on it of set theory. Unfortunately, he did not conceive many of the fundamental distinctions which they used; thus his system is rather confused and inconsistent, and any historical assessment of it (which is not supplied by the editor) is perilous. I can indicate here only one typical problem. For all his talk of the cohesion of objects into a whole, Bolzano’s essence and sets are usually non-empty and are conceived extensionally, so that he does not handle well the issue of intensions and extensions.\(^3\) For example, ‘The idea, which the sign A—A denotes . . . is objectless’ (gegenstandlos, p. 164), since the idea involved is that of zero. Thus here (and also in other passages) Bolzano has not grasped the tridistinction between nothing, an empty class, and zero, a distinction which his successors were to use so effectively.

The Gesamtausgabe is being prepared with an astonishing care over the rendition of documents. Unclear passages and editorial conjectures are enclosed with square brackets ‘[ ]’; circumspect writings of ‘u’, ‘ü’, and some other vowels are printed in italics; Bolzano’s marginal additions and the corrections made on his manuscripts in others’ hands are surrounded by angled brackets ‘< >’; lineations are indicated by one vertical line ‘|’, and numbered lines (with the numbers in the inside margins) and places of foliation (folio numbers being given in the outside margins) marked by two vertical lines ‘||’. However, the admiration for the scholarship is tempered by the thought that perhaps such a degree of editorial prominence hinders the comprehension of the material presented. Bolzano is difficult (and, to be honest, tiresome at times) to read without appearing before us as, for example, ‘ein | and[e][e]r[d][e]r in d[i][e][s][e][m] G[e][g][a]-| || ‘ (p. 185; surely the last square brackets should contain only ‘an’). Further, there is unfortunately no index of technical terms.

But if there is excess here, it is excess in the right direction. Few projects in the current history of science rival this one for attention to detail, and none exceeds it. It will be a long time in progress, and every major library should support it throughout. New readers please note.

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\(^1\) Einleitung: E. Winter, *Bernard Bolzano. Ein Lebensbild* (1969); J. Berg and others, *Bolzano-Bibliographie und Editions-prinzipien der Gesamtausgabe* (1972). I reviewed these volumes in *Annals of science*, xxxii (1975), 179–80.

\(^3\) Bolzano’s discussion of objects ‘of the same kind’, and of ‘parts’ of sets, is similar in content (and in incoherence, especially concerning intensions and membership vis-à-vis inclusion) to Schröder’s theory of ‘consistent manifolds’, which I have discussed in my ‘Wiener on the logics of Russell and Schröder . . .’, *Annals of science*, xxxii (1975), 105–32.

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I. GRATTAN-GUINNESS

\[\begin{array}{c}
\text{MEDICINE} \\
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\text{Public Health and the Medical Profession in the Renaissance. By Carlo Cipolla. London: Cambridge University Press, 1976. Pp. viii+136. £5.50.}
\end{array}\]

Of the necessity for recognizing the relation between the contemporary conceptions of the science of nature and medicine there is no longer any need to speak: there is an abundant literature in which this is discussed. The corresponding relationship between medical theory and the contemporary practice in respect of both public and private health has been too little cultivated: it is sufficient to contrast the irrelevance of Nicolò Leoniceno’s elegant Latin tract on the origin of the *Morbis gallicus* with the crude but fairly effective diagnosis by the contemporary Town Council of Aberdeen. Professor Cipolla’s book
comprises two distinct contributions to this field, one entitled *The origin and development of the Health Boards* (substantially the Ellen McArther Lectures delivered in the University of Cambridge in 1975), the second, *The medical profession in Galileo's Tuscany*; they are preceded by an *Introduction* (pp. 1–10) to which I shall refer later. Both articles are based mainly on state archives of eight of the leading cities of Northern Italy, but by judicious use of contemporary and later literary sources Cipolla has lightened the reader's journey through what is inevitably a forest of statistical facts. The value of this information is greatly enhanced by judicious citation from the correspondence preserved in the archives which shed a most revealing light on the remarkable degree of sophistication in the conduct of 'diplomatic' exchanges between the 'bureaucracy' and both the medical profession and 'pressure groups' such as merchant guilds and the Health Boards of other cities; particularly welcome are Cipolla's comments on the humanitarian motivation, political hazards, economic consequences, and rapid means of communication. The same liberality of approach is manifest in the article on the medical profession, which, though based on detailed reporting of contemporary statistical sources (and especially the Tuscan inquiry of October 1630 set out in four textual and five appended tables), is rich in perceptive asides.

Having emphasized the authenticity and 'infinite riches in a little room' of Cipolla's work I must warn potential readers of certain aspects of his presentation that could be seriously misleading, especially to such readers (or whom I hope there will be very many) lacking wide experience of the history of medicine in the Renaissance and of the earlier traditions on which it drew. The title itself is misleading: that already too elastic term 'Renaissance' has been stretched to cover a much later period than would normally be accepted, especially for Italy. And it is almost exclusively to Italy (though the title gives no hint of this) that the book refers. Thus in the list of universities flourishing before 1370 (p. 2) Macerata is named, but Oxford, Prague, Montpellier, Vienna, and many others are not. Under 'Medical profession . . .' no mention is made of Jean Fernel, perhaps the best-documented case of medical practice in the sixteenth century; of the influential medical schools of Basel, Montpellier, and Breslau; or of the phenomenal circulation of the text-books of Leonhart Fuchs. A more serious warning must be registered in respect of the whole *Introduction*—the misconceived demarcation between *Ars* and *Scientia*. If 'Ars—that is, technology—was the skill of the artisans, unsystematic and empirical . . .' how came it that the teaching at Padua was based on Galen's *Ars parva*, a highly sophisticated inquiry into the methodology of medical teaching? The book was also known as *T(h)e(ni, a derivation from the Arabic corruption of the Greek τεχνη, generally regarded as 'craft leading to action on the best available information', an acceptable 'definition' of medicine. *Scientia* (*pace* Cipolla, p. 3) did not mean 'philosophical speculation (ital. mine) but was contrasted with *ars* as was ἐπιστήμη with τεχνη; that is, knowledge 'demonstrated' from true premises, hence hardly applicable to medicine. Pedantry? Perhaps; but it played a leading part in the education of physicians from Pietro d'Abano to Zabarella (and incidentally Galileo and Harvey), and consequently vitiates Cipolla's inferences. I hate to say it (being of an age to prefer books!) but he would, I suggest, have been wiser to publish his invaluable contributions as monographs: the impossible task of finding an accurate title and sketching the history of medicine in half a dozen pages would have been avoided. A good index and a number of facsimile documents are provided. I noticed only two slips: 'scienta' (p. 3) and 'Pistola' (p. 71) correctly given as 'Pistoia' in the index.

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