

by advances in the study of non-literary or para-literary papyri, and need to be reassessed periodically (like the concept of 'standard' and 'sub-standard' Greek). Rapid progress is being made in the application of linguistics to the papyri: my only wish after reading this dense collection is that every few years a conference should be organised like the one which led to this book in order to give scholars fresh opportunities to discuss these topics.

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NATURAL SCIENCE

KEYSER (P.T.), IRBY-MASSIE (G.L.) (edd.) *The Encyclopedia of Ancient Natural Scientists. The Greek Tradition and its Many Heirs*. Pp. x + 1062, figs, ill. London and New York: Routledge, 2008. Cased, £230. ISBN: 978-0-415-34020-5.

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The Editors of this book claim that one-eighth of their entries are not listed in any other encyclopaedia, including the *RE*, and that over one-fifth of the 2043 entries came to light only during research for the 1558 originally projected. Readers of the preface to Pliny's *Natural History* will be struck by the similarity in tone between this statement of achievement and the ancient encyclopaedist's tally of 20,000 facts from 2,000 volumes, most of which were too abstruse to have received much scholarly attention, together with material either unknown to his predecessors or discovered subsequent to their efforts. The 276 entries 'new to scholarship' are also assigned one of the numerous indexes which take up an impressive 207 pages out of a total of 1062, another feature which no doubt would have appealed to Pliny.

In keeping with the Editors' aspirations to an encyclopaedic comprehensiveness (p. 1), the definition of natural science and natural scientist has been kept as broad as possible, encompassing those whose writings seem in the widest sense to have contributed to the conceptualising and understanding of the natural world 'on the basis of investigation and reason'. Thus, we find material on alchemy, paradoxography and harmonics, as well as on medicine, astronomy and meteorology. Chronological parameters, too, are wide, embracing writers from Hesiod to the mid seventh century A.D., and the scope of Greek influence includes not just writings in the Latin tradition, but also in others, including Persian, Sanskrit, Egyptian and the Semitic languages.

The Editors are clearly enthused by the cataloguing possibilities of their material. These include, in addition to a 54-page gazetteer detailing 'all 290 or more sites and all 35 or more regions from which ca. 1000 ancient scientists are attested or considered to have originated' (p. 855), a glossary (compiled by fourteen contributors, pp. 911–36), a time-line (pp. 937–89) and an index of topics covered (pp. 991–1020). A further series of categorising indexes, including lists of writers who are female (30), Christian writers (62), poets (119) and even monotheists (82) and rulers (24: kings, queens, tyrants, consuls and emperors) induces the feeling that enthusiasm may have overcome utility. Such things, however, have their own fascination. Above all, though, it is the assemblage of such a considerable body of named individuals not covered elsewhere which gives this volume an instant and considerable value, and the index listing them allows the reader the opportunity

to highlight these rarities quickly and efficiently. The alternative (assuming that the majority of these names are unfamiliar to the majority of readers) is simply to browse through the volume at leisure: serendipitous discovery is one of the delights of this work. The individual entries on these little-known figures are generally painstaking in their efforts to gather every shred of evidence and list the few references which have uncovered their existence. Of course, it usually remains impossible to gauge the true importance of these individuals to the Greek scientific tradition and one or two isolated references cannot allow us to construct an accurate picture of the real scope of their interests. Such limitations are inevitable; but, while urging caution due to the likelihood (despite their best efforts) of gaps in the material, the Editors highlight the more positive aspects of their researches. Their gazetteer and other tables open up the possibility of exploring general trends in scientific activity, such as (to take an obvious example) the correlation between the flourishing of scientific activity and prosperous localities open to trade and outside influence.

If the shedding of light on the obscure (to quote Pliny again, *pref.* 15) is the great achievement of this volume, the accommodation of the better-known presents more of a problem. Constraints of overall word-count appear to have presented the contributors with an almost impossible task, as they attempt to balance the need for general biographical material against the specific need to do justice to the scientific contribution of their subjects. In the case of the former, compression, omission or over-simplification can occasionally leave the reader in need of supplementary material from other sources such as Pauly or *OCD*. Contributors also vary considerably in the amount of internal referencing and additional bibliography they provide. In addition, the relative importance of an individual figure's contribution to the scientific tradition is not necessarily reflected in the overall length of the entry. The entry on Tacitus, for example, is only slightly shorter than that on Cicero, but has comparatively little scientific material to deal with, other than geographical elements and a few *paradoxa* in the *Agricola*, *Germania* and *Histories*. Cicero's considerable contribution, however, has to be approached very differently. Happily, the entry's focus on later influence and reception succeeds in doing what is often lacking in this volume; namely, providing a real insight into the notion of 'tradition'. Individual entries, often admirable in themselves, remain in isolation, with little to indicate how the discrete parts might relate to each other. There is some internal cross-referencing, but no comprehensive linkage to related individuals and articles and no guidance from generic entries. Instead, readers must make use of the various indexes. To take one example: in order to trace all entries dealing with the Peripatetic school and its considerable significance in the Greek scientific tradition, readers must take the not entirely obvious step of looking up 'Peripatos' in the glossary, where a brief definition and a list of individual entries is given. A generic entry on the School and its importance would seem called for, but is not provided. The plethora of indexes can sometimes be a hindrance rather than a help. Those wishing to trace references to paradoxography will find an entry '*paradoxon*' in the glossary, together with a list of a dozen or so writers who made use of such material. Only a couple (Ps.-Aristotle *De mirabilibus auscultationibus*, Phlegon) can be associated with the more specialist paradox/*mirabilia* literature, a list of entries to which has to be unearthed elsewhere, in the separate, 'topics', index.

The true value of this encyclopaedia, then, lies in its bringing of the unknown, or relatively unknown, to the fore. This alone would justify its claim to a place in

any reference library. The various indexes and glossaries may seem confusing at first, but potential users will find that spending a little time familiarising themselves with them pays dividends. As mentioned earlier, this is also a book which lends itself to rewarding browsing. A well-produced, if expensive, volume, it is unlikely to be superseded in the near future as a ready work of reference in English, especially if, as the Editors claim, the Brill New Pauly will contain only 40% of the entries available here.

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Too (Y.L.) *The Idea of the Library in the Ancient World*. Pp. x + 265. Oxford: Oxford University Press, 2010. Cased, £55, US\$90. ISBN: 978-0-19-957780-4.

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The preface and introduction to this extended essay repay early reading, since they lay out the work's parameters. Having written a related book entitled *The Idea of Ancient Literary Criticism* (1998), T. now turns her attention to 'the idea' of the ancient library. She is thus concerned not so much with libraries themselves, though she finds them 'an interesting topic' (p. vii) as with the variety of conceptions of 'library' in the minds of the ancient Greeks and Romans. T. thinks that though the ancient Alexandrian Library has long enjoyed pride of place among ancient libraries, there were other conceptions of libraries in the classical world that warrant examination. Besides representing a building and a collection of texts, ancient libraries tell us about the people and communities that created and used them. That is, the purposes these institutions served, deliberately or not, are worth exploring.

In short, T. finds the considerable literature on libraries in the classical era to be thorough in discussing the evidence for physical collections, their housing and their societal roles, yet somehow lacking a connection to modern and current theories of communication and cultural symbols. This is essentially the challenge of the author and dilemma of the reader: current redefinitions of the modern 'library' are seen as insights into how the ancients may have viewed libraries.

The eight chapters are divided into four unequal sections that deal with library creation, forms of information, memory as preservation and transmission, and the physical environment. Specific works become case studies to represent the whole in several chapters. But as T. suggests in her preface, these divisions are arbitrary and there is a good deal of overlapping of interests throughout the book. Thus the Introduction serves as a useful summary of the whole and should be read carefully.

The usual primary classical sources receive attention, though T.'s mention of secondary or interpretative treatments has several conspicuous omissions, suggesting greater familiarity with the guild of classical scholars than with the work of broadly-based cultural historians of the ancient world. Findings of archaeological research receive scant notice; and there is virtually no consideration of influences arising from Judaism and Christianity. Nevertheless, the treatment of ancient libraries, qua libraries, is solid enough. The work concludes with a selected bibliography of nearly two hundred books and journal articles, a general index and an *index locorum*.