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Epicurean Inferences

The Evidence of Philodemus's *De signis*

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I

The empirical and foundational turn in Hellenistic epistemology is familiar to students of ancient Greek philosophy. We tend to suppose that the positions defended by the Epicureans and the Stoics, and sceptically examined by the Academy, were broadly characterized by two assumptions. They took the concepts that give thought its content to be somehow derived in the last analysis from sensory experience; and, more importantly for our purposes, they divided potential objects of knowledge into two classes. The first comprises phenomena or evident matters: that is, truths that can be known immediately without being inferred from other truths, typically because they are accessible to direct perceptual observation, but perhaps in other ways as well. To the second belong non-evident matters (*adēla*), which lie beyond the reach of direct apprehension. Knowledge of these, when possible at all, must rest on grounds or evidence afforded by other truths. These in turn must be grasped immediately as evident truths or inferred from other truths themselves, with the result that everything we know is known either because grasped immediately as an evident truth or ultimately on the strength of truths apprehended in this way.

This picture emerges nowhere more clearly than in the work of Sextus Empiricus. According to his version, knowledge of evident matters is treated by the philosophers in their theories of the criterion, while the transition (*metabasis*) from the evident by means of which non-evident matters are apprehended is discussed under the head of signs and demonstrations (*sēmeia*, *apodeixeis*) (*M* VII. 24 6). This division of epistemic labour is presented by Sextus as part of the undisputed common ground shared by all the contending schools. Sextus's use of it as an uncontroversial framework with which to classify competing dogmatic positions

testifies to the hold it exercised on ancient philosophical imaginations; but the lack of historical sensitivity with which he and his sources applied this framework to the philosophers they discuss is well known. None the less, it does appear to suit Hellenistic philosophers like Epicurus better than, say, Parmenides or Heraclitus. Indeed, there is reason to suppose that Epicurus played a large —perhaps the largest—part in giving currency to the key terms and notions of this framework.[1] In view of this, it is surprising how difficult and idiosyncratic the details of Epicurus's epistemology prove to be. The problems posed by his list of criteria are notorious, as are those raised by his insistence that all sense impressions are true. But his account of the means by which knowledge is extended to embrace non-evident truths presents difficulties as well. There is no dearth of testimony that Epicurus believed such knowledge has its origin in knowledge of evident matters; and he often makes this point with the aid of the vocabulary of 'signs' and 'demonstrations' familiar to us from Sextus Empiricus (*Ep. Hdt.* 38, 39; *Ep. Pyth.* 87, 97, 104; cf. DL X. 31). Rather, the difficulty is to discover a consistent and satisfying interpretation of all that he has to say about the matter.

Epicurus's use of analogy in his theorizing about the non-evident is especially important. In view of his debts to the natural philosophy of the pre-Socratics, it is not surprising to find Epicurus employing the kind of analogy so prominent in their work, in which, to put matters very crudely, an item or process in our experience is taken as a model for a non-evident one, which is then conceived as *mutatis mutandis*, like its evident model. When a philosopher uses analogy as Epicurus does, it is reasonable to ask whether he makes or observes a distinction between the use of analogy to suggest a hypothesis and its use to prove it true.[2] This way of putting the question unsurprisingly implies that the idea of proof by analogy, unlike its use to suggest hypotheses, is to be viewed with suspicion. And even if we put the difficulties concealed by the *mutatis mutandis* clause aside and, as certain later Epicureans seem to have done, treat arguments by analogy as a species of inductive inference, distinguished from their narrowly inductive counterparts by projecting beyond our experience regularities that obtain within it *mutatis mutandis*, rather than without qualification, the well-known difficulty of justifying such inferences remains. What enti-

[1] About '*prolēpsis*' cf. D. Sedley, 'Epicurus On Nature Book XXVIII', *Cronache Ercolanesi*, 3 (1973), 5–83. About '*enargeia*' cf. F. H. Sandbach, 'Ennoia and Prolepsis in the Stoic Theory of Knowledge', in A. A. Long (ed.), *Problems in Stoicism* (London: Athlone Press, 1971), 23–37, at 33. About '*kritērion*' cf. G. Striker, 'Κριτήιον τῆς ἀληθείας' in *Nachrichten der Akademie der Wissenschaften in Göttingen*, Phil.-hist. Kl. (1974), ii. 47–110, 58–9.

[2] The question is so put by R. Robinson, *Plato's Earlier Dialectic*, 2nd edn. (Oxford: Clarendon Press, 1953), 205.

tles us to put an inference from an observed regularity to the conclusion, however qualified, that that regularity obtains universally beside an unexceptionably valid deductive argument and view the conclusion as following in the same way from the premisses put forward in its support? But if we cannot do this, what is the nature of the support, if any, lent to the conclusion of an inductive argument by its premisses?

It might at first seem that concerns about Epicurus's use of analogy are misplaced, however. The most prominent method of proof on display in the *Letter to Herodotus*, where Epicurus expounds the basic tenets of his physics, seems not to be analogical at all. Instead, Epicurus typically proves a non-evident thesis by establishing that its contradictory has an implication shown to be false by observation.[3] Thus there is no such thing as creation *ex nihilo*, because, if there were, anything could come to be anywhere or at any time without any seeds, which is evidently not the case (38; cf. Lucretius, II. 159 ff.). In the same way, the existence of void is demonstrated by showing that, if there were no void, and thus no place for objects to move, motion would be impossible, as it evidently is not (40). On the other hand, Epicurus's most conspicuous use of analogy is in connection with unexplained natural phenomena for which he offers multiple explanations. To understand his approach to these matters, it is essential to see that he speaks of 'phenomena' in two ways: as we do, of natural phenomena in need of explanation because their causes are hidden from us, but also of the phenomena in our experience, which are the basis or point of departure for conclusions about non-evident matters. Epicurus did not subscribe to the strict form of empiricism which denies that we ever see the causes of an event at work because, it insists, we observe only *that* events occur and in what sequence, and never *why*. When he recommends that we seek causal explanations for meteorological –and indeed all non-evident– matters by observing in how many ways like matters in our experience come about, it is clear that he takes observation to be perfectly capable, so far as it goes, of seeing causes bring about their effects in the phenomena in our experience (*Ep. Hdt.* 80). Only in this way is he able to make the processes whose explanation is evident serve as a model for the analogous explanation of natural phenomena with non-evident causes.

This could suggest that Epicurus's view is that the phenomena in our experience give rise to knowledge of the non-evident by performing two distinct functions. They first suggest analogous explanations for the natural phenomena under investigation by providing observable models for

[3] D. J. Furley, 'Knowledge of Atoms and Void in Epicureanism', in J. P. Anton and G. L. Kustas (eds.), *Essays in Ancient Greek Philosophy* (Albany, NY: State University of New York Press, 1971), 607–19; repr. in D. J. Furley, *Cosmic Problems* (Cambridge: Cambridge University Press, 1989), 161–71.

them. But the phenomena, though probably not the same phenomena, must then be used to refute theories about the non-evident by contradicting implications of theirs and, less often, to confirm a theory by contradicting an implication of its contradictory. The existence of a plausible analogy based on some points of resemblance would not, on this view, establish that the analogy obtains *in toto*. It remains a conjecture until confirmed by the phenomena acting in their second capacity, to which any similarity between them and the non-evident matters is irrelevant. In the *Letter to Pythocles*, multiple explanations modelled on the phenomena in our experience are proposed for meteorological phenomena such as the waxing and waning of the moon, the varying lengths of nights and days, thunder and lightning, and the like. And it could seem that analogy is being used in an unexceptionable way in these cases to suggest aetiological hypotheses which can be neither decisively confirmed nor falsified by the evidence at our disposal. The burden of Epicurus's complaints against those who reject multiple explanations would then be that it is irrational to prefer one to the others arbitrarily, and in view of his conviction that the purpose of natural philosophy is to free us from superstitious fear of the gods, unnecessary as well (cf. *Ep. Pyth.* 87). To this end, all we need to know is that there is a natural explanation for the phenomenon in question, not what it is. A closer view shows that this cannot be entirely right, however. The explanations discovered by the 'multiple method', or the 'possible method' as Epicurus calls it (*Ep. Pyth.* 87, 97), are more than epistemically possible—that is, possible for all we know or all we can say. Rather, Epicurus seems to have regarded all the explanations compatible with the phenomena as objectively possible. Indeed, he seems to have held that they are realized either at some time in connection with some occurrences of the natural phenomenon in question in our world or in some world in the infinite universe (cf. Lucretius, V. 526–33). The method that makes multiple explanations available to us, then, does more than discover hypotheses about how natural phenomena may be caused for all we know; it provides us with causally sufficient explanations for them that obtain either in another world or at some time in ours.

This goes some way towards explaining the part assigned to contestation (*antimarturēsis*) and non-contestation (*ouk antimarturēsis*) as tests of truth in Epicureanism. These are mentioned together with attestation (*epimarturēsis*) and non-attestation by Epicurus himself, and they occupy the central place in Sextus Empiricus's account of Epicurean epistemology, with, however, a curious change of emphasis to which we shall have to return (*Ep. Hdt.* 51; cf. DL X. 34; *M* VII. 203ff.). Falsity arises when an opinion is not attested or contested, truth when it is attested or not contested. Attestation and non-attestation apply to opinions about evident

matters. The opinion, for example, that that is Plato over there, awaits attestation. It can legitimately be accepted as true if upon closer inspection it is confirmed, and rejected as false if not. For their part, contestation and non-contestation concern non-evident matters. The use of contestation to eliminate false opinions presents no problems. A thesis is contested when it is seen to have an observable implication which the phenomena show to be false—that is, one that is not attested by them. But it has always been much harder to understand how Epicurus could have supposed the mere absence of contestation can establish the truth of an opinion. Inevitably it often happens that several incompatible theories about the non-evident causation of a natural phenomenon are uncontested (cf. Lucretius, VI. 703 ff.). In the light of Epicurus's views about multiple explanation, however, it seems reasonable to suppose that what is shown to be true by non-contestation is not that a particular episode of a phenomenon or its occurrence in this world is caused in this particular way, let alone that every episode is so caused, but that the uncontested opinion is, unlike, for example, superstitious appeals to divine agency, a genuine explanation: the natural phenomenon in question can, in a very robust sense, occur as this explanation maintains it does; indeed, episodes of it are somewhere or at some time so caused.

If non-contestation secures truth conceived in this way, the strong claims which Epicurus makes on its behalf become easier to understand. His innovation was to construe theories first put forward in the spirit of universal explanation—as applicable at all times and in all places to a natural phenomenon in need of explanation—so that they apply only to some episodes of it or its occurrence in some worlds, when more than one theory is not contested by the phenomenon. But if the explanatory power of a theory can be relativized to worlds or occasions in this way, why should not its contestation be made relative in the same way, so that it shows only that the theory does not apply on this occasion or in this world, not that it could not apply anywhere or ever? Imagine for a moment that one could somehow directly observe the circumstances in which a meteorological phenomenon arises, in this way determining which explanation does obtain, and thereby which others do not. The explanations not obtaining should be no less possible for being seen not to apply in this case. An experience of this kind, then, would be more like the non-attestation of an opinion than its contestation, which makes it clear that contestation differs from non-attestation not only because it concerns non-evident matters, but in the way in which it shows opinions about them to be false. It is an instrument of aetiology applied to *theories*, which aim to discover how things must or can be by nature, as opposed to the contingent matters of fact that are candidates for attestation or non-attestation. Contestation

shows that the contested theory *could* not be true.[4] Neither direct inspection of the kind just imagined nor the failure of an observable implication of the theory in question to obtain 'as it happens' will do this. There must be some feature of the case that prevents us from reconstruing the theory as applying only some of the time, as happens when it is contested by phenomena that cannot fail to obtain themselves. It seems to be in this way, for example, that the hypothesis that there is no void is contested by the phenomenon of motion, without which no cosmos can come to be or exist.

A full discussion of Epicurus's account of non-contestation is outside our present scope, but it should already be clear that the modest tone which Epicurus adopts in his pronouncements about aetiology by multiple explanation is misleading. Behind his cautious strictures to be satisfied with multiple explanations when the limits placed on human knowledge do not permit greater accuracy is a conception of the space enclosed by those limits that is quite remarkable for its optimism (cf. *Ep. Hdt.* 80; *Ep. Pyth.* 87, 94, 95, 98). According to Epicurus, not merely are only the theories uncontested by the phenomena true; all of them are, in that they can and sometimes do explain natural phenomena. The phenomena are, then, a control on theories about the non-evident. For present purposes it is most significant that theories earn the imprimatur of the phenomena by being compatible with them, with the result that the straightforward inference to *the* correct theoretical conclusion about a non-evident subject-matter plays a far smaller part in Epicurus's epistemology than one would have expected. To be sure, Epicurus does in effect infer the basic tenets of his natural philosophy from the phenomena; they are proved true because their contradictories are contested by the phenomena. But even in these cases Epicurus speaks of their unique agreement with the phenomena (*monachē tois phainomenois sumphōnia*), which suggests that he regards such proofs as a special case of the more common multiple explanation (*Ep. Pyth.* 86).

We first hear of a relation of consequence or implication (*akolouthia*) in the account of Epicurean epistemology preserved by Sextus. But this is the account of non-contestation in which the puzzling shift of focus already mentioned occurs; in it, attention is directed away from the cases so prominent in Epicurus's own use of non-contestation, where several competing theories are not contested by the phenomena, to those in which, beyond having no observable implications contested by the phenomena, the opinions at issue have contradictories which are (*M* VII. 213). Here the non-contestation of p has effectively become the contestation that not-p. This is, to be sure, equivalent to the inference that p, but this conception of non-

[4] A point that is lost if one opposes contestation and attestation as Sextus Empiricus sometimes does (cf. *M* VII. 324).

contestation is very likely of later Epicurean inspiration.[5] If we choose to speak of inference in connection with Epicurus's own use of non-contestation, then, we must do so circumspectly. For the most part, the phenomena against which a theoretical opinion is checked do not license the conclusion that the natural phenomenon at issue is caused in *this* way without qualification. If you will, talk of inference conceals an ambiguity which our expectations make it hard for us to notice. For we tend to assume that this episode of a natural phenomenon is caused by these conditions only if the relation between them exemplifies a universal law-like relation between natural phenomena of this, and causal conditions of that, type. But according to Epicurus, we are typically entitled to conclude only that a natural phenomenon is caused in a certain way among others. If we call these 'aetiological inferences', one of the most distinctive features of Epicurean epistemology will be the large part that aetiological inferences play at the expense of inferences from the phenomena in our experience to their necessary causal conditions, which tell us how things in fact are at the same time that they exemplify the universal law-like relations with which, in common with many of Epicurus's predecessors and contemporaries, we are more comfortable.

It should now be clear that the opposition between the use of analogy to suggest hypotheses about how things might be and its use in inferences establishing how they are is not best suited to Epicurus's method. Because there is not a single cause but many, analogies could fail to establish *the* non-evident cause of a natural phenomenon without on that account being relegated to the supporting part of suggesting hypotheses in need of additional confirmation. To discover what part they do play, we need to ask whether and how they contribute to establishing that a non-evident opinion agrees or conflicts with the phenomena. Does a theory that represents the non-evident causal conditions which give rise to a natural phenomenon as similar or analogous to processes observed taking place in our experience *eo ipso* agree with the phenomena? Does the rejection of such a theory or the postulation of one which represents non-evident matters as behaving in a way that has no analogue in our experience bring one into conflict with the phenomena? If so, it would seem that analogy is able to establish by itself the objective possibility of an opinion regarding the non-evident, which is equivalent in Epicurus's view to establishing that the natural phenomenon in question is caused in this way among others. In the case of some natural phenomena, where only one theory is suitably analogous to the phenomena, it may even suffice to establish the universal and unqualified truth of that theory.

[5] Cf. W. Heintz, *Studien zu Sextus Empiricus* (Halle: Niemeyer, 1932), 103 ff.

The clearest indications that Epicurus considered analogy equal to these tasks are furnished by passages in the *Letter to Pythocles* that call attention to the multiple explanations for meteorological phenomena suggested by the phenomena in our experience, and warn against arbitrarily preferring one to the others. Epicurus observes, for example, that the waxing and waning of the moon could come about in all of the ways in which we see similar processes occurring in our experience (94). The same is true of the way in which the moon gets its light; it may be the source of its own light or receive it from the sun, just as some things in our experience have their own light while others receive it from another source (95). The impression left by these passages that the phenomena imply the possibility of their non-evident analogues is strengthened when Epicurus goes on to suggest that the rejection of other possible theories implicit in the adoption of one as the sole explanation for the natural phenomena in question constitutes a repudiation of the phenomena in our experience—a failure, if you will, to see them as the signs they are (97). Most striking of all is the way in which, after a survey of competing explanations for the variation in the lengths of nights and days over the course of the year suggested by analogous occurrences in our experience, he amplifies his insistence that it is necessary to speak of meteorological matters in a manner consonant (*sumphōnōs*) with the phenomena with the further remark that those who adopt only one of the possible explanations are in conflict (*machontai*) with the phenomena (98). Here, similarity to the phenomena appears to come very close to agreement with them, and Epicurus seems to regard the repudiation of any of the theories that agree with the phenomena in this way not only as a rash presumption to know what it is not possible for human beings to know—though he does say this as well—but as in conflict with the phenomena, which, as it seems, imply the possibility of their non-evident analogues.[6] To say that natural phenomena cannot come about in other than one way flies in the face of the evidence afforded by similar phenomena in our experience, which *shows* that they can. What is more, much of Epicurus's talk of 'signs' and 'signification' can be interpreted as concerned with analogical projections of this kind. In the middle of his discussion of the aetiology of lightning, Epicurus observes that one will be able to grasp the ways in which it can come about by adhering to the phenomena and being able to grasp what is similar to them (102). A short while thereafter, in the discussion of thunder, he insists that one's explanations will be uncontaminated by myth if in drawing conclusions (*sēmeiōtai*) about the non-evident one follows the phenomena as one

[6] Cf. *Ep. Pyth.* 90, where it appears that it is not the view that worlds originate in a vortex of some kind that Epicurus means to reject as in conflict with the phenomena, but the view that they arise of necessity only in this way.

should (104). If we connect these passages, it seems that Epicurus takes signs, or at any rate some of them, to be similar to what they signify, and to discharge their function as signs of the non-evident precisely by being similar to them.

It might still be argued that the contribution of the phenomena in our experience is confined to *suggesting* explanations for natural phenomena. Because of Epicurus's distinctive conviction that compatibility with the phenomena is not only a necessary but also a sufficient condition for the truth of a theory, there would be a stronger presumption in favour of the theories suggested by analogy than if absence of contestation were regarded as establishing only that a theory is possible for all we know; all the same, it would still be necessary to determine if they were contested by the phenomena. If this were so, analogy would after all belong to the preliminary stage of an inquiry that is able to achieve definite results only after the hypotheses it brings to light have been tested for implications incompatible with the phenomena, where this is not a matter of being unlike them. Epicurus does sometimes write in a way which suggests or is consistent with this view of the matter (e.g. *Ep. Pyth.* 92, 93, 98–9). It may be the view that best describes much of his practice; perhaps it is the position he should have taken. But he need not have seen things in this way himself. It was open to him to regard the discovery that a theory has implications contradicted by the phenomena as showing not that analogy is an unreliable guide to the conditions prevailing in the non-evident realm, but rather that the argument at issue was based on a faulty analogy or a specious likeness. To this way of thinking, the search for such implications acts as a check on the misuse of analogy, but there can be no conflict between its results and those of a properly constructed analogy.

II

At all events, Epicurus's successors inherited many arguments in which, as it seems, the fact that items of a certain kind have a certain feature or behave in a certain way in our experience is put forward as a ground for the conclusion that relevantly similar items have a similar feature or behave in a similar way outside our experience. On a number of occasions, in cases of what he calls unique agreement, Epicurus even argues for a universally applicable account of a natural phenomenon by means of analogy. The opinion that the sun is about as large as it appears, for instance, is established by an appeal to the behaviour of signal fires in our experience (*Ep. Pyth.* 91). The nature of the minimal theoretical magnitudes is established by a comparison with that of *minima visibilia* (*Ep. Hdt.* 58). Even

the argument for the existence of void, the paradigm of an unexceptionably non-analogical argument, presents an appearance in Epicurus very different from the one it presents in Sextus Empiricus (*Ep. Hdt.* 39–40; *M* VII. 213–14). In Epicurus's version it is only a step on the way to the conclusion which it is his principal aim to establish: namely, that the universe is made up, at bottom, of bodies and void and nothing else. And his way of stating the conclusion—that apart from these nothing can be conceived either apprehensively (*perileptōs*) or analogously to the things apprehended—might suggest that it rests on the projection beyond our experience of conditions shown to hold in our experience, broadly construed, by a combination of observation and inference.

Epicurus's failure to say anything very definite about the standing of such projections is that much less surprising in view of his and his followers' well-known scorn for logic. It may not be necessary to study logic to pose the kind of questions which we have put to Epicurus, but it surely helps to bring them into focus. It is one thing to speak, as Epicurus does, of broadly logical notions of agreement (*sumphōnia*) and conflict (*machē*), or to use, apparently without mentioning, that of consequence (*akolouthia*), but quite another to make them an object of study in their own right. Both the Stoics and the Aristotelians attempted, albeit in very different ways, to give a rigorous account of what it is for a conclusion to follow validly from the premisses of an argument, and the Stoic account crucially relied on an analysis of relations of consequence and conflict between the propositional components of complex propositions. Some ancient authorities, and the scholars who have followed their lead, conclude that since the Epicureans had much to say about epistemological matters, which are the concern of logic according to the broader, ancient conception of the discipline, they did in effect recognize a logical, along with an ethical and a natural, part of philosophy.[7] This is fair enough so far as it goes, but it risks obscuring the effect that a concern with more narrowly logical issues—what we call logic, and what the Stoics and other philosophers of the Hellenistic period called dialectic—is likely to have on a philosopher's treatment of epistemological issues. Both the Aristotelians and the Stoics make their logic serve broadly epistemological purposes in their accounts of proof or demonstration (*apodeixis*). The Stoics agreed with Aristotle that a demonstration is an argument by grasping which one comes to know. Their accounts of valid argument are of course very different, and the conditions, apart from constituting a valid argument, which they require the premisses and conclusion of a demonstration to satisfy also differ in a way that reflects their very different conceptions of

[7] Cf. H. Usener (ed.), *Epicurea* (Leipzig: Teubner, 1887; repr. 1966), fr. 242.

the knowledge to which it gives rise. Very roughly, an Aristotelian demonstration is less concerned to disclose new truths than to further understanding by exhibiting the explanatory relation that obtains between the explanans captured by the premisses and the explanandum stated in the conclusion. A Stoic demonstration, on the other hand, resolves a matter previously unclear or in doubt by an inference from truths already grasped. If it serves an explanatory purpose, it is not directly by presenting an explanation in the Aristotelian manner, but rather by uncovering necessary conditions for a natural phenomenon that belong to its explanation. But however great the differences between these two accounts, they crucially agree that to come to know by means of a demonstration, one must grasp the purely logical relation of consequence that obtains between its premisses and conclusion.

In a philosophical climate in which such purely logical matters had become the object of study in their own right, questions about the legitimacy of inferences that project what is true in our experience beyond our experience, either without qualification or analogically, were bound to stand out more prominently. Later Epicureans were unable to avoid them, and they are aired in the *De signis* of Philodemus, the first-century BC Epicurean, which is the only substantial testimony about the extensive Epicurean discussion of the subject after Epicurus to have survived.[8] Though potentially a very rich source, this work presents special difficulties because of the manner in which it has come down to us. What we have are the remains of a single papyrus roll, part of the library buried in Herculaneum by the eruption of Mount Vesuvius in AD 79 and uncovered in the eighteenth century. The concluding thirty-eight columns have survived, along with eight fragments from the earlier part of the roll. Edited texts were published by T. Gomperz in the nineteenth century,[9] and more recently by P. H. and E. A. De Lacy.[10] Though in comparatively good condition, this is a papyrological text, heavily dependent on restoration involving varying degrees of conjecture, from the nearly certain to the highly speculative.[11]

[8] The subscription at the end of the papyrus which names Philodemus as the author and gives the title reads: ΦΙΛΟΔΗΜΟΥ ΠΕΡΙ ΦΑ [. . .]Ν[. . .]Ν Κ[ΑΙ] ΣΗ[ΜΕ]ΙΩΣΕΩΝ. The beginning of the title appears to be either Περι φαινομένων or Περὶ φαντασιῶν. For a full discussion of the title, cf. R. Philippson, 'Zur Wiederherstellung von Philodems sog. Schrift Περὶ Εημείων καὶ Εημειώσεων', *Rheinisches Museum*, 64 (1909), 1–38, at 3, to whom the second suggestion (requiring that the first legible N be read as an A) is due.

[9] T. Gomperz (ed.), *Herkulanische Studien*, i: *Philodem über Induktionschlüsse* (Leipzig: Teubner, 1865).

[10] P. H. and E. A. De Lacy (eds.), *Philodemus: On Methods of Inference*, 2nd edn. (Naples: Bibliopolis, 1978).

[11] On the character of the Herculaneum papyri and the special difficulties they present, see R. Janko, 'Philodemus Resartus: Progress in Reconstructing the Philosophical Papyri of Herculaneum', in J. Cleary (ed.), *Proceedings of the Boston Area Colloquium in Ancient Philosophy*, vii (Lanham, Md.: University Press of America, 1991), 271–308.

The surviving part recounts a controversy over sign inference between the Epicureans and a group of unnamed opponents. It is divided into four parts, which recount the views of either two or three Epicurean authorities.[12] The first, already under way where the surviving part of the papyrus begins, commences with a catalogue of the opponents' arguments against the Epicurean position (Ia. 1–V. 36 (chs. 1–7));[13] they are answered in sequence in columns XI. 26–XIX. 4 (chs. 17–26). The account of both objections and replies is due to Philodemus's teacher, Zeno of Sidon, and this is Philodemus's own report of those views as they were related to him by Zeno (XIX. 4–9 (ch. 27)). Placed oddly in between is another set of objection and replies, presumably also due to Zeno. The second section contains another report of Zeno's views due to Philodemus's fellow student Bromius (XIX. 9–XXVII. 28 (chs. 28–43)). The third relates the views of Demetrius of Laconia, another Epicurean teacher and a younger contemporary of Zeno (XXVIII. 13–XXIX. 16 (ch. 45)). The last begins after a short lacuna by describing the manner in which an unnamed 'he' handles the issues in discussion (XXIX. 20–XXXVIII. 22 (chs. 46–60)). It has sometimes been viewed as a report of how Demetrius treated the subject in oral, as opposed to written, discussion; but the identification of the source as Demetrius has been vigorously contested.[14] The four sections differ in their handling of the same issues in tone and emphasis, and perhaps in doctrine as well. Philodemus does not attempt a critical synthesis in the surviving portion, and what we have could fairly be regarded as a notebook or a source book.[15]

Our understanding of the debate he recounts would be greatly improved if we could say with confidence who the Epicureans' opponents were. Although the suggestion of Gomperz, that Zeno's opponent is Posidonius,

[12] Cf. R. Philippson, s.v. 'Philodemos', in W. Kroll (ed.), *Pauly's Real-Encyclopädie der classischen Altertumswissenschaft*, xix (2) (Stuttgart: Metzler, 1938), cols. 2444–82.

[13] The chapter numbers are the De Lacys'.

[14] The view that the speaker is Demetrius is defended by Philippson, 'Philodemos', col. 2451, who cites the '*dialegomenos*' of XXIX. 24; he defends this view, and a restoration which lends support to it, at greater length in 'Zur Wiederherstellung', 33, 37–8. (Originally he had supposed that the fourth section was also due to Zeno; see *idem*, *De Philodemi libro, qui est* Περὶ σημείων καὶ σημειώσεων *et Epicureorum doctrina logica* (Berlin: Berliner Buchdruckerei-Aetien-Gesellschaft, 1881), 5.) It is opposed by D. Sedley, 'On Signs', in J. Barnes, J. Brunschwig, M. F. Burnyeat, and M. Schofield (eds.), *Science and Speculation* (Cambridge/Paris: Cambridge University Press, 1982), 239–72, at 240 n3, who is followed on this point by J. Barnes, 'Epicurean Signs', in J. Annas and R. H. Grimm (eds.), *Oxford Studies in Ancient Philosophy*, suppl. vol. (1988), 91–134, at 93 n. 9; for earlier arguments against Demetrius's authorship, see P. Natorp, *Forschungen zur Geschichte des Erkenntnisproblems im Altertum* (Berlin: Wilhelm Hertz, 1884; repr. Hildesheim: Olms, 1989), 239 n. 1; A. Schmeckel, *Die Philosophie der mittleren Stoa in ihrem geschichlichen Zusammenhange dargestalt* (Berlin: Wiedmann, 1892; repr. Hildesheim: Olms, 1989), 340.

[15] Cf. Barnes, 'Epicurean Signs', 92; De Lacys (eds.), *Philodemus*, 156.

has not met with favour, the scholarly consensus is that they are Stoics.[16] But the evidence is not so strong that other alternatives can be confidently excluded. Recent proponents of the identification of the opponents with the Stoics have tended to express a degree of dissatisfaction with their own case, and the possibility that the opponents included Academics has also been defended.[17] There is one piece of circumstantial evidence: one opponent is named 'Dionysius' (VII. 5–6, XI. 13–14), and the most likely candidate among bearers of the name known to us is the Stoic, Dionysius of Cyrene.[18] But the case ultimately depends on how well the views and arguments of the opponents in the *De signis* can be made to square with known Stoic views, and the difficulties in the way of this conclusion are not negligible.

None the less, I shall not defend a new conclusion about the identity of the opponents. I do, however, want to air more fully the difficulties that face the orthodox view to discover precisely what further conclusions it commits us to. In particular, I shall argue that the identification of the opponents as Stoics can be maintained only if allowance is made for the distorting effect on their position of the Epicurean perspective from which it has been viewed. In other words, I want to suggest, the opponents can be regarded as Stoics only if the Epicureans have misunderstood their position. But this misunderstanding is worth exploring in some detail, because it is motivated by deeper disagreements that promise to throw light on the issues at the heart of the ancient debate about the nature and purpose of inference from the evident to the non-evident.

III

Let us then postpone identifying the opponents as Stoics, and restrict ourselves to what can be said about them on the basis of the *De signis*. The controversy is between proponents of two methods of sign inference. The Epicureans advocate the method of similarity, their opponents the method

[16] Gomperz, *Herkulanische Studien*, i. 13; F. Bahnsch, *Des Epicureers Philodemus Schrift Περὶ σημείων καὶ σημειώσεων: Eine Darlegung ihres Gedankengehalt* (Lyck: Emil Wiebe, 1879), 5; Philippson, *De Philodemi libro*, 5 *et passim*; De Lacys (eds.), *Philodemus*, 156, 214ff.; Sedley, 'On Signs', 240–1; Barnes, 'Epicurean Signs', 93–4. Natorp, *Forschungen*, 239, is sympathetic to the view that the opponents belong to the school of Posidonius.

[17] Cf. E. Asmis, *Epicurus' Scientific Method* (Ithaca, NY: Cornell University Press, 1984), 198.

[18] Cf. Philippson, *De Philodemi libro* 4; Natorp, *Forschungen*, 239; De Lacys (eds.), *Philodemus*, 98 n. 28, 159 n. 5; Sedley, 'On Signs', 241; Barnes, 'Epicurean Signs', 93 with n. 12; J. L. Stocks, 'Epicurean Induction', *Mind*, NS 34 (1925), 185–203, repr. in *idem*, *The Limits of Mind and Other Essays* (London: Benn, 1932), 266–93. On Dionysius himself see Schmeckel, *Die Philosophie*, 298–303.

of elimination (*anaskeuē*).[19] Roughly speaking, the first prescribes how to project features that items of a certain type have been observed to have in our experience on to items of the same or a similar type lying outside our experience. It embraces what have traditionally been considered inductive inferences from a finite sample of a kind to a conclusion about its whole population—for example, from the fact that all human beings in our experience are mortal to the conclusion that all human beings, wherever they may be, are mortal—as well as others which we should call analogical—for example, inferences from the behaviour of macroscopic bodies to that of atoms, or from that of bodies on earth to those in the heavens. As we have seen, the latter are especially important in Epicurean natural philosophy. But the method is the same in each case: similarity in another respect is projected via one, already acknowledged relation of similarity. A preliminary characterization of the competing method of elimination advocated by the opponents is much harder to produce; indeed, as we shall see, it is surprisingly hard to say what that method *is*.

But the principal issue in dispute is clear. The opponents argue that only their method produces cogent inferences which necessitate their conclusions, and they attempt to establish that the method of similarity does not possess the required cogency. Their arguments directly against the method of similarity, and the responses they elicited from the Epicureans, are by far the most straightforward and easily understood parts of the controversy. The opponents propose arguments with the same form as similarity inferences whose conclusions the Epicureans accept, that differ by reaching conclusions unacceptable to the Epicureans. If the opponents are right, then, the method will mistakenly project features belonging to items in our experience on to items outside our experience to which they do not belong. It will, for example, require us to conclude that atoms are coloured and perishable, because all objects in our experience are (XVII. 11 (ch. 24)). What is more, it will lead us to exclude (i.e. project the absence of) genuine possibilities because they are not attested in our experience. The opponents appeal to a very diverse set of unique phenomena to support this contention—for example, the magnet is the only stone that draws metal, the square of four the only figure with a perimeter equal to its area—all of which would have been excluded had our experience been more limited (cf. I. 19 ff. (ch. 3), IX. 35–8 (ch. 14), XI. 9 ff. (ch. 16), XIV. 33 (ch. 20), XV. 13 (ch. 21)).

The Epicureans respond that the similarity method does not in fact license these inferences, a contention that they support by a more detailed

[19] This is the translation favoured by Sedley, 'On Signs'; Barnes, 'Epicurean Signs', prefers 'rebuttal'. For reasons shortly to be explained, the De Lacys' choice of 'contraposition' will not do.

specification of the method showing how, when well and carefully applied, it excludes faulty inferences of this kind. The question that remains is, of course, whether any amount of refinement can guarantee that no faulty inferences are sanctioned by the method. I want to put aside consideration of this part of the debate, however, in order to concentrate attention on the more difficult part of the argument set in train by the opponents' claim that only the method of elimination can give rise to legitimate sign inferences; for it is in this part of the controversy that issues about the basic character and purpose of sign inference are most fully ventilated. But clarity about the difference between the two methods is made harder to achieve by apparent variations in the Epicureans' own attitude toward elimination. There are passages which suggest each of the following three views.

(i) The method of elimination is parallel to, and independent of, the method of similarity. There are thus two methods of sign inference, and the opponents' mistake is only to deprive us needlessly of a perfectly sound method and the inferences it sanctions. This view is suggested by the fullest discussion of the difference between the two methods (XI. 26 ff. (ch. 17)), and by the contrasts several times made between them (XIV. 2 ff. (ch. 19), XXVIII. 17–25 (ch. 45), XXXVII. 30–8 (ch. 58)).

(ii) The method of elimination, though perfectly sound, is wholly dependent on that of similarity. The similarity method pervades that of elimination, and the latter is secured by the former (VII. 10–12 (ch. 10)). In consequence, the method of elimination has no independent power to produce sound inferences without the support of the similarity method (VIII. 21 ff. (ch. 13); cf. XVII. 8 ff. (ch. 24)). If successful, this argument would show that the opponents' position is even weaker, for by rejecting similarity, they have deprived themselves of the power to make any sign inferences at all.

(iii) The method of similarity is the *sole* method of sign inference (XXX. 37–XXXI. 1 (ch. 47)). If successful, this argument would be still more destructive of the opponents' position.

The passages that point to (i) and (ii) can be reconciled. Everything that Philodemus says suggestive of independence is compatible with the claim that the method of elimination is ultimately dependent on the method of similarity. The apparent differences are to be explained by the dialectical contexts of the different passages. In some passages Zeno grants that the opponents' method does capture some valid sign inferences; his aim in them is to show that even so, and with issues about the ultimate standing of elimination put aside, elimination fails to capture a range of sign

inferences that are captured by similarity. And since the bulk of the passages pointing to both (i) and (ii) come from the part of the *De signis* whose source is Zeno, an interpretation that shows them to be in harmony is to be preferred. But the passage on which (iii) is based cannot be so easily reconciled with the material cited in (i) and (ii), and it has been the object to much scholarly concern.[20] It could be that a substantive disagreement is involved; the passage denying that there is any method of sign inference apart from similarity occurs in the fourth section of the *De signis*, and could thus represent a disagreement with the Zeno.[21]

A few lines after insisting that similarity is the only method of sign inference, however, Philodemus's source in the fourth section explains himself in this way (XXXI. 8–17 (ch. 48)):

> Those who say that the method by elimination depends on sign inference by similarity, even if they say virtually the same thing that we do, by leaving the suspicion in their teaching that there are *two* methods of sign inference intertwined with each other . . . [there is a short lacuna in which they are presumably said to go wrong somehow].

What is more, he seems happy to speak of signs in connection with inferences by elimination (XXXI. 36–XXXII. 6 (ch. 49), XXXV. 31–2 (ch. 53), XXXVI. 21–4 (ch. 55)).[22] And he distinguishes two relations of consequence obtaining between the phenomena and non-evident matters, similarity and another that supports elimination, and appears to fault the opponents, just as Zeno had, for recognizing only the second (XXXVII. 1–XXXVIII. 8 (chs. 57–8)). It appears, then, that it is neither the soundness of the inferences by elimination admitted by Zeno, nor the applicability to them of the eliminative account, to which the source of this part of the *De signis* objects. Rather, his objection seems to be to any account of the relation between elimination and similarity which accords the standing of a method of sign inference to the use of elimination. What his objections do show is that he cannot be Zeno. Indeed, it seems to be precisely Zeno's approach to which he objects, for as we have seen, it does give the impression that there are two methods of sign inference by its talk of dependence. The explanation of why the source for this section wanted to reserve the status of a method of sign inference for similarity in this way will have to wait until more clarity is achieved about the issues in dispute between the Epicureans and the partisans of elimination.

[20] Cf. Bahnsch, *Des Epicureers Philodemus*, 21–2; De Lacys (eds.), *Philodemus*, 122 n. 96; Schmeckel, *Die Philosophie*, 340.

[21] Cf. Barnes, 'Epicurean Signs', 101–2, who defends an interpretation along these lines.

[22] Cf. Philippson, 'Zur Wiederherstellung', 37.

IV

The difference between the two methods receives the most detailed attention at XI. 26–XII. 35 (ch. 17).[23] To understand this passage, it is essential first to eliminate a possible source of confusion. '*Anaskeuē*', which I have rendered as 'elimination', is translated throughout by the De Lacys as 'contraposition'.[24] But this passage, in which the clearest reference to the principle of contraposition is made, shows that this cannot be right, because in it Zeno answers an argument of the opponents, who have striven to link elimination with contraposition, by trying to show that elimination, though a sufficient condition for contraposition, is not a necessary one: the inconceivability to which the method of similarity gives rise is also sufficient (XI. 32–XII. 19 (ch. 17)):[25]

> For granted that 'If the first, then the second' is true whenever 'If not the second, not the first either' is true, it does not therefore follow that only the Elimination Method is cogent. For 'If not the second, not the first either' comes out true sometimes inasmuch as, when the second is hypothetically eliminated, by its very elimination the first is eliminated too—as in 'If there is motion, there is void', since, when the second is hypothetically eliminated, by its mere elimination motion will be eliminated too, so that such a case fits the Elimination type—but sometimes not in this way but because of the very inconceivability of the first being, or being of this kind, but the second not being, or not being of this kind.

The part played by contraposition in the dispute, then, is that of a minimum necessary condition accepted by both parties for a true conditional.[26]

What is more, closer inspection reveals that something more than bare contraposition is at issue. The requirement that a conditional contrapose is met by conditionals which satisfy only the Philonian account, according to which a conditional is true as long as it does not begin with a true antecedent and conclude with a false consequent, a demand notoriously satisfied by conditionals such as 'If it is day, then I am talking' (cf. Sext. Emp. *PH* II. 110). Rather, Zeno seems to have taken the relevant requirement to amount to the *impossibility* that the first obtain if the second does not (cf. XIV. 15–17 (ch. 19)). And he grants that both elimination and inconceivability are sufficient conditions for this more restrictive

[23] Where Zeno answers the first two of the opponents' arguments; they are not preserved in the surviving part of the papyrus roll, which begins with the third argument.

[24] Who follow Bahnsch, *Des Epicureers Philodemus*, 8, on this point.

[25] Cf. Sedley, 'On Signs', 245; Barnes, 'Epicurean Signs', 99. The translation is that of A. A. Long and D. Sedley, *The Hellenistic Philosophers* (Cambridge: Cambridge University Press, 1987), i. §18F, 1–4.

[26] Cf. '*antistrophōs*', XXXIII. 6 (ch. 50).

requirement; the opponents go wrong, he maintains, by supposing that only elimination is. But it might seem that this more restrictive requirement in terms of impossibility already specifies necessary and sufficient conditions for a strict form of implication. Why, then, is it treated here only as a necessary condition on a satisfactory account of the conditional corresponding to a sign inference? But perhaps this is a misleading way of putting the question. The Epicureans' motives for participating in the debate were largely epistemological. They were less interested in the truth conditions of conditional propositions than in how it is we come to know that the implications exploited in inferences to conclusions about non-evident matters are true. Their demand, then, was for a perspicuous account of what it is about these implications by grasping which we come at the same time to see that those conditions are fulfilled.

In any case, it was agreed by the Epicureans and their opponents that these implications must satisfy the strengthened requirement of contraposition; the issue in dispute was rather whether elimination was the only account of the conditional satisfying this requirement also able to perform the required epistemological task. This Zeno denies. In the passage cited above, he allows that those conditionals in which, by the bare elimination of the first, the second is co-eliminated as well, are true by elimination; but he immediately goes on to insist that they do not exhaust the valid sign inferences, because others are true, roughly speaking, when it is not conceivable that the first obtain and the second fail to, a condition to which the method of similarity gives rise. The contrast is drawn in essentially the same terms several times elsewhere in the *De signis*, and inference by elimination is illustrated, as it is here, by that from motion to void (XIV. 11–23 (ch. 19), XXVIII. 16–25 (ch. 45), XXXVII. 7–17 (ch. 57), XXXVII. 34–XXXVIII. 8 (ch. 58)).

The identification of the Epicureans' opponents as Stoics depends on whether a link between the doctrine of elimination and known Stoic views can be established. The term '*anaskeuē*' has no special claim to be a Stoic one.[27] Indeed, it is better attested in Epicurean contexts, notably in Sextus Empiricus's account of Epicurean epistemology (*M* VII. 214).[28] It is, however, brought into relation with '*sunartēsis*' ('connection') in the pseudo-Galenic treatise *De optima secta* (1. 116 (17ff. Kühn)).[29] Without

[27] It is not, so far as we know, a technical term in Stoic logic, as the De Lacys (eds.), *Philodemus*, 95 n. 19, and J.-P. Dumont, 'Confirmation et Disconfirmation', in Barnes *et al.* (eds.), *Science and Speculation*, 273–303, at 288, optimistically suggest.

[28] Asmis, *Epicurus' Scientific Method*, 198–201, defends the view that it is an Epicurean concept on the strength of its use there.

[29] Cited by De Lacys (eds.), *Philodemus*, 95 n. 19, and Sedley, 'On Signs', 245–6. I think it is just as likely that the connection it reports between *sunartēsis* and *anaskeuē* was made by a non-Stoic familiar with the Stoic view as it was by a Stoic. The practice of making such

mentioning any other possibilities, Diogenes Laertius describes *sunartēsis* as the Stoic account of the truth conditions of the conditional (VII. 73), and it is now generally thought, on the basis of a somewhat complicated argument, to be the account advocated by Chrysippus.[30] According to it, a true conditional is one in which the contradictory of the consequent is incompatible or in conflict (*machetai*) with the antecedent (DL VII. 73; Sext. Emp. *PH* II. 111). Though the nature of the incompatibility referred to is not specified in the definition, there are good grounds for taking it to be broadly logical rather than empirical. It is the third of the 'criteria' in Sextus Empiricus's catalogue of accounts of the conditional (*PH* II. 110–12). The definitions are organized in a sequence: each imposes a new, more restrictive set of necessary and sufficient conditions, so that those specified previously are now necessary only. And each new account is illustrated with an example carefully chosen to focus attention on the special features of the criterion under consideration. The example counts as true in accordance with it, but not by the next more restrictive criterion; and by being counter-intuitive, each example also furnishes a motive for the move to a stricter account meant to exclude conditionals like itself. Thus, as we have already seen, Philo's truth-functional account is illustrated by the conditional 'If it is day, I am talking'. The second account is that of Diodorus, according to whom the true conditional 'neither permitted nor permits beginning with a truth and concluding with a falsehood'. At first glance, this account seems to make the transition to a non-empirical account of implication with its talk of 'permission' (*endechetai*), but when Diodorus's non-modal account of possibility, according to which a proposition is possible ('is permitted') if it either is or will be true, is taken into account, his criterion requires that a true conditional be true by the Philonian criterion at all times, and it is equivalent to an uncredited account mentioned by Sextus produced by adding one word to the Philonian account so that it requires only that the conditional *never* begin with a truth and conclude with a falsehood (*M* VIII. 416).[31] Like the Philonian account, it approaches the truth of the conditional through an

connections is not unknown among medical writers. Galen, *De meth. med.* X. 126, 10 127, 3 Kühn = K. Deichgräber (ed.), *Die griechische Empirikerschule: Sammlung der Fragmente und Darstellung der Lehre*, 2nd edn. (Berlin: Weidmann, 1965), fr. 45, connects the indication of the medical rationalists and 'emphasis', the fourth and apparently most stringent criterion of the conditional listed by Sextus Empiricus after *sunartēsis* at *PH* II. 110–12. But it may be enough that the two terms were brought into connection in this way, for the Epicureans could have used 'elimination' to characterize the Stoics' view, even if it was not the term the Stoics would have preferred themselves.

[30] Cf. M. Frede, *Die stoische Logik* (Göttingen: Vandenhoeck und Ruprecht, 1974), 86ff.; I. Mueller, 'Introduction to Stoic Logic', in J. M. Rist (ed.), *The Stoics* (Berkeley: University of California Press, 1978), 1–26, 18ff.

[31] Cf. B. Mates, *Stoic Logic* (Berkeley: University of California Press, 1953), 37.

independent assessment of the truth of its component propositions, and Sextus's example—'If it is not the case that the elements of things are without parts, the element of things are without parts'—makes it clear why a more restrictive account requiring an internal logical connection was thought to be desirable. This is apparently supplied by Sextus's third account in terms of *sunartēsis*, and the term itself, 'connection', is presumably to be explained in this way.[32]

Such an account seems well suited to the conditionals under discussion in the *De signis*. The way in which the opponents use elimination to construct alternative formulations of the Epicurean arguments would seem to support the identification of *anaskeuē* with *sunartēsis*, understood in this way as a conceptually enforced necessary connection (IV. 10 ff. (ch. 6), XXXIV. 36 ff. (ch. 52)).[33] For in the reformulation that the opponents offer the Epicureans of their inference to the mortality of human beings, wherever they may be, this conclusion is made to follow from premisses in which the mortality belonging to human beings in our experience is taken to belong to them in so far as they are, or *qua*, human beings. And that the Epicureans took themselves to be engaged in a debate about the conditional is shown by the remark, in the fourth section of the *De signis*, that inconceivability, not elimination, is the best way of judging (*krisis*) the conditional, for which they use the technical Stoic term *sunēmmenon* (XXXIII. 1 ff (ch. 50)).[34]

But if elimination is to be identified with the Stoics' connective account of the conditional, and inconceivability is an Epicurean alternative, it becomes quite difficult to say what the difference between them is.

Elimination (*sunartēsis*): P→Q iff not-Q is incompatible with P.
Inconceivability (*adianoēsia*): P→Q iff (P & not-Q) is inconceivable.

To be sure, one could try to make something of the apparently more subjective and psychological character of the Epicurean criterion, inconceivability. But 'inconceivability' may well describe a perfectly objective relation between concepts.[35] And even if the Epicureans are open to criticism on this score, the charge of psychologism raises comparatively subtle issues; one does not expect rival 'psychological' and 'logical' conceptions to capture a strikingly different range of conditionals in the way that the rival accounts in terms of elimination and inconceivability do; rather, they should give different accounts of a more or less agreed upon sample of true conditionals. The *De signis*, however, presupposes both that they dif-

[32] Cf. Frede, *Die stoische Logik*, 84 ff.
[33] Cf. Sedley, 'On Signs', 247.
[34] The term '*krisis*' is also used of the rival accounts of the conditional by Sext. Emp. *M* VIII. 245.
[35] Cf. Barnes, 'Epicurean Signs', 125–6.

fer in their extensions and that the underlying difference because of which they do is too obvious to need any but the briefest explanation.

What is more, closer inspection suggests a more complicated relation between elimination and inconceivability than is implied by the contrast drawn in the passage at XI. 32 ff. (ch. 17) that we have already examined, where both are said to satisfy the test of contraposition. It is clear from this passage and others that the division between the two is meant to exhaust valid sign inferences, but it is less clear that it is meant to be exclusive as well, despite the evidence which seems to link inconceivability exclusively with similarity (cf. XIV. 14–28 (ch. 19)). Although the Epicurean sources of the *De signis* may have disagreed among themselves about whether elimination inferences like that from motion to void are properly termed 'sign inferences', none denied that they were valid inferences. The question naturally arises as to whether inconceivability applies to them as well as to those grounded in similarity. The method of similarity itself makes it clear that motion without void is impossible (cf. VIII. 28–32 (ch. 13)); it would be surprising if it were not also inconceivable. And in the fourth section of the *De signis*, inconceivability is said to apply to inferences of both sorts, albeit in a passage whose train of thought is not especially clear (XXXVII. 24–XXXVIII. 8 (ch. 58)).[36] It is clear that the

[36] The De Lacys begin a new chapter, ch. 58, at XXXVII. 24, and they take the distinction made there between the inferential transition to perceptible matters (*aisthēta*) and that to those grasped by reason (*ta logōi theōrēta*) to introduce a new train of thought. Philodemus immediately proceeds, in the De Lacy trans.: 'in spite of this difference, they disregard the distinctive features of each form of inference,' and he goes on to distinguish, in a now familiar way, between similarity and elimination inferences, illustrated by inferences from motion to void and from the mortality of human beings in our experience to those outside it, respectively. But the difference must be between two relations of consequence, rather than between the perceptible and imperceptible items about which inferences are drawn. That distinction cuts across the division between similarity and elimination inferences: inference to conclusions about both types of item is possible by both methods. Indeed, on closer inspection, it is clear that the distinction with which the chapter begins is between types of items about which similarity inferences, not inferences quite generally, are drawn. For the transition from perceptibles to perceptibles is said to arise in accordance with complete indistinguishability (*aparallaxia*), while the matters grasped by reason, to which the second kind of transition is made, are characterized as analogous to the phenomena (cf. XIX. 25–9 (ch. 30)).

This problem can be solved by taking XXXVII. 24 ff. more closely with the immediately preceding argument in the De Lacys' ch. 57 (cf. Sedley, 'On Signs', 261 n. 54; Natorp, *Forschungen*, 244 n. 2). At issue in that chapter is a distinction, ignored by the opponents, between two kinds of consequence (*akolouthia*); one, it seems, supports elimination inferences, while the other is based on similarity. Consequence of the second kind is illustrated by an inference concerning the behaviour of atoms, partially interrupted by a lacuna. And the distinction between inference to perceptible and to theoretical entities that Philodemus immediately proceeds to make is a parenthetical elaboration which is part of the account of similarity inference. The difference referred to at XXXVII. 29–30 is not this difference; rather, reference to a difference here marks a resumption of the main topic, the difference between two kinds of consequence. The train of thought would, then, be from the

opponents stand accused of ignoring the difference between two ways in which the second proposition can follow the first in a conditional, by assuming that there is only one: namely, elimination. The difference is illustrated by the now familiar inferences from motion to void and from the mortality of human beings in our experience to the mortality of human beings everywhere. The passage concludes with the remark that the inconceivability is the same in both cases. This comes as a surprise after the pains taken by the Epicureans to distinguish the two forms of inference. But the view that the inconceivability is the same in both cases could have been held by an Epicurean who regarded elimination and similarity as two distinct methods, both of which give rise to inferences satisfying the inconceivability requirement. Though the connections exploited by the corresponding conditional are different, it would, then, be equally inconceivable that the second fail to hold when the first does in both cases. And even if the claim is a mistake of the opponents to which the Epicureans, object,[37] the Epicureans' objection would seem to be to the opponents' suggestion that the inconceivability was indistinguishable, not to the view that it applies in both cases.

Perhaps, then, implications true by elimination should be regarded as a special case of inconceivability.[38] And this appears to be confirmed by the claim earlier in the same part of the *De signis* that inconceivability, not elimination, is the best criterion of the conditional (XXXII. 31–XXXIII. 9 (ch. 50)). For the Epicurean complaint here seems to be that their opponents have conflated one of two types of true conditional with the test of the truth of all conditionals, with the result that they reject conditionals not satisfying the elimination account, thereby needlessly forgoing the many inferences based on implications true in virtue of similarity. The criterion of inconceivability is best, then, because it captures all and only the true conditionals, not merely a proper subset of them.[39]

opponents' failure to grasp the difference between the two forms of consequence to a corresponding failure to understand the difference between two ways in which the second proposition of a conditional follows the first.

[37] Cf. Sedley, 'On Signs', 260 n. 53.

[38] If so, the instinct that led Philippson, *De Philodemi libro*, 41–2 with n. 7, to treat elimination as a species of inconceivability was sound, though he went too far when he made the difference between the two a matter of probability.

[39] The remark with which the passage concludes that the opponents do not lock down the inferences captured by elimination by any other means that inconceivability (XXXIII. 7–9)—could be taken to make the point made in several other passages: namely, that elimination ultimately depends on the method of similarity for the hypothetical connections between the items it exploits (cf. Sedley, 'On Signs', 260). But I am inclined to think that it means that the conditionals to which elimination applies are, like those produced by similarity, which is not mentioned here, true when, and because, they satisfy the inconceivability criterion (cf. XV. 37 (ch. 21)).

The problem of how to understand the contrast between inconceivability and elimination, on the assumption that the latter is equivalent to the Stoic criterion of the conditional, connection, remains, however. If elimination is connection, when the opponents reject the Epicurean inference from the mortality of human beings in our experience to the conclusion that human beings, wherever they may be, are mortal, they mean to deny that the negation of this conclusion is incompatible with the evidence from which it is said to follow. The truth expressed in the observational claim does not, on their view, exclude the possibility that things may be different elsewhere; or if it does, it is owing to an implicit reliance on a premiss which goes beyond the experience from which the Epicureans make their inference: namely, that the human beings in our experience are mortal *qua* and in so far as they are human. But if this is so, they are hardly likely to have conceded that it is nevertheless inconceivable that this conclusion fail to obtain if the evidence is true. Surely, they would have held that it is conceivable. On the other hand, it is hard to see why, if elimination is connection, the Epicureans did not contest their opponents' claim that the implications exploited by similarity inferences do not satisfy the elimination test, together with the claim that it is conceivable that the evidence be such and the conclusion still not obtain.

The passage about inconceivability just examined affords some help by exposing a gap between the different claims that the Epicureans and their opponents were willing to make on behalf of elimination, behind which there may be a corresponding gap between the Epicureans' conception of elimination and that of their opponents (XXXII. 31–XXXIII. 9 (ch. 50)). It is clear from this passage that the opponents took themselves to be giving an account of the conditional, satisfied by all and only true conditional propositions. The Epicureans, on the other hand, demote it to an account applying to some true conditionals, on a level with the method of similarity; each captures a distinct set of true conditionals. What the two accounts have in common, and what makes the conditionals to which they apply all true in the last analysis, is that they satisfy the test of inconceivability. As we have seen, the Epicureans believe their opponents go wrong by taking a sufficient condition for being a true conditional to be necessary as well. In view of the difficulties we have had distinguishing the Epicurean criterion of inconceivability from elimination, when it is understood as connection, the possibility should be considered that elimination, as it is understood by the Epicureans in *De signis*, is a relation narrower than the one the Stoics intended to capture with '*sunartēsis*'.

There is evidence suggesting that it might be in a passage discussing contraposition that we have already discussed. After explaining that elimination applies when, by the elimination of the second, the first is

co-eliminated as well, Zeno immediately goes on to characterize similarity and the inconceivability to which it gives rise in these terms (XII. 14–30 (ch. 17)):

> . . . but sometimes not in this way [by elimination] but because of the very inconceivability of the first being, or being of this kind, but the second not being, or not being of this kind: for instance, 'If Plato is a man, Socrates is a man too'. For given that this is true, 'If Socrates is not a man, Plato is not a man either' comes out true as well, not because by the elimination of Socrates Plato is co-eliminated, but because it is impossible to conceive of Socrates not being a man but Plato being a man. And that belongs to the similarity method.[40]

If elimination is equivalent to Stoic connection, it is hard to see anything more than a logical blunder here. When a conditional is composed of two existential propositions, it is easy enough to switch from speaking of the elimination of the items whose existence is asserted to talk of the negation of the propositions in which their existence is asserted.[41] But the logical form of the similarity implication cited as an example by Zeno does not permit such a straightforward translation into the idiom of item elimination. As he rightly notes, to say that if Plato is a man, it is inconceivable that Socrates not be a man, is not to say that Plato's existence is in any way dependent on Socrates'. But a proponent of connection would never maintain that it is. Rather, he would take the conditional at issue as equivalent to something like the following: 'If (Plato exists and he is a man), then not-(Socrates exists and he is not a man)'.[42] This conditional will satisfy the elimination account, understood as *sunartēsis*, if and only if the contradictory of its consequent—that is, 'Socrates exists and he is not a man' –is incompatible with the antecedent, which sounds like something the Epicureans should want to maintain. For what it is worth, the verb '*sunērtēsthai*' is used both of connections of similarity between evident and non-evident matters (XXXIII. 28 (ch. 51)) and of narrowly eliminative relations recognized as such by the Epicureans (XXXV. 5 (ch. 53)). Perhaps more significant is Zeno's answer to the opponents' argument from unique cases. One of their examples is the square of four, which alone

[40] The translation is that of Long and Sedley, *Hellenistic Philosophers*, i. §18F, 4–5, and it takes up immediately where the quotation above on p. 323 leaves off.

[41] Cf. Sedley, 'On Signs', 243. The De Lacys' awkward rendering 'the denial of Socrates', 'the denial of Plato', brings out the difficulty; one expects a that-clause to be denied, rather than an object. Dumont, 'Confirmation', 288, takes the passage to be about the co-elimination of 'the attribution of "man" to Plato' by the elimination of its application to Socrates, but there is nothing corresponding to 'the attribution of man' in the text. The assumption that relations between propositional items and their truth-values are at issue is natural enough, but is it right?

[42] No special weight is to be placed on precisely this way of analysing the conditional. What is essential is that the conditional proposed by Zeno be seen to be something like this order of logical complexity.

has a circumference equal to its area (I. 30–2 (ch. 3)). Zeno maintains that this distinctive characteristic, far from posing a problem for the method of similarity, is, on the contrary, discovered by experience. Anyone who takes away this variation among squares of four is in conflict with the phenomena (XV. 19–25 (ch. 21)).[43] It would be ridiculous, he continues, for someone making a sign inference from what is manifest to be in conflict ([μά|χε]σθαι) with what is manifest. Thus Philodemus is willing to use the language of 'taking away' and 'incompatibility' in connection with a similarity inference, and he immediately goes on to connect the inference described in these terms with inconceivability (XV. 26 XVI. 1 (ch. 21)).

To be sure, it may be that incompatibility and inconceivability could have been distinguished so that someone could consistently maintain that it is inconceivable that the consequent does not necessarily obtain when the antecedent does, while denying that the contradictory of the consequent of this conditional is incompatible with its antecedent. But such a distinction would have been a rather subtle one, requiring some explanation. As things stand, it is hard to see why an Epicurean who held that it is inconceivable that the first obtain while the second does not would not also want to maintain that the contradictory of the consequent is incompatible with the antecedent. There is, in other words, no obvious reason why a commitment to similarity could not be combined with an acceptance of the connective account of the conditional. A proponent of the connective account who wished to reject similarity implications, on the other hand, would not, as Zeno implies, do so on the ground that, for example, the elimination of Socrates leaves the existence of Plato unaffected, but rather because, on his view, the contradictory of the consequent of the more complicated conditional cited above is compatible with its antecedent. In sum, there is a question why, despite the fact that there is room for argument on this point, the debate is not about whether similarity implications satisfy the elimination account, but rather whether its failure to do so, which Zeno takes to be obvious, prevents them from giving rise to sound inferences.

We should, then, take seriously the suggestion that, at least to the Epicurean way of thinking, a narrower relation than that envisaged by the connective account of the Stoics is at issue, a relation in some way parallel to that of similarity and, like it, capable of supporting *some* of the conditionals satisfying the test of inconceivability. And we should also keep in mind that there is a difference to which the Epicureans are unlikely to have attended as much as they should between the question of what the

[43] αὐτοὶ γὰρ οἱ τετρά|[γωνοι ἀριθμμοὶ] πάντες ἐκ πείρας [βεβασανισμένοι] ταύτην αὐ|τη[ν τὴν διαφο]ράν ἐν αὐτοῖς | ὑπά[ρχο]υσα[ν π]αρεδειξαν, ὥσ|τε τὸν ἀν[αιρουν] τ᾽ αὐτὴν *μά|χεσθαι* τοῖς ενα[ρ] γ[έ] σι.

conditions that must be satisfied by a pair of propositions, P and Q, if they are to be the antecedent and consequent of a true conditional, are and the question how one comes to grasp 'if P then Q' as true. If, as I have already suggested, it was the latter question which most gripped the Epicureans, then the relation in question should, like similarity, help answer this more epistemologically oriented question. It should be a relation that it is within the power of human beings to grasp, and by grasping which one at the same time comes to see that the conditions that must be satisfied by a true conditional are fulfilled by 'if P then Q'.[44] But what might that narrower relation be? The almost universal tendency has been to conclude, or at least consider the possibility, that elimination applies to causal-explanatory inferences, roughly speaking from outcomes to their causally necessary conditions.[45] The inference from motion to void cited throughout the *De signis* satisfies this description.[46] And just such a causal connection seems to be at issue in a passage already cited from the fourth part of the *De signis*, where two forms of consequence (*akolouthia*) are contrasted (XXXVII. 1–12 (ch. 57)):

> And because some unperceived things follow on appearances in such a way as to have a unique connection with them, since all appearances are products of elements or things made of elements or are conjoined with them in some other way—and for that reason it is judged that they are eliminated if the elements are not posited—, our opponents formulate after this pattern the consequence of the unseen on the seen; but since there is consequence in another way, as when there is similarity or analogy with similar or analogous things.[47]

But the suggestion that elimination is at bottom a causal relation is confronted with a difficulty from the start. It is clear that the opponents took

[44] The first person plural in Philodemus's account of the test of the true conditional may not be without significance (XXXIII. 1 7 (ch. 50)): 'the best test of the true conditional and the proper sign [is] when *we* are not able to conceive that the first obtains and the second does not and conversely' (my emphasis).

[45] Bahnsch, *Des Epicureers Philodemus*, 9 10; Philippson, *De Philodemi libro*, 39, 42; Barnes, 'Epicurean Signs', 100; Asmis, *Epicurus' Scientific Method*, 201; Sedley, 'On Signs', 261.

[46] If the opponents are Stoics, they cannot have accepted the inference, for they held that there is no void space within the cosmos, and that motion nevertheless takes place within it. Curiously, the inference is cited in other contexts which show familiarity with Stoic logic. Whether this is evidence for the existence of a logically minded group of Epicureans, as J. Mau, 'Über die Zuweisung Zweier Epikur-Fragmente', *Philologus*, 99 (1955), 93–111, argues, is disputable (though there are traces of Epicurean interest in proof theory; cf. Sext. Emp. *M* VIII. 337); but in the *De signis*, at least, the example seems to be accepted for the sake of argument as one to which the elimination account would apply were it a valid inference in the first place. That is, the Stoics, if the opponents were Stoics, could have allowed the inference to enter the argument because the Epicurean account of why it goes through would, if true, have qualified it as an elimination inference (cf. *Ep. Hdt.* 40).

[47] The De Lacys' trans. slightly altered.

the elimination account to apply to the inferences, discussed several times in the *De signis*, from '*qua*' or 'in so far as' premisses (IV. 11 (ch. 6), XXXV. 3–4 (ch. 52)). And many of these inferences—for example, that from the mortality of human beings in our experience in so far as they are human beings to the conclusion that human beings everywhere are mortal—do not immediately fit the causal-explanatory pattern exemplified by the inference from motion to void. Matters are made still more difficult by the fact that the Epicureans appear not to have conceived the inferences in dispute as their opponents did. They tend to evade those of their opponents' arguments that point to a broader conception of elimination by bringing it closer to the connective account of the conditional. For they appear to treat elimination as the means by which the truth of the proposition from which the opponents maintain the inference must proceed is to be grasped, rather than regarding it as an account of the truth of all conditionals, in particular of the conditional corresponding to the inference at issue. Thus, for example, the Epicureans represent elimination as their opponents' preferred test of the truth of the proposition 'Human beings are mortal *qua* and in so far as they are human beings' rather than of the conditional of which this is the antecedent and whose consequent is 'Human beings everywhere are mortal' (IV. 10–13 (ch. 5), XXIX. 4–12 (ch. 45)).[48] Thus their response, that the point of departure proposed by the opponents, 'Human beings are mortal *qua* and in so far as they are human beings', cannot be *confirmed* or *established* by elimination (however much it may satisfy the eliminative account), but must itself be the conclusion of an inference by similarity (XVI. 31–XVII. 11 (ch. 24)), though a potentially fair epistemological point, fails to confront the logical point of their opponents if those opponents are defending a connective account of the conditional. At best, then, the extension of the concept of elimination agreed upon for the sake of the argument satisfies the description 'causal-explanatory', but it cannot be what the opponents *meant* by elimination, or how the Epicureans—to the extent that they allowed that it applied somehow to the *qua* inferences or statements—understood it, even if they saw causal-explanatory relations as its sole semiotically interesting application.

But if the narrower relation for which we are looking cannot be a causal-explanatory one in this way, the stress on causal connections in the *De signis* may, none the less, have put us on the right track. I should like to suggest that, at least in the context of the *De signis*, elimination is best understood as a relation between items that are in the first instance non-propositional (and not propositions and their truth-values), of which that

[48] XXXV. 3–4 (ch. 52) is neutral, but compatible with this view.

between outcomes and their necessary causal conditions is only the most conspicuous and semiotically useful example. Such a relation between two items holds precisely when, by the elimination of the second, the first is co-eliminated, just as it is put in the *De signis*. It holds between an outcome and its causally necessary conditions, to be sure, but also between an object and each of its essential properties and between pairs of necessarily co-instantiated properties. Such an account of elimination would apply to relations of the kind exemplified by that holding between motion and void (on the Epicurean view) as well as those expressed in *qua* propositions. As required, it conspicuously fails to hold of similarity relations. And in many cases at least, it can be seen to obtain by a kind of thought-experiment which brings to light the inconceivability essential to the conditional according to the Epicureans. What is more, this understanding of elimination also exhibits some affinities with philosophical applications of elimination outside Philodemus and Epicureanism, especially when the term '*anairein*', also used by Philodemus, is allowed to capture the same notion (cf. XII. 7–12). Elimination was applied by Aristotle, and in the Pyrrhonian tradition, as a test of conceptual dependence, mutual in the case of relatives like father–son or double–half, unidirectional in that of items related as posterior to prior like human being–mammal.[49]

But viewed in this way, elimination cannot be identified with the Stoics' connective account of the conditional. For connection is a logical relation between the component propositions of a conditional that obtains *whenever* the second follows the first. It was presumably intended to capture relations between outcomes and their causally necessary conditions when properly formulated as conditionals, but it was not confined to them or the broader class of eliminations just described. If you will, the causal relation between non-propositional items to which elimination applies supports a logical relation of consequence between propositions that is captured by connection but which also obtains in cases where sub-logical relations of the kind to which elimination applies are absent. But if elimination cannot be identified with connection, then either the Epicureans' opponents are not Stoics who adhere to this view or the view of elimination with which they are saddled is a distortion of their real position.

In view of the circumstantial evidence pointing to the Stoa, the second

[49] Cf. Sedley, 'On Signs', 246 7 with nn. 22 and 23; Barnes, 'Epicurean Signs', 131, additional note C. There is of course nothing about the terms '*anaskeuazein*' and '*anairein*' or the basic idea of 'taking-away' that they express that makes them inapplicable to the negation of propositions, and '*anairein*' is used by Galen in just this way in his account of the relation of deficient consequence (or contrariety) between two propositions (C. Kalbfleisch (ed.), *Institutio Logica*, x (Leipzig: Teubner, 1896), 9) and throughout Arist. *Top.*

possibility merits serious consideration.[50] And although a conclusive resolution of the issue is probably impossible, I should like to suggest that an explanation along these lines is a plausible solution to some of the difficulties presented by the *De signis*. For the mistake it imputes to the Epicureans is not an unnatural one: to see a deep disagreement about the nature of consequence, when the real disagreement between them and the Stoics, if it is they, was over which inferences fell under the concept's extension.[51] As we noted earlier, on this view, the Epicureans might have done better to contest the opponents' claim that similarity inferences do not satisfy the elimination requirement. For it would not obviously have been out of place for an Epicurean to argue that careful study of the phenomena, in the course of which, as they put it, not a trace or spark of opposition has presented itself, shows that all claims about matters outside our experience representing them as dissimilar in certain respects are excluded because in conflict with our experience. Indeed, as we have already observed, they do sometimes speak in this way (XV. 19–25 (ch. 21)).[52] Such a mistake would have been that much easier, as the examples agreed upon for the sake of argument by both parties, such as the inference from motion to void, satisfied a description in terms of elimination, as the Epicureans understood it. Their mistake, then, would have been to pass illegitimately from the fact that the inferences admitted by the Stoic opponents were, in Epicurean terms, true by elimination to the conclusion that to be true by elimination in this way is what it is to be a true conditional according to the Stoics.[53] It may also have been a mistake to which

[50] That it is possible to take principles of Stoic logic intended to govern propositions as applying instead to subpropositional items is proved by the frequency with which it has been done. As an example of the first indemonstrable, 'If the first, then the second. But the first. Therefore the second.' Ps.-Ammonius gives: 'If man, then animal. But the first. Therefore, the second' (*In an. pr.* 68. 25; I owe the examples to Mates, *Stoic Logic*, 2 n. 4). Also worth considering in this connection are the totally hypothetical syllogisms, on which see I. M. Bochenski, *La Logique de Théophraste*, Collectanea Friburgensia, NS 32 (Fribourg en Suisse: Librairie de l'Université, 1947), 111–16, esp. 114. It is also telling that Natorp, *Forschungen*, 241, with this passage of Philodemus in view, takes the Stoics to require: 'ist A, so ist auch B, denn wäre nicht B, so würde A nicht sein; oder, die A als A (sofern sie A sind) sind B, also sind alle A B': elsewhere he takes elimination to be the test of a 'beständigen Verknüpfung im Dasein' (p. 246). Clearly relations between subpropositional items rather than propositions are at issue. Though this is a mistaken reading of Stoic views on the conditional, it is, I should like to suggest, the right way to understand elimination in the *De signis*.

[51] This would explain Demetrius's identification of the opponents' failure to understand the relation between elimination and similarity as their most significant and pervasive error (XXVIII. 15 (ch. 45)), for he seems to be chiding them for taking the Epicurean' inferences as failed attempts to produce elimination inferences, when, as he sees it, they obviously do not satisfy the elimination requirement, but are perfectly good inferences all the same, because they do satisfy the similarity account (XXVIII. 15–25 (ch. 45)).

[52] Cf. n. 43 above.

[53] Cf. Natorp, *Forschungen*, 246, who seems to have done just this.

the Epicureans were predisposed, because they had already distinguished between inferences grounded in similarity and those based on causal connections for reasons of their own. In his exposition of atomic theory, Lucretius directs his readers' attention to the motion of dust motes visible in the rays of the sun, which affords an unusual example of a piece of evidence exemplifying both semiotic relations. It is, he tells us, an image and simulacrum from which we may infer (*conicere*) the behaviour of the invisible atoms, which are also in perpetual motion; but, he immediately goes on to add, this phenomenon is still more worthy of attention, for the visible motion of the dust motes signifies the hidden motion of the atoms because it is—to paraphrase freely—the necessary causal pre-condition of that motion (II. 112–41).

If this is right, the Epicurean argument against elimination is wide of the mark. Their cause was not advanced by their attempt to distinguish kinds of conditionals. Their real task was to vindicate the claim of a class of implications to be true. But the kind they make up is not a logician's kind, distinguished by an interesting logical feature; as we have seen, all the difficulties raised against similarity implications from the point of view of the connective account of the conditional could equally well be raised from that of inconceivability. The disagreement between the Epicureans and their opponents was less about the essential character of the relation of consequence than about when and where it obtains. But the argument just examined is only one of several brought by the Epicureans against their opponents, whom I shall treat, with reservations, as Stoics from now on. Let us now examine the rest of the Epicureans' case in the light of these conclusions.

V

The Epicureans resort several times to the charge that the opponents' arguments are self-refuting. Thus the source of the fourth section maintains that when the opponents argue on the basis of the unique phenomena already experienced that items outside our experience may differ from those within it, they employ the method of similarity themselves, and thus effect a reversal of their own position (*perikatōtropē*) (XXIX. 24–XXX. 15 ch. 46)). Zeno too lodges this complaint against the opponents (XI. 9–26 (ch. 16)), and he objects to their argument that the sun is not, as Epicurus maintains, about as large as it seems because, like other rapidly moving objects, it can appear very slowly from behind an obstacle only if it is very large, on the grounds that it employs the method of similarity (X. 20–6 (ch. 15)). In a similar way, Sextus Empiricus reports that the Pyrrhonists'

arguments against sign inference and demonstrations were said by their opponents to be instances of sign inference and demonstration, and thus to undermine themselves (*M* VIII. 278, 281–2, 480–1). But, as their response showed, it is a treacherous weapon. For the opponents may reply, as the sceptics often did, that, on the assumption that the method of similarity is sound, which they have adopted only for the sake of argument, it follows that it is unsound, so that the charge of self-refutation can be levelled with more justice against the method of similarity itself. The Epicureans may not have grasped the dialectical character of their opponents' argument.[54]

More promising is the argument that specific inferences to which the opponents *are* committed depend on similarity. Philodemus maintains that the opponents' own arguments that human beings are receptive to wounds, illness, old age, and death, and that there are no Pans and Centaurs, employ the method of similarity (XXXI. 23–36 (ch. 48)). But the Epicureans do not seem to have pursued this line of argument, probably because their attention was focused on a less anecdotal, more systematic argument in the same spirit. As we have already observed, they repeatedly charge that their opponents' preferred method, elimination, is wholly dependent on the method of similarity, so that attacks on the latter threaten to demolish the former as well. The point is especially clear in the part of the *De signis* due to Zeno. According to him, the method of similarity pervades that of elimination, which is, he maintains, confirmed or secured by similarity (VII. 8–11 (ch. 10)). He returns to this point in the next column, where he explains in some detail how the inference from motion to void, which he accepts as a genuine instance of sign inference by elimination, ultimately derives its cogency from the method of similarity (VIII. 21–IX. 9 (ch. 13)). It exploits a necessary connection between motion and void, so that the first is impossible without the second. But, according to Zeno, we come to grasp this relation by seeing that there is space in all cases of motion in our experience. As a result of our appraisal (*epilogismos*) of these cases, we judge that all moving objects move in similar conditions, and we infer (*sēmeioumetha*) that motion is impossible without void.[55] In other words, the necessary connection between motion and void exploited by the elimination inference from the existence of motion to that of void is itself the conclusion of a sign inference by similarity from the behaviour of moving objects in our experience to that of moving objects in any place and of any size.

[54] Cf. De Lacys (eds.), *Philodemus*, 103 n. 40.

[55] About '*epilogismos*', cf. M. Schofield, '*Epilogismos*: An Appraisal', in M. Frede and G. Striker (eds.), *Rationality in Greek Thought* (Oxford: Clarendon Press, 1996), 221–37.

The source of the fourth section holds a similar view (XXXV. 35–XXXVI. 7 (ch. 53)), but, as we have seen, he disagrees with Zeno about the implications which the priority of the similarity method holds for the standing of elimination; at least some of the time he appears to withhold the status of a sign inference from elimination inferences altogether (XXX. 37–XXXI. 1 (ch. 47)). We should now be in a better position to understand why. The first thing to notice is how similar elimination inferences and so called *qua* truths are on the Epicurean view. Zeno maintains that *qua* truths—for example, that human beings are mortal in so far as they are human—are established through the method of similarity, not by elimination (XVII. 3–11 (ch. 24)). The point is made in considerably more detail in the fourth section, whose source immediately goes on to apply it to elimination inferences as well (XXXV. 4ff. (ch. 53)). The transition from *qua* relations to eliminative signs is somewhat obscure, but the train of thought seems to be this. First, the source argues that *qua* relations are established by the method of similarity. For example, as a result of surveying many and various human beings, who, though they vary in other respects, show no variation in respect of mortality, we come to see that humanity is inseparable from mortality in such a way that human beings are mortal in so far as they are, and *qua*, human beings. He then observes that a distinctive feature of these relations 'is not so in the case of things apprehended only through the elimination of the sign' (XXXV. 29–31 (ch. 53, trans. De Lacys). But, he immediately goes on to say that, even in these cases, the relation exploited in the inference is secured by the method of similarity, giving as an example the connection between motion and void and that between smoke and fire.

What is obscure is the distinctive feature said here to belong to *qua* relations but not to sign inferences by elimination. Clearly the difference is not that the first rests on similarity, while the second does not; according to this passage, they both do. What is more, semiotic relations like that between motion and void are not distinguished from *qua* relations by the fact that *elimination* applies only to them. The passage is a response to the opponents' charge that the Epicureans' inferences are valid only if from a *qua* premiss, and that such inferences make use of the method of elimination (XXXV. 1–4 (ch. 52); cf. IV. 5–10 (ch. 6)). The Epicureans' answer does not deny that elimination applies to *qua* premisses, but, rather, insists that such premisses are secured by a prior application of the method of similarity, a feature that they share with relations of the kind exemplified by that between motion and void. What is secured by the method of elimination, if anything, is that void exists; but the relation between motion and void that supports this inference is secured by the method of similarity no less than *qua* relations are. *Qua* relations differ from those exploited

by elimination inferences, it seems, by belonging to one of the four types, discussed in the immediately preceding section, to which the expressions '*qua*' and 'in so far as' are applied (XXXII. 33 ff. (ch. 52)).[56] On the other hand, the feature that sets relations like those between motion and void and smoke and fire apart from *qua* relations is that they support sign inferences.[57] *Qua* relations do not support sign inferences; rather, they are the conclusions of such inferences.[58]

Similarity, then, gives rise to sign inferences that secure necessary connections, some of which, like that between motion and void, can in turn support further inferences by elimination. The sharp distinction between similarity and elimination inferences on which the Epicureans insist, and the priority they grant to the former, are natural in the light of this conclusion. This probably explains why the source of the fourth section objects to his colleagues', particularly Zeno's, way of characterizing elimination as dependent on similarity, on the grounds that it suggests that there are two methods of equal standing interwoven with each other, even if in so doing, they say virtually the same thing as he does (XXXI. 8–16 (ch. 48)). But how is his seeming willingness to speak of signs in connection with elimination to be reconciled with the apparently stronger claim, made a few lines earlier, that there is no correct method of sign inference besides that of similarity (XXIX. 37–8 (ch. 47))?

I offer the following speculative suggestion. The Epicureans embrace a conception of sign inference according to which it is the means by which conclusions with theoretical significance are inferred from the starting-points afforded by observation. That human beings are mortal *qua* human, that they are mortal wherever they may be, or that motion is impossible without void, are all conclusions of the required type. Some of them will involve truths about items lying outside the reach of direct observation, so-called theoretical entities; others will be about observable items, but about them *qua and* in so far as they are of a certain nature. In either case, to grasp such a truth is to grasp a truth that goes beyond what is given in experience, but one which must ultimately be derived from experience. To the Epicurean way of thinking, the method of similarity is alone capable of inferring theoretical conclusions of this kind from the

[56] Cf. Barnes, 'Epicurean Signs', 120–3, for a full discussion of the varieties of *qua* truth distinguished in this passage.

[57] The Epicureans' claim to make sign inferences in accordance with each of the four varieties of *qua* statement then refers to the conclusions of the sign inferences (XXXIV. 27–9 (ch. 52)).

[58] On this point I agree with A. A. Long, 'Reply to Jonathan Barnes, "Epicurean Signs"', in J. Annas and R. H. Grimm (eds.), *Oxford Studies*, 140–3, who rejects Barnes's view that the Epicureans 'agree with their opponents that valid sign inferences must sometimes rest on *qua* truths' (pp. 120–1).

starting-points afforded by observation, such as that human beings in our experience are mortal, or that objects move in our experience only when there is space into which they may move. If the function of a method of sign inference is to effect semiotic transitions of this kind, elimination inferences will not qualify. It may appear that the inference from motion to void belongs alongside that from the mortality of human beings in our experience to the mortality of human beings wherever they may be. But on the Epicurean view, the existence of void does not follow from the phenomenon of motion alone, but from that phenomenon taken together with the fact that motion is impossible without void; whereas the mortality of human beings always and everywhere does follow by similarity from the phenomena alone, without any further assumptions which themselves need to be inferred, as does the extra assumption on which the first inference depends. The implication of void by motion, then, belongs alongside the *conclusion* that human beings wherever they may be are mortal, rather than the inference by which this conclusion is inferred.[59]

Perhaps this is part of the point of Fragment 1, where Philodemus seems to say that the composition or construction (*sunthesis*) of sign inferences does not come about by elimination, but is grasped through the sense impressions (*phantasiai*) that lend themselves to this purpose (1–6).[60] At all events, it appears to be the point of the passage near the beginning of the fourth section where the term 'composition' also occurs in the explanation of the source's refusal to countenance any method of sign inference apart from similarity (XXX. 33–XXXI. 8 (ch. 47)):

> But our opponents, in attempting to discredit the method of sign inference according to similarity, render all non-evident matters unsignified. For there is no correct method of sign inference other than this. But although (*ei kai*) the leading signs (*ta proēgoumena tōn sēmeiōn*) are sometimes dissimilar and sometimes even opposite, of necessity they receive the composition (*sunthesis*) proceeding in accordance with the method of similarity if they are about to demonstrate, as we established in the earlier account.

The passage is a cryptic one, but I should like to suggest that it makes the most sense if viewed as concerned with the method of composing or constructing sign inferences. In it the Epicurean claim that similarity is the sole method of signification is, as it seems, supported by the further claim

[59] But why is the Epicurean method of similarity not itself dependent on just such an assumption: viz., as the opponents suggest, that matters outside our experience are similar to those within it (II. 25 ff. (ch. 5))? The account of how experience gives rise to inconceivability is the Epicureans' answer.

[60] Cf. Philippson, *De Philodemi libro*, 33, on whose restorations the text printed by the De Lacys depends (id. 7; 'Zur Wiederherstellung', 12). 'That lend themselves to this purpose' is my guess at the meaning of φαν|[τασιῶν] τῶν τὰς χρείας ἀποδι|[δουσῶν.

that, even in conditions that suggest otherwise, the composition of the sign inference is in accordance with similarity. Every sign inference, then, is put together in accordance with the method of similarity.

But is every genuine sign inference in turn a similarity inference? It all depends on the circumstances, a fact that suggests that similarity is not the only method of signification. The principal difficulty is the reference to 'leading signs'. It is usually assumed that the term is being used in a technical sense, but that sense has long puzzled interpreters.[61] It occurs in three other passages in the fourth section (XXXII. 2 (ch. 49), XXXVI. 19 (ch. 55), 33–4 (ch. 56)).[62] In the second of these, Philodemus's source warns against the danger of ignoring the variety of leading signs: for, he continues, had the opponents paid proper attention to it, 'they would never have judged it right to make use only of those signs which are eliminated if the non-evident fails to obtain' (XXXVI. 17–24 (ch. 55)). Are the signs they are led to neglect in this way those linked to the matters they signify by similarity? If they are, leading signs should embrace examples of both the elimination and the similarity types. The impression that they do is strengthened by the first of the three passages (XXXI. 36–XXXII. 8 (ch. 49)).

> They disregard the fact that we do not say that all things are signified by similarity when the leading is taken as a sign, but some only. Thus they ask in cases of elimination what sort of similarity we have, as though they will not be asked in the case of similars how elimination applies, and even more in the case of opposites.[63]

Surprisingly, this passage appears to put sign inferences by similarity alongside those that proceed by elimination. The opponents are pictured as pointing to sign inferences by elimination, and asking the Epicureans to identify an element of similarity in them. Presumably these are inferences that the Epicureans accept, such as that from motion to void and that from smoke to fire. The Epicurean response is to observe that the opponents could be asked with equal justice to explain how elimination applies in cases of sign inference by similarity.[64]

[61] Cf. De Lacys (eds.), *Philodemus*, 121 n. 95; Sedley, 'On Signs', 262 n. 55.

[62] I assume that '*proēgoumenon*' and '*proēgētikon*' are synonymous, but perhaps this is not so (cf. De Lacys (eds.), *Philodemus*, 123 n. 98).

[63] As Sedley, 'On Signs', 262 n. 55, notes, a translation with a different emphasis is possible: 'They overlook the fact that we do not say that all sign-inferences by similarity are made by apprehending the *antecedent* (*proēgoumenon*) sign, but only some.' But this suggestion is motivated by the conviction that the fourth section does not countenance eliminative signs, against which I have already argued. What is more, the rendering I have adopted seems to fit the immediately following lines better. I do not know, however, what to make of the reference to opposites, or whether it is to be connected with the reference to opposites in the preceding column (XXXI. 3 (ch. 47)).

[64] Presumably, the inferences they have in mind are or should be accepted by their opponents: in the next column, in an argument already mentioned, the Epicureans point to similarity inferences to which, they claim, the opponents are committed (XXXI. 26–35 (ch. 48)).

The circumstances suggesting that similarity is not the sole method of signification mentioned in the preceding column seem, then, to be precisely those adduced by the opponents here: namely, that some leading signs are not linked to the matters they signify by a relation of similarity, but are dissimilar or even opposite to them. Motion is not similar to void, smoke is not similar to fire. (The paucity of examples makes it hard to give an example of a sign which is the opposite of the matter it signifies.) According to the source of the fourth section, the proper Epicurean response is that even in these cases the *composition* of the sign inference is by the method of similarity. These should be cases in which the connection on which the inference depends, though it satisfies the elimination account, is secured by the method of similarity. If this is right, then the source of the fourth section allows talk of 'signs' in connection with elimination inferences. What he denies is that there is a *method* that makes possible the composition of sign inference apart from similarity; his complaint against his colleagues is that they suggest that there are two *methods* of sign inference with their talk of dependence.[65] Such a position is perfectly consonant with the Epicurean view that, though it applies to some inferences, elimination does not by itself give rise to, or secure, inferences. Suppose we make a gift of the notion of a complete or autonomous sign inference to the source of the fourth section. Such an inference must win new knowledge by inferring a conclusion from grounds which are known independently of inference. Similarity inferences satisfy the requirements by starting from the phenomena which are grasped non-inferentially by direct observation. Elimination inferences do not, because they fail to put their conclusions into an inferential relation with the evidence directly given in perception, but instead make assumptions that themselves need to be established by sign inference; when they are supple-

[65] Here I am inclined to agree with Philippson, 'Zur Wiederherstellung', 38, and disagree partially with Sedley, 'On Signs', 262 n. 55, that the emphasis is on 'method' rather than 'sign inference' here; but the matter is a complicated one. The term 'sign' is used several times in the fourth section, in connection with elimination inferences, in a way that makes it hard to view them merely as quotations of the opponents, and the verb form '*sēmeiousthai*' seems to me to be used of elimination inferences at XXXI. 38 (ch. 49)). But the term 'sign inference', or a sense of it, may be restricted to similarity inferences. Such an assumption might help to explain the otherwise puzzling argument at XXXVI. 4 ff. (ch. 56). There Philodemus's source accuses the opponents of going astray by failing to take account of the fact that the expression 'sign' is used sometimes of the phenomenon with reference to which the sign inference is composed, and sometimes of the sign inference itself. Struck by the difference between leading signs (actually leading *enargēmata*) and the non-evident matters they signify, the opponents mistakenly do away with the method of similarity by confounding the two—i.e. presumably the two senses of 'sign', the sign proper, which is unlike the signified, and the sign inference, which in the last analysis is by the method of similarity. If this is right, even though motion is a sign of void, the transition from motion to void must in the last analysis be viewed as part of a sign inference by similarity.

mented so that the eliminative relations they exploit are shown to follow from the phenomena, the complete inference produced in this way is by similarity. According to the Epicureans, the opponents' mistake is to suppose that elimination provides direct epistemic access to eliminative inferences, when it merely characterizes a relation exploited in those inferences that must be grasped by means of similarity.[66]

VI

Although, on this view, the Epicurean position promises to infer all the conclusions that Epicurean theory requires from the evidence afforded by experience alone, it should be regarded as a form of empiricism only with the most serious reservations. As we have already noted, Epicurus's conception of experience is far too rich to qualify as empirical in any but the loosest sense. The Epicureans of the *De signis* seem sometimes to take a similarly generous view of what is given by experience; their reply to the opponents' argument that the method of similarity licenses inferences to conclusions which the Epicureans reject—for example, that atoms have colour or are perishable—is a case in point (V. 1 ff. (ch. 19)). For they insist that it is not *qua* body that observable bodies have these features; observable bodies, they maintain, are perishable in so far as they participate in a *nature* opposed to the corporeal: namely, void. Speaking of a thing's nature or its possession of properties *qua* thing of a certain kind in this way is of course out of bounds to a strict empiricist, and the Epicureans' appeal to these notions here might seem to lay them open to the charge that their inferences must take their start from premisses stating *qua* truths, a contention which they are elsewhere at pains to reject by treating such propositions as the conclusions, rather than the premisses, of similarity inferences (cf. XXXIII. 24 ff. (ch. 51)). The Epicureans' account of how the properties that can legitimately be projected become salient in the course of the right kind of survey of the phenomena was meant to lay concerns of this kind to rest, but their opponents were surely right to press the Epicureans to clarify just how they proposed to divide the labour of establishing non-evident truths between a generous conception of experience and an optimistic view about the powers of inference.

[66] If this is right, Demetrius is the odd man out when he remarks (XXX. 4 ff. (ch. 45)): 'it is an error not to have perceived that the description "in so far as this thing is of this description" . . . is not in all cases captured through elimination but many are captured also through similarity, as for example, that the man who has been beheaded, in so far as he has been beheaded, since his head does not grow again, dies' (trans. De Lacys), for this seems to indicate that some *are* captured by elimination (cf. Sedley, 'On Signs', 240 n. 3).

Nevertheless, the distinctive character of the Epicureans' position in the *De signis* emerges most clearly from a comparison with more strictly and self-consciously empirical positions defended in antiquity. Such a view is prominently on display in a well-known pair of passages in which Sextus Empiricus discusses sign inference, fulfilling half of his promise to treat the transition to the non-evident by means of signs and proofs that was our point of departure above (*PH* II. 97–133; *M* VIII. 141–299). Sextus organizes his discussion around an opposition between commemorative and indicative signs. In his words, an indicative sign signifies that of which it is a sign by its own nature and constitution (*PH* II. 101; cf. *M* VIII. 154). The outlook that finds expression in this conception of sign inference can fairly be viewed as a version of rationalism. It crucially relies on a rational faculty by means of which the underlying nature of things can be grasped, and it puts the insights afforded by this faculty to work in inferences that extend knowledge into regions beyond reach of direct observation. In the same way, a form of empiricism seems to lie behind the commemorative sign, which Sextus defines as (*PH* II. 100; cf. *M* VIII. 152) '[an item] which having been evidently co-observed with the signified, together with its occurrence when the signified matter is non-evident, leads us into a recollection of what was co-observed with it but is now not manifest'.

Despite appearances, it is clear from the broader context of these passages that the commemorative and the indicative sign were not intended to complement each other within a single unitary position. The partisans of the commemorative sign repudiate indicative signification, and deny that there is a rational faculty with the power to draw inferences about matters beyond reach of observation. On their view, human knowledge is confined to what is given in experience, strictly construed, and what can be projected on the basis of observed relations of conjunction and sequence among events. The connections established in this way are purely empirical correlations, which have no part to play in rationally satisfying causal explanations. The sign inferences they support are capable only of putting us in mind of other observable matters with which they have been connected in experience; why matters exhibit the patterns of sequence and conjunction that we observe—where this is a question of the underlying nature of things, which would explain at the same time as it makes necessary this behaviour—is a question about which they are and must remain silent.

As it happens, there are excellent reasons to believe that the distinction between commemorative and indicative signs had its origin in a dispute between the ancient medical school of self-styled Empiricists and the more heterogeneous group of medical theorists they polemically designated as

Rationalists.[67] Readers of Philodemus have often been struck by the affinities between the Epicurean view he defends and the position of the medical Empiricists.[68] Thus, like the Empiricists, Philodemus speaks frequently of *epilogismos*; he distinguishes between one's own experience (*peira*) and the testimony of others (*historia*), just as they did between autopsy and history (XVI. 35–7 (ch. 24); cf. e.g. Galen, *De sect. ingred.*, SM III. 3. 19–20 Helmreich[69]); and the transition according to similarity of which the Epicureans speak at least sounds very much like the transition to the similar, the method by which the medical Empiricists generate suggestions about how to treat new cases unlike those of which they have had past experience.[70] But most significantly, once we have realized that the paradigmatic Epicurean sign inference is not from motion to void, but rather from the co-occurrence of motion and space in our experience (VIII. 33–5 (ch. 13), XXXV. 35 (ch. 53)), it become clear that the Epicureans and Empiricists share a conception of sign inference that assigns the crucial part to the projection of observed regularities. Both schools also agree in rejecting the view that reason affords direct insights into the underlying necessary natural connections of consequence and exclusion ultimately responsible for the observable features of the natural world. It is especially regrettable in view of these affinities that Philodemus's promise to discuss the views of some physicians about inference by similarity is not fulfilled in any of his surviving works (XXXVIII. 25 ff. (ch. 60)).

Yet Sextus Empiricus treats Epicurus as a partisan of indicative signification (*M* VIII. 177), and the inference from motion to void, and many other Epicurean inferences like it, would seem to be paradigms of the kind of reasoning rejected by the Empiricists as instances of empty rationalist speculation (cf. Galen, *De sect. ingred.*, *SM* III. 9. 6–7; 10. 5 10, Helmreich). The extent to which the two schools part ways stands out especially clearly in a passage where Philodemus treats the relation between motion and void and that between smoke and fire as alike secured by the method of similarity (XXXV. 8–XXXVI. 8 (chapter 53)). The latter is of course a favourite example of the commemorative sign (cf. Sext. Emp. *PH* II. 100; *M* VIII. 152); the former would be regarded by a

[67] Cf. my discussion in 'Pyrrhonism and Medical Empiricism', in W. Haase (ed.), *Aufstieg und Niedergang der römischen Welt*, ii. 37. 1 (Berlin: De Gruyter, 1993), 646–90.

[68] Cf. Philippson, *De Philodemi libro*, 44 ff., who goes so far as to hold that Zeno of Sidon was directly influenced by the Empiricists (p. 56); De Lacy, 'Supplementary Essay III: The Sources of Epicurean Empiricism', 154 ff.; M. Frede, 'An Empiricist View of Knowledge: Memorism', in S. Everson (ed.), *Epistemology* (Cambridge: Cambridge University Press, 1990), 225–50, at 241–2.

[69] G. Helmreich (ed.), *Scripta Minora*, iii (Leipzig: Teubner, 1893).

[70] Cf. Philippson, *De Philodemi libro*, 56; Natorp, *Forschungen*, 239 n. 2.

medical Empiricist as an indicative sign. In Epicurean terms, Empiricists confine sign inference to conclusions about matters that are indistinguishable from those affording it its point of departure, while the Epicureans themselves permit inferences to conclusions about matters analogous to the phenomena, which they describe as grasped by reason—precisely the description under which they are declared inaccessible to human knowledge by the Empiricists (XXXVII. 24ff. (ch. 58)).[71] What is more, although the Epicureans insist that some—indeed, the most basic and essential—sign inferences are not by elimination, and further, that even the eliminative inferences they accept are secured by similarity inferences, they agree that relations of elimination when grasped are grasped as necessary (cf. VIII. 30–IX. 2 (ch. 13), XII. 27 (ch. 17)). In other words, the Epicureans seem to deny only that there is a non-inferential grasp of necessary relations of the eliminative types; yet the method that infers these relations infers truths to which they are willing to apply '*qua*' and 'in so far as' in precisely the same way as their opponents. Nor, as we have seen, do the Epicureans show any trace of Empiricism's reluctance to speak of the natures of things (XV. 11 (ch. 20), XVIII. 1 (ch. 25), XXIV. 8 (ch. 39), XXVII. 24 (ch. 43), XXXIII. 17 (ch. 51)). All these features of the Epicureans' view point to an affinity with the Rationalist temperament; they would certainly have been viewed in this way by a medical Empiricist. The Epicureans of the *De signis* seem, then, to have combined features of rationalism and empiricism regarded by their adherents as irreconcilable. Setting out from starting-points to all appearances like those from which Empiricists proceed—though we have seen that there is room for doubt on this score—the Epicureans infer all the necessary, potentially explanatory connections a Rationalist could wish from a basis that he and his Empiricist counterpart agree is inadequate.

How faithful is this distinctive position to Epicurus? This issue has proved fertile ground for speculation, and strikingly different conclusions have been drawn: that the Epicureans of the *De signis* are to be credited with little or no originality or, alternatively, that Zeno was the inventor of an Epicurean logic.[72] As we have seen, the later Epicureans' commitment to broadly analogical modes of inference was not an innovation. Their defence of the claim that relations of similarity support conditionals was new, to be sure, but it merely served to make explicit the inferential use which Epicurus and his followers had already been making of similarity. The distinction between inference by elimination and by similarity may

[71] Cf. n. 38.

[72] Bahnsch, *Des Epicureers Philodemus*, 5, 37–8, holds the first view, Philippson, *De Philodemi libro*, 31 2 *et passim*, the second; his views about the uniqueness of Zeno are effectively criticized by Schmeckel, *Die Philosophie*, 338–9.

have had some basis in Epicurus's own teaching, but the later Epicureans seem to have turned to it with a new insistence (cf. Lucretius, II. 112–41). Their contention that all inferences to the non-evident were at bottom grounded in inferences by similarity was very likely new; their elaborate defence of it certainly was. The later Epicureans' most striking departure from Epicurus is not to be looked for in any of these developments, however, but rather in the range of similarity-based inferences they were willing to contemplate. The multiple explanations so prominent in Epicurus's own analogical reasoning are conspicuous by their absence in Philodemus, and it seems that this is not only a difference of emphasis, to be explained by accidents in the transmission of the Epicureans' writings. Indeed, taken together with the account of non-contestation in Sextus Empiricus, which makes it no longer applicable to the multiple explanations which were its *raison d'être* in Epicurus, their absence in the *De signis* makes it tempting to suppose that later Epicureans gave up or de-emphasized this most distinctive feature of Epicurus's own position.

Were they trying, even if only unconsciously, to render the views of their master more respectable, and if so, by whose lights was the Epicurean position to be made respectable? In view of the identification of the opponents in the *De signis* that we have accepted, the most natural answer would be the Stoics. Certainly it is reasonable to suppose that some of the other developments we have detected in the later Epicureans' views arose in the course of their controversy with the opponents to whom they owe their willingness to speak of conditionals. But this line of argument conceals several dangers. In the first place we must be on guard against imputing to the Stoics a position of the kind they seem to urge on the Epicureans in the *De signis*. This position has surprisingly little to tell us about the views of the opponents. It is significant that the example of the elimination method most frequently cited by the opponents is the inference from motion to void, which the Stoics did not accept.[73] Instead, it seems to have played the part of an inference acceptable to the Epicureans to which the elimination account would have applied if it—the inference—were valid in the first place, because the Epicureans believed that a relation obtains between the propositions 'There is motion' and 'There is void' which, were it in fact to obtain, would make the conditional 'If there is motion, there is void' true by elimination, when elimination is understood as connection. The opponents would then have been concerned more to show the Epicureans what their—the Epicureans'—position should be, given their commitment to certain inferences, than to compel the Epicureans to accept their—the opponents'—own inferences. It is not enough, however,

[73] Cf. n. 46.

to guard against ascribing this or other Epicurean inferences to the Stoics, for it is far from clear that the Stoics' disagreement with the Epicureans was confined to a particular set of inferences and their conclusions. They also seem to have placed considerably less confidence in the powers of inference to solve the problems in natural philosophy than the Epicureans did. As a result, they adopted a considerably more cautious attitude towards aetiology, sometimes resorting to plausible conjectures, on other occasions forgoing attempts at causal explanation and contenting themselves with a merely empirical account. Thus we find Strabo complaining that 'there is much aetiologizing and Aristotelizing in [Posidonius], which our people [the Stoics] shun because of the hiddenness (*epikrupsis*) of the causes' (2. 3. 8). According to Galen in his account of Chrysippus's views about the location of the ruling part of the soul, Chrysippus maintains that the issue cannot be resolved by direct inspection or by inference, and falls back in consequence on a battery of plausible but non-conclusive arguments based on etymology, mythology, and other considerations (*De plac. Hipp. et Plat.* 152. 23–7; cf. 170. 23–7; 220. 5–9, De Lacy[74]). About other matters Chrysippus was not willing to go even this far, urging us instead in the traditional terminology of the empirical arts, to remain silent about matters that stand in need of *experience* and *history* if we do not have anything stronger or clearer to say (Plut. *De stoic. repugnan.* 1047c).

This is not to say that there was no place in Stoicism for inferences from the evident to the non-evident (cf. DL VII. 52): only that a too exclusive focus on such inferences does justice neither to the methods of inquiry actually employed by the Stoics nor to their reflective understanding of those methods. But with this conclusion we seem to have returned to the difficulty that was our point of departure. Though it must be indebted to the leading Hellenistic schools of philosophy, the framework which divides epistemic labour between directly given evidence and the demonstrations and sign inferences which set out from it, and by means of which knowledge of the non-evident is won, accommodates the epistemological positions of those schools very imperfectly. We saw how it left Epicurus's distinctive reliance on multiple explanations out of account, and we have just seen how misleading and one-sided a picture it gives of Stoic epistemology. But this suggests that it may not be enough to point to the influence of a single school of opponents to explain the change whereby later Epicureans came to conform more closely to this framework by adopting a more straightforwardly inferential account of how theories are built up on the basis of directly given evidence. To cite the spirit of the age, on the

[74] P. De Lacy (ed. and trans.), *De Placitis Hippocratis et Platonis* (Berlin: Akademie-Verlag, 1978–80).

other hand, will do only as a stopgap. What is needed is a fully rounded picture of the thought of that age, one that draws on what we know of minor as well as major figures in and outside the ranks of professional philosophy. Only in this way can we hope to understand how certain assumptions about inference and the use of evidence came to seem so natural that they were no longer questioned even by the successors of figures like Epicurus who did not share them.