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*Theophrastus of Eresus: On Weather Signs* edited by David Sider and Carl Wolfram Brunschön

Philosophia Antiqua 104. Leiden/Boston: Brill, 2007. Pp. x + 263. ISBN 978-90-04-15593-0. Cloth € 99.00, \$134.00

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*Reviewed by*  
Harry M. Hine  
University of St Andrews  
[hmh@st-andrews.ac.uk](mailto:hmh@st-andrews.ac.uk)

Theophrastus, Aristotle's successor as head of the Lyceum, had philosophical and scientific interests as wide-ranging as Aristotle's, but the only major works that survive complete are the botanical ones (*Historia plantarum* and *Causae plantarum*), as well as his briefer but influential *Characters*. Of his other major works we have only fragments and *testimonia* culled from later writers; and there is also a series of minor works by, or attributed to, Theophrastus. Since 1979, Project Theophrastus, founded by Professor William Fortenbaugh of Rutgers University, has produced a new edition of the fragments, the first volumes in a series of commentaries, and several volumes of essays on Theophrastus and related authors. More recently the project has embarked on a series of new editions of, and commentaries on, the minor works.<sup>1</sup> The volume under review belongs in the last category, being an important and valuable new edition of the treatise *De signis* (*On Weather Signs*). Sider and Brunschön have produced a new edition of the Greek text with an introduction, translation, commentary, and detailed indexes. The preface explains that Sider did most of the initial writing and is chiefly responsible for the Greek text; Brunschön is chiefly responsible for the descriptions of manuscripts and the *apparatus criticus*; but there has been constant consultation between them both.

The introduction is divided into the following sections:

1. Predicting the weather
2. Writing it down
3. Origin of *De signis* (preliminary considerations)

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<sup>1</sup> See <http://www.ucl.ac.uk/GrandLat/people/sharples/theophr.htm>.

4. Survey of ancient weather literature
5. Structure of *De signis*
6. The nature of *De signis*
7. How accurate are the weather signs
8. Authorship reconsidered
9. Textual tradition

In section 1, the authors distinguish between, on the one hand, treatments of the regular annual cycle of weather and of weather characteristically associated with the seasons as well as with smaller periods of the year, and, on the other hand, signs of what is not regular—which include both signs of imminent weather (it is one thing to know that it is likely to snow in winter, another to see a sign indicating that it will snow in the next hour) and signs of departures from the normal patterns (such as an unusually snowy winter or an unusually mild one). In section 2, Sider and Brunschön point out that these two types of prediction do not fit together easily in the same work: thus, Hesiod's *Works and Days* concentrates on the former, while *De signis* concentrates on the latter.

Section 3 gives the basic evidence and maps out the main possibilities concerning the authorship of *De signis*. Both Aristotle and Theophrastus are credited with works on weather signs; the manuscripts containing *De signis* all contain collections of Peripatetic works; some manuscripts attribute the work to Aristotle, in some it is anonymous, in one late manuscript it is attributed to Theophrastus. The main possibilities are that:

- *De signis* is a collection of raw data on weather signs gathered for Aristotle;
- it was written by Aristotle;
- it was written by Theophrastus;
- it is an abridgment of either Aristotle's or Theophrastus' work; and
- it is effectively an abridgment of them both, and perhaps even deserves to be considered as a compilation by a later author.

One important feature of *De signis* is that, with one or two brief exceptions, it contains none of the 'philosophical underpinning or scientific framework that Aristotle or Theophrastus would surely have supplied' [4]. Sider and Brunschön return to these issues later.

Section 4 is a useful survey of ancient Greek and Latin weather literature, both surviving and lost, starting from Hesiod and ending

up with anonymous works and extracts in late Greek manuscripts. Sider and Brunschön note any overlap, or lack of overlap, between the subject matter covered in these other writers (so far as their works are known) and in *De signis*. Some, like Hesiod's *Op. et dies* and the *parapegmata* (weather-calendars), deal exclusively with regular weather patterns and have hardly any overlap with *De signis*. *De signis* arranges its material according to the weather indicated, whereas some other works arrange, or can be conjectured to have arranged, their material according to the sign. In the course of the survey, Sider and Brunschön argue against the views, which have been held by some scholars, that Aelian, when in the *Nature of Animals* he says that he is using Aristotle, is in fact using *De signis*, or that *De signis* is a source of the Aristotelian *Problemata*. They also demonstrate that Aratus' *Διοσημείαι* is derived from *De signis* and not *vice versa* as some have argued.

Section 5 analyses the structure of *De signis*. After a prologue [cc. 1–9], the signs are arranged in five sections: signs of rain [cc. 10–26], wind [cc. 26–37], storms [cc. 38–49], fair weather [cc. 50–55], and miscellaneous weather [cc. 56–57]. But the prologue introduces topics that are virtually absent from the rest of the work (e.g., astronomical signs), discusses the causes of phenomena [ch. 3] in a way that is virtually absent from the rest of *De signis*, and contains other indications that it was originally the prologue to a longer, more comprehensive work; so that our *De signis* looks like an abridgment of a more extensive and more complex work. The main body of the work (on signs of rain, wind, storms, and fair weather) is arranged by type of weather indicated, which is not very helpful for practical purposes: arrangement by sign would be more useful. However, within each section there are traces of an arrangement by sign—this is tabulated on page 33—suggesting that some of the material may have been drawn from a work or works so organized. The final section [cc. 56–57] seems to have been an addition to the original text.

Section 6 summarizes the main characteristics of *De signis*, recapitulating some of the previous discussion and adding that it makes no attempt at completeness (many further signs are known from other ancient sources). It makes no claims about the practical value of the work, which is in fact rather impractical not just in its arrangement by types of weather, already mentioned, but also in the lack of

specificity at many points (e.g., winds are sometimes mentioned without any indication of their direction; and there is very little about the weather associated with specific winds). The work has ‘a certain scientific appearance’ [38], but makes no attempt to understand or explain what it describes. Section 7 raises questions about the accuracy of the weather signs, arguing that the meteorological signs are the most reliable category. Animal signs seem intuitively less reliable, though there is little modern scientific literature on the subject.

Section 8 first reviews previous opinion on the authorship of *De signis*. It was first attributed to Theophrastus by Simon Grynaeus, who excluded it from his 1531 edition of Aristotle and included it in his 1541 edition of Theophrastus. Theophrastean authorship was challenged by J. Böhme in 1884. Sider and Brunschön conclude that most likely *De signis* was based on Theophrastus’ work on weather signs, with all the discussion of causes removed.

Finally, section 9 examines the textual tradition: there are 13 Greek manuscripts and a 13th-century Latin translation by Bartholomaeus of Messina. This literal translation is based on an independent Greek text. The Greek manuscripts are described, and their relationships analyzed, with a stemma [56] largely based on the work of D. Harlfinger and D. Reinsch [1970].

There follows a new text and translation [57–95] and commentary [97–219]. The text with *apparatus criticus*, based on fresh examination of the manuscripts, is a marked improvement on its predecessors. Significant misreports of manuscript readings are corrected; the commentary contains detailed textual discussions; and the editors have suggested emendations in more than 20 places, suggestions that are often convincing and always worth considering. The commentary, besides discussing textual matters, discusses the numerous places where the interpretation of *De signis*’ elliptical Greek is problematic. Sider and Brunschön also set the work in the context of ancient weather-forecasting literature, with full citation of parallels in Aratus and in writers of the Peripatetic tradition, and briefer references to other ancient authors. There is also careful attention to the language and style of the work, and numerous notes on vocabulary correct or supplement the treatment of words in Liddell-Scott-Jones’

lexicon. There are careful explanations of the meteorological phenomena mentioned in *De signis*, and full discussion of the identification of the various plants, animals, and birds mentioned.<sup>2</sup>

After the commentary [221–225], there is a new edition and translation, by V. D’Avella, of a short text ‘On the Locations and Names of the Winds’, attributed to Aristotle. The book ends with detailed bibliographies (including brief descriptions of all earlier editions of, and commentaries on, *De signis*), an ‘Index of Important <Greek> Words’, a ‘General Index’, and an ‘Index of Ancient Texts Cited’, which will make this valuable work easily accessible for those who wish to consult it quickly.

I offer a few comments on points of detail in the text, translation, and commentary; references are given by chapter and line number in Sider and Brunschön’s text.

- 10.67–68: The text printed is ἐάν γὰρ δὴ πρότερον, the manuscript reading; but the translation ‘if not before’ assumes, correctly, that Wimmer’s conjecture μὴ should be accepted in place of δὴ.
- 14.96: χειμῶνος ὄντος is a paleographically bold conjecture by Sider and Brunschön. Since the related passage 42.311 talks of black snuff, perhaps the manuscripts’ τρεῖς conceals some other color?
- 15.101: The passage of Varro Atacinus quoted in the comment on τύπτουσαι belongs in the previous note, with the quotation from Vergil [*Georg.* 1.377].
- 22.147–148: The commentary states: ‘The second-order rainbow occurs when the sun hits water droplets at a 52° angle from the eye to the direction of the sun so that a beam of light is reflected four times within a droplet before being directed to the eye’ [142]. This is inaccurate. The angle is 51° and there are not four reflections: the beam of light is reflected twice within the droplet and refracted twice (on entry to and exit from the droplet). See [Greenler 1980](#), 5–7, which is cited by Sider and Brunschön.
- 31.218: The commentary states that ‘τε does not occur elsewhere in *De signis*’. As it stands this is false, for τε is used elsewhere: τε γὰρ is found at 2.8, 3.18, τε...καί at 5.31–32 and elsewhere, ἐάν τε...ἐάν τε at 16.109–111. Sider and Brunschön presumably

<sup>2</sup> On birds, there has now appeared, too late for Sider and Brunschön to use, the survey of ancient Greek birds in [Arnott 2007](#).

mean to say that τε is not used elsewhere in *De signis* as a sentence connective. But Sider and Brun Schön's emendation of τε to δέ is still justified, for τε as sentence connective is very rare by this date [see Denniston 1954, 499–500] and Bartholomaeus has *autem*.

- 33.237–238: In the commentary 'if the wind affects winds' should presumably read 'if the moon affects winds'.
- 34.247: In the commentary, Posidonius 'F 263 Thummer' should read 'F 263 Theiler'.
- 52.381: The emendation of πετόμεναι to πρὸ ἑαυτῶν is paleographically bold and surely unnecessary. There is a slight illogicality ('they [*sc.* cranes] do not fly until, *while flying*, they see clear weather'), but it is not really troublesome: the point is that while on the ground they cannot see whether there is clear weather ahead or not; they must already be in the air, flying, to get a good view, before they can decide whether to fly off in a straight line or to turn back. Sider and Brun Schön's translation, 'until they see a clear sky ahead of them *as they fly*' [my emphasis] seems to combine their conjecture and the manuscript text.
- 54.397: The note in the commentary on the important point that ἔτος can mean 'season' repeats ground covered already in the commentary on 25.174–5, with no cross-reference.

But these are minor points in comparison to the achievement of Sider and Brun Schön in producing a much improved text and richly informative introduction and commentary on *De signis*. Their work will be useful to students of the Theophrastean corpus, of ancient weather lore, and of the kind of popularizing scientific writing that *De signis* represents.

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