descriptions of single events in the lives of his chosen characters. Nicholson's work is also an excellent example of how a literary perspective on ancient historiography can complement historical research in a meaningful way. The author's knowledge of, and discussion about, the relevant scholarly literature in all languages is impressive, and there are no apparent errors or shortcomings. This volume is a fundamental contribution to Polybian studies. The book will also be essential to anyone researching Philip V and ancient Macedon, or the ancient historiography of this era in general.

Jasmin Lukkari
University of Helsinki

Philipp Roelli: *Latin as the Language of Science and Learning*. Lingua Academica 7. De Gruyter, Berlin – Boston 2021. ISBN 978-3-11-074575-7; ISBN (e-book) 978-3-11-074583-2. XIII, 646 pp. EUR 89.95.

As is well known, Latin has a rich past with different linguistic and historical phases and various areas of special terminologies. Thus, the lifespan of Latin is, indeed, *longue durée*. Philipp Roelli's *Latin as the Language of Science and Learning* is a general treatise about the origins of Latin as a scientific language, and the stages of its development and change in this context. Latin, after all, has long been thought of as "a language of science" (see p. 3–8 and 13–27). Roelli traces Latin's scientific association through such words as *scientia formalis*, *scientia naturalis*, *ars*, *scientia*, *historia* and *philosophia* and the different branches of science that were formed in the past. In German we have *Wissenschaft*, in Russian наука (*naúka*), and in Modern Greek επιστήμη (*epistēmē*), all relating to branches of science. In English and French, the word *science* has a narrower extension (see p. 22).

Roelli's aim is to afford "a broad overview of the topic [in question], investigating the rôle of the Latin language as a vehicle for science and learning over much of the time of its existence" (p. 1). This extensive book is divided into three thematic parts, "Semantics of the term 'science'", "Diachronic panorama of Latin science and learning", and "Changes in the language of science", and it offers a wide viewpoint of development of scientific Latin by means of Roelli's multi-method approach.

In the introduction, Roelli offers the rationale and aims for his study, describes its contents and explains why Latin is a 'language of science'. He also covers what problems are related to the concept of science and how scientific languages are connected with technical languages (*Fachsprachen*). The first part is about the semantics of the concept of science and other relevant concepts in different languages, the nature of science and the scientific thought style (*Denkstil*). This

can be seen as the first philological and methodological part of the book – the third part makes the other philological and methodological part (see especially p. 389–397), as the second part is about the historical development of the Latin language. Roelli begins with modern conceptions about 'science' and proceeds to more vague conceptions of Ancient Greek and Latin regarding ἐπιστήμη (*epistēmē*) and *scientia*. Interestingly, the latter was employed in *Rhetorica ad Herennium* (ca. 86–82 BC) by an unknown author for the first time (see p. 34). Roelli reminds us here that "[i]n Antiquity, there is no clear notion of 'science'" (p. 29). He also clarifies other relevant terms here, such as μάθημα (*mathēma*), τέχνη (*tekhnē*), *historia* and *philosophia*. Lastly, Roelli discusses the demarcation problem concerning the concept of science and scientific activity. He also proposes two accounts regarding criteria for scientific *Denkstil* (i.e., fundamental: systematic methodology and outlining; searching and explanation of patterns; unbiasedness; optional: coherence and non-sterility; community effort; formalisation of results), that he applies in the second chapter of the book, as well as criteria for scientific communication (i.e., well-defined terminology; exactness and unambiguity; extensibility and flexibility; perspicuity, evidentiality and modality).

The second part deals with the development of Latin science and learning concerning typical approaches of intellectuals and scientific thinkers of certain – but partly arbitrary – epochs. This part is contextualizing, historicizing, and comparative since Roelli applies the above-mentioned criteria of scientific *Denkstil* for these epochs and approaches. He proceeds here chronologically and examines how the various approaches occur in classical Roman Antiquity, Late Antiquity, the twelfth century, Scholasticism or University science and Aristotelian Revolution, Renaissance times, the Scientific Revolution, and the post-Latin science. Moreover, Roelli justifiably touches on an era of Ancient Greek and the dawn of Western thinking (Chapter 7) as well as the demise of Latin (Chapter 14). The second part concerns various topics, such as the *artes liberales*, Christian neo-Platonism, the Carolingian renewal, Arabic science, different translation methods, Humanist Latin, vernacular languages, crypto-Latin, and scientific vocabulary, and the relation of these things to different literary genres (see p. 115–122) and disciplines (such as philosophy, jurisprudence, Christian theology, botany, and philology). Naturally, a wide array of persons (such as Plato, Aristotle, Cicero, Boethius, Suárez, Descartes, Newton, Leibniz, Kircher, Linné), works (e.g. Vitruvius' *De architectura*, Beauvais's *Speculum maius*, Suárez's *Disputationes metaphysicae*, Copernicus' *De revolutionibus orbium coelestium*, Linné's *Systema naturae*) and schools (such as the Oxford calculators, hermetic neo-Platonism, the Jesuit Order) are related to these topics. For these reasons, a detailed description of the second part is not possible here. The wide-ranging second part of Roelli's book contains useful data and many relevant observations, notices, and references as well as descriptions of apparent changes in the criteria of scientific *Denkstil*. Its content, however, is at times sketchy and superficial. Having said that, it is in its entirety useful as it offers a wide cross-section of ideas about the origins and development of scientific Latin.

In the third part of *Latin as the Language of Science and Learning*, Roelli studies changes of scientific Latin. This part is based on new methods and can be seen as the philological part of the book. First, Roelli discusses briefly the elements of the evolution of scientific languages and introduces new methods that are related to, *inter alia*, the differences in the distribution of parts of speech, i.e., PoS, in different contexts and corpora. Regarding the PoS, the differences concern syntactic differences, which can be traced either by the traditional system, which recognizes eight or nine parts of speech, or by the Corpus Corporum Latin PoS tagger, TreeTagger, which distinguishes even more parts of speech (see p. 392–401). Roelli applies the latter in the Corpus Corporum Latin language full-text collection (https://mlat.uzh.ch/), which is a digital repository of Latin texts developed by the University of Zurich under the direction of Roelli. He also uses Principal component analysis (PCA), which projects "multidimensional data onto two dimensions in the 'best' way, that is, preserving as much of the variation as possible" (p. 429) and stylometry, which can also be applied to distinguish different scientific types of language in addition to more traditional questions about solving authorship. In the following sections, Roelli presents the results that are achieved by these methods and by using different parameters for different materials. E.g., there are traditions but also new developments, such as various types and styles (see p. 439–444), and certain connections between technical vocabulary and syntax with examples (see p. 445–454). Roelli clarifies further differences regarding corpora of arithmetic, historiography and scientific poetry (Chapter 20), expressions of new scientific concepts in seven medical texts at different times (Chapter 21), the importing of Greek science into Latin, Arabic, Sanskrit and Chinese by means of the examples of Euclid's *Elementa* and Aristotle's *Poetica* (Chapter 22), and the reuse of Latin in the modern languages of science (Chapter 23). Roelli ends the third part by combining several things in the last chapter, which is about the relation between science, culture and language. He considers here, *inter alia*, roots, development, relevance and the linguistic structure of Greek science, nascent science outside Europe, suffixation of Latin, the lack of article in Latin and science as a Graeco-Latin *Denkstil*. Finally, Roelli runs through the grounds of his book and summarizes the contents and results of the three parts in a summary.

Roelli's *Latin as the Language of Science and Learning* is a diverse and extensive work, which shows the author's considerable erudition. Roelli's approach is holistic as he studies the origins and development of scientific Latin in a large time scale and by several traditional and recent methods. The book possesses many strengths. It is for one thing nicely and clearly written and has good illustrations and its premises and progress are clearly explained. It is also well-structured and takes into account different aspects regarding the development of scientific Latin, such as important connections between Ancient Greek and Latin. It contains a lot of useful information, such as various sources, and offers many interesting points of view. The book is versatile, and thus many scholars and non-specialists can find it worthwhile – the first and third parts are philologico-methodological and

the second part historical. However, I am not satisfied with certain things about Roelli's book. The section marks (§*x*) and footnotes should be running, so that they would be clearly identifiable – this would make the use of the book easier. Some figures, moreover, are not very clear or illustrative (such as in the p. 115). A more serious drawback is that due to its extensive content, the book contains minor errors and controversial claims – e.g., Lucretius' atheistic stance (p. 171) is not self-evident as Lucretius speaks of gods frequently in his *De rerum natura*, and Roelli's claim that "Lucretius' aims were not scientific" (p. 195) is to my mind problematic since Lucretius argues that the understanding and knowledge of nature is essential for human beings (cf., e.g., *De rerum natura*, book 1, lines 127–130 and 146–149). Finally, a separate index for the figures, tables and lists would have been helpful. In its entirety, Roelli's *Latin as the Language of Science and Learning* is a thought-provoking and versatile work, which is, I think, usable in different contexts and for many purposes.

Visa Helenius
University of Turku

Maria Giovanna Sandri: *Trattati greci sui tropi: Introduzione ed edizione critica.* Untersuchungen zur antiken Literatur und Geschichte 150. De Gruyter, Berlin – Boston 2023. ISBN 978-3-11-107214-2; ISBN (e-book) 978-3-11-107570-9. XV, 600 pp. EUR 119.95.

Maria Giovanna Sandri's book provides a critical edition and an Italian translation of the περὶ τρόπων treatises transmitted by mediaeval codices. The seven treatises are attributed to Concordius, Georgius Choeroboscus, and the authors known as Trypho I, II and III and Anonymus III and IV. This is the *editio princeps* for Trypho III and Anonymus IV, while the other texts are found in the volumes of the *Rhetores Graeci* (C. Walz, L. Spengel). The so-called Trypho II was edited by M. L. West in 1965 ("Tryphon *De Tropis*", *CQ* 15.2, 230–248). The fragmentary treatises preserved on papyrus are included in the discussion although not in the edition; Sandri emphasises their significance for the comprehension of the tradition of the περὶ τρόπων (p. 27; p. 47 ff.). The meticulous edition has undoubtedly benefitted from Sandri's familiarity with the papyri and also her previous work with a group of texts in many ways similar to the treatises περὶ τρόπων: the *Trattati greci su barbarismo e solecismo. Introduzione ed edizione critica* edited by Sandri was published in 2020 (Untersuchungen zur antiken Literatur und Geschichte 135; Berlin – Boston). The critical   apparatus is, as Sandri herself observes (p. VIII), quite comprehensive.

With an introduction of about 50 pages, the book is not simply an edition of the treatises but a clearly written and informative study on tropes in antiquity. Part 1 of the introduction discusses,