SHORTER NOTICES

James Stirling: A Sketch of his Life and Works, along with his Scientific Correspondence. By Charles Tweedie. Oxford, Clarendon Press, 1922. x + 213 pp.

This book is an interesting and valuable contribution to the history of mathematics, giving as it does a considerable amount of new information about the work of the early successors of Newton. One of the ablest of these was James Stirling, and thus his hitherto unpublished mathematical correspondence contains much of interest.

The book is divided into three parts, "Life," 22 pages, "Works," 26 pages, and "Correspondence," 160 pages. The first part adds some interesting details to the rather meagre stock of information available concerning Stirling's life. He was one of the non-juror students at Oxford, and as such under suspicion at the time of the accession of George I, when there were riots and a revolution in favor of the restoration of the Stuarts seemed imminent. In fact, because of his Jacobite leanings, Stirling was deprived of a scholarship which he had previously held; but the usual account * that he was expelled from the University and "fled to Italy" is incorrect, as the author brings out the fact that Stirling only left Oxford in 1717, to go to Venice on the offer of a mathematical professorship there. This was the year in which he published (in Oxford) his book on cubic curves. The offer in Venice was eventually declined, on account of the religious conditions attached to it. He remained in Italy, however, till about 1724, when he located in London. He was a friend of Newton and of Maclaurin, and was highly esteemed by other contemporary mathematicians, particularly Machin, DeMoivre, and Cramer. The latter part of his life (from the age of 43 on) he devoted to commercial work, and thus his mathematical productivity came to an end just at the time when he was in a position to have added much to the development of the subject.

Stirling's chief works are *Lineae Tertii Ordinis* (1717) and *Methodus Differentialis* (1730). These are well described in the second part of the book under review. The *Methodus Differentialis* contains most of Stirling's own contributions to mathematics; these relate to the summation of series, to interpolation, and to approximation formulas, the most famous of the last being "Stirling's Formula,"

$$n! = \sqrt{2n\pi} \cdot n^n \cdot e^{-n}.$$

He finds the exterpolated value of the term preceding the first in the series of factorials,

$$1, 1, 2, 6, 24, 120, \text{etc.}$$

to be 1.7724538502, and says that this is equal to $\sqrt{\pi}$. He also introduces the Beta Function as an integral, for the interpolation of

$$a, \quad \frac{r}{p} a, \quad \frac{r(r+1)}{p(p+1)} a, \quad \cdots,$$

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* *Dictionary of National Biography*; Cantor, *Geschichte der Mathematik*, vol. 3, p. 372.