
Inference from Signs: Ancient Debates about the Nature of Evidence
by James Allen

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James Allen's purpose in this book is 'to explore some of the more important attempts that were made to understand the nature of evidence after it became an object for theoretical reflection in the ancient Greek and Roman world' [1]. This statement suggests that the author's investigation centers on an issue with which ancient philosophers concerned themselves in their inquiries into human knowledge. But Oxford University Press advertises Allen's book as making an important contribution not only to the history of ancient philosophy, but also to the history of ancient science. For instance, in her remarks on the back of the dust jacket, Gisela Striker predicts that *Inference from Signs* will become 'the authoritative work on this important chapter in the histories of science and philosophy'. Similarly, after noting the considerable role that inference from signs played in ancient philosophical and scientific methods, the blurb on the leaf of the dust jacket concludes that the book will fill 'an important gap in the histories of science and philosophy'. The following discussion will first summarize the main points of *Inference from Signs* and then go on to consider briefly the extent to which the book might contribute to the history of ancient science.

Allen organizes his book into four studies, rather than chapters, in order to 'emphasize the extent to which the views and controversies under consideration... cannot be made to fit the pattern of a single continuous development in which positions are taken and defended with reference to a framework common to all parties' [7-8]. These four studies focus respectively on the accounts of inference from signs offered by Aristotle, Sextus Empiricus, the Stoics, and the Epicurean philosopher Philodemus in his treatise *De signis*.

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The main concern of the first study is the distinction that Aristotle draws in the *Prior Analytics* and the *Rhetoric* between signs that yield an irrefutable conclusion (*τεκμήρια*) and signs that render a conclusion probable or likely (*σημεία*). This distinction, Allen maintains, marks the ‘path-breaking’ recognition that an argument need not be deductively valid in order to be persuasive to rational human beings [8, 14, 249]. Allen’s study aims to explain how this sympathetic attitude towards deductively invalid but reputable inferences from signs, which he locates in the *Prior Analytics* and two distinctive passages of the *Rhetoric*, developed from the less receptive attitude found in the *Sophistical Refutations*, the *Topics*, and in what Allen takes to be early portions of the *Rhetoric*. Following the work of Friedrich Solmsen, Allen argues that Aristotle’s discovery of the categorical syllogistic and his application of it to everyday practices of argument was responsible for this development. In particular, he maintains that Aristotle came to a deeper understanding of the reputability of non-deductive inference from signs once his theory of the categorical syllogism showed that the earlier topical method used in dialectic failed to account sufficiently for forms of argument in rhetoric. Allen concludes with a discussion of Aristotle’s distinction in the *Posterior Analytics* between demonstrative syllogisms and valid sign-based syllogisms. He argues that for Aristotle the former is a superior form of argumentation since it produces knowledge by explaining the reason why its conclusion must be true. Signs, on the other hand, provide only evidence (in the case of *τεκμήρια*, conclusive evidence) for concluding that some fact happens to be the case. Allen thus classifies Aristotle’s conception of signification as ‘low’, in so far as Aristotle restricts the term ‘sign’ to inferior, quotidian forms of inference, rather than extending the term to include the grounds of necessary inferences about causes and principles.

The second study of *Inference from Signs* examines the history and nature of the distinction that Sextus Empiricus draws between ‘indicative’ and ‘commemorative’ signs.¹ Allen emphasizes that Sextus appeals to this distinction as a framework for distinguishing dog-

¹ An indicative sign reveals something that is not evident by nature and therefore does not appear alongside what it indicates (e.g., motion as a sign of void). A commemorative sign calls to mind something that temporarily is not evident, but which ordinarily does appear alongside its sign (e.g., smoke as a sign of a hidden fire).

matism from Pyrrhonism. The dogmatists, Sextus insists, maintain that they can reveal the hidden, unobservable nature of things by means of indicative signs, while Pyrrhonists only rely on commemorative signification in their inquiries. Following the work of Robert Philippon, Allen argues that the distinction between indicative and commemorative signs originates in a debate between medical Empiricists and their opponents, the so-called Rationalist physicians, about the nature and limitations of inferences that can be drawn on the basis of direct evidence. The medical Empiricists developed an epistemological position that denied that reason is able to provide through the use of indicative signs a means of drawing true inferences about non-evident matters, such as the nature of the human body or the causes of disease. At the same time, they affirmed that knowledge is possible through commemorative signs. In their view, knowledge is not a matter of rational inference from sign to signified, but a matter of being reminded of what already has been observed and entrusted to memory. It is in respect of this epistemological position, Allen observes, that medical Empiricists differ from the Pyrrhonists, who proposed to suspend judgment on all matters, including whether and how the non-evident is knowable. Allen's main argument here is that Sextus fails in his attempt to employ the distinction between indicative and commemorative signs as a valid framework for distinguishing dogmatism from Pyrrhonism. Allen supports his argument by explaining how that distinction depends on assumptions unique to the debate between the medical Empiricists and their opponents, such as the assumption that dogmatism attempts to go beyond what is evident to reveal the non-evident.

In his third study, Allen seeks to reconstruct the character and purpose of the Stoic theory of inference from signs, especially in light of the framework of indicative and commemorative signs found in Sextus' writings, our only source for that theory. Allen argues that contrary to Sextus' view the Stoics espoused a theory that requires a notion similar to the commemorative, not indicative, sign. Sextus reports that the Stoics defined the sign as 'a proposition antecedent in a sound conditional and revelatory of the consequent' [149–150, Allen's translation]. Given the appeal to the conditional in their definition, Allen examines the Stoics' place within the ancient debate on the nature of the relation between the antecedent and the consequent of a true conditional. He argues that the Stoics understood the

true sign-conditional according to Philo's minimal, truth-functional analysis in which a true conditional is simply one that does not have a true antecedent and false conclusion. This definition is to be contrasted with Chrysippus' stronger, 'connective' conditional, the truth of which is established by the fact that the negation of the consequent would be incompatible with the antecedent. According to Allen, the Stoics developed this theory of the sign in response to a need to distinguish an inferior form of inference from the superior form that they classified as demonstration, the requirements for which even the wise man could rarely satisfy. The Stoic notion of signification therefore qualifies as what Allen classifies as a 'low' conception, rather than the 'high' conception that Sextus' account suggests. Allen supports his interpretation by showing how the truth of sign-conditionals in Stoic accounts of divination depend on inductive observations of conjoined events, rather than on a relation of logical entailment connecting the sign and the truth that it signifies.

Allen's fourth and final study investigates the Epicurean accounts of inference from signs present in the writings of Epicurus and Philodemus' *De signis*. The author pays special attention to the extent to which the latter account relates to the former. Both views of inference from signs, Allen explains, are grounded in the notion of analogy or the 'method of similarity'. In particular, Allen provides an analysis of Philodemus' account of a debate between his Epicurean predecessors and their anonymous opponents (whom Allen suggests are Stoics). This debate concerns whether similarity can ground the inferences that the Epicureans draw about the non-evident principles of nature. According to Allen's analysis, an analogical inference proceeds from a finite set of evident particulars of a certain kind and the assumption that something non-evident is similar to members of this kind, to a conclusion about that non-evident thing. We may take as an example the following reconstructed argument:

All moving objects in our experience always move into empty space. Atoms are similar to the moving objects in our experience. Therefore, atoms move into (something similar to) empty space (i.e., void).

In short, analogy comes into play by allowing us to draw true conclusions about things that cannot be observed, things which, despite their assumed similarity to things in our experience, are different

at least in respect to perceptibility. Allen goes on to argue that the Epicureans embraced a 'high' conception of signification, in that they insisted that such inferences are not inferior in cogency to inferences that necessitate their conclusions. Their opponents, on the other hand, insist that the method of similarity cannot provide legitimate grounds for inferences that necessitate their conclusions. Such grounds, they claim, can be secured only when the presence of the sign would be inconceivable if what it signifies were eliminated (the 'method of elimination'). That is to say, they regard the conditional 'If p , then q ' as true only whenever 'If not- q , then not- p ' is true. Allen concludes that if these opponents were in fact Stoics, then the Epicureans have wrongly attributed to them a 'high' conception of signification.

The above outline of Allen's four studies of ancient theories of inference from signs should suffice to demonstrate the philosophical nature and extent of his book. But how might these studies make a relevant contribution to the history of ancient science? Admittedly, it is often difficult, even impossible, to draw a clear and agreeable boundary between ancient philosophical and scientific pursuits. But certainly Allen's investigation and its topic are fundamentally philosophical, in so far as they constitute a part of the larger question of the nature, scope, and sources of human knowledge. It therefore would be misleading to suggest that *Inference from Signs* makes any direct contribution to the history of ancient science.

With that said, it is not the case that the book has nothing to say about ancient scientific methods. As Allen points out, Aristotle distinguishes between inference from signs and demonstration in the context of defending his conception of scientific knowledge. The Empiricists appeal to a theory of signs in order to repudiate their opponent's medical methodologies and to support their own. The Stoics, according to Allen, developed a theory of signs in order to account for knowledge based on observations of regularities as in the science of divination. And the Epicureans inquire into signs in order to ground their scientific method and to justify their claims about the principles of natural philosophy.

Each of these cases suggests that a philosophical theory of signs could potentially influence scientific practice and explanation purported to be based on signs. Accordingly, Allen's discussions provide

a firm starting-point for understanding possible philosophical assumptions and contexts behind the appeals to signs in ancient scientific writings. With a detailed philosophical understanding of these contexts, the scholar and student of ancient science may be able to ascertain whether and to what extent explicit views of inference from signs might have guided the methods for establishing and defending scientific explanations. In one case, Allen briefly suggests an answer to such a question when he notes that Aristotle often appeals to signs in the argumentation of his scientific works [14, 41], but does not follow the theoretical distinction between $\sigma\eta\mu\epsilon\acute{\iota}\alpha$ and $\tau\epsilon\alpha\mu\acute{\eta}\rho\iota\alpha$ that he establishes in the *Rhetoric* and *Prior Analytics* [27n23, 72].

In short, while it is not the purpose of Allen's book to examine the methods and use of inference from signs in ancient scientific writings, his four studies of theories of signs do in fact help to provide a basis for further examination of ancient scientific methods. As for its direct contribution, *Inference from Signs* offers the reader a meticulous modern philosophical analysis of an important ancient philosophical issue.