been of this mixed character. Indeed, for the star catalogue, the Tunisian manuscript is arranged in nearly, though not precisely, the same way as the Latin version (see pp. 100 f).

The bulk of Part 2 is a list, with extensive notes, of the terms in both the Arabic and Latin versions (as well as in other related texts) for the 48 constellations and for 652 of Ptolemy's 1022 stars (pp. 172-348). In each case where the Arabic star name differs in the two Arabic versions, the Latin is identified with one of them. The Arabic and Latin terminology is carefully examined, and instances where the Latin translator misunderstood the Arabic are indicated. Kunitzsch decided not to present the coordinates and magnitudes of these stars, and has attempted neither to analyze Ptolemy's observations nor to justify the identifications with modern star designations. For these purposes one must still consult C.H.F. Peters and E. B. Knobel, *Ptolemy's Catalogue of Stars* (Washington, 1915), and a few subsequent studies [cf. O. Pedersen, *A Survey of the Almagest*, (Odense, 1974)].

I found one relatively minor error (p. 127, n. 58): Ptolemy's *Planispherium* is to be found in Istanbul Ms. Aya Sofya 2671, *not* in Istanbul Ms. Köprülü 1589 which is the copy of Ptolemy's *Centiloquium* (both manuscripts are noted on the same page in Krause's list of Istanbul mathematical manuscripts). Moreover, on AS 2671, f. 76b, Ptolemy is transcribed in Arabic as Batliymūs, *not* Batlamyūs as in Krause and Kunitzsch.

The star names in Latin were often subject to textual corruption. The present work, together with Kunitzsch's earlier studies, are invaluable aids for the proper identification of star names that occur in a large variety of texts. It is also useful to have a discussion of the complex tradition of one of the most significant ancient texts for medieval science based on the manuscripts themselves, rather than on often inadequate catalogue entries.

RIEMANN'S ZETA FUNCTION. By Harold M. Edwards. New York. (Academic Press). 1974. 315 pp.

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H. M. Edwards' book is an excellent companion to the classical papers on the Riemann zeta function. He considers, thoughtfully, the work of Riemann, von Mangoldt, Hadamard, de la Vallée Poussin, and makes many useful remarks of insight and perspective. Methods of computation are discussed, and a good exposition is presented of Euler-Maclaurin summation and the Riemann-Siegel formula. There is a chapter on the order of the zeta function in the critical strip, a chapter on zeros on the line (written before the Levinson 1/3 result) and some miscellany about M(x), Farey series and integral transforms with zeros on the line.

There is also a chapter on the modern functional-analytic way of looking at Fourier Analysis and its applications to prime number theory. He also uses Stieltje's integrals on occasion to analyze what is happening. The book is not an exhaustive survey on the thousands of papers that have been written on the zeta function and prime number theory but rather follows several lines of papers directly flowing from Riemann's work.

KARL MARX. MATHEMATISCHE MANUSKRIPTE. Edited, with an introduction and commentary, by Wolfgang Endemann. Kronberg Taunus, BRD (Spriptor Verlag). 1974. 178 p.

KARL MARX. MANOSCRITTI MATEMATICI. Translated and edited by Francesco Matarrese and Augusto Ponzio. Bari, Italy (Dedalo Libri). 1975. 184 p. 3,000 lire.

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At the burial of Karl Marx, 17 March 1883, Friedrich Engels noted that Marx had worked in many fields and "in each, even in that of mathematics, he made independent discoveries" (Marx/Engels, *Werke*, vol. 19, p. 336). That Engels singled out mathematics for special mention was no accident; Marx was often occupied with mathematics in his later years, although he never published his mathematical writings. Nor was Engels able to carry out the intention he expressed in 1885 of doing so. Then interest in this aspect of Marx' studies seems to have languished until 1933 when, on the occasion of the 50th anniversary of Marx' death, two brief articles, dating from 1881, dealing with "the concept of the derived function" and "the differential", along with some additional material, were published in Moscow in Russian translation. After that, perhaps the first outside the Soviet Union to call attention to the interest of Marx' ideas in mathematics was D. J. Struik ("Marx and Mathematics", *Science and Society* 1948, *12*, 181-196). Struik had access to the original German text of the Russian publication and gave English translations of several pertinent passages. But Marx' mathematical manuscripts were not published in their original German until the complete--some 1000 pages of manuscript are in the Institute of Marxism-Leninism--Moscow edition of 1968. This also includes a preface and other material by the editor, S. A. Yanovskaya, along with a Russian translation of all the manuscripts. The book is divided into two sections: the first contains the essentially original writings of Marx, including the two articles mentioned above. (Only these two were left by Marx in a complete state, and even then were not as such intended for publication). The second, larger, section includes summaries of books Marx studied, excerpts from them along with his commentary, etc. The first volume under review