for the most part, no final answer can be given, and over which we must continually ponder in the light of new evidence; it is not therefore an empty phrase to say that it makes one think. It is a pity that one's processes of thought are sometimes interrupted by misprints, spelling mistakes, and solecisms, of which the following alone are worthy of note: the Nicomachean Ethics are repeatedly referred to as the "Nichomachean Ethics;" 31, n. 33 "Contra Dionysodorus;" note 34, the title of Van Groningen's edition of Book 2 of the *Oeconomica* is *Aristotle, Le Second Livre de L'Économique*, not "... *de l'Économie;*" 34, n. 40, "Demosthenes, Contra Aphobos;" 35, n. 41, "Lysias, Contra Diogneiton" should be "Contra Diogeitonem;" on 97, the apparent references to a (col.) II of *PHib.* 27 are simply to "11.," and on the same page the essential noun λύχνους has fallen out between καί and κάουσι. Such minor flaws apart, the book is well produced.

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EPICURUS' SCIENTIFIC METHOD. By ELIZABETH ASMIS. Ithaca and London: Cornell University Press (Cornell Studies in Classical Philology 42). 1984. Pp. 385.

"EPICURUS IS WIDELY KNOWN AS AN EMPIRICIST .... Yet very little is known about Epicurus' scientific method. Indeed it is generally believed that Epicurus did not have a coherent method of scientific inference" (9). In this important and detailed study Asmis sets herself the task of showing that Epicurus had a coherent method of scientific inference, and that he applied it consistently throughout his philosophical system. The book succeeds admirably, and illuminates many aspects of Epicurus' thought along the way. Asmis reinterprets the ancient sources in light of recent scholarship, and presents an elegant and on the whole convincing picture of Epicurean scientific theory.

The book is divided into six major sections. The first two treat what Asmis calls Epicurus' two rules of inquiry (*Letter to Herodotus* 37–38): (1) the investigator must have concepts that correspond to the words that are used as a means of judging a problem, and (2) the investigator must use empirical observations as evidence of what is unobserved. Asmis explores both rules in detail, and discusses many important Epicurean doctrines as they relate to them: initial concepts (προλήψεις), the relationship of utterances to things, rejection of definition, standards of truth, perception, compacting, the affections, and Epicurus' notorious doctrine that all perceptions are true. In section 3 Asmis examines Epicurus' theory of signs as it relates to his scientific method, and explores the difference between "the expected"

(τὸ προσμένον) and "the nonapparent" (τὸ ἄδηλον). Asmis discusses Epicurus' theory of signs in its historical context, and argues that scholars have confused the distinction between τὸ προσμένον and τὸ ἄδηλον. Sections 4 and 5 show how Epicurus applied his scientific method in his fundamental theories (presented in *Letter to Herodotus* 38–44) and in his further elaborations of these theories. Asmis tries to show that all of Epicurus' fundamental theories have an empirical basis, and compares Epicurus' treatment with those of the early atomists and Parmenides. The last section provides a helpful summary of Epicurus' scientific method. It argues that Epicurus derived much of his scientific method from the early atomists, and that the early atomists, like Epicurus, made far greater use of empirical arguments than has been appreciated.

Asmis treats many difficult problems of interpretation concisely and convincingly. The remainder of the review can only comment on a few of her more important and controversial conclusions.

Asmis's account of initial concepts or presumptions (προλήψεις) is important but problematic. She rightly objects to any interpretation of προλήψεις as an intermediate class between utterances and objects, since ancient sources make it clear that Epicurus recognized no such intermediate class. Asmis argues that προλήψεις are to be identified closely with external objects. Most of her account is plausible, but she thinks (27–28) that there is in effect no difference between the individual perception of an object and an initial concept formed from individual perceptions. This seems unlikely. Asmis does not successfully show how, on her view, Epicurus could account for initial concepts like "man." Asmis writes (64) that "The general features that one thinks of by presumption are features that have appeared the same from one observed instance to another," but when one thinks of a man, what sort of image (εἴδωλον) comes from without and enters the mind? It cannot simply be the memory of a particular man or men one has seen, and must involve some further stage of thought or abstraction beyond individual perceptions.

Asmis's accounts of the criteria of truth and the focusing (ἐπιβολή) of the mind and senses are balanced and persuasive, but she is less convincing on the difficult concepts of "compacting" (πύκνωμα) and the "residue" (ἐγκατάλειμμα) of images the senses and the mind receive (*Letter to Herodotus* 50). She argues that two passages from Alexander of Aphrodisias show that the compacting of an image in sensation takes place when "small parts of *eidola* enter successively and combine in the eye to form the single presentation of an object" (132). She does not show, however, how this theory of taking in an image bit by bit accounts for objects of sight appearing smaller at a distance. Another theory, which Asmis rejects, holds that the images (εἴδωλα) shrink between the external object and the eye. On Asmis's account, since this shrinkage of the image does not occur, the phenomenon of

objects appearing smaller at a distance is left unexplained. Asmis's treatment of the "residue" of images is also unconvincing. She restricts "residues" to the senses even though the mind can easily be said to retain "residues" in the sense of patterns of motions which make it receptive to particular images. Asmis helpfully adduces a passage of Lucretius (4.706–721) to support her position that it is the senses which contain residues (although she slightly misreads it [138]: Lucretius says it is lions who are afraid of the sight of cocks, not vice versa). Still, Lucretius should be interpreted as saying that "residues" remain in both the organs of perception *and* the mind: he writes of "open paths that remain in the mind" (*relicuas tamen esse vias in mente patentis*) in 4.976. This brings Epicurus' theory closer to Aristotle's, who talked about residues in the sense organs which also affect the mind in recollection and dreams.

Asmis tackles much more in this book. Her treatments of Epicurus' doctrine that "all perceptions are true," the Epicurean use of different types of arguments ("counterwitnessing" [ἀντιμαρτύρησις] and "no counterwitnessing" [οὐκ ἀντιμαρτύρησις], induction, and deduction), and Epicurus' use of multiple explanations, and her discussion of the relationship between Parmenides, the early atomists, and Epicurus are important reading. Not all will agree with Asmis on individual points of interpretation, but everyone interested in Epicurus' scientific method, epistemology, and other fundamental doctrines will consult the book for clear discussions of the chief difficulties and attractive suggestions for their solution. This is a major contribution to Epicurean studies.

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The Phonological Interpretation of Ancient Greek: A Pandialectal Analysis. By Vít Bubeník. Toronto: University of Toronto Press (*Phoenix* Supplementary Volume 19). 1983. Pp. iv, 241, 34 illustrations.

Having long been an admirer of Bubeník's work, I regret that this book is not up to par. There are few truly new or "different" analyses. Even the title is misleading. One doesn't learn until page 20 that the study is primarily historical. Trivial concerns about taxonomic phonemicization (consistently misspelled) and *a priori* assumptions about phonemic inventories (e.g., 64 ff.) detract from Bubeník's historical-dialectal endeavor. The pandialectal presentation of data (e.g., vowel contractions [65–74], on which see Peters 1980 and Threatte 1980), while providing possible stages in the development of dialects for which historical information is lacking, unfortunately substi-