

Epicurean epistemology

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I Canonic

The two main issues of Epicurean epistemology may be put as follows: what is the foundation of knowledge; and how is knowledge built on this foundation? There is general agreement that Epicurus proposed to rely on sensory observations as a means of knowing what is unobserved. But there is much debate on the extent to which he proposed to rely on empirical observations, on what he took to be the basic objects of observation, and on how he proposed to proceed from sensory information to the discovery of what is not perceived by the senses.

It has been argued that Epicurus proposed to use empirical observation as the only means of determining the truth or falsity of beliefs. He set out two rules of investigation at the beginning of his physics requiring that the truth and falsity of beliefs rest entirely on sensory observations. The two rules consist of a demand for empirical concepts and a demand for empirical data. The latter consist of uninterpreted, or what may be called 'raw' or 'incorrigible', acts of perception. Epicurus proposed to infer all truths about the physical world and human happiness from this incorrigible foundation.¹

Against this interpretation, it has been held that Epicurus was not nearly as methodical in his use of empirical observations. Rather, he accepted many nonempirical claims, while proposing to support theories (much like Aristotle) by agreement with perception. Although he supposed that all perceptions are in a sense incorrigible, Epicurus singled out what are ordinarily called true perceptions as the basis for checking scientific theories. Thus he bolstered his atomic theories by adding empirical evidence, but did not propose a method for inferring physical and ethical truths solely on the basis of empirical facts.

The following discussion attempts to adjudicate between these two

interpretations. Epicurus' epistemology was considered problematic, even incoherent, from its very beginning. Epicurus' followers engaged in the debate and tried to strengthen his arguments. The polemics that ensued can be confusing. Yet there is enough novelty and brilliance about the Epicurean effort to encourage the modern investigator to sort out the ancient lines of inquiry and propose a reconstruction. For regardless of their answers, Epicurus and his followers advanced epistemology enormously by the way they framed their problems. Epicurus plotted the ascent from sensory experience to knowledge of the hidden structure of the world by distinguishing, in the first place, between what is 'evident' (ἐναργές) and what is 'nonevident' (ἀδηλον). The 'evident' is known immediately by sense perception and by preconceptions based on sense perception; the 'nonevident' must be inferred. Epicurus also drew a contrast between uninterpreted sensory information and belief, between ordinary and scientific concepts, and between conjectures and scientific conclusions. In elaborating these distinctions, he elevated epistemology into a major branch of philosophy.

The sources on Epicurean epistemology extend from Epicurus himself to Sextus Empiricus and beyond. Because relatively little is preserved of Epicurus' own writings, we must often resort to later reports, some of which are quite detailed. A basic point of difference among modern interpreters concerns the reliability of these later sources.

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Epicurus invented (so far as we know) the term 'canonic' (κανονική) to designate epistemology as a branch of philosophy. Etymologically, canonic is the science of using a 'measuring stick' or canon (κανών). It was the subject of a work by Epicurus, *Canon* (also called *On the Criterion*), which is no longer extant. Sextus Empiricus (*M* VII.22) describes Epicurean canonic as dealing with what is 'evident' and 'nonevident' and related matters. It has two components: it deals with the measures by which we obtain an immediate grasp of what is true or 'evident'; and it deals with how we use what is 'evident' as a measure of what is 'nonevident'.

In Epicurus' philosophical system, canonic takes the place of logic or dialectic as the first subject of study. It is also closely linked with physics. Whereas the Stoics classified logic as the first of three parts of philosophy, co-ordinate with physics and ethics, Epicurus joined canonic to physics as both preliminary and subordinate to it.

It was commonplace to accuse Epicurus and his followers of being

¹ See in general Asmis 1984, and Barnes 1996a.

ignorant of logic. Epicurus' followers retorted that the truth that others seek through logic is revealed by physics, as guided by the rules of canonic. As Torquatus, the Epicurean spokesman in Cicero's *De finibus* (1.63), puts it, 'it is by this science [that is, physics] that the meaning of words, the nature of discourse, and the relationship of consequence or conflict can be understood'. Physics attains these insights by observing 'the rule that has glided down, as it were, from heaven for the knowledge of all things'. The 'rule' is Epicurus' canon, understood as either his book or the standards it proposes.

Although we lack Epicurus' book *Canon*, there is ample evidence for his epistemology. His *Letter to Herodotus*, a summary of his physics, includes a summary of his canonic. We also have a brief survey of the *Canon* itself by Diogenes Laertius. In addition, there are numerous ancient discussions of various aspects of Epicurean canonic. They consist of both attacks and defences. Among the latter, the most important are Lucretius' explanation of sense perception in his poem *On the Nature of Things*, Philodemus' *On Signs*, and Sextus Empiricus' account of Epicurus' criterion of truth.

The *Letter to Herodotus* shows how canonic is related to physics. Epicurus presents his canonic in two stages: he prefaces his summary of his physics with a brief outline of his two rules of investigation (*Ep. Hdt.* 37-8); then he explains these rules in the course of outlining his physical system. The main part of this explanation consists in showing how the senses serve as a means of determining the truth (*Ep. Hdt.* 48-53). Epicurus also adds explanations about concepts (*Ep. Hdt.* 72) and about the formation of language (*Ep. Hdt.* 75-6). Torquatus refers to this sequence of preliminary rules and subsequent explanation when he says that 'unless the nature of things is seen, we will not be able to defend in any way the judgements of the senses' (Cic. *Fin.* 1.64).

Epicurus' initial statement of his rules is as follows:

First, Herodotus, it is necessary to have grasped what is subordinate to our utterances, so that we may have the means to judge what is believed or sought or perplexing by referring to [what is subordinate to our utterances], and so that we will not leave everything unjudged as we go on proving to infinity, or have empty utterances. For it is necessary that the first thought in accordance with each utterance be seen and not require proof, if we are to have a referent for what is sought or perplexing and believed.

Next, it is necessary to observe everything in accordance with the perceptions (αἰσθήσεις) and simply the present applications (ἐπιβολαί) of the mind or any of the criteria (κριτήρια), and similarly [in accordance

with] the existing feelings (πάθη), so that we may have signs (σημειωσόμεθα) for both what is waiting (προσμένον) and what is non-evident (ἄδηλον). (*Ep. Hdt.* 37-8)²

This preamble is followed by the announcement: 'After making these distinctions, it is now time to consider what is nonevident.' Then Epicurus begins a sequence of deductions about the universe.

In the first place, Epicurus requires thoughts associated with the words that we utter. These initial thoughts, for which Epicurus coined the term προλήψεις, 'preconceptions', do not require proof. Second, Epicurus requires observations to serve as signs of what is not observed. These observations are of two kinds: perceptions, and feelings.

By following the two rules of inquiry, the investigator arrives at truths about what cannot be observed. This intellectual journey is at the same time a process of discovery and a method of proof. To be sure, there is a psychological process by which an investigator tries out ideas gathered from a variety of sources. But the investigator does not properly make a discovery until he proves the idea by following the rules of inquiry. There is no doubt that Epicurus' physics includes claims (beginning with 'nothing comes to be from non-being', *Ep. Hdt.* 38) that he derived from the Eleatics and other philosophers. But this makes no difference to Epicurus' empiricism. If Epicurus offers an alternative, empirical argument in support of these claims, their provenance is irrelevant. What matters is that they should rest on empirical evidence, not that they should have been prompted by it.

Epicurus' initial remarks, as we have them, are very condensed and their interpretation is controversial. We will return to each main point in what follows. But it can be seen at first glance that Epicurus sets out the three 'criteria' that later authors attribute to him: preconceptions, perceptions, and feelings. Epicurus also refers to what later authors attribute to him as a fourth 'criterion', the so-called 'presentational applications of the mind'.³ Whereas Epicurus himself seems to reserve the term κριτήριο, 'instrument of judgement', for the five senses and the mind

² πρῶτον μὲν οὖν τὰ ὑποτεταγμένα τοῖς φθόγγοις, ὡς Ἡρόδοτε, δεῖ εἰληφέναι, ὅπως ἂν τὰ δοξαζόμενα ἢ ζητούμενα ἢ ἀπορούμενα ἔχωμεν εἰς ταῦτα ἀναγαγόντες ἐπικρίνειν, καὶ μὴ ἄκριτα πάντα ἡμῖν ἢ εἰς ἀπειρον ἀποδεικνύουσιν ἢ κενούς φθόγγους ἔχωμεν. ἀνάγκη γὰρ τὸ πρῶτον ἐνόημα καθ' ἕκαστον φθόγγον βλέπεσθαι καὶ μηδὲν ἀποδείξεως προσδεῖσθαι, εἴπερ ἔχομεν τὸ ζητούμενον ἢ ἀπορούμενον καὶ δοξαζόμενον ἢ ἀνάξομεν. εἶτα κατὰ τὰς αἰσθήσεις δεῖ πάντα τηρεῖν καὶ ἀπλῶς τὰς παρούσας ἐπιβολὰς εἴτε διανοίας εἴθ' ὅτου δήποτε τῶν κριτηρίων, ὁμοίως δὲ κατὰ τὰ ὑπάρχοντα πάθη, ὅπως ἂν καὶ τὸ προσμένον καὶ τὸ ἄδηλον ἔχωμεν οἷς σημειωσόμεθα. On the text see Asmis 1984, 83 n. 1, and Long and Sedley 1987, vol. 11, 92.

³ D.L. x, 31, cf. Cic. *Acad.* 1. 142. As Diogenes points out, Epicurus himself groups the presentational application of the mind with perceptions and feelings in KD 14.

acting as a sense, later authors use the term to designate the three (or four) types of awareness.⁴

In his statement of the rules, Epicurus moves from language to preconceptions, then to observations. This order differs from the arrangement found in Diogenes' summary, which deals first with perceptions, then preconceptions, then feelings. Since preconceptions are built up from perceptions, it is reasonable to explain the latter before the former. Diogenes' order may well have been the order that Epicurus used in his *Canon*. The present chapter offers a variation on Diogenes' order: it will deal first with perceptions and feelings, then preconceptions.

II Perceptions

The proliferation of technical vocabulary in Hellenistic philosophy can be extremely confusing. The vocabulary of sense perception is particularly treacherous. A key problem is: what is an 'object of perception', αἰσθητόν? Further, what is αἴσθησις ('sense perception', 'perception'), φαντασία ('presentation' or 'impression'), and the meaning of 'true' as added to either of these terms? Amid the plethora of terms, two demand special attention: ἐπιβολή ('application', 'act of attending') and ἐνάργεια ('evidence'). This pair of terms is especially prominent in Epicurean epistemology and may be said to characterize it. Ἐπιβολή is not found as a technical epistemological term before Epicurus; and ἐνάργεια receives a new sense and importance.

The basic problem is this: can sense perception show what exists in the external world? Epicurus identifies all acts of perception as 'present' acts of sensory attention. What makes these acts a means of measuring the truth?

Epicurus explains 'applications', together with ἐνάργεια and κριτήριον, in the central epistemological section of the *Letter to Herodotus* (49–53). By the time he comes to this section, Epicurus has already established that everything in the universe is atoms and void. He now explains sensory perception. Turning first to sight and thought, he claims that very fine configurations (τύποι) of atoms, called 'images' (εἶδωλα), are continually detached from the surface of external solids, having similar shape and colour to the solid. These images form a stream that extends from the solid to the sense organ while preserving a 'sympathy' with the pulsation of atoms deep within the solid. When this stream enters the eyes or the mind, it produces a 'presentation' (φαντασία).

The mind obtains visual impressions in the same way as the sense of

⁴ But see Striker 1974, 59–61, and 1990, 144.

sight. It has 'perceptions', therefore, just like any of the sense organs, and acts as a sensory criterion, just like the five senses. Its sensory activity includes dreams, memories, hallucinations, and so on. Elsewhere, it is called 'presentational' by contrast with the non-sensory, rational activity of the mind. In conformity with this unusual doctrine, Epicurus classifies the mind's sensory acts as a subdivision of 'perceptions' in the *Letter to Herodotus*. His followers later made a concession to standard philosophical terminology by classifying mental perceptions as a separate category, coordinate with the perceptions of the five senses. But they did not thereby alter Epicurus' theory.

Immediately after arguing that we see an external solid by means of a continuity between the presentation and the solid, Epicurus summarizes his theory of truth and falsehood:

And whatever presentation we take hold of by an application (ἐπιβλητικῶς) of the mind or the senses, whether of shape or of concomitants, this is the shape of the solid, coming to be in accordance with successive compacting or a remnant of the image.

But falsehood and error always lie in what it is additionally believed will be witnessed or not counterwitnessed and then is not witnessed <or is counterwitnessed>. For appearances that are obtained as a likeness or that happen in sleep or by some other applications of the mind or of the remaining criteria would never have a similarity with things that are called 'existent' and 'true' if they were not also things that we encounter.

Error would not exist if we did not also take within ourselves some other motion that is attached, but has a distinction. In respect to this motion, if there is no witnessing or counterwitnessing, falsehood comes to be; if there is witnessing or no counterwitnessing, truth comes to be.

It is necessary to hold on tight to this belief, in order that the criteria that judge in accordance with evidence may not be eliminated, and that error, by being similarly upheld, may not confuse everything. (*Ep. Hdt.* 50–2)⁵

⁵ *Ep. Hdt.* 50–2: καὶ ἦν ἂν λάβωμεν φαντασίαν ἐπιβλητικῶς τῇ διανοίᾳ ἢ τοῖς αἰσθητοῖς εἴτε μορφῆς εἴτε συμβεβηκότων, μορφῆ ἐστὶν αὐτῆ τοῦ στερεμίου, γινόμενη κατὰ τὸ ἐξῆς πυκνώμα ἢ ἐγκατάλειμμα τοῦ εἰδώλου. τὸ δὲ ψεῦδος καὶ τὸ διημαρτημένον ἐν τῷ προσδοξαζομένῳ αἰεὶ ἐστὶν ἐπιμαρτυρησέσθαι ἢ μὴ ἀντιμαρτυρηθῆσθαι, εἴτ' οὐκ ἐπιμαρτυρουμένου <ἢ ἀντιμαρτυρουμένου>. ἢ τε γὰρ ὁμοιότης τῶν φαντασμάτων οἰοεὶ ἐν εἰκόني λαμβανομένων ἢ καθ' ὕπνου γινομένων ἢ κατ' ἄλλας τινας ἐπιβολὰς τῆς διανοίας ἢ τῶν λοιπῶν κριτηρίων οὐκ ἂν ποτε ὑπῆρχε τοῖς αἰσῶσι τε καὶ ἀληθέσι προσαγορευομένοις, εἰ μὴ ἦν τινα καὶ ταῦτα πρὸς ἃ βάλλομεν. τὸ δὲ διημαρτημένον οὐκ ἂν ὑπῆρχεν, εἰ μὴ ἴλαμβάνομεν καὶ ἄλλην τινὰ κίνησιν ἐν ἡμῖν αὐτοῖς συναρμηνῆν μὴν διάληθιν δὲ ἔχουσαν. κατὰ δὲ ταύτην, ἔάν μὲν μὴ ἐπιμαρτυρηθῆ ἢ ἀντιμαρτυρηθῆ, τὸ ψεῦδος γίνεται ἔάν δὲ ἐπιμαρτυρηθῆ ἢ μὴ ἀντιμαρτυρηθῆ, τὸ ἀληθές. καὶ ταύτην οὖν σφῆρα γὰρ δεῖ εἶναι δεῖσαν κατέχειν, ἵνα μήτε τὰ κριτήρια ἀναρῆται τὰ κατὰ τὴν ἐνάργειαν, μήτε τὰ διημαρτημένων ὁμοίως βεβαιοῦσθαι πάντα πανταχόθεν. For the text, see further Assis 1984, 142 n. 1.

Epicurus distinguishes between two kinds of 'taking': we take hold of a presentation by an 'application' of the sensory organ; and we take hold of another, inner kind of motion, which is linked to the first but distinct from it. The first type of motion is a 'present' application of a sensory organ (*Ep. Hdt.* 38). The second adds a belief to the presentation, and this belief may be true or false. There is no falsehood or error, on the other hand, in the first kind of 'taking'.

Epicurus divides the first kind of taking into two kinds: those by which we get hold of dream images or copies (such as a picture) or other resemblances to what is 'called existent and true'; and those by which we get hold of what is 'called existent and true'. Epicurus' language is circumpect and strained. While distinguishing between simulations (such as dreams) and things called 'existent and true', he excludes falsehood from the former on the ground that the simulations would not be similar unless they were also certain things 'that we encounter'.⁶

Whenever we have a perception, therefore, we need to distinguish between two kinds of activity: the perception itself, which is a present application to something encountered from outside; and the addition of a belief, which is a movement from inside ourselves. This distinction provides a foundation for knowledge. Perceptions in themselves are uncontaminated by any belief: they are 'raw' acts of cognition, presenting the world to us without any interpretation. Because they are free of belief, they serve as the means of judging the truth or falsehood of beliefs. They are the ultimate basis of judgement; for there is no further criterion by which the perceptions themselves can be judged. As the later sources explain, one perception cannot judge another, since all have equal validity; nor can one sense judge another, since each has a different object; nor can reason judge perception, since it is wholly dependent on perception.⁷ Epicurus warns that one must not throw out any perception: otherwise one will throw out every instrument of judgement (*KD* 24).

The claim that there is no falsehood in perception is boldly counterintuitive. Surely we have false perceptions, and these are sometimes so similar to true perceptions as to be indistinguishable from them? Socrates had addressed this objection in Plato's *Theaetetus* (157e-158e). Against the claim that dreams and other allegedly 'false perceptions' can be so similar to allegedly true perceptions as to be indistinguishable from them, he responds, on behalf of the thesis that perception is knowledge, that all perceptions are unique experiences, occurring to different subjects at

⁶ πρὸς ἃ βλάλλομεν: this is the reading of one MS., viz. P. ⁷ D.J., 5.32 and *Enchir.* IV.412-19.

different times. There is no conflict among them; for all 'are' equally and are equally 'true'. Epicurus holds likewise that a perception is a present interaction between a percipient subject and a perceived object. The very similarity between allegedly true and false perceptions provides the basis of his argument: the similarity shows that there is in each case something that we 'encounter'. These objects of encounter are without falsehood.

Epicurus does not actually say in his extant writings what the later sources say, namely that 'all presentations', or 'all (sense) perceptions', or 'all objects of perception' are 'true', and that all objects of perception are 'existent' or 'real'.⁸ But the later versions purport to capture Epicurus' meaning; and indeed there is no substantive difference.

Thus Demetrius of Laconia explains that 'we call the perceptions true by reference to the objects of perception'.⁹ According to Sextus (*M* VIII.9), Epicurus 'said that all objects of perception are true and existent (ἀληθῆ καὶ ὄντα), for there is no difference between saying that something is true and saying it is real (ὑπάρχον)'. Epicurus' followers also argued that the presented object (τὸ φανταστόν) is in every case just as it appears, that is, is something 'real'. As they put it, all presentations are not only from, but also in accordance with, the presented object (*M* VII.203-10). This Epicurean argument consists of an analogy between the 'primary feelings', pleasure and pain, and perceptions. Just as pleasure and pain are necessarily from and in accordance with something real (for example, pleasure is from and in accordance with something pleasant), so every perception necessarily corresponds to its producer, which 'is' just as it appears.

But granted that Epicurus and his followers are agreed on the reality of whatever is perceived, what sort of reality does this object of perception have?¹⁰ In *Ep. Hdt.* 50 Epicurus explains the object of perception, exemplified by the shape of a solid, as an effect produced by incoming atoms: at the causal level, the presentation or presented object corresponds to atoms interacting with each other. The truth of a presentation, therefore, may be explained in two different ways, phenomenally and causally: a presentation is true insofar as it presents something that is in reality just as it appears; and a presentation is true insofar as it corresponds to an impact of atoms on the sense organ. The second formulation provides the

⁸ See frs. 247-54 Usener. ⁹ *PHerc.* 1012, col. 72.3-6 Puglia 1988.

¹⁰ A much disputed question: while most interpreters take the truth of a perception to consist in some sort of correspondence between the presentation and its atomic stimuli (so Furley 1971, 616, C. Taylor 1980, 119-22, Everson 1990b, 173-4), Rist 1972, 19-20, proposes that what makes a presentation true is that it is a real event, and Striker 1977, 134-5, 142, suggests that what is true is a proposition expressing the content of a sense impression.

physical explanation for the first. For it identifies the object of perception as the effect of an arrangement of atoms coming from outside.

Epicurus' followers rely on the physical explanation when they claim that a perception is true because it is 'moved' by something, as opposed to moving itself. Diogenes Laertius (x.32) applies this explanation to allegedly illusory appearances: 'The appearances (φαντάσματα) of madmen and dreams are true, for they move [the sense or mind], and what does not exist does not move anything'. More precisely, a perception is true because it is not moved by itself and, when moved by something else, cannot add or take away anything (S.E. *M* VIII.9). Hence it is 'irrational' and without memory. Sextus (*M* VIII.63) identifies the mover as images which 'underlie'. Alleged misperceptions, such as Orestes' vision of the Furies, are true because they are moved by underlying images. That there are external solid Furies is a false inference added by the mind. Because a perception is no more than a response to an external stimulus, it is free of any interpretative contamination.

Clearly, this notion of perceptual truth does not agree with our ordinary notion. Ordinarily, a perception is considered true if it corresponds to an independently existing external object, not to an immediately impinging stimulus. Epicurus seems to evade the problem by redefining perceptual truth. This seems all the more reprehensible as Epicurus proposes to test all answers by reference to ordinary concepts. His followers, moreover, certainly give the impression that they deal with external reality (as ordinarily understood) when they advance the claim that all perceptions are true.

Then let us look more closely at how Epicurus explains the difference between true and false perceptions in the ordinary sense. It has generally been supposed that the first sentence of *Ep. Hdt.* 50 spells out the conditions of a 'true' (in the ordinary sense) or 'reliable' perception. Epicurus claims that the shape of the solid is produced in one of two ways: by 'successive compacting', or by a 'remnant of the image' (*Ep. Hdt.* 50). It has been held that these two methods guarantee a perception that is faithful to the external solid.¹¹ However, it is clear that all visual presentations, whether true or false (in the ordinary sense), are formed by these two methods.

The first way consists in the successive merging of images in the sense organ. Atoms that have entered are continually reinforced by new arrangements of atoms arriving in imperceptibly small units of time.

¹¹ So Furley 1971, 607-11, cf. 1967, 308.

The successive arrival of parts of images in the eye results in a composite image which presents a whole.¹² As Lucretius explains, we do not see the individual *images* that stream from an external thing. Instead, we see the 'thing itself' as a result of the merging of images in the sense organ:

In this one must not wonder in the least bit why, when the images that strike the eyes cannot be seen singly, things themselves (*res ipsae*) are discerned. For also when the wind lashes us little by little and bitter cold flows, we are not in the habit of perceiving each individual particle of wind and its cold, but rather we perceive the wind as a whole, and we note blows happening on our body just as if some object were lashing it and providing a perception of its own external body. Moreover, when we strike the stone itself (*ipsum*) with the finger, we touch the outermost colour of the rock at the very surface, yet we do not perceive this by touch but instead we perceive the hardness itself (*ipsam*) deep within the rock. (Lucretius, *iv.256-68*)

Lucretius draws an analogy between the sense of touch and the sense of sight. When we feel a cold wind blowing, we do not perceive the successively arriving particles of wind, but the wind as a whole. When we touch a rock, we do not perceive the fine surface layer with which our finger makes contact, but rather the hardness deep within the rock. Analogously, what we see is not individual images, but 'things themselves', *res ipsae*. The images are simply the means by which we obtain a perceptual grasp of the solid from which they flow.

According to Epicurus (*Ep. Hdt.* 48), the images that stream from a solid preserve 'for a long time' the arrangement they had on the surface of the solid; but their arrangement may also be disturbed. Similarly, in the case of hearing (*Ep. Hdt.* 52-3), the stream of atoms from the external source produces a perception of the source 'for the most part'; but it may also show only what is 'external' to the source.¹³ In general, whenever the sensory organ is at a distance from the source of the perception, there is a perceptual stream extending from the source to the sense organ. If no disturbance occurs, the successive compacting of effluences permits a perception of the source itself. In this case, the source reaches through the perceptual stream right to the sensory organ, so that there

¹² In addition to Lucretius, see Aug. *Ep.* 118.30 and Alex. *de Sens.* 56-63 and *de An. Mant.* 134-6 (discussed by Asmis 1984, 128-37). The merging of εἰδωλα explains how we can see objects larger than the surface of the pupil: we do not see an object as the result of a single εἰδωλον shrinking between the object and ourselves, but as the result of a stream of εἰδωλα depositing eidolic parts in the eye. ¹³ See also S.E. *M* vii.207-9; Lucretius, *iv.353-61*.

is an immediate perceptual contact with the source itself. Otherwise, we have a perception only of what is outside the source. But this makes no difference to the veracity of the perception: whether or not the perceptual stream has become disturbed, we encounter an object that is real.

There is a further complication. Images do not always come from an external source, but may be formed spontaneously in midair, like clouds (Lucr. iv.129-42). Even when they come from an external source, moreover, the images that cause mental visions are prone to combine with each other in midair because they are especially fine (Lucr. iv.722-48). For example, a horse image may combine in midair with a man image to produce the mental vision of a centaur.¹⁴ Although our sources mention composite streams only with reference to mental images, there is no reason why such streams should not also occur in sight, hearing and smell. In all cases, there appear to be three possibilities: a stream may form an undisturbed continuum between the percipient and an external source; a stream from an external source may be disturbed; and a stream may form spontaneously (i.e. combine) in midair.

The second way in which the perceived shape of a solid is said to be produced is by a 'remnant of the image' (*Ep. Hdt.* 50). Since atoms may remain in the sense organ for a time after they have entered, it is reasonable to suppose that an image that has been constituted in the sight or mind by successive compacting may linger so as to produce a kind of after-image. This after-image corresponds to what remains of the image. The remnant does not stay long enough to produce dreams and memories, for these are produced by newly arriving images.¹⁵

In the case of touch and taste, there is no external stream intervening between the sensory organ and the source. Instead, there is an immediate contact between percipient and source. Yet here too we ordinarily draw a distinction between true and false perception. Epicurus explains this distinction as well. For apart from external arrangement, there is an internal factor that determines the kind of perception; and it applies to all senses. This is the condition of the sensory organ. Even if there is no disturbance in the external stream, a derangement of the sensory organ may alter the perception.

¹⁴ Lucretius points out that a single mental εἰδωλον, even though extremely fine, is able to move the mind; for the mind too is extremely fine (iv.746-8). This does not imply, as is generally supposed, that a mental presentation is due to a single εἰδωλον entering the mind. Here too the image is due to an eidolic stream, as Lucretius' explanation of moving dream images indicates (iv.794-806). ¹⁵ See Asmis 1984, 137-9.

Basically, a sense organ takes in precisely what is commensurate with it (σύμμετρον, *Ep. Hdt.* 53, cf. 50). Its condition, therefore, determines what parts of the perceptual stream it encounters.¹⁶ As a result, perceptions vary from one type of animal to another, from one individual to another, and from one perception to another. If the organ of taste is in a healthy condition, for example, honey tastes sweet. But if it is diseased, the taste is bitter. In the former case, atoms productive of sweet taste interact with the sense organ; in the latter, atoms that produce a bitter taste are admitted instead (Lucr. iv.658-72). When we enter a dark room, we may not be able to make out colours at first, although we can do so after a little while (Plu. *Col.* 1110c-d). The reason lies in the adjustment of the sense organ to the incoming atoms.

In receiving particles from outside, moreover, the sensory organ does not simply submit passively to the impacts. It engages in an active response called 'application' (ἐπιβολή). Epicurus refers to this contribution along with 'successive compacting' and 'remaining'; and it is essential to the formation of any presentation. How it works can best be gauged from Lucretius' defence of Epicurus' theory of mind.

The dependence of the mind on newly arriving images is a peculiarity of Epicurean psychology that provoked much criticism in antiquity. It conflicts with the well-entrenched position that, unlike the five senses, the mind has objects of its own, which it can call up whenever it likes, regardless of what happens to it from outside. Lucretius defends the Epicurean view by arguing that the mind, like any other sense organ, has an active role in perception. This sensory activity is not a self-movement, as Diogenes Laertius (x.31) makes clear, but an act of responding to incoming atoms. By an act of application, etymologically an 'onslaught' or 'thrust upon' an object, the sensory organ goes to meet what is presented to it.

Lucretius asks (iv.779-880): how can the mind straight away think of anything it likes? The answer is twofold. On the one hand, there is a vast number of images impinging upon the mind at any single perceptible time. On the other hand, the mind cannot see anything clearly unless it 'strains' to see it; it must 'have prepared itself' for what it sees. To obtain a sequence of thought, it 'prepares itself further and hopes that it will see what follows each thing, with the result that it happens' (iv.802-6). Lucretius compares the mental act of preparation to the focussing of eyes on tiny objects. Then he extends this analogy to perception in general:

¹⁶ Lucr. iv.668-70, 706-11; Plu. *Col.* 1109c-1110d.

even when things are openly perceptible, if one does not pay attention, everything is 'as though separated by all time and far removed' (iv.812-13).

Sensory application, then, is the act of attention by which the sense organs (including the mind) obtain a clear awareness. This activity need not be deliberate.¹⁷ What makes it an active response rather than passive submission is that the organ is in a state of attentiveness toward what is presented to it. Though determined by preceding atomic movements, this state in turn determines the effect of the incoming streams. Without it, there is only the vaguest awareness: nothing is clear. In other words, nothing is 'evident' (ἐνσργής). This vague awareness is not sufficient to constitute a presentation.¹⁸

All presentations are evident; and all equally show what is true.¹⁹ This evidence is, in Sextus' words (*M* vii.216), the 'base and foundation' of all cognition. What makes a sense organ an organ of judgement, a 'criterion', is that by making an application it always gets hold of what is 'evident'. Epicurus draws this correlation between the sense organs and evidence when he warns us not to eliminate 'the criteria that judge in accordance with evidence' (*Ep. Hdt.* 52) and urges us to pay attention to 'all the evidence that is present in accordance with each of the criteria' (*Ep. Hdt.* 82).

In sum, two factors are necessary for the production of any sense perception: a stream of atoms that impinges on the sensory organ; and a sensory organ that responds actively to this stream. In every act of perception, a presentation or 'evidence' is produced by an act of attention of the sensory organ to incoming arrangements of atoms. What is presented – the object of perception – is not an arrangement of atoms, but an effect produced by the atoms. These effects differ for each sense. In the case of sight, it is colour, along with the shape and size of colour at a remove from us. In hearing, it is sound. The sense of taste perceives flavours; the sense of smell perceives odours; and touch perceives body, as well as the contiguous shape, size, and so on, of body.²⁰

We do not perceive an image, or any arrangement of atoms; nor do we perceive some sort of inner mental object. We perceive in every case some-

¹⁷ As shown by Furley 1967, 208; cf. 1971, 611. But neither is ἐπιβολή an entirely passive process, as Furley proposes.

¹⁸ As Sextus observes (*M* vii.203), Epicurus also used the term ἐνσργεια for presentation.

¹⁹ Pace e.g. Bailey 1928, 242-3, 254-7.

²⁰ *Ep. Hdt.* 49-53; *Lucr.* iv.489-95. The anonymous (Philodemus?) *PfHer.* 19/698 has a detailed (though fragmentary) discussion of these objects of perception; see esp. cols. 17, 18, 21, 25, 26, and fr. 21 Scott. New edition of the papyrus in Monet 1996. For a different view of the objects of perception, see Sedley 1989b, and Long and Sedley 1987, vol. 1, 84.

thing projected outside ourselves, as existing outside us. We see a red square, or hear a shrill cry, or touch a hard body. When Orestes has a vision of a Fury, he does not see an image of a Fury or a mental image; he sees a Fury as a three-dimensional object existing outside of himself.

We must distinguish, therefore, between what we ordinarily call an object of perception and the object of perception as revealed by physical science. In redefining perceptual truth, Epicurus redefines 'object of perception'. Whereas we ordinarily take it to be an external object distinct from us, it is the convergence of an external stream on the sense organ. The organ reads off a part of this stream. If the stream comes from a particular source and the sense organ reads off what is directly 'on' the source, there is a true perception (in the ordinary sense). If the organ reads off a part outside the source or altogether detached from a particular source, there is still a truthful object of perception, even though it does not coincide with a particular source. The difference between a true and false perception (in the ordinary sense) comes down to this: does the object of perception, as redefined, coincide with what it presents as its source? If the sense is able to reach, by means of the perceptual stream, the very source it shows, there is what is ordinarily called a true object of perception; otherwise, not.

Let us now return to Epicurus' sentence on the shape of the solid (*Ep. Hdt.* 50). Epicurus mentions both the internal cause of the presentation, the application, and the external cause, an influx of images. Nothing in this causal analysis suggests that Epicurus is here singling out what is ordinarily called a 'true' perception; and the indefinite form of the sentence ('whatever presentation we take...') suggests rather that he is referring to any visual presentation of an external solid at all, whether distorted or not. As Sextus puts it, what is presented is either the colour outside the solid or the colour on the very surface of the solid. Either type of colour shows the shape of the solid.

But there remains a problem. Epicurus describes the shape of the solid as 'coming to be' in accordance with the impact of images. At the same time, he indicates that there is an external solid that has shape and colour, which may be conveyed to the percipient by means of images. Qualities such as colour and shape, sound, odour, and so on, are not just temporary qualities, existing only at the moment of perception, but more or less enduring features of the external world. Epicurus himself divides these qualities into permanent and occasional, and says that the former make up a body's 'own nature' (*Ep. Hdt.* 68-9).

How does this view square with Epicurus' physics? Physical investigation shows that there is no colour, sound, odour, flavour, or bodily texture

independently of perception. There are just atoms, having shape, size, and weight, moving about in various arrangements in the void. What is presented in perception is the effect of an interaction between us and incoming atoms. Apart from perception, there is no external red sphere: the coloured three-dimensional shape that we see exists only in perceptual interaction; outside us, there are fine networks of colourless atoms that are densely arranged in the so-called 'solid' source and very thinly distributed in the perceptual stream reaching from the source to the beholder.

Now Epicurus draws a distinction between 'in relation to us' (πρὸς ἡμᾶς) and 'in itself' (καθ' αὐτό): 'in relation to us', he writes (*Ep. Pyth.* 91), the size of the sun and other heavenly bodies is just as it appears; 'in itself' it is larger or a little smaller or the same. Elsewhere, Epicurus contrasts 'in relation to us' with 'the underlying thing in itself'.²¹ 'In relation to us' clearly means 'as we perceive it'. The size of the sun 'in itself', by contrast, would seem to be the underlying cause of the perception, namely the size of the distant sun. To take our perceptual stream, with the percipient at one end, the solid sun at the other, and the stream of images in between: from the point of view of the beholder, that is 'in relation to us', the size of the sun is just as it appears; the size of the sun 'in itself', on the other hand, is the size of the solid sun considered in itself, apart from the beholder.

One and the same thing, therefore, may be described in two ways: 'in relation to us', it is just as it appears; 'in itself', it is the same as it appears or different. 'In itself' the sun is tiny. It is also brightly coloured and hot. Moreover, it is a network of colour-producing and heat-producing atoms. Because this atomic source effects certain perceptual qualities – those that are perceived in a perception 'upon' the source – the external source may be said to have these qualities 'in itself'.

Epicurus thus combines a robust ontology of perceptual objects with his atomic theory. The senses always present what exists in the external world and often (though not always) present a source 'in itself'. Because they always present an immediately underlying external thing, they never lie. They also often present the object that we think (by the addition of a belief) they present. Hence physical theory not only justifies a trust in all perceptions, but also saves our ordinary beliefs about perception.

But there is still a problem. Although the senses can display an external solid without distortion, or 'in itself', they cannot tell whether their dis-

play is without distortion: their judgement is necessarily 'in relation to us'. In the words of Lucretius, the senses cannot know the 'nature of things' (*naturam rerum*, iv.385). Instead, reason must discover whether the objects that appear to be moving or stationary, one or many, same or different, distant or close, straight or bent, round or square, and so on, really are so (iv.380–461, 500–6).

We return, therefore, to the question whether there is any way of singling out certain perceptions as reliable witnesses about enduring objects. At the conclusion of the *Letter to Herodotus* (82), Epicurus pairs the perceptions and feelings again:

One must pay attention to the present feelings and perceptions, to those that are common in accordance with what is common and to those that are particular in accordance with what is particular, and to all the evidence that is present in accordance with each of the criteria of judgement.

A further distinction among perceptions is that they may be particular to an observer or common to all. This distinction depends on the assumption that there are enduring objects of perception that are the same for all. Does reliance on common perceptions, then, help us to a solid basis of inference? We will return to this possibility when we discuss preconceptions.

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In his procedural note (*Ep. Hdt.* 38), Epicurus joins 'feelings' (πάθη) to perceptions as a basis of inference. In his survey of Epicurean canonic, Diogenes Laertius (x.35) states that there are two feelings, pleasure and pain, by which choice and avoidance are judged. This is in agreement with Epicurus' own claim that pleasure is the starting-point of choice and the measure (κρυσίον) of all good (*Ep. Men.* 129). But this does not imply that pleasure and pain are not also a criterion of truth. For they determine action by serving as a measure of what truly is good and bad. In addition, the feelings are signs of what is nonevident in the area of psychology (*Ep. Hdt.* 63 and 68).

Epicurus does not explain feelings separately in the *Letter to Herodotus*. Their epistemological role can be inferred, however, from what he says about perceptions. The basic difference between these two measures of truth is that feelings are acts of awareness of inner states, whereas perceptions are directed at what is external to us. As a type of canon, the feelings are not simply altered conditions of the sense organ; they include an awareness of the condition. Epicurus agreed with others that every act of perception depends on an alteration of the sense organ; and this may be

²¹ *On nature xi, PHerc.* 1042, col. vb.6–8 Sedley 1976b, 34, where the contrast between καθ' αὐτό ... τὸ ὑπο[κεί]μενον καθ' ἑα[υτὸν] and πρὸς ἡμᾶς applies to the rising and setting of the sun and moon.

called a feeling. In addition to being moved, the sense organ may have a feeling of being moved; and this constitutes a criterion of truth.

At the most general level, this criterion is a feeling of pleasure or pain. Subsumed under these feelings is the whole range of bodily sensations, such as feeling sated or hungry or having a pain in the stomach, and the entire range of emotions, such as anger, sadness, or joy. Since feelings are a kind of awareness, they may be subsumed in turn, along with perceptions proper, under the general heading of 'perception', as occurs in the later sources.²² And just like perceptions in the narrow sense, the feelings depend on an 'application' of the sense organ and are correlated with 'evidence'.²³

As a criterion of goodness, feelings form the foundation of Epicurean ethics. In physics, the area in which feelings are most important is psychology. Epicurus signals this special role by framing his analysis of the soul in the *Letter to Herodotus* (63 and 68) with references to both perceptions and feelings. One highly controversial claim supported by reference to feelings is the claim that the mind is situated in the heart. Like the Stoics (though with a different logical apparatus), the Epicureans sought to determine the location of the mind by the 'evident' fact that the heart is where we feel fear, joy, and other emotions.²⁴ Since the mind is the seat of the emotions, this feeling shows that the mind is located in the heart.

III Preconceptions

In addition to perceptions and feelings, the investigator must have preconceptions (προλήψεις) at the outset of an inquiry (*Ep. Hal.* 37-8). Preconceptions correspond to the utterances used to state a belief or problem. They must not require proof; otherwise proof would go on to infinity. Rather, they share with perceptions and feelings the property of being 'evident' and so constitute a third type of measure or canon.

Since Epicurus says very little about preconceptions, it is best to turn immediately to Diogenes Laertius (x.33):

They say that preconception is something like apprehension (κατάληψις) or correct belief (δόξα) or a conception or a general (καθολική) stored notion, that is, a memory of what has often appeared from outside, for example, 'a human being is this sort of thing'. For as soon as

²² See Cic. *Fin.* 1.30-31 and 11.36.

²³ They are linked with ἐνάργεια at *PHerc.* 1251 col. 13.8-12; cf. Indelli and Troiano 1995, 91 and 171-3. ²⁴ Lucr. 11.141-2; Demetrius of Laconia, *PHerc.* 1012, cols. 32-7 Puglia 1988.

'human being' is spoken, an outline of a human being is thought of in accordance with the preconception, as a result of antecedent perceptions. What is first subordinate to every word, therefore, is evident.

And we would not have sought what we seek if we had not previously come to know it, for example: is the thing standing in the distance a horse or a cow? For it is necessary to have come to know at some time by preconception the shape of a horse and cow. Nor would we have named anything unless we had previously learned its form by preconception.

Diogenes adds that we would not seek anything unless we had first learnt what it is; nor would we name anything unless we had first acquired a preconception of it.²⁵ In conclusion, he reiterates that preconceptions are 'evident'. As attested elsewhere, a preconception is an act of 'application'.²⁶ Like sensory self-evidence, conceptual self-evidence consists in a 'thrust upon' something real.

In this account, which is clearly influenced by later debates with non-Epicureans, two things stand out: preconceptions are derived from sense perception;²⁷ and their function is to serve as points of reference for inquiry. Epicurus states the second point explicitly in his procedural note. The first is the more problematic: how soundly are Epicurus' preconceptions based on sense perception? How can they exclude an element of interpretation added to sensory information?

Diogenes offers alternative descriptions of preconception in response to positions taken by various other philosophers.²⁸ His basic explanation is that it is a 'memory of what has often appeared from outside'. The appearances from outside are sensory appearances 'preceding' the formation of the conception. Their repeated occurrence results in a 'memory' of a type of thing or of an individual item. For just as we associate the outline of a human being with the words 'human being', so we associate an outline of Socrates, for example, with the word 'Socrates'. We use this notion whenever we form any sort of belief about Socrates. In the case of individual human beings many perceptions result in a notion of a certain kind of shape and behaviour; and this is a 'stored, general notion' no less than the more general notion of 'human being'. Indeed, Epicurean preconceptions range in complexity from notions of simple sensory qualities, such as 'red',

²⁵ The function of preconceptions is to answer a problem put by Plato in the *Meno*: how can we inquire into anything without previously knowing it? Epicurus' solution is that we have notions derived from sense perception. Having learned by observation what a horse and a cow are, we can ask the question: is the indistinct shape seen in the distance a horse or a cow? (see above, pp. 195-6). ²⁶ Clemens Alex. *Strom.* 11.4.

²⁷ See Asmis 1984, 61-80; cf. Long and Sedley 1987, vol. 1, 89.

²⁸ For difficulties in Diogenes' account, see Glidden 1985, 180-6.

'bitter', 'hot', to notions that combine a number of sensory properties, such as 'Socrates', 'human being', 'god', and 'just' (said to be 'what is communally advantageous', *KD* 36).

By attending to sensory appearances, the mind comes to pick out certain features as constituting a type. This conceptual act poses a special problem within Epicureanism: is it an interpretation added by the mind to sensory impressions? If so, it is not simply the product of outside influences and consequently requires verification by the senses. It appears that a preconception is a special kind of belief formed out of an accumulation of sensory impressions. Repeated in the mind, sensory impressions turn into a conception, which is continually reinforced and confirmed by further sensory impressions.

The self-evidence of preconceptions, then, is much more complex than that of individual sensory impressions. Another complexity concerns the existence of what is conceived. Does the object conceived exist in the peculiar Epicurean sense in which all objects of perception exist, or does it have existence 'in itself'?

The preconception about which we have most information and which therefore promises to throw most light on this question is the notion of god. It was highly controversial in antiquity and is still much debated.²⁹ In Epicurus' words (*Ep. Men.* 123), 'the common notion of god outlines' that god is an 'indestructible, blessed living being', and 'the gods exist, for the knowledge of them is evident'. Cicero (*ND* 1.43-4) shows that 'common' means 'common to all people', and he cites this consensus as proof of the existence of gods:

... [Epicurus] saw that there are gods, because nature herself had impressed a notion of them in the minds of all. For what nation or race of men is there that does not have a certain preconception of the gods without any teaching? ...

Since [this] belief has not been established by some convention or custom or law and there abides a firm agreement among everyone, it must be understood that there are gods. For we have implanted, or rather inborn, notions of them; what the nature of all is agreed on must be true; therefore it must be admitted that there are gods.

Cicero draws a distinction between the natural formation of the concept and the imposition of a belief by some form of teaching, such as custom or law. The thought that there are gods is naturally implanted in everyone; it

²⁹ For a detailed discussion, see below, p. 455.

follows that there are gods. In addition, we all naturally think of the gods as 'blessed and immortal' (1.44):

For the same nature that gave us an outline of the gods has engraved in our minds that we consider them everlasting and blessed. (1.45)

On the basis of universal natural agreement, Cicero establishes two basic claims about the gods: they exist, and they are immortal and happy.

While this account is compatible with Epicurus' views, it has been carefully adjusted to fit a conceptual framework that is shared by other philosophers. These adjustments are not without problems. Thus what makes an Epicurean preconception natural is that it has been imposed on human minds by the external environment, whereas Stoic preconceptions, for example, are rooted in human nature. The Epicurean preconception of god is produced, like any other, by repeated sensory presentations. It is the result of waking and dreaming visions of the gods, which are caused by images streaming into our minds (*Lucr.* v.1169-71). While Epicurean preconceptions may be called *ἐμφυτοί* ('in one's nature', a term translated by Cicero as *innatas*, 1.44), as Stoic preconceptions were called, the term can mislead the reader into taking it to imply an origin entirely within the human being or, worse, to mean 'innate'. Epicurean preconceptions are naturally implanted from outside, and this is what distinguishes them from customs, conventions, and laws, which are taught.

Nothing in the Epicurean account of preconceptions suggests that all preconceptions are held universally. Such a requirement would exclude preconceptions not only of individuals such as Socrates, but also of elephants, mangoes, oceans, islands, and so on. Do only common preconceptions, then, guarantee existence? All preconceptions, as Diogenes Laertius says, are 'evident'; and Epicurus appeals to 'evident' knowledge as proof of the existence of the gods. In the case of perceptions, 'evidence' guarantees a certain kind of existence, that which is 'relative to us'. Do preconceptions likewise show only existence that is 'relative to us'? Certainly preconceptions of centaurs and other fictional entities - if there are any such preconceptions - do not show objective existence. We return to the question: do common preconceptions, then, show objective existence?

There is little doubt that Cicero's Epicurean spokesman, Velleius, takes the gods to be real creatures and not just mental constructs. This is how the Academic critic, Cotta, understands his claim (1.62-4). Is Velleius' appeal to universal agreement, then, simply a premiss taken from his opponents, which he does not endorse himself? This is unlikely, since he attributes the argument to Epicurus. Indeed Epicurus appeals to

the universality of the preconception in his own brief discussion. Did Epicurus, then, propose common agreement, when naturally implanted, as a guarantee of objective existence? We saw earlier that Epicurus distinguishes between common and individual perceptions and feelings in the *Letter to Herodotus* (82). Earlier in the *Letter*, Epicurus cites the 'common perception of bodies as evidence that there are bodies'.³⁰ He also appeals to the common feeling (common not just to humans, but to all animals) of the pleasant as good as evidence that pleasure is the supreme good (Cic. *Fin.* 1.30). Is universal experience, then, a guarantee of objective existence both for perceptions and for preconceptions?

If this were the case, one would surely expect some mention of this criterion in the later discussions on Epicurean perception. As it is, the Epicurean position is distinguished from it. Sextus points out that whereas the sceptical followers of Aenesidemus accept common (though not individual) sensory appearances as true, the Epicureans accept all sensory appearances as true (*M* VIII.8-9). Neither Sextus nor any other source mentions that Epicurus singled out common perceptions as showing objective existence. Indeed, how could such an assumption fit Epicurean epistemology? It is plausible, for example, that everyone sees the sun as tiny. But Epicurus does not use this as proof that the sun is tiny 'in itself'; instead, he reasons out this conclusion by analogy with other perceptions.

In short, preconceptions pose a problem that was previously confronted in connection with perceptions: how can one bridge the gap between relative and objective existence? The most consistent strategy for Epicurus, it seems to me, would be to rely only on perceptions and preconceptions that are common. This is also historically the most plausible solution. Epicurus' confidence that we 'often' have a perception of the source suggests that, because of their great frequency, he thought that common perceptions can be taken to show objective existence. Common preconceptions, since they are based on so much higher a degree of consensus, can all the more justifiably lay claim to certainty. Common perceptions and preconceptions are not distinguished in their nature from those that are individual; they are formed in just the same way. Nonetheless, they support 'authoritative opinions'.

How, then, does the mind ascend from sensory impressions to a preconception? The content of the preconception of god is not a so-called proper object of perception, such as colour, shape, and so on, but properties inferred from such objects. Lucretius lists a sequence of beliefs: the

³⁰ *Ep. Lett.* 39, cf. Lucret. 1.417.

first three constitute a preconception of the gods, whereas the fourth is a false addition (v. 1169-93). The repeated appearance of human-shaped figures with exceptionally vigorous bodies, he explains, caused humans to attribute sensation, immortality and perfect happiness to these figures. But humans also made the enormous mistake of holding the gods responsible for the events in the heavens. The appearances, it seems, give rise equally to true and to false beliefs. How is one to distinguish between them? What demarcates a preconception from a false belief?

Epicurus (*Ep. Men.* 123-4) warns against attaching anything to the gods that is 'alien' to their indestructibility and happiness. Such additions, he says, are false suppositions, not preconceptions. Similarly he distinguishes between an evident state of affairs and an attached belief in the case of perceptions. The difference is that in the case of preconceptions what is evident is itself a belief, and that additional beliefs are tested against it by their compatibility or incompatibility with it. Epicurus illustrates this test in the first of his *Kuriai Doxai*: 'What is happy and indestructible does not take trouble or make trouble for another, so that it is subject neither to acts of anger nor to favours; for everything of this sort belongs to weakness.' The test is an inference, which consists in taking the evident superiority of the gods as proof that they are not given to anger or favouritism.

How, then, do we come to think of the evident properties that constitute the preconception? It was suggested earlier that they are patterns imprinted in the mind. This explanation requires some refinement; preconceptions are not simply impressions from outside, but inferences from them. By using Cicero's distinction between natural and taught beliefs, we obtain the conclusion that a preconception is an inferred pattern imposed naturally from outside. Reasoning is an activity produced in the mind by means of atomic movements. To reason is to arrange images; and this mental power is the result of images continually impinging on the mind and establishing certain patterns within it. From the beginning, successively arriving images are arranged automatically according to similarity and difference. This process gradually becomes an ability of the mind to sort out images deliberately, that is, to perform acts of reasoning.

Some Epicureans indeed assimilated the formation of preconceptions to the type of reasoning used in constructing scientific arguments. Their position will be examined in detail later; but what they said on preconceptions is relevant here. Zeno of Sidon proposed that all valid inferences about what is not observed are inductive inferences, obtained by passing from carefully scrutinized observed cases to similar unobserved cases.

This method is called 'transition by similarity' (ἡ καθ' ὁμοιότητα μετάβασις). Preconceptions are one type of inference made by this method. For example, we infer that a body, insofar as it is a body, has mass and resistance, and that a human being, as human being, is a rational animal.³¹

By treating preconceptions just like scientific theories, Zeno runs the risk of obliterating the difference between initial conceptions and the theories built on them. If preconceptions are theories, they are in need of proof. In his text, Philodemus does not distinguish the testing of preconceptions from that of scientific theories. This does not mean, however, that there is no difference. What is needed is the distinction between a natural type of inference, which results in preconceptions, and a technical type, by which we prove theories. Zeno's analysis must allow this kind of difference if preconceptions are to have epistemological priority.

Let us return now to Epicurus' initial instructions. A preconception is 'subordinate' to 'utterances' (*Ep. Hdt.* 37). When linguistic sounds are uttered, the hearer has thoughts corresponding to the sounds, and these thoughts are of general features existing in the world. A preconception is also the 'first' (*Ep. Hdt.* 39, cf. D.L. x.33) thought corresponding to an utterance. This is generally, though not necessarily, the first thought that comes into a person's mind when hearing the sounds. Preconceptions are 'first' in the sense that they are epistemically prior to the beliefs that are attached to them. What makes them 'first' is that they are derived directly from sensory perceptions, with the result that they too are 'evident'.

As evident starting-points, preconceptions do not require either proof or definition.³² Epicurus rejected the requirement for definitions: we must indeed be clear about our terms in order to have something to which we may 'look' and 'refer'; but it is never appropriate to start with a definition.³³ We may be reminded of a preconception by a brief description, such as 'god is an indestructible and blessed living being'. But this descriptive sketch merely states what we naturally think of first when we hear the word 'god'. Since we already have a distinct concept, there is no need for it to be supplied or sharpened by a definition.

If the foregoing discussion is roughly correct, Epicurus intends to base all knowledge on the phenomena of sense perception. The two points on which his method seems most problematic are the gap between relative and objective existence, and the exclusion of interpretation from both

³¹ *Phld. Sign.* col. 34.5-11. ³² See Asmis 1984, 39-45.

³³ See further Cic. *Fin.* II.4; and the anonymous commentary on Plato's *Theaetetus*, col. 12.10-41 (Bastianini and Sedley 1995, 120).

perceptions and preconceptions. It remains to see how these empirical starting-points can lead to correct beliefs about what is not observed.

iv Beliefs

Equipped with preconceptions and perceptions, we may formulate problems and test beliefs. These beliefs are of two kinds: about what is 'waiting' (προσμένον),³⁴ and about what is 'nonevident' (ἄδηλον). The former are verified by 'witnessing' (ἐπιμαρτύρησις) and falsified by 'no witnessing' (οὐκ ἐπιμαρτύρησις). The latter are falsified by 'counterwitnessing' (ἀντιμαρτύρησις) and verified by 'no counterwitnessing' (οὐκ ἀντιμαρτύρησις).

The senses can display the things that we believe to exist. For example, upon seeing a roundish tower from a distance, we might form the belief that the tower is square. This belief is correct if it is 'witnessed' by the appearance of a square tower when we come close, and false if it is 'not witnessed' in this way. The component -μαρτύρησις shows that the test of truth and falsehood lies in the first-hand reports of the senses. The square tower is an object of belief that 'awaits' verification by a present perception. Epicurus warns specifically that belief about 'what is waiting' must be distinguished from 'what is present already in perception' (*KD* 24).

Without actually using the term 'waiting' (προσμένον), Sextus gives an example in his account of Epicurean verification and falsification. His report, which is the only survey of Epicurus' theory of verification that we have, supplements Epicurus' own schematic distinctions in the *Letter to Herodotus* (50-1).

Witnessing is an apprehension by evidence (κατάληψις δι' ἐναργείας) that what is believed is such as it was formerly believed. For example, when Plato approaches from afar, I guess and believe, by reason of the distance, that it is Plato. When he has come near, it was witnessed in addition (προσεμαρτυρήθη), when the distance was eliminated, that it is Plato, and this was witnessed (ἐπεμαρτυρήθη) by evidence (δι' ἐναργείας) itself. (*S.E. M VII.212-13*)

³⁴ The MSS are divided between the active and passive participles at *Ep. Hdt.* 38 and *KD* 24. Bollack 1975 and Long and Sedley 1987 vol. II, 91, attribute the passive form to Epicurus. Diogenes (x.34) gives some support to this interpretation by assigning the wait to the beholder: 'to wait (προσμένειν) and come near the tower and learn how it appears (φαίνεται) from close up'. On the other hand, the active form, insofar as it designates an object, makes a parallel with both ἡσυχίαν and ἄδηλον, and the strangeness of the usage suits Epicurean terminology, as well as providing an explanation for the substitution of the less strange passive form.

'No witnessing', the 'opposite' of witnessing, is explained as follows:

It is an impact by evidence (ὑπόπτωσις δι' ἐναργείας) that what is believed is not such as it was believed. For example, when someone is approaching from afar, we guess, by reason of the distance, that it is Plato, but when the distance has been eliminated, we have learned by evidence (δι' ἐναργείας) that it is not Plato. (S.E. *M* VII.215)

Beliefs about what is not presently observed are verified by the actual appearance of what was previously conjectured. They are falsified, on the other hand, by the appearance of something other than what was believed. Presumably, the beholder makes a conjecture about an object 'in itself': he conjectures, for example, that what he sees really is Plato. This object is the three-dimensional source of the perception. In vision, it usually presents itself when the distance is short. A belief about such an object is true whenever it is matched by an appearance of the object.

But how will the beholder know that he has a presentation of the object 'in itself'? His knowledge of the object is always mediated by a presentation. As a perceiver, he cannot gauge the amount of distortion in the atomic stream. Physical theory can tell him about distortion, but it is based on a prior faith in perception; nor can it ever give him sufficiently accurate knowledge about any particular perceptual stream.

Further, what is the truth value of a belief whenever there is no present appearance that matches the belief? Epicurus' terminology seems designed to fit the theory that objects of perception are nothing but momentary states of the perceiver. Since such objects of perception exist only when perceived, 'no witnessing' is a necessary and sufficient condition for the non-existence of a perceptual object. On this view, everything that is 'waiting' to appear does not yet exist.³⁵

As we have seen, however, Epicurus posits not only real momentary objects of perception, but also enduring objects of perception. If there are enduring objects of perception, a belief may be true even in the absence of an appearance. Consequently, Epicurus' theory becomes a theory of verification. Even though a belief may be true, it cannot be accepted as true unless there is a confirmatory appearance; and even though a belief may be false, it cannot be rejected as false unless there is an appearance that clashes with it.

Sextus' examples and explanation agree with the latter interpretation. The observer ventures a guess that it 'is' Plato; and this belief is verified by

³⁵ So Annas 1984, 190-1.

an appearance that is without distortion since it is from close up. It is falsified by an appearance that takes the place of a confirmatory appearance. 'No witnessing' must be understood not merely as the absence of a confirmatory appearance, but as the non-existence of conditions that would produce a confirmatory appearance. Just when a confirmatory appearance should occur, there is an appearance of something else; and this appearance turns out to be evidence of the falsity of the belief. As Sextus explains, when the distance is eliminated there is evidence that it is not Plato. This is precisely when a confirmatory appearance would appear if there were an object corresponding to the belief.

Plutarch (*Col.* 1121c) faults the Epicureans for thinking that they can escape the realm of appearances. His blustering, hypothetical Epicurean proclaims: 'When I approach the tower and when I touch the oar, I will declare that the oar is straight and the tower angular; but he [the sceptical opponent] will agree to no more than the belief (δοκεῖν) and the appearance (φαίνεσθαι), even when he comes close.' Plutarch responds that the Epicurean is in just the same position as the sceptic, without realizing it. Since no 'presentation or perception is any more evident than another' (*Col.* 1121d-e), he cannot pick out any particular presentation as proof of external reality; all presentations equally show only inner conditions.

Is there any way the Epicureans can justify the move from inner conditions to outer reality? We confronted this question earlier in discussing perceptions. The step that Epicurus proposes as a way out is the existence of an atomic stream reaching from an external source to the observer. Since this stream can present the source without distortion, it is possible for an observer to have a true opinion about an external perceptual object. Coming close to a visual object is a test of the perception, although there is nothing about a presentation itself that makes one more reliable than another: that is just the point of saying that all are equally evident. The critics appear to be right that, as far as Epicurean theory goes, no amount of testing can guarantee that a belief is true. Epicurus and his followers seem to insist that in practice, when all are agreed on the confirmation of a belief by a presentation, a belief can be upheld as certain or 'authoritative' (κρίσις).

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We now turn from sensory phenomena to the hidden entities that are investigated by physical science. By contrast with things that are 'waiting', 'nonevident' things are not expected to become evident. But they too are known by reference to appearances. If a theory is 'counterwitnessed' by

sensory evidence, it is false; if it is 'not counterwitnessed', it is true (*Ep. Hdt.* 50-1). Again, the component *-marturēsis* shows that the ultimate test of the belief lies in the reports of the senses.

Just a little way into his physical investigations in the *Letter to Herodotus* (39), Epicurus states that one must infer (τεκμαίρεσθαι) the nonevident by calculation (λογισμός) in accordance with perception, 'as I said before'. This is a reference to the preceding note (*Ep. Hdt.* 38), in which he said that one must use sensory observations as 'signs'. The verb τεκμαίρεσθαι implies that sensory phenomena serve as conclusive signs, τεκμήρια, of what is nonevident. Whereas the phenomena serve only as plausible indicators of what will appear, they show conclusively whether a theory is true or false. The conclusion is worked out by a calculation that shows the perceptual consequences of a theory.

Whereas beliefs about perceptible things are verified by an appearance and falsified by the lack of a confirmatory appearance, beliefs about nonevident things are falsified by appearances and verified by the lack of disconfirmatory appearances. Sextus explains falsification as follows:

Counterwitnessing (ἀντιμαρτύρησις is . . . the elimination (ἀνασκευή) of the phenomenon by the posited nonevident thing. For example, the Stoic says that there is no void, claiming something nonevident, but the phenomenon – I mean motion – must be co-eliminated by what is thus posited. For supposing there is no void, necessarily motion does not occur either . . . (S.E. *M* VIII.214)

The belief that there is no void is 'counterwitnessed' by the phenomenon of motion; for motion is eliminated by the elimination of void. The proof is constructed in this way. We conjecture: there is no void. This is a hypothesis about what is nonevident. Next we calculate: if there is no void, there is no motion. But we observe that there is motion. It follows that there is void.

In his abbreviated account at *Ep. Hdt.* 39-40, Epicurus supplies no argument in support of the conditional claim 'if there is no void, there is no motion'. Both Lucretius (I.335-9) and Sextus (*M* VII.213) indicate that he argued along these lines: if everything is packed tight with bodies, there is no place for bodies to move into; hence there can be no beginning of movement. What in turn supports this calculation? The claim 'if there is no void, there is no movement' looks suspiciously like an a priori claim borrowed from the Eleatics; and it has usually been understood as such. If Epicurus did take over an Eleatic claim, without somehow recasting it as an empirical claim, then his two initial rules do not summarize his

method. If Epicurus is content to adopt a priori truths, he does not build his scientific structure entirely on a foundation of sensory phenomena.

Epicurus' followers argued vehemently that the conditional is known empirically. Epicurus himself might well have supported his apparently Eleatic claim by appealing to empirical conceptions of body, motion, and void. In constructing the conditional 'if there is no void there is no motion', he uses the preconception of 'body' as something that resists touch. This notion is derived from perception. Suppose, then, that everything is body: there would everywhere be resistance, so that none of the bodies could begin to move.

Epicurus uses the same method of 'counterwitnessing' to prove the first two doctrines of his physics. He supports his first claim that 'nothing comes to be from nonbeing' by arguing: if this were not the case, then everything would come to be from everything. As Lucretius (I.159-73) makes clear in his detailed proof, this consequence is in conflict with the phenomena. That we do not see everything coming from everything is an evident sign of the nonevident state of affairs 'nothing comes to be from nonbeing'.

Here is a clear example of an apparently Eleatic doctrine being verified by reference to an empirical fact. It is important to note that Epicurus proves the truth of the apparently Eleatic claim by an argument that takes the phenomena as evidently true. He does not simply add confirmation by showing an agreement with the phenomena. He establishes its truth wholly by an argument showing that it must be true if the phenomena are as they are. A critic may well doubt whether the premiss 'if something were to come from nonbeing, everything would come from everything' can be established empirically. Epicurus presumably thought he could verify it by reference to an empirical concept of coming-to-be.

Epicurus' second claim, that nothing is destroyed into nonbeing, is established in the same way by reference to the phenomena. The foundation of Epicurus' physics, then, rests on the method of 'counterwitnessing'. A theory is proved by the refutation of its contradictory. But how does this fit with the method of 'no counterwitnessing', by which a theory is said to be verified? Sextus explains as follows:

No counterwitnessing (οὐκ ἀντιμαρτύρησις) is the consequence (ἀκολουθία) of the posited and believed nonevident thing upon the phenomenon. For example, when Epicurus says that there is void, which is nonevident, this is proved by something evident, motion. For if there is not void, there must not be motion either, since the moving body does not have a place into which it will pass because everything is full and

packed. So, since there is motion, the phenomenon 'does not counterwitness' the believed nonevident thing. (S.E. *M* VII.213)

Again, Sextus' account implicitly contains a conditional. The argument may be formulated as: if there is motion, there is void; there is motion; therefore there is void. The non-evident thing, void, has the relationship of 'consequence' to the evident thing, motion. In other words, it 'follows upon' motion. This consequence defines 'no counterwitnessing'. Since the conditional is equivalent to the contrapositive 'if there is no void, there is no motion', 'no counterwitnessing' turns out to consist in the disproof ('counterwitnessing') of the negated hypothesis.

This restriction of 'no counterwitnessing' is surprising. One expects 'no counterwitnessing' to mean simply that there is no counterevidence against a hypothesis, not that there is evidence against its contradictory. 'Consequence' seems too strong a requirement. Why should the nonevident thing 'follow upon' the phenomena rather than simply be in agreement with them? But if we fault Sextus' definition as being too restrictive, another difficulty looms. Mere agreement with the phenomena permits multiple alternative explanations, all equally plausible. How can multiple explanations all be true? It has been suggested that Epicurus viewed 'no counterwitnessing' simply as a test of possibility.³⁶ But this goes against his own statement (*Ep. Hdt.* 51) that 'no counterwitnessing' is a test of truth, as well as upsetting the symmetry of his fourfold scheme of verification and falsification.

Epicurus himself made much use of multiple explanations; and these promise to throw some light on the difficulty. He held that, whereas single explanations are required for the foundation of physics, there is no need for single explanations of all events. Multiple explanations for the events in the heavens, for example, are sufficient for our happiness. Single explanations have a 'single agreement (*συμφωνία*) with the phenomena'; multiple explanations have a multiple agreement (*Ep. Pyth.* 86). Epicurus repeatedly refers to this multiple agreement by saying that there is 'no counterwitnessing'. He asserts, for example, that images may be formed in various ways, none of which 'is counterwitnessed by the perceptions' (*Ep. Hdt.* 48). He defends his extensive use of multiple explanations in astronomy and meteorology by saying that all are 'in agreement with' or 'not counterwitnessed by', the phenomena (*Ep. Pyth.* 86-8, 92, 95, 98). Singling out one explanation, on the other hand, when there are several, 'conflicts' with the phenomena (*Ep. Pyth.* 96).

³⁶ See Striker 1974, 71-80.

Lucretius shows how there is truth in multiple explanations. He compares the observation of events in the heavens with seeing a corpse at a distance (VI.703-11). It is necessary to state all causes of death - sword, cold, illness, poison, and so on - he writes, in order to state the one cause of this particular death; similarly, for some events it is necessary to state several causes, 'of which one nonetheless is the case'. After proposing several explanations of the movements of the stars, he points out that 'it is difficult to state for certain' which of these causes applies to this world; yet he does state 'what can and does happen' in the universe as a whole and one of these events 'necessarily' occurs in this world (V.526-33). One of the multiple explanations, therefore, does apply to the specific event under investigation. All of them together apply to the general type of event under investigation. Just as each cause of death applies to some death, so each cause of stellar movement applies to some star in the universe as a whole.

Multiple explanations, therefore, are all true with respect to the general type of event; and one of the explanations is true of the specific event. Since the event to be explained is known only as a general type, all explanations are true of just what is being explained. If the investigator had more specific information (by being able to come closer, for example, as in inspecting a corpse), then the explanation might be narrowed to a single cause. What is 'persuasive' (as Epicurus puts it) about multiple explanations is that any one of them might apply, and one does apply, to the specific event under investigation. In a sense, therefore, each explanation is 'possible' rather than true. At the same time, however, each explanation is true of some specific event belonging to the general type.

If this interpretation is correct, the method of 'no counterwitnessing' is at least in part an inductive method. 'No counterwitnessing' occurs whenever there is unopposed similarity between a phenomenon and something nonevident. Yet Sextus Empiricus says nothing whatsoever about induction in his explanation of this method. How can his view of 'no counterwitnessing' as the counterwitnessing of the contradictory hypothesis be reconciled with Epicurus' use of induction? We might suppose that there are two kinds of 'no counterwitnessing': counterevidence against the contradictory hypothesis; and the lack of counterevidence against an inductive inference. Sextus mentions only the former kind. But this does not imply that his account is inaccurate. Provided that his definition of 'no counterwitnessing' as a 'consequence' of the nonevident thing upon the phenomenon can accommodate unopposed induction, his account is not even incomplete, even though he uses an example that illustrates only one type of 'no counterwitnessing'.

It will be objected that induction can never yield 'consequence': it does not 'follow upon' observed facts, no matter how numerous or how thoroughly tested, that something else, that is known to be similar in other respects, has the inferred similarity. Yet Epicurus' followers did argue just this. Drawing on his teacher Zeno, Philodemus argues in his book *On Signs* that there is 'consequence' in inductive inferences no less than in inferences by 'elimination': in both cases, the nonevident thing 'follows upon' the phenomenon. Indeed, he maintains that all truths about what is nonevident are really inductive inferences. By recasting all calculations about what is nonevident as inductions, Zeno and his associates tried to remove all shadow of a doubt that there might be some a priori truths lurking in the foundations of Epicurean science.

Before we make a final judgement, then, about Epicurus' method of inference, we must turn to his followers.

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Philodemus' *On Signs* is a response to an attack against the Epicurean method of inductive inference, called 'method of similarity' or 'transition by similarity' (ἡ καθ' ὁμοιότητα μετάβασις).³⁷ The opponents claim that only the 'method of elimination (ἀνασκευή)' is valid. Philodemus responds that the method of similarity is the only valid method of inference and that it subsumes elimination.

This response was worked out by Philodemus' teacher, Zeno of Sidon, in association with other Epicureans. Only one opponent, a certain Dionysius, is named. He has customarily been identified as a Stoic.³⁸ But he could just as well have been an Academic. We have one other attack on Epicurean induction. It is part of a sustained attack on Epicurean theology by the Academic Cotta in Cicero's *De natura deorum* (1.87-90, 97-8). Mocking the 'very great delight' that the Epicureans take in similarity ('Isn't a dog similar to a wolf?', he asks, 1.97), Cotta makes some of the same objections that occur in Philodemus' work. In fact, there was a broad coalition of philosophers and scientists who were aligned against Epicurean induction; and Philodemus seems to be responding to all of them. He offers a revised Epicurean theory of signs that takes into account developments of the preceding two centuries, and he presents this revision in several versions: his own report of con-

³⁷ Barnes 1988c, 110-11, warns against calling the method of similarity 'induction'; but see Long's response (1988c, 140).

³⁸ Sedley 1982c, 240-1, defends the view that he is the Stoic Dionysius of Cyrene, a pupil of Diogenes of Babylon.

versations with Zeno; a report of Zeno's teachings by a fellow student, Bromius; a summary by the Epicurean Demetrius of Laconia, followed by a detailed attack and defence by an unidentified source who may well be Demetrius again.

A sign inference may be expressed with the help of a conditional: 'if the first, the second', where 'the first' expresses the sign, which is something evident, and 'the second' is the nonevident thing that is signified. In common with other philosophers, the Epicureans call this kind of sign 'particular' (ἴδιον, 14.7, 32.36, 33.3). Instead of signifying a multiplicity of situations and so being common (κοινόν) to what is true and false, a particular sign uniquely signifies what is the case. A particular sign, moreover, 'necessitates' the existence of the nonevident thing that it signifies (1.12-16).

A basic issue, then, is this: what makes a conditional true? Philodemus accepts that a conditional is true whenever its contrapositive is true (11.32-7). However, he insists, it does not follow from this that only the method of elimination has the necessity of a particular sign (11.37-12.1, 32.31-33.1). A conditional is true by elimination whenever the removal of the hypothetical nonevident thing, just by itself, brings about the removal of the evident thing (12.1-14, 14.11-14). Sometimes, indeed, the elimination of the consequent carries with it the elimination of the antecedent, as in the conditional 'if there is motion there is void'. But there is also another valid method, that of similarity. According to this method, a conditional is true whenever it is impossible to conceive of the first being the case and the second, which is similar, not being the case. An example is: 'If Plato is a human being, Socrates too is a human being' (12.14-31). This is true because it is inconceivable that Plato is a human being and Socrates is not; and what makes it inconceivable is the similarity between Plato and Socrates. Philodemus claims that in the second type of conditional, too, there is 'consequence' (37.9-17) of the nonevident thing upon the evident thing and a necessary 'link' (συστηρηθῆσθαι, 35.5).

Philodemus (37.1-12) grants that there is sometimes a special 'interweaving' (συμπλοκή) between what is evident and what is nonevident. An example is the link between a product and its constituents. In these special cases, a sign conditional is true by elimination. Philodemus here seems to be singling out necessary causal connections. But there is also a conceptual link, which is just as necessary as the causal link. In these cases, the removal of the nonevident thing (such as Socrates' humanity) is not accompanied by the removal of the evident thing (Plato's humanity), but

it is inconceivable (ἀδιδκνότητου) for the observed thing to exist or be of a certain sort and for the nonevident thing not to be likewise.³⁹

In defence of this position, Philodemus distinguishes between two uses of the expression '(insofar) as'. The first has the form: since certain things in our experience are of a certain sort, nonevident things are also of this sort '(insofar) as' the things in our experience are of this sort. An example is: since humans in our experience, insofar as they are humans, are mortal, if there are humans anywhere they are mortal (33.24-32). Here '(insofar) as' picks out the similarity (humanity) which is assumed to be common to observed and nonevident instances. Since it is always observed to be conjoined with another feature, mortality, one may draw the general conclusion that humans, '(insofar) as' humans, are mortal. This universal claim, Philodemus insists, is a conclusion that is reached by, and indeed only by, the method of similarity (17.3-8). Conceptual necessity is established empirically, by inductive inferences based on observed conjunctions.

Philodemus states the relationship between elimination and similarity in various ways. At times, he is concerned to show that the method of elimination is not the only valid method and so argues for two methods. At other times, he subordinates the method of elimination to the method of similarity. He claims that the method of similarity 'extends' entirely through the method of elimination, which is 'secured' by it (7.8-11, 8.22-9.8). He also says outright that there is just one method of sign inference, similarity; those who abolish it, abolish all inference by signs (30.33-31.1).

Along with promoting induction as the only method of knowing the truth about what is nonevident, the Epicureans attempted to strengthen it. Within their own system, they needed to set apart scientific induction from guesses about what will appear, which are verified only by an actual appearance. The Epicurean task was particularly urgent since other philosophers, joined by scientists, concluded that induction, no matter how well tested, yields no more than a good guess. Thus the Empiricist school of medicine, which originated in the third century BC, developed an intricate method for using accumulations of observations as guides to treatment, not as a means of discovering what is nonevident.⁴⁰ Whenever they did not have past observations, the Empiricists proposed to resort to 'transition by similarity', by comparing the present situation to a similar observed situation.⁴¹ Philodemus closes his book *On Signs* with a parting shot at the physicians who use 'transition of similarity'.⁴² These are surely

Empiricists, refusing to use the method of similarity as a means of discovering the truth.

Against this trend, Zeno and his friends argued that a careful calculation of the phenomena, called ἐπιλογισμός, produces knowledge of what is unobserved. Epicurus had distinguished 'calculation' (ἐπιλογισμός) from 'proof' (ἀπόδειξις). It is an analysis of what is evident, as opposed to a demonstration of what is nonevident. 'There is need of calculation, not proof' for example, that we associate time with days, nights, and so on (*Ep. Hdt.* 73). We must 'calculate' what our natural goal is (*Ep. Men.* 133). As well as extending the method of induction to all sign inferences, Zeno and his group extend calculation to all forms of reasoning. It turns out that the type of rational reflection used to discover what is nonevident is nothing but calculation. In short, scientific proof is nothing but a calculation about the phenomena.

Philodemus sums up the Epicurean method as 'scrutinizing [or 'going around', περιουδουόντων] the similarities by calculation' (17.32-4) and 'drawing conclusions by calculation' (23.5-6). There are three main points. One must consider many instances that are not only of the same kind but also varied (20.32-6, 33.12-13, 35.9-10). Further, one must rely not only on one's own observations, but also on the reports of others (16.35-8, 20.37-9, 32.13-21). Last, there must be no indication to the contrary (e.g. 16.38-17.2, 21.13-14). The inferences are so thoroughly tested that there is 'neither a footprint nor a glimmer' to the contrary, as Demetrius vividly puts it (29.1-4). These rules incorporate methods used by the opponents. Carneades proposed the 'scrutinized' (περιουδουομένη) presentation as the most trustworthy of three kinds of presentation.⁴³ The Empiricist doctors divided observations into two kinds, 'seeing for oneself' and 'inquiry'. Philodemus charges his opponents with ignoring the fact that the Epicureans rely not only on their own experience, but also on the reports of others (32.13-21).

How faithful, then, are the later Epicureans to Epicurus? Let us first consider Sextus. According to Philodemus, the truth of a belief about what is nonevident does indeed consist in a relationship of 'consequence' between what is evident and what is nonevident. Philodemus analyses this consequence differently from the way Sextus illustrates it. But since Philodemus recognizes elimination as a special type of inference, there is no conflict with Sextus' report. Sextus does not say that the whole of 'no counterwitnessing' is elimination: he merely exemplifies it by elimination.

³⁹ See also 14.2-27 and 32.31-33.9. ⁴⁰ Gal. *Subf. Emp.* chapters 1-6. ⁴¹ See below, pp. 311-12.

⁴² 14.17; cf. 15.37-8, 38.6-8, and 14.23-4.

⁴³ S.E. *M VII* 1B2-4; it is also called περιουδουομένη.

Nothing in his analysis implies that he (or his source) did not know of the reformulation proposed by Zeno. Indeed, the fact that he does not define 'no counterwitnessing' as a form of elimination, but defines it instead as 'consequence', suggests that he may have been familiar with Zeno's views.

As for Epicurus, there is no evidence that he ever reformulated his argument for the void, or any other argument later said to exemplify 'elimination', as an induction. Epicurus' followers are notorious for refusing to depart from the doctrines of their master. But they showed themselves very willing to interpret these doctrines in new ways, especially in response to attacks by other philosophers.⁴⁴ It was suggested earlier that, if his methodology is to be consistent, Epicurus must reduce all calculations about what is unobserved to empirical judgements. He does not explain in his extant writings how this reduction is to be accomplished. With help from their opponents, his followers worked out what they considered to be the implications of his position. All calculations about what is unobserved, they proposed, are inductive judgements. Among these judgements are preconceptions. The Epicureans thereby restructured Epicurus' distinction between what is evident and what is nonevident. In agreement with Epicurus, they demarcated what we observe from what needs to be inferred from observations. But very differently from Epicurus, they built a transition from the one to the other by allowing sufficiently tested empirical judgements to become, in the end, judgements about what is unobserved. The sign conditional, which grounds the inference, is verified in this way entirely by empirical observations. As a result, the conclusion rests entirely on self-evident, empirical premisses.

⁴⁴ Cf. Sedley 1989a.

Stoic epistemology

MICHAEL FREDE

I The possibility of knowledge

Stoic epistemology¹ is best understood as a response to a twofold challenge. Socrates had assumed that whether one had a good life depended on whether one had managed to acquire a certain kind of knowledge, which he identified with wisdom, in particular the knowledge of what is good and what is bad. For this reason he had devoted his life to philosophical inquiry concerning the good, the bad and related matters. Yet, for all of his efforts, even he himself did not think that he had obtained this knowledge. At the same time Socrates had made it clear that we should not content ourselves with mere belief or opinion concerning these matters, even if this belief happened to be true. One would not want to rely for the success or failure of one's life on mere opinion which at best happened to be true. Moreover, the Socratic elenchus suggested that one was not entitled to any belief which one did not hold as a matter of knowledge. For Socratic refutation seemed to rest on the fact that somebody who holds a belief as a matter of mere opinion can be made to see that he has equal reason to espouse the contradictory belief.

A century of philosophers since Socrates had done no better. Indeed, as if oblivious to Socrates' strictures against mere belief, they had rushed precipitously to produce thesis after thesis, theses often quite extravagant and often contradicting each other, and in any case all a matter of mere opinion, as closer scrutiny would reveal. The first challenge, then, was to find a way to break out of the realm of mere belief in order to arrive at true knowledge. This challenge was first taken up by the Epicureans, and it is important to see that the Stoic response is patterned on the Epicurean response. The Stoics follow the Epicureans in assuming that knowledge is made possible by the facts (i) that some of the impressions we have are by

¹ Main texts: Cicero *Acad.* 1.40-2; 11.17-31, 143-6; Sextus *M.* VI.150-8, 227-60, 401-35. D.L. VII.49-54. Note, in addition, *Philo.* 1020; Stobaeus *Eccl.* II 7.5; Aëtius IV.19.1-5. Literature: Watson 1966; Sandbach 1971; Striker 1973; Frede 1983; Annas 1990b.