similarity is too vague and too weak in that similarity cannot engender *qua* truths, and hence cannot ground necessitation.

qua truths; but they claimed that the way of similarity could itself establish the truth of *qua* propositions.⁹⁷

They had a rich vocabulary with which to express *qua* propositions: η , καθό, and παρό;⁹⁸ and, in some cases at least, σύν, and possibly also οὐκ ἄτερ or χωρίς.⁹⁹ The author of Part 4 purports to distinguish four kinds of *qua* truth—or four senses of the *qua* terminology, as he puts it (xxxiii.33–4). The discussion is illegible at one point, but the four ‘senses’ can be recovered with something approaching certitude. (1) In the first sense, Ks are F *qua* K if being F follows K of necessity, that is, if necessarily any K is F. For example, men are fleshy *qua* man, for men are necessarily fleshy (xxxiii.35–xxxiv.5). (2) In the second sense, Ks are F *qua* K if being F is the λόγος or πρόληψις—in effect, the definition—of K. For example, bodies have mass and resistance *qua* body (xxxiv.6–11).

(4) For the fourth sense the characterization is lost but the examples are preserved (‘Knives cut *qua* sharpened’, ‘Atoms are indestructible *qua* solid’). The form of these examples is: Ks are F *qua* G. But this form is not suitable for employment in sign-inferences, even though Philodemus explicitly says that all types of *qua* truth are used in σημειώσεις (xxxiv.27–9). I assume, therefore, that the fourth type of *qua* truth can also be expressed in the form: Ks are F *qua* K. And the way so to express it is plain. The fourth sort of *qua* truth must be *non-immediate*, that is, in the fourth sense, Ks are F *qua* K if F-ness necessarily belongs to something which necessarily belongs to Ks. For example, atoms are indestructible *qua* atom because they are indestructible *qua* solid and solid *qua* atom. (3) For the third sense the example is lost¹⁰⁰ and the characterization is vague (τὸ συμβεβηκέναι τόδε τῷδε: xxxiv.11–12). But if my account of the fourth sort of *qua* truth is right, then there is a gap in the Epicurean analysis. For the second sort of *qua* truth marks off what is immediate and definitional, and the fourth sort caters for what is non-immediate: there is a gap for *qua* truths which express what is immediate but *not* definitional. And this gap is surely what the third sort of *qua* truth was meant to fill. Thus: in the third sense, Ks are F *qua* K if F-ness

⁹⁷ Cf. xvii.3–8; xvii.37–xviii.8; xxvii.22–8; xxxiii.24–32.

⁹⁸ These are the ‘official’ terms at xxxiii.33–4. In fact παρό occurs *only* here, whereas η (17 occurrences) and καθό (23) are common. Note also παρόσον (xxix.14), and (?) ἔ[φό (xxii.12).

⁹⁹ ‘Ks are F *qua* F’ can be expressed as ‘Ks are K *ὡν τῶ F εἶναι*’: xvii.6; xxv.1; xxvi.31 (?); xxxiii.37; xxxv.27. (This use of σύν is also found in Sextus and elsewhere.) For ἄτερ and χωρίς see perhaps xxiv.7 and viii.34.

¹⁰⁰ At xxxiv.13–15 de Lacy prints: τὸν ἀνθρωπο[ν] καθὸ ἀνθρωπ[ός] ἐ[στ]ῖν ἀπονήσκ[ει]ν ΟΤ. . . Sedley has proposed: . . . ἐ[στ]ῖν περιπατ[εῖν] ὅτ[αν] θέλῃ . . .

belongs necessarily to Ks, and does so immediately yet without being (part of) the definition of K. For example, men are mortal *qua* man.

The four sorts of *qua* truth are not on a level. Every *qua* truth is an example of the first sort (for in every *qua* truth it is necessary that Ks be F). All *qua* truths are either immediate or non-immediate. If the latter, they belong to sort four. If the former, then they are either definitional, and hence belong to sort two, or else non-definitional, and hence belong to sort three. All sorts of *qua* truths may, as I said, be used in sign-inferences; or rather, the premiss of a sign-inference, 'All known Ks are F' may appeal to Ks which are F *qua* K in any of the ways in which Ks may be F *qua* K. And all four *quas* introduce necessity (xxxiv.24–7). That is to say, if Ks are F *qua* K, then Ks are necessarily F.

It is agreed, then, among Epicureans and opponents, that 'All known Ks are F' will serve as a premiss in a sign-inference only if Ks are F *qua* K. Hence we may construct a fourth rule: 'Since every observed K is F, all Ks are F' is valid only if Ks are F *qua* K. The advantage of the rule is plain. If Ks are F *qua* K, then Ks are necessarily F—and hence all Ks are F. Hence if Ks are F *qua* K, we can safely infer from 'All known Ks are F' to 'All Ks are F', and the sign-inference is necessitating.¹⁰¹ And in addition the unwanted inference to coloured atoms can be outlawed:

Bodies in our experience do not have colours *qua* bodies. For tangible things in so far as they resist the touch are bodies, but in so far as they are tangible they exhibit no colour. At any rate, in the dark they have no colour but they are bodies.

(xviii.3–10)

The disadvantage of the rule is equally evident: it seems—and so the opponents possibly alleged¹⁰²—to do no more than displace the problem. The Epicureans claim that their similarity method validates certain sign-inferences, that it establishes conditions under which the inference

¹⁰¹ The sign-inference is not:

Since all known Ks are F *qua* K, all Ks are F

but rather:

Since all known Ks are F, all Ks are F

The fact that it is *qua* K that Ks are F underlies and grounds the inference: it is not a part of the inference (but see e.g. xxxiii.30).

¹⁰² At iv.13–17 de Lacy prints: εἰ δὲ κ[ατ]ὰ τὴν ὁμοιότητα [τὴν τῶν σημείων πο][τ]ῶν ἀσόμεθα σύν[θεσιν, πάλιν εἰς] τὴν αὐτὴν ἐμ[πεσοῦμεθα κακίαν. (The apparently bold restorations are derived from iv.26–30.) The original κακία is that of not relying on *qua* truths (iii.35–iv.2). The opponents suppose that the Epicureans will try to establish *qua* truths by the similarity method, and that they will therefore fall into the same κακία, again trying to reach a conclusion from starting-points which do not involve *qua* truths.

from 'All known Ks are F' to 'All Ks are F' is valid. And with the fourth rule they have succeeded in determining conditions under which the inference is indeed valid. Yet the question now arises: how can the similarity method establish that these conditions in fact hold? How can we tell, by employing the way of similarity, that the fact that all known Ks are F is grounded on the fact that Ks are F *qua* K? The question is urgent; for unless it is answered, the way of similarity is empty and a sham. Moreover, it seems to be essentially the same old question, expressed in new words and placed in a new location.

Earlier I noted that, according to the Epicureans, ἀνασκευή depends on the similarity method: by attending to similarities, and only by attending to similarities, we discover that if F-ness is rebutted so too is K-hood. And the question was: *how* can similarity deliver this result? *How* could the Epicureans have thought that their way of similarity established co-rebuttal? Now the establishment of *qua* truths is not the same thing as the establishment of co-rebuttal. But the two problems are—in the present context—similar in their logical status: they both involve the introduction of modal notions. Allegedly the way of similarity can establish *qua* truths and co-rebuttals. But how can an empirical survey of similarities among Ks establish the modal connection between K-hood and F-ness which *qua* truths and co-rebuttals both require? If any answer to this question is to be found in Philodemus' *de Signis*, then it must be found in the fifth and last of the Demetrian points.

(e) *Inconceivability*

The opponents, according to Demetrius,

have not taken into account the peculiarity of the method of rebuttal (how it involves the idea that when what is unclear is removed the evident fact is co-rebutted because of that very thing) in relation to the fact that, because of the similarity between what is evident and what is unclear, it is impossible to think that what is evident exists or is such-and-such while what is unclear does not exist or is not such-and-such.

(xxviii.15-24)¹⁰³

The papyrus is full of holes, and the restorations (which make less than pellucid sense) are not certain. But one point seems reasonably clear: the

¹⁰³ τό τε μὴ ἐπιλελογίσθαι τῆν ιδιότητα τοῦ κατ' ἀνασκευὴν, ὡς ἔχει τὸ αἰρουμένο[υ τ]οῦ ἀδήλου παρ' αὐτὸ τοῦτο συν[α]νασκευάζεσθαι τὸ ἐναργές, πρὸς τὸ διὰ τὴν ὁμοιότητα τὴν τοῦ ἐναργ[οῦς] καὶ τοῦ ἀδήλου μὴ εἶναι νοεῖν [τὸ] μ[ὲν] ἐναργές ὑπάρχον ἢ τοιοῦ[τον] ὑπάρχον [τὸ δ' ἀ]δη[λ]ον οὐχ ὑπ[άρχ]ον ἢ οὐ [τοιοῦ]τον ὑπάρχον.

similarity method establishes that we cannot *think* of the *φαινόμενον* holding and the *ἄδηλον* not holding.

Part 4 expresses the same idea more clearly and more pungently:

The best test for a conditional and for the holding of a special sign occurs when we cannot conceive of the first holding and the second not holding and conversely.

(xxxiii.1–7)¹⁰⁴

And Zeno too says the same thing:

When it is inconceivable that what is evident exists or is such-and-such while what is unclear does not exist or is not such-and-such, this holds not in virtue of rebuttal but in virtue of similarity, in virtue of which what is evident cannot be thought to exist or be thought to be such-and-such while what is unclear does not exist or is not such-and-such—as Epicurus cannot be thought to be a man and Metrodorus not a man.

(xiv.17–27)¹⁰⁵

The point is repeated elsewhere in Philodemus' work;¹⁰⁶ and an appeal to 'inconceivability' has some importance in the writings of Epicurus himself.¹⁰⁷

This is a striking view—and it seems to provide just what the Epicureans need. For inconceivability or unthinkability can surely make the link between experienced similarities and deductive necessity. We get a fifth rule: 'Since all known Ks are F, all Ks are F' is valid just in case you cannot think of all known Ks being F and some unknown Ks not being F. Thus the rule tightens further the constraints on 'K' and 'F'; for the similarities must now be so carefully assembled and surveyed and tested that it is no longer possible to think that there might be another K similar

¹⁰⁴ κρίσιως ἀρίστης οὕσης συνημμένου καὶ <ι>δίου σημείου καθεστῶτος ὅταν μὴ δυνάμεθα διανοηθῆναι τὸ μὲν ὑπάρχον τὸ δὲ δεύτερον μὴ ὑπάρχον καὶ ἀντιστρόφως. (For the correct interpretation of καὶ ἀντιστρόφως see Sedley, 246 n 19.)

¹⁰⁵ ὅταν ἀδιανόητο[ν] ἢ τὸ μὲν εἴναρ[ές] εἶναι ἢ τοιοῦτ' [εἶναι, τὸ δ' ἄδηλον μὴ <ὑπάρχειν ἢ μὴ τοιοῦτον>] ὑπάρχειν, [οὐχὶ κατ'] ἀνασκευὴν ἔστιν τ[ὸ] τοι[οῦτ'] ἀλλὰ καθ' ὁμοίότητα, καθ' [ἦν οὐ δύναται τὸ μὲν ἐναρ[γές] ὑπ[άρ]χειν νοεῖσθ' ἢ τοιοῦτο νοεῖσθαι τὸ δ' ἄδηλον μὴ ὑπάρχειν ἢ μὴ τοιο[ῦ]τον, ὥσπερ οὐ δύναται νοεῖσθ' Ἐπίκουρος μὲν ἀνθρωπ[ῶ]ς Μητρόδωρος δ' οὐκ ἀνθρωπ[ῶ]ς. (The supplement at xiv. 19 is mine.)

¹⁰⁶ See esp. xii.14–35 (at 16 <ν>οεῖν is certain, despite the paltry remnants; at 28 Sedley rightly suggests Σω[κ]ράτη[ν] νοεῖν for de Lacy's Σω[κ]ράτη[ν] εἶναι); xv.37–8; xxiv.5–8 (which explains xxi.22–9); xxxvii.36–xxxviii.8; also xxii.25 (νοεῖσθαι plausibly restored); and cf. xix.2–4. Note too that the argument of *de Dis* III relies constantly on the idea of inconceivability: *PHerc* 152/157 vii.32–5; viii.33, 38–9; ix.10–14, 33–4, 43–x.2; x.11–12; xi.6–7, 12–13, 18–21; xiii.12, 20–5, 37–40.

¹⁰⁷ E.g. *ad Hdt* 71; *ad Pyth* 97; cf. P. H. de Lacy, 'Limit and Variation in the Epicurean Philosophy', *Phoenix*, XXIII (1969), 104–13.

to the observed Ks which is none the less not itself F.¹⁰⁸ And the rule thereby allows us to move to necessity; for if we cannot conceive of a K which is not F, then surely there cannot be a K which is not F? For Philodemus, as for Epicurus himself, necessity is grounded on inconceivability.¹⁰⁹

The fifth rule is controversial at two points. It adduces inconceivability in order to link observed similarity to logical necessity: similarity produces inconceivability, and inconceivability produces necessity. But in each case the means of production are of dubious value.

In generating necessity from inconceivability, the rule incorporates a classical thought about modality. Hume puts it as follows:

'Tis an establish'd maxim in metaphysics, *That whatever the mind clearly conceives includes the idea of possible existence*, or in other words, *that nothing we imagine is absolutely impossible*. We can form the idea of a golden mountain, and from thence conclude that such a mountain may actually exist. We can form no idea of a mountain without a valley, and therefore regard it as impossible.

(*Treatise* I.ii.2)¹¹⁰

The maxim expresses a form of psychologism. Now psychologism had a long and successful career on the philosophical stage. But it was exploded by Frege, and is now in retirement and disgrace. And indeed, in its crudest form, it is evidently a false doctrine. If I cannot imagine that P, why conclude that it cannot be that P? An alternative diagnosis is to hand: I have a weak imagination. Perhaps Hume could not imagine there being a swan that was not white. But from this we conclude not that swans must be white but that Hume's imagination was clouded by Scotch mist or corrupted by Scotch whisky.

¹⁰⁸ See Additional Note G.

¹⁰⁹ For Epicurus see e.g. the celebrated argument for minimal parts within the atoms: *ad Hdt* 56–7. De Lacy (op cit n 107), 112, says that 'Philodemus quite explicitly makes inconceivability an alternative to logical necessity as a test of inference'. But for Philodemus, and the Epicureans generally, inconceivability is not an *alternative* to necessity: it *grounds* or even *constitutes* necessity. The inconceivability test, being a product or part of the way of similarity, is an alternative to *ἀνασκευή*, not to *ἀνάγκη*.

¹¹⁰ Hume's text is odd. He seems to state, as his maxim of metaphysics, that

If it is conceivable that P, then it is possible that P

—and *this* principle does not entail that if it is inconceivable that not-P, then it is necessary that P. But the second of Hume's two examples does not illustrate the maxim in the form in which Hume states it; and it seems plausible to assume that Hume *meant* the maxim to be biconditional in form, thus:

It is conceivable that P if and only if it is possible that P.

And from this it *does* follow that it is necessary that P if it is inconceivable that not-P.

It is not clear that the Epicureans must rely on the crudest form of psychologism. When they say 'You cannot think that . . .' they perhaps refer less to the processes of our imaginations than to the content and structure of our concepts. The suggestion, then, is not that we lack the imaginative powers to think that so and so, but rather that our conceptual apparatus excludes that so and so. In other words, 'You cannot think that P' means 'It is conceptually excluded that P' rather than 'It is unimaginable that P.'¹¹¹

Now conceptualism is less shocking than crude psychologism. But it too finds little favour today. For suppose that the concepts which I happen to have developed do not allow that Ks can be F. Why should I infer that Ks cannot be F? Why not infer that my concepts are corroded or confused or inadequate? At the end of the last century doctors could not conceive of male hysterics: hysteria, their concepts assured them, was a disease of the womb and hence confined to women. They were wrong—or so we now usually think.

However that may be, there is a second difficulty with the fifth rule. It supposes that psychological or conceptual unthinkability is empirically based, that observation of similar cases is the foundation on which the thinkable and the unthinkable are constructed.¹¹² But how can that be? How can an empirical survey of swans or hysterics generate truths whose negations are conceptually or psychologically unthinkable?¹¹³

It is true that in the last decade or so philosophers have again become acquainted with—and in most cases reconciled to—the idea that there are certain a posteriori necessities. The table I am writing on is made of mahogany, and that is a fact which I have learned (and could only have learned) through my senses and by experience—a posteriori. Yet the table—*this* table—could not but have been made of mahogany. It could

¹¹¹ De Lacy (op cit n 107), 112, refers to 'the Epicurean emphasis on the "subjective" or "psychological" aspect of certainty'. But the Epicurean appeal to inconceivability *need* not introduce any subjective element into logic. Whether something is conceivable or not may be a thoroughly objective matter: it depends on objective facts about human nature and our relation to the external world.

¹¹² 'The inconceivability in these cases is determined entirely by empirical investigation. It is observation alone that makes it inconceivable, and hence impossible, that the antecedent should be true and the consequent false' (Asmis, 201). Yes. But *how* can observation turn the trick?

¹¹³ Some arithmetical truths can (or must) be proved by *σμιεώσις*, and the way of similarity (above, n 33). Here we might be more ready to countenance the appearance of inconceivability and unthinkability. But in precisely these cases we shall be *less* ready to countenance a probative appeal to empirical similarities.

not have been made of oak or of iron. It is necessarily made of mahogany.¹¹⁴

Such notions are fashionable, and their general character exhibits, no doubt, a spark or footstep of Epicureanism. But the Epicureans demanded more of empirical observations than the moderns dare. The modern view is compounded of two ideas: that we tell by empirical observation that this table is made of mahogany; and that we possess an intuitive grasp of the fact that what anything is made of it is necessarily made of. By compounding these two thoughts we reach the conclusion that this table is necessarily made of mahogany. The Epicurean view allows no place to intuitions or bare deliverances of the mind. For the Epicureans base everything on empirical observation:

Someone who moves from men in our experience and infers about men anywhere, that they are mortal, by the fact that both those he has learned about and those he has met have all been mortal, when nothing drags in the opposite direction, makes a sign-inference in virtue of similarity; and that men in our experience are mortal *qua* man—which is the same as that men are men together with this—is confirmed by this very fact.¹¹⁵

(xvi.31–xvii.8)

It is the observation of numerous—and varied—cases, together with the lack of contrary evidence, which induces and warrants the belief that men are mortal *qua* men, that they are essentially or necessarily mortal. The inconceivability to which the judgement of necessity is warped is itself anchored in the shifting sands of empirical observation.

How can this be? An answer—or at least, a partial answer¹¹⁶—should start from the realization that for the Epicureans the empirical process by which we come to learn that men are mortal is at the same time a process of concept formation or of concept development. We naturally think, perhaps, as though the following account of scientific investigation were roughly true: the scientist inquires whether Ks are F (whether swans are

¹¹⁴ I allude to the ideas made current by Saul Kripke, *Naming and Necessity* (Oxford, 1980²).

¹¹⁵ ὁ γὰρ μεταβαίνων [ἀ]πὸ τῶν παρ' ἡμῶν καὶ συλλογ[ι]ζόμενος περὶ τῶν ὀπουδ[ή]ποτ' ἀνθρώπων ὅτι εἰσὶν θνητοί, τῷ καὶ τοὺς καθ' ἱστορίαν [γε]γονότας καὶ τοὺς ὑπὸ τῆν [πέ]ραν πε[π]τωκότας ἀνθρώπους πάντας εἶναι θνητούς, εἰς τοῦναντίον μηδενὸς ἀνέλκοντος, κατὰ τὴν ὁμοιότητα σημει[ο]ῦνται. καὶ τὸ τοὺς παρ' ἡμῶν ἀνθρώπους ἢ ἄ[ν]θρωποι εἶεν εἶναι θνητούς, ὅπερ ἴσον ἐστὶ τῷ σὺν τούτῳ τοὺς ἀνθρώπους ἀνθρώπους ὑπάρχειν, αὐτῷ τούτῳ διαβεβα[ι]οῦνται. Cf. xvii.37–xviii.8; xxvii.23–8; xxxiii.24–32.

¹¹⁶ The answer is partial because it deals only with those *qua* truths which in some fashion rest upon *προλήψεις*. It is not clear to me how best to extend the answer to cover the other varieties of *qua* truth.

white). He possesses, at the outset and as a prerequisite for his enquiry, clear and articulated concepts of K-hood and F-ness (he knows what it is to be a swan and what—for a swan—it is to be white). Possession of these concepts enables him to pick out individual Ks and examine them for F-ness. If enough and varied Ks prove on examination to be F, then he concludes that Ks are (probably) F. The Epicurean idea of scientific investigation is somewhat different from this—and the differences explain how ‘empirical’ enquiry may yield (or be plausibly thought to yield) *qua* truths and inconceivabilities. We do not start our enquiries with a full and fully articulated conception of what it is to be a swan and what it is to be white, of K-hood and F-ness. Rather, we start with a rough, preliminary idea of what a swan is¹¹⁷—a swan, as Epicurus would have put it, is a bird of *that* shape.¹¹⁸ Our cumulative observations then have two functions and two results—or rather, their function and result unite elements which we normally think of as distinct. For the cumulative observations gradually articulate and enrich our conception of what it is to be a swan, and at the same time and thereby they extend our empirical knowledge.¹¹⁹

A story of this sort would not have seemed strange to John Locke.

One of *Adam's* Children, roving in the Mountains, lights on a glittering Substance, which pleases his Eye; Home he carries it to *Adam*, who, upon consideration of it, finds it to be hard, to have a bright yellow Colour, and an exceeding great Weight. These, perhaps at first, are all the Qualities, he takes notice of in it, and abstracting this complex *Idea*, consisting of a Substance having that peculiar bright Yellowness, and a Weight very great in proportion to its Bulk, he gives it

¹¹⁷ I.e. a *πρόληψις*: according to Epicurus, you cannot investigate anything (*ζητεῖν*) unless you already have a *πρόληψις* of it (see Sextus, *M* I.57, and the other texts collected as fr 255 Us). The force of the prefix *προ-* in *πρόληψις* is this: a *πρόληψις* is what you (must) grasp *before* you investigate or learn anything.

¹¹⁸ Cf. Sextus, *PH* II.25; *M* VII.267.

¹¹⁹ The evidence for this is sparse (and scholars seem to have paid the matter sparse attention). The crucial text is a fragment of Plutarch (but the ascription is contested) which reports his contention *ὅτι ἄπορον ὄντως εἰ οἶόν τε ζητεῖν καὶ εὐρίσκειν, ὡς ἐν Μένωνι προβέβληται*. In order to turn this paradox, the Peripatetics vainly adduced the passive intellect, the Stoics uselessly referred to natural notions, *οἱ δὲ Ἐπικούρειοι τὰς προλήψεις* [*sc* *αἰτιῶνται*]. *ὡς εἰ μὲν διηρθρωμένως, φασί, περιττὴ ἢ ζήτησις, εἰ δὲ ἀδιαρθρώτους, πῶς ἄλλο τι παρὰ τὰς προλήψεις ἐπιζητοῦμεν ὃ γε οὐδὲ προειλήφαμεν* (fr 215 f Sandbach). Thus *προλήψεις* gave the Epicureans an answer to Meno's paradox. But the *προλήψεις* with which we start the enquiry cannot, they say, be articulated (for then the enquiry would be unnecessary). This implies, first, that we begin any enquiry with an unarticulated prenotion, and secondly, that the end and goal of the enquiry is an articulated notion. (The *μὲν* clause gives the Epicureans' own view, as *φασί* shows. The *δέ* clause must give Plutarch's view, not that of the Epicureans. For, according to Plutarch, the Epicureans, like the other Schools, tried but failed to solve Meno's puzzle.)

the Name *Zahab*, to denominate and mark all Substances, that have these sensible Qualities in them. . . . But the inquisitive Mind of Man, not content with the Knowledge of these, as I may say, superficial Qualities, puts *Adam* upon farther Examination of this Matter. He therefore knocks, and beats it with Flints, to see what was discoverable in the inside: He finds it <will> yield to Blows, but not easily separate into pieces: he finds it will bend without breaking. Is not now Ductility to be added to his former *Idea*, and made part of the Essence of the Species, that the Name *Zahab* stands for?

(*Essay* III.vi.46-7)

The story demands a more detailed telling. I do not know if it can be made compelling; but I think that it can at least be made plausible, and I am sure that it is an old Epicurean tale. However that may be, I end with an anachronistic anecdote.

VIII Coda

I am fond of a certain sort of vegetable which I decide to call a potato. I am curious to discover how potatoes grow. I possess a crude notion or *πρόληψις* of the thing: a potato is a vegetable of *that* sort. On my neighbour's allotment I see what is apparently a row of potato plants. He tells me that he grew them not from seed but from tubers. I inspect a few more plants on nearby allotments: they too, it turns out, were all grown from tubers. I decide to proceed more methodically.

I determine to investigate the kind *potato*—not, say, the subkind *main-crop potato* nor the superordinate kind *root vegetable*. My kind K—a putative natural kind—is precisely the kind of potatoes.

Now potatoes come in different shapes and sizes and colours. They grow at different times of the year and on different soils and in different climatic conditions. The plants are sometimes small and yellow-leaved, sometimes bushy and verdant. I scrutinize numerous varieties—Arran Pilot, King Edward, Majestic, Great Scot, Javelin, Epicure, Foremost, . . . I make sure that some of my examples are sports or freaks—one root produces a single grotesquely large potato, another produces a score of little potatoes in the shape of a pig. In every one of these strikingly different cases propagation was by tuber.

I do not rely merely on *πείρα*, my own experience: I also call on *ἱστορία*, in the form of seed catalogues, gardeners' handbooks, botany manuals, agricultural journals. Everywhere I find potatoes growing from tubers, nowhere are they reported as being propagated by seed or by rhizomes or by cuttings or by corms.

Nothing tells against my growing conviction. Other vegetables and other lands do not pull one footstep in the contrary direction: as far as I know, vegetable kinds tend to propagate in a uniform way by species; and, as far as I know, there is nothing peculiar about vegetables grown on English soils. Nor am I concerned with celestial spuds—and there are no potatoes at the atomic level.

I have selected the most especially similar kind, the kind of potatoes. I have surveyed many and varied examples. There are no contrary sparks. And thus I come to see that the potato is a tuber propagator *qua* potato, that it is part of the nature of potatoes to propagate by tuber. Hence it comes—or turns out—to be a part of my concept of a potato that it propagates by tuber. I cannot conceive of a potato which reproduces itself by rhizomes. It is unthinkable that a King Edward should grow from a cutting. And with this background, I finally produce a sound and deductively valid sign-inference:

Since all potatoes in our experience grow from tubers, potatoes in Budapest—if there are any—also grow from tubers.¹²⁰

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¹²⁰ A first version of this paper was read to a seminar in Oxford; a second draft was presented at Oberlin, and again (in part) to the Hungarian Academy of Sciences in Budapest. My audiences gave me much help—in particular, Julia Annas in Oxford and Tony Long in Oberlin and Istvan Bodnar in Budapest. It is neither modesty nor a craven desire to disarm my critics which leads me to insist that the present version is far from definitive. In my more optimistic moments I suppose that I have understood two-thirds of the text of *de Signis*—and definitiveness demands more than an optimistic 66 per cent. (That I have understood any of the text is due first of all to the work of de Lacy, on whose edition I, like others, have constantly relied; and secondly to the papers—and to the friendship—of Myles Burnyeat and David Sedley who know, each in his own way, far more about the *de Signis* than I do.)

Additional Note A: A σημείωσις is a συλλογισμός, and someone who conducts a σημείωσις συλλογίζεται: xvi.32; xx.3; xxxvi.30, 35; fr 3.1, 11 (and already in Epicurus: [29][25] 15–17 Arr). Asmis rightly stresses that sign-inferences are *inferences*. She refers to ‘a logical relationship worked out by calculation, λογισμός’ (176—I assume she means that the inference is itself a λογισμός). She then observes that there are three main types of λογισμός: συλλογισμός, αναλογισμός, and επιλογισμός. Thus there should be three varieties of sign-inference (176–8; cf. 205).

The verb αναλογίζομαι is used twice in *Sign* (xxvi.23, 39): on each occasion a translation such as ‘take into account’ seems plausible. There is no allusion to any inferential process.

The term επιλογισμός has acquired a literature of its own (references in de Lacy, 100 n 34, Asmis, 177–8, 205 n 23). In *Sign* the best translation of επιλογίζομαι and επιλογισμός is normally ‘survey’: viii.35; xiii.32; xvii.33; xxii.38; xxiv.4; xxvii.23; fr 4.3, 5. In three similar texts in Part 3 ‘take into account’ seems better: xxxviii.15, 26, 37 (cf. βλέπειν at xxxviii.30

and *διειληφέναι* at xxxix.4). In none of these passages will ‘infer’ or ‘inference’ serve. Only in one text might one seem to sniff an *inference*. At xxiii.5 Philodemus writes *ἐπιλογισμῶ συνβιβάζων ὅτι*, ‘concluding by *ἐπιλογισμός* that’. But this occurrence of the word picks up the earlier one at xxii.38, where it plainly has its normal sense of ‘survey’. Hence *ἐπιλογισμῶ συνβιβάζων ὅτι* must mean ‘concluding, by virtue of a survey, that’.

Thus neither *ἀναλογισμός* nor *ἐπιλογισμός* denotes the inference from sign to thing signified—indeed, the terms do not denote any form of inference at all. To characterize sign-inferences Philodemus usually sticks to the word *σημείωσις*. When he wants to allude specifically to the logical aspect of the matter, he uses *συλλογισμός*, the normal Greek word for ‘inference’ or ‘deduction’. From the point of view of the *inference* it conveys, there is nothing logically special about a *σημείωσις*. (This point is neither trivial nor terminological.)

Additional Note B: Sometimes sign-inferences proceed *ἀπὸ αἰσθητῶν ἐπὶ αἰσθητά*, sometimes they proceed *ἐπὶ λόγῳ θεωρητὰ τοῖς φαινόμενοις ἀναλογοῦντα* (xxxvii.24–9). The text seems to imply that there are important logical differences between these two cases (xxxvii.30–6). But the conclusion of the argument suggests the opposite: that the cases are not significantly different (xxxviii.6–8). However that may be, it is plausible to connect this distinction with the distinction implicit in the lacunose fr 4, between *τὰ προσμένοια* and *τὰ ἀδηλα* (fr 4, 8–10), and hence with the two sorts of things about which, according to Epicurus, we can make sign-inferences (*ad Hdt* 38). It is further tempting to invoke the celebrated distinction between *σημεῖα ὑπομνηστικά* and *σημεῖα ἐνδεικτικά* (so Asmis, 190), and to find an implicit reference to this distinction in Philodemus (so Burnyeat, 214 n 51). (The distinction is familiar from Sextus, and from related texts in the tradition of Empiricist medicine. Its origins are disputed, and its connection with the Stoics—once a commonplace—is now controversial.) See most recently D. Glidden, ‘Skeptical Semiotics’, *Phronesis*, XXVIII (1983), 213–55. Sedley, 241 n 8, argues that *Sign* does not know the distinction: he is surely right in claiming, against e.g. de Lacy, 103 n 42, that Philodemus uses *ἐνδείκνυσθαι* (xi.11; xiii.26, etc.) in a non-technical sense and without specific reference to *σημεῖα ἐνδεικτικά*. But it does not follow that Philodemus was ignorant of the distinction. The evidence seems to me to suggest that—at the very least—he *knew*, even if he did not make much use of, a distinction which was very similar to the distinction between ‘commemorative’ and ‘indicative’ signs.

Additional Note C: For *ἀνασκευάζειν* in Aristotle see Bonitz’ *Index* 52a17–22 (cf. 45b10–41 on *ἀναιρεῖν*, 722b44–9 on *συνανααιρεῖν*). The noun *ἀνασκευή* is not found in Aristotle’s text, but this is hardly significant. If we had Philodemus’ terminology and nothing else to go by, we should surely take seriously the possibility that his opponents, the *ἀνασκευή* men, were Peripatetics or under Peripatetic influence. Asmis, 198–201, holds that *ἀνασκευή* is an Epicurean notion, to be identified with *ἀντιμαρτύρησις*, and she appeals to the notorious use of *ἀνασκευή* by Sextus at *M* VII.214. Were she right, we might toy with the notion that the opponents were dissident Epicureans (though Asmis herself does not draw this conclusion from her argument). But the appeal to *M* VII.214 can carry no weight (the passage is too controversial), and Asmis’s claim that ‘the method of removal . . . is presented throughout Philodemus’ treatise as a method used by the Epicureans in common with other philosophers’ (198) is false in itself and contradicted by her own later words (208–9). Sedley’s discussion of *ἀνασκευή*, 242–56, is more illuminating. He associates *ἀνασκευή* with the *συνάρτησις* analysis of the conditional which is certainly Stoic and indeed Chrysippean; and he infers that the *ἀνασκευή* men are Stoics. The association is surely right. (But when Sedley, 247, following de Lacy, 211, maintains that the *ἀνασκευή* method presupposes a logical or conceptual link between the items which are co-rebutted, I demur. For I see no clear evidence in the text for this contention. But since I do not believe that the *συνάρτησις* analysis of conditionals requires a logical or conceptual connection between antecedent and

consequent, this point does not—to my mind—break the association between *ἀνασκευή* and *συνάρτησις*.) But we are not bound to infer that Philodemus' *ἀνασκευή* men are Stoics. For we need not think that *only* Stoics were permitted to accept the *συνάρτησις* analysis of conditionals. Outside Philodemus, we find the notion of *ἀνασκευή* applied to conditionals by Galen: οὐ τῇ συνπαρξεί τοῖνυν κριτέον τὴν ἀκολουθίαν ἀλλ' οὐ ἀνασκευαζομένου ἐξ ἀνάγκης τι συνασκευάζεται καὶ τιθεμένου τίθεται, ἐκείνῳ ἐκεῖνο ἀκόλουθον ἡγήτεον εἶναι (*Opt Sect I.117K*). Galen was not a Stoic, but he could accept an analysis of conditionals which is at least closely associated with a Stoic analysis. The Epicureans' opponents might have adopted a view which coincided with a Stoic analysis without themselves being Stoics.

Additional Note D: The canonical Epicurean argument for the existence of void is given by Sextus in the following form:

Epicurus thinks that he has produced a very powerful proof of the existence of void, as follows: 'If there is motion there is void; but there is motion: therefore there is void'.

(*M VIII.329*)

The original version of the argument is found at *ad Hdt* 40:

If there were not that which we name void and space and intangible nature, bodies would have nowhere to be and nothing through which to move, as they are seen to move.

(Sextus offers a *modus ponens* formulation. The version in *ad Hdt* is implicitly in *modus tollens* form.) Philodemus alludes to the argument four times in *Sign.* (On the argument itself see J. Mau, 'Über die Zuweisung zweier Epikur-Fragmente', *Philologus* 10, (1955), 93–9. But Mau is wrong to argue that Sextus' version of the argument cannot have come from Epicurus on the grounds that it relies on Chrysippus' first indemonstrable. Men used *modus ponens* before Chrysippus canonized it. Epicurus may well have produced the same simple argument in a number of slightly different forms, and a *modus ponens* version may have been found by Sextus' source in a text of Epicurus himself. But in any case, Sextus' version is a thoroughly decent report of the passage in *ad Hdt.*)

The question is this: how is the standard Epicurean proof of the existence of the void related to the theory of *σημείωσις*? At xxxvii.32–xxxviii.4 the proposition εἴπερ ἔστιν κίνησις ἔστιν κενόν is explicitly (οὕτως) put on a level with the proposition εἴπερ οἱ παρ' ἡμῖν ἄνθρωποι τρωτοὶ καὶ θνητοί, καὶ οἱ πανταχῆ. At xii.8–9 the same conditional is cited and Zeno says that εἰς τὸ κατ' ἀνασκευή[ν γέν]ος ἐναρμόττειν τὸ τοιοῦτο (see above, n 42). Both these passages might suggest that 'Since there is motion, there is void' is itself a *σημείωσις*, and in particular, that it is a *σημείωσις* the validity of which is underwritten by *ἀνασκευή*.

Two other passages suggest something different. At viii.27–ix.3 (above, n 54) and at xxxv.35–xxxvi.2 (ἐκ γὰρ τοῦ τὰ παρ' ἡμῖν κινούμενα πάντα διαφορὰς μὲν ἄλλας ἔχειν κοινὸν δὲ τὸ διὰ κενωμάτων, πάντως τὸ κἂν τοῖς ἀδήλοισ) the text plainly sees the conditional 'If there is motion, there is void' as the *conclusion* of a sign-inference. The *σημείωσις* itself is this:

Since moving things in our experience move through void, moving things everywhere move through void.

And this is a sign-inference based on similarity. (It is a further question how we can tell that all—or any—moving things in our experience move *through void*.)

This similarity inference is a straightforward example of an Epicurean *σημείωσις*, and we should not doubt that some Epicureans at least thought that the first premiss of the standard *ἀπόδειξις* was derived from a *σημείωσις*. This *σημείωσις* does not conclude to the existence of void: its conclusion entails that void exists, given that motion exists; it does not state that void exists.

What, then, of the two texts which suggest that 'Since there is motion, there is void' is itself a sign-inference? At xxxvii.37–xxxviii.4 the point of the comparison between 'If there is motion, there is void' and 'If men in our experience are mortal, men are mortal every-

where' is not that both conditionals are to be construed as sign-inferences. Rather, Philodemus is drawing attention to the fact that the latter conditional *contraposes* in just the same way as the former. What he says is certainly true—and it plainly does not require him to construe the former conditional as a *σημείωσις*. (But it remains puzzling *why* he adverts to contraposition in this context.) And something similar can be said about xii.8–9. All that Philodemus asserts here is that the conditional 'If there is motion, there is void' fits into the class of truths guaranteed by *ἀνασκευή*: rebut void, and by that very rebuttal you also rebut motion. Again, this is true (or at least plausible), and again it does not require Philodemus to construe 'If there is motion, there is void' as a sign-inference.

Additional Note E: Three texts in Part 4 seem to suggest that its author allowed that the way of rebuttal might in some cases function as a method of sign-inference (see n 52). All three texts are puzzling on any view. (1) *παρὰπέμπουσιν ὡς οὐ πάντα καθ' ὁμοιότητα σημειοῦσθαι λέγομεν λαμβανομένου σημείου τοῦ προηγητικοῦ τινὰ δὲ μόνον. ἐρωτῶσι γοῦν ἐπὶ τῶν κατ' ἀνασκευὴν, ποῖον ὁμοίον ἔχομεν, ὡς περ ἐπὶ τῶν ὁμοίων οὐκ ἐρωτηθῆσόμενοι πῶς ἀνασκευάζεται, μᾶλλον δὲ καὶ ἐπὶ τῶν ἐναντίων* (xxxii.37–xxxii.8). 'Antecedent' signs are also mentioned at xxxi.1 and xxxvi.19 and 33; but the term is not explained and we can only guess its meaning (see de Lacy, 121 n 95). Nor do I understand the reference to *ἐναντία* at xxxii.8. Thus the point of the passage is obscure. However that may be, the first sentence is crucial. It could, I suppose, be taken to mean: 'They ignore the fact that in our view not all but only some sign-inferences take place by similarity'. Then the author of Part 4 recognizes *ἀνασκευή* as a co-ordinate and independent method of *σημείωσις*. But this construal of the sentence is directly contradicted by xxxii.8–10. Hence we should take the text to mean: 'They ignore the fact that, in our view, not all but only some similarity inferences rely on an antecedent sign'. And in that case, whatever the rest of the text may imply, it must be compatible with the claim that only *ὁμοιότης*—and not *ἀνασκευή*—can ground a *σημείωσις*. (2) At xxxiii.8–9 there is a clear reference to *τὰ δι' ἀνασκευῆς ἀλυσκόμενα*. But this is at least compatible with the claim that *ἀνασκευή* does not ground sign-inferences; for the fourth author could be taken to allow that some things can be *grasped* by rebuttal, but to deny that such a grasp is gained by way of a sign-inference. (3) The same can be said of the third passage: *ἵνα μὴ πυρὸς ὄντος ἢ γεγονότος ὁ καπνὸς ἀνασκευασθῆ* (xxxvi.2–4: text after Sedley). Here again there is no implication that the rebuttal grounds or constitutes a sign-inference. (Similarly, at xxxv.30–1 the phrase *τὰ δι' ἀνασκευαζομένου σημείου μόνον λαμβανόμενα* does not imply the acceptance of the way of rebuttal as a mode of sign-inference: 'the things grasped through a rebutted sign' are the things grasped by applying rebuttal to what the opponents falsely take to be a sign-inference.)

Additional Note F: Three passages might seem to suggest that the Epicureans allow a weaker link than necessity between premiss and conclusion in a sign-inference. (1) At vii.32–5 de Lacy prints: *οὐ μὴν ἀλλ' ἐπαρκέσει ἡμῖν [τό τε] πεπεισθαι περὶ τ[ο]ύτων καὶ περὶ τῶν ἐκ τῆς πε[ρί]ρας κατ[ὰ τὴν] εὐλογίαν*. This presumably means that in certain matters 'we shall be content to be persuaded in accordance with what is reasonable'—and it has been taken to suggest that in certain sign-inferences the conclusion is only probabilified and not necessitated by the premisses. But it is not clear that *εὐλογία* here refers to the relation between premisses and conclusion, nor indeed that a sign-inference is under discussion at all. And more importantly, de Lacy's restorations are questionable. The preceding text, vii.26–32, is very obscure; but Sedley has argued convincingly (249 n 25) that 'we' here refers not to the Epicureans but to the opponents. (He repunctuates and proposes *ἐπαρκέειν* for *ἐπαρκέσει*.) In that case the passage provides no evidence for Epicurean views. (2) At viii.18–21 the heavily restored text runs: *ΑΙΟΙ καὶ τὸ δ[ό]γμα [ἀληθεύεσθαι] ῥομιζο[μ]εν κατ[ὰ] μόνον ὡς ἐπὶ πολλ[ῶ]ν χ[ρ]εῖν ῥωμεν τὴν] ὁμ[ο]ιότητα*. It is unclear what the text should read and what Philodemus means. But if he is referring to the discovery of similarities which hold only 'for the most part', then I suppose he will have had in mind an inference

from 'Most known Ks are F' to 'Most Ks are F'. It is the premiss of the *σημείωσις*, and not the inferential connection between premiss and conclusion, which is qualified as holding only for the most part. (3) . . . τοὺς ἀποφ[αι]ν[ο]μένους περὶ ὠδήπου' ἐνίστ[ε] μὲν περὶ τοῦ καθολικοῦ διουχ[υ]ρίζεσθαι, ποτὲ δὲ χρῆσθαι τῷ ὦ[ς] ἐπὶ τὸ πολὺ, καὶ τούτων αὐτῶν ἐκ τῶν φαινόμενων κατωπενομένων (xxv.28–34). The context of this remark is again obscure. But its content is reasonably plain: sometimes a sign-inference may use a premiss of the form 'Most known Ks are F'. Once again, this point—interesting as it is—has no bearing on the nature of the inferential link between premiss and conclusion. (See above, 115.)

Additional Note G: The way of similarity invokes *ὁμοιότης* at two points: the observed Ks are all similar to one another, and the observed Ks are similar to the unobserved Ks. In Part 4, at xxxvi.24–xxxvii.1, Philodemus argues that the opponents have been misled by ambiguities (*ὁμωνυμία*). In particular, the word *σημεῖον* can denote either the *φαινόμενον* from which we infer, or else the *σημείωσις* itself. But

προσπίπτουτες τῇ διαφορᾷ τῶν προηγουμένων ἐναργημάτων πρὸς τὰ μὴ δῆλα περὶ ὧν οἱ συλλογισμοὶ φέρονται, τὸν κατὰ τὴν ὁμοιότητα τρόπον τῆς σημειώσεως ἀβετοῦσιν, ἐκότερα φύροντες εἰς ταῦτό.

(xxxvi.32–xxxvii.1)

How are we to understand the mistake allegedly made by the opponents? They fall upon the difference between *φαινόμενα* and *ἄδηλα* and therefore reject the *similarity* method of *σημείωσις*. And in doing so they confuse the two senses of the term *σημεῖον*. I find this puzzling. The best I can do with it is this: 'The opponents correctly observe that there are various differences between known Ks on the one hand and unknown Ks on the other. They infer that the *σημείωσις* cannot rely on a similarity between the known and the unknown, and hence they reject the way of similarity. But here they confound the two senses of the word *σημεῖον*. For when the Epicureans talk of the similarity involved in a *σημεῖον*, they do not mean a similarity in the *σημείωσις*, i.e. a similarity between what the inference moves from and what the inference moves to; rather, they mean a similarity among the *φαινόμενα* (among the *φαινόμενα* in the sense of the things from which the inference moves).' In that case, the similarity method must ground sign-inferences *not* on similarities between known and unknown Ks but on similarities among known Ks. It is because all observed Ks are similar to one another (in relevant respects) that we can infer from the fact that all known Ks are F to the conclusion that all Ks are F.

Now this may seem strange. Zeno plainly adverts to similarities between the *ἄδηλα* and the *φαινόμενα* (e.g. ii.20, 30; iii.13, 23; iv.36). And we cannot hold that the author of Part 4 differs on this point from Zeno; for at xxxvii.23 τὰ ὅμοια are contrasted with τὰ παρ' ἡμῖν and clearly refer to τὰ ἄδηλα. In any event, it would be bizarre for the Epicureans to *deny* that there was a similarity between known and unknown Ks.

But there is in fact no contradiction. Zeno can quite well hold both that known and unknown Ks are similar to one another and also that the inference from known to unknown Ks is grounded not on this similarity but on the similarity among the known Ks. And reflection on the way in which the similarity method is defended gives some support to all this. The role of similarity in Epicurean *σημείωσις* is to place certain restrictions on the range of 'K' and 'F'. In brief, the similarity requirement is (in principle) such as to guarantee that the selected 'K' and 'F' will combine to form a *qua* truth and hence to validate the *σημείωσις*. The way of similarity *establishes* similarities with unknown Ks (but absolutely *any* way of validating sign-inferences would have to do this). The way is not—and of course cannot be—*grounded* on such similarities.

REPLY TO JONATHAN BARNES, 'EPICUREAN SIGNS'*

A. A. LONG

JONATHAN BARNES'S paper is almost too good for its subject.¹ Philodemus' papyrus was crabbed long before it became carbonized and lacunose. With an elegance that the Gadarene himself disdains, Barnes has injected philosophical life into the tortuously expressed thoughts of the *de Signis*. He acknowledges his indebtedness to the work of other scholars, especially Phillip and Estelle De Lacy, David Sedley, and Myles Burnyeat. Yet in two important ways Barnes's paper represents a fresh approach to the study of the text. First, he makes minimal assumptions about its relation to Stoic and other doctrines, thus allowing Philodemus' repository of concepts and arguments greater autonomy than they are frequently given. Secondly, he probes the Epicureans' defence of their methodology with such clarity and sophistication that he enables them, in the end, to give a highly plausible account of themselves.

The chief doubts I will register concern his findings about necessity and induction, and some details of his account of the 'qua' formula (Barnes ss VI and VII (*d*)). Before coming to those points, I comment briefly on some of the issues he discusses in the preliminary sections of his paper.

1 The method of ἀνασκευή

Barnes is quite right to agree with Sedley against De Lacy in rejecting 'contraposition' as the rival methodology denoted by ἀνασκευή. This

* © A. A. Long 1988.

¹ The relation of these remarks to the ones I offered at the Oberlin Conference is more distant than the genre of 'paper and response' might be thought to justify. In excuse I can only say that the previous comments were prepared with too much haste to be worth publishing without major revision. I have excised what was then said about natural kinds, partly in response to some telling objections that Joan Kung sent to Jonathan Barnes and me shortly before her untimely death. The present comments on induction, necessity, and *qua* truths are further thoughts about Barnes's excellent paper, which is little changed from its original version.

obscure term, rendered 'rebuttal' by Barnes, does not refer simply to the principle that 'if p , q ' is valid just in case 'if not- q , not- p ' is valid, but to the narrower requirement that the denial of q 'just by itself' involve the denial of p . It is widely assumed that this requirement specifies an a priori or logical link between antecedent and consequent, such as the Stoics are commonly thought to invoke by *συνάρτησις*, their criterion for conditional validity. Barnes is resistant because he sees 'no clear evidence in the text for this contention' (Additional Note B).

He is right to be cautious about the language *we* should use to characterize the link *ἀνασκευή* requires between sign and thing signified. Minimally, however, we can say that, for the *ἀνασκευή* people (not necessarily restricted to Stoics, as he rightly says) sign-inferences use *λόγος*, not 'similarity', as the instrument 'through' which they establish the 'essential' properties of non-evident things (cf. vi.31–vii.5, a passage unmentioned, I think, by Barnes). Since *λόγος* must exclude inference on the basis of 'similarity', it can hardly include less than what Sextus Empiricus reports as the nature of 'indicative signs' (*M* 8.154–6): for example, 'the *reasoning* that treats bodily movements as signs of the soul'. I am not suggesting that the Epicureans' opponents in Philodemus have precisely the concept of 'indicative signs', but rather, that Barnes should credit them with something like these in order to give substance to the dispute. That supposition is compatible with a degree of indeterminacy in the formal logic of the *ἀνασκευή* people, but it allows them, as the text requires, to offer *rationalist* alternatives to Epicurean methods of inference.

2 Epicurean assessments of *ἀνασκευή*

A particular merit of Barnes's discussion is his sensitivity to the multivoocal character of the Epicureans whose views Philodemus reports. This bears on the difficult but important question, whether any of the Epicureans treat *ἀνασκευή* as an occasionally necessary supplement to the 'similarity method'. Barnes does not claim to have settled this question, but the upshot of his discussion in section IV, taken together with Additional Note C, is negative and thus in disagreement with Sedley ('On Signs', in *Science and Speculation*, ed Barnes *et al.* (Cambridge, 1982), 259–63, and in A. A. Long and D. N. Sedley, *The Hellenistic Philosophers*, vol 1 (Cambridge, 1987), 96). I am inclined to agree with Barnes, and will later suggest a reason for the differences he notes between the more positive remarks Philodemus attributes to Zeno of Sidon on *ἀνασκευή* and the

negative views expressed by the anonymous Epicurean in Part 4 of the work.

3 The 'similarity method', necessity, and induction²

Throughout the early part of the treatise, as Barnes points out (s V), the Epicureans are criticized for producing inferences which lack 'necessity'. The charge is characteristically expressed in the following way: οὐκ ἔστιν ὁ κατὰ τὴν ὁμοιότητα τρόπος ἀναγκαστικός. Conversely, the method of ἀνασκευή is taken by its proponents to be one which generates conclusions that 'have' or 'produce' τὴν ἀνάγκην (cf. for instance iii.19, viii.25). Since it is generally agreed that, for all its obscurity, the ἀνασκευή method is deductive, it might seem that the Epicureans are being criticized for employing inductive logic in their sign-inferences. The premisses of deductively valid arguments entail or necessitate their conclusions; this, as we all know, is what primarily differentiates deduction from induction.

Moreover, ever since Theodor Gomperz first published Philodemus' treatise under the title *Über Induktionsschlüsse* (Leipzig, 1865), it has become standard practice to describe Epicurean sign-inferences as 'inductive'. Gomperz excitedly described the work as 'the first model of an inductive logic' (der erste Entwurf einer induktiven Logik), likening it, in its exclusively empirical outlook, to 'echt baconische Geist'.

Barnes demurs. To decide whether he is right to do so, we should first consider his remarks about 'necessity' and then his account of 'induction'.

He notes that Zeno of Sidon 'nowhere *explicitly* states that the similarity method does necessitate'. However, as Barnes indicates, Zeno does not rebut his opponents' criticism on the ground that the Epicureans never claimed 'necessity' for the conclusions of their sign-inferences. Rather, Zeno 'gives every impression of accepting their presupposition'. Barnes concludes that the opponents are not guilty of *ignoratio elenchi*, and that 'Zeno and the other Epicureans—like their opponents—assumed without question that sign-inferences could only be valid if they necessitated'.

I think Barnes would be correct to infer that the Epicureans, at least when challenged, described valid sign-inferences established by 'similar-

² The points made here owe much to discussion with Alan Code and Michael Wedin, though neither of them should be taken to endorse what I say.

ity' as *ἀναγκαστικά*. However, does their use of this term imply that they claimed 'logical necessity' or deductive validity for their inferences?

The term *ἀναγκαστικός* deserves a little scrutiny. Philodemus uses it at least a dozen times in securely legible lines of the *de Signis*, and more than once in his *Rhetoric*. Earlier Greek literature, according to LSJ and the *Thesaurus Linguae Graecae*, can muster only three instances of the word. In Plato, *Laws* 930b it is proposed that a law concerning widowers should be *συμβουλευτικός* as distinct from *ἀναγκαστικός*, that is, 'advising though not compelling'. Aristotle uses the term twice. In *Nicomachean Ethics* X.1180a21, as in Plato, it is a predicate of *νόμος*: 'Law has a compelling power, since it is reason (*λόγος*) that issues from some intelligence and intellect'. In *de Generatione et Corruptione* I.315b21 Aristotle writes of *λόγοι ἕτεροι ἀναγκαστικοὶ καὶ οὐκ εὐποροὶ διαλύειν*. He is referring to arguments, which he will later prove *false*, that *γένεσις* is *σύγκρισις*.

Something *ἀναγκαστικός*, then, may have a law-like forcefulness, but the term itself has no known connection, prior to Philodemus, with necessary truth or logical necessity. 'Compelling', 'constraining', or 'cogent' (De Lacy's rendering of the word's occurrences in *de Signis*) are appropriate translations. Now, of course, this meagre evidence of pre-Philodemian usage does not settle the interpretation of *ἀναγκαστικός* in his text. As with *ἀνάγκη* itself and other cognate terms, it is the context and requisite sense that must ultimately determine what kind of 'constraint' is involved. Our present context is a logical one, and thus different from those surveyed above. But the usage of *ἀναγκαστικός* before Philodemus is sufficiently rare and untechnical to suggest that his Epicureans wanted a word that did *not* saddle them with precise views about 'logical' necessity.³

³ The LSJ entry on *ἀναγκαστικός* gives the misleading impression that Philodemus is the last Greek author to use the word. Thanks to the tapes of the *Thesaurus Linguae Graecae*, of the University of California at Irvine, I have been able to survey some forty further instances of *ἀναγκαστικός* in authors ranging in date from Galen to Photius. About one-third of these occur in contexts to do with logic. One usage, best exemplified by Galen (5.102, 14 Kühn), is to draw a contrast with arguments that are merely possible and plausible. Referring to Stoic, Epicurean, and Peripatetic arguments on void, Galen says: *πᾶσι δὲ τοῖς παροῦσι σαφῶς ἐφαίνετο μηδεὶς ἀναγκαστικὸν λόγον εἰπῶν, μηδ' ἀποδείξεις γραμμικῆς ἐχόμενον, ἀλλ' ἐξ ἐπιχειρημάτων συγκείμενον, οἷοις οἱ ῥήτορες χρῶνται*. The connection of *ἀναγκαστικός* with *ἀπόδειξις* is also found at Simplicius, in *Aristotelis Physica* (*in Phys.*) 9.556.20 (commenting on *Physica* 210b8), and in *Aristotelis Categoriae* 6.25. However, in none of these or in any other passages does the term denote the 'necessary' connection between the premisses and conclusion of a demonstrative syllogism. Rather, it characterizes the 'compelling' character of the argument as a whole. That this is the typical usage of *ἀναγκαστικός* in logical contexts is borne out by instances of the comparative and superlative (see also n 5 below). Philoponus (cf. Galen above) contrasts *λογικὰ ἐπιχειρήματα*, which draw their premisses from *ἐνδοξα*, with *τὰ φυσικώτερα τε καὶ ἀναγκαστικώτερα τῶν*

The question I want to put to Barnes, then, is this: why does he assume that the Epicureans, if they did describe their valid inferences as *ἀναγκαστικά*, were interested in anything *we* would characterize as entailment, deductive validity, or logical necessity? My own guess is that the assumption is not justified. I think it likely that *ἀναγκαστικός* is a word the Epicureans themselves applied to their inferences,⁴ and that they meant by it no more and no less than 'cogent'. I suspect their opponents took them to be claiming thereby what they, the opponents, often describe in Philodemus by *κατ' ἀνάγκην*: for example i.13, 'If the particular sign is *ἀναγκαστικόν*, it cannot exist otherwise than with that which *we* say belongs to it *κατ' ἀνάγκην*, that is, the unobserved thing of which it is the sign'.

If this is correct for the Zenonian section of the work (the only part clearly relevant to this point), the Epicureans and their opponents, as Barnes says, agree in claiming 'necessity' for the conclusions of their respective inferences. But what they mean by 'necessity' is not the same. For the Epicureans, an inference is *ἀναγκαστικός*, just in case we are constrained to accept it and find its negation inconceivable. This is not 'deductive' necessity or entailment, and it is that kind of necessity, or something like it, which the Epicureans' opponents insist that genuine congruency consists in.⁵ In that case, there is no *ignoratio elenchi*. The

ἐπιχειρημάτων, in *Phys.* 417.22. Alexander of Aphrodisias contrasts induction with deduction by saying that the former contains *τὸ πιθανόν* but not *τὸ ἀναγκαῖον*, in *Aristotelis Analytica Priora* 44.1–2. A few lines later he says that when 'the part' is proved from 'the whole', the proof is *ἀναγκαστικώτατη*. He is saying that such arguments are 'most compelling', not that inductive proofs lack *ἀναγκαστικόν simpliciter*. Similarly, Simplicius (in *Phys.* 1231.1) says *τὰ καθόλου δεικνύμενα τῶν ἐπὶ μέρους ἐστὶν ἀναγκαστικώτερα*.

It appears, then, that the relevant usages of *ἀναγκαστικός* in later Greek are entirely compatible with the sense I propose for the term in Philodemus.

⁴ I conjecture that *ἀναγκαστικός* is the Epicureans' term, rather than one first introduced by their opponents. Philodemus uses it in contexts where he is either saying, on behalf of the opponents, that Epicurean sign-inferences lack this attribute, or replying, on behalf of the Epicureans, that, if their inferences do not have it, nor do those of their opponents. As Barnes shows, we need to credit the Epicureans with some 'necessity' claim concerning their sign-inferences. If their word for this had been some more familiar form of *ἀναγκ-*, we should expect this other term, and not *ἀναγκαστικός*, to predominate. I have the impression that 'being *κατ' ἀνάγκην*' or 'having/producing *τὴν ἀνάγκην*' is the way the opponents characterized their own sign-inferences; cf. i.37, iii.19, ix.8. However, I do not claim that consistent doctrinal differences should be derived from these terminological variations: note that at xii.35 Zeno denies that his opponents have proved that 'similarity' falls to *προσφέρεσθαι τὴν ἀνάγκην*.

⁵ Deductive necessity cannot be 'more or less', but editors have conjectured *ἀναγκαστικωτέρ]α* (Gomperz), *ἀναγκαστικωτέρ]α* (De Lacy) as a predicate of Epicurean sign-inference at xi.24. If Gomperz really saw a *σ* before the lacuna, the conjecture is difficult to resist.

opponents will be saying that sign-inferences cannot be 'cogent' unless they are deductively valid; and the Epicureans will reply that deductive validity is entirely parasitical on cogency in their own sense.

It will be clear that I am reluctant to accept Barnes's injunction to 'banish the word "induction" from discussions of Philodemus'. But more needs to be said on just this point. Barnes has two reasons for insisting that Epicurean sign-inferences are deductive and not inductive. One of these, of course, concerns 'necessity'. According to standard usage of the terms induction and deduction, only deductive arguments can have conclusions which are necessitated or entailed by their premisses. Barnes thinks that the Epicurean sign-inferences do have such conclusions, but I have questioned whether those conclusions are 'necessary' in this logical sense. Secondly, Barnes notes that the Epicurean arguments do not introduce as premisses the singular propositions characteristic of 'the older' sense of 'induction'. Instead of arguing from the particular to the general or from the particular to the particular, the Epicureans typically draw a universal conclusion, for example, 'All men are mortal', from a premiss that is a universal proposition, 'All men within our experience are mortal'.

Barnes is, of course, right to say that these arguments are not inductive according to the classical criterion of generalization from particular instances. However, that does not seem a telling point. As far as we know, the Epicureans had no interest in the formal characterization of logic, and had no theories about *ἐπαγωγή* as distinct from *ἀπόδειξις*. Our justification as modern interpreters for talking about deduction and induction is the utility of these terms for elucidating Philodemus' text. From this perspective, the Epicureans' usage of universal propositions as premisses does not tell against calling their sign-inferences inductive. To exemplify the difference between deductive and inductive arguments, Wesley C. Salmon offers as an example of the latter: '[Since] Every horse that has ever been observed has had a heart, every horse has a heart' (*Logic* (Englewood Cliffs, NJ, 1963), 14). The example is precisely parallel to Epicurean sign-inferences, and it appears to be compatible with other standard accounts of induction (cf. Max Black, 'Induction', in *The Encyclopaedia of Philosophy*, ed P. Edwards).

4 'Qua' Truths

I turn now to section V(d) of Barnes's paper. He writes: 'The Epicureans agreed [sc. with their opponents] that valid sign-inferences must some-

how rest on *qua* truths; but they claimed that the way of similarity could itself establish the truth of *qua* propositions'. By *qua* truths Barnes refers to such propositions as 'man is mortal *qua* man', where *qua* translates $\eta\iota$ or $\kappa\alpha\theta\acute{o}$ *vel sim.* Barnes is certainly right in the second sentence quoted above; indeed, the Epicureans frequently say that the way of similarity is the only method for establishing the truth of *qua* propositions. But is Barnes right to posit agreement between the Epicureans and the $\acute{\alpha}\nu\alpha\sigma\kappa\epsilon\nu\acute{\eta}$ people concerning the requirement that valid sign-inferences should 'rest on' *qua* truths?

Prima facie, this would be surprising since it seems to undercut the principal point of dispute. According to Barnes, the Epicureans adopt the rule: 'Since every observed K is F, all Ks are F' is valid only if Ks are F *qua* K. This has the advantage, he says, of ensuring that the sign-inference is necessitating. But, as he goes on to note, that advantage is useless unless the similarity method itself can establish the *qua* condition. 'How can we tell, by employing the way of similarity, that the fact that all known Ks are F is grounded in the fact that Ks are F *qua* K?' Barnes offers an interesting solution to this problem in his final section on 'inconceivability'. Instead of commenting on that, I want instead to ask whether it is correct to suppose, as he does, that the Epicureans in general agree with their opponents that 'valid sign-inferences must somehow rest on *qua* truths'.

Early on in the work, at sections 5–6 De Lacy, (the Stoic?) Dionysius presents the Epicureans with an objection that can best be interpreted as a dilemma. The Epicurean inference, 'Since men familiar to us are mortal, all men are mortal', is valid if the premiss includes the assumption that men in unperceived places are similar to those familiar to us in all respects; without this assumption, it is invalid. I take this to be a dilemma since, if the Epicureans choose to accept the first alternative, their inference only becomes valid by means of a premiss that begs the whole question: compare iv.34–7 (highly supplemented) and xix.36–7.

Next, Dionysius indicates his view of the acceptable premiss: 'Since men familiar to us are mortal' needs to be equivalent to 'Since men familiar to us, in so far as and according as they are men, are mortal'. Here the *qua* condition is introduced by the opponents as something that they, unlike the Epicureans, are competent to demonstrate by their own method of $\acute{\alpha}\nu\alpha\sigma\kappa\epsilon\nu\acute{\eta}$.

The Epicurean Zeno offers robust responses to this challenge in sections 23–4 De Lacy. First he rejects the charge that the premiss, 'Since men familiar to us are mortal', assumes anything in advance about unper-

ceived men. Secondly, he claims that Dionysius' *qua* formulation, 'men familiar to us, in so far as and according as they are men, are mortal' is 'secured' by the 'similarity method'—that is, the knowledge of all known instances and the absence of contrary evidence—and cannot be secured by the method of his rivals. Here, then, so far from 'resting' his inference on *qua* truths, Zeno claims that the 'similarity' method is the way to establish such things. That is precisely what we should expect him as an empiricist to respond to his essentialist opponents.

In section 31 De Lacy the opponents raise the same dilemma. It is answered in section 38 without any suggestion that Zeno (here reported by Bromius) has any doctrinal interest in *qua* truths as foundations of inferences.

In section 45 Demetrius claims, on behalf of the Epicureans, that their opponents are wrong to think that *qua* truths can *only* be established by ἀνασκευή. He gives an example of such a truth that is established by the 'similarity method'—'a beheaded man, in so far as he has been beheaded, since his head does not grow again, dies'. Here again, the issue is one of establishing *qua* truths. Demetrius does not claim or imply that the 'similarity' method rests on them.

It is only the anonymous Epicurean whose views are reported in the last section of the book who appears to be captured by Barnes's interpretation (ss 51–3 De Lacy). But is the appearance sufficiently clear to warrant that inference? This Epicurean writes (xxx.24–32):

When we say that since things familiar to us are of such a kind things outside our experience are of that kind, we are judging that in so far as things familiar to us are of such a kind something outside our experience is conjoined to them, as in the case of 'since men familiar to us, in so far as they are men, are mortal, if there are men anywhere else they are mortal'.

(I adopt Sedley's interpretation and most of his translation of these lines, as given in his paper 'On signs', 258 n 48.)

Notice the difference between 'In so far as things familiar to us are of such a kind' and 'in so far as they are men'. The first *qua* condition advertises its empirical foundation; the second does no such thing. Further, the second *qua* condition precisely recalls the opponents' formulations, mentioned above. This Epicurean, I suggest, is saying that the essentialist-sounding 'in so far as they are men' amounts to no more and no less than 'in so far as men familiar to us are mortal'. His remarks do not suggest that the Epicurean has any independent use for the second *qua* condition.

In section 52 the same anonymous Epicurean, as Barnes reports, lists

four acceptable uses of the *qua* term; and he remarks that inferences that follow from them are 'necessary' (π[α]ρακ[ολ]ουθει μὲν οὖν τούτοις κα[ὶ] τὸ ἐξ ἀνάγκης, xxxiv.24). He then attacks his opponents for failing to understand how Epicureans understand *qua*.

The beginning of section 53 elucidates this last remark: 'We grasp that this is necessarily attached to that from the very fact that this is observed to follow in all instances that we have experienced' (τὸ γὰρ τόδε συνηρητῆσθαι τῶιδ' ἐξ ἀνάγκης λαμβάνομεν [ἐ]ξ αὐτοῦ τοῦ πᾶσιν οἷς περιεπέσομεν τεθεωρηῆσθαι τούτο παρακολουθοῦν). In other words, the Epicurean *qua* condition is precisely 'in so far as Ks familiar to us are F'.

Consistency requires that this should be so. But the finding is not a mere logical mouse. The Epicureans' rationalist opponents could not accept this interpretation of their own *qua* condition. They should say that the last Epicurean is no nearer to formulating a sound sign-inference than was Zeno. In return, he should say that no more than Zeno has he conceded anything to their essentialism. He grants that 'Since men familiar to us are mortal' may be read as a premiss which implies a *qua* truth or which can be reformulated as a *qua* truth. Since, however, this *qua* truth is of the form 'In so far as Ks familiar to us are F', the Epicurean dodges Barnes's question: 'How can we tell, by employing the way of similarity, that the fact that all known Ks are F is grounded on the fact that Ks are F *qua* K?' For the Epicurean, to say that 'K is F *qua* K' is just to say that 'K is F in so far as every known K is F without exception and nothing speaks to the contrary'. The grounding is 'similarity', and that makes any Epicurean use of *qua* quite different from that of their opponents. Philodemus' last spokesman argues that the *qua* truths his opponents insist upon are in fact the very propositions the Epicurean comes to by patient empirical enquiry. For this reason, I think Barnes misleads when he says the Epicureans agreed with their opponents that sign-inferences must 'somehow rest on *qua* truths'.

Philodemus' anonymous and final Epicurean is the most interesting of his collection. Perhaps my last remarks have a bearing on the fact, noted by Barnes, that he alone of the Epicureans completely excludes ἀνασκευή as a method of sign-inference.

I think Barnes is on the right lines when he advances his 'boring possibility' (s IV)—that this Epicurean accepted Zeno's argument concerning the dependence of ἀνασκευή on the 'similarity method', and inferred that the former is not really a method of sign-inference at all. To proceed further along these lines, we have only to note that it is this Epicurean who, in Sedley's nice phrase ('On Signs', 258), 'takes the battle right into

the enemy's camp'. Sedley is referring to the usage this Epicurean will make of *qua* truths in grounding his inferences (the material I discussed above), and calls it a 'concession'. But, as I understand the position, what may have the appearance of concession is in fact theft of the enemy's arsenal.

ἀνασκευή would threaten the 'similarity' method if it offered an alternative and stronger way of arriving at truths about non-evident matters; but according to the Epicurean, the essentialism or *qua* truths on which it relies are a pretence unless they are established by the 'similarity method'. The last Epicurean does not appropriate his opponents' essentialism. He steals their language, thereby showing that the promise of *ἀνασκευή* is actually honoured only by 'similarity'.

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