

Wales, see C. HUTTON, *Phil. and Math. Dict.*, second ed. 1815; E. I. CARLYLE, *Dict. Nat. Biog.*, v. 59, 1899; *Math. Gazette*, v. 14, 1929, p. 388; and *Mechanics' Mag.*, v. 60, 1854, p. 436-437. Garrard's T. IV of Meridional Parts is for each minute of the quadrant to 2D; Robertson's table, p. 215-224, for the same range, is to 1D. John Robertson (1712-1776) became a fellow of the Royal Society in 1741, and was its Librarian for the last few years of his life.

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58. TABLES OF POWERS  $N^p$ . Among many tables of this type,  $p$  non-integral, attention may be directed to one which seems to be comparatively unknown to mathematicians. It was calculated by L. A. BARRY and published in JOHN GOODMAN, *Mechanics Applied to Engineering*, London, New York & Toronto, Longmans, v. 2, 1927 [new impression 1941; reprint 1943], p. 450-469, 12.0 × 18.4 cm. The table gives to 4S, without differences, values of  $N^p$  where  $N = 1.1(.1)30$  and  $p = 1.1(.1)4$ . As a one-volume work, Goodman's book goes back to the last century; but the second volume, which consists chiefly of worked examples, was first published in 1927.

Another, though smaller, table in which  $p$  takes a range of fractional values is that given in JAHNKE & EMDE, *Tables of Functions* (1933 edition and Dover reprints), and repeated in F. EMDE, *Tables of Elementary Functions*, 1940, p. 8 (see *MTAC*, v. 1, p. 384). This gives  $N^p$  to 3-4D, without differences, for  $N = .1, .5(.1)1(.2)3(.5)5, 10$  and  $p = .05(.05)1$ . On errors in this table, see *MTAC*, v. 2, p. 47.

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## QUERIES

18. ADDITIONS TO THE RUDOLPHINE TABLES.—Kepler's last great work, *Tabulæ Rudolphinæ, Quibus Astronomicæ Scientiæ, Temporum longinquitate collapsæ Restauratio continetur* was published at Ulm in 1627, and there were later editions including one in English. To this original work three additions were later made, namely: (a) in 1629, 8 pages (p. 121-128), by Kepler, of "Sportula Genethliacis missa de Tabularum Rudolphi usu in computationibus astrologicis: cum modo dirigendi novo et naturali"; (b) A celebrated "Mappa Mundi Universalis," dated, 1630, but mysteriously dedicated to Kaiser Leopold, who did not commence to reign until 1658; (c) An Appendix, 46 p., by Kepler's son-in-law, J. BARTSCH, published at Sagan in 1630. In Providence, R. I. there are three copies of Kepler's work all including (a), and two of them also including (b). In MAX CASPAR, *Bibliographia Kepleriana* (Munich, 1936), where libraries having Kepler's works are listed, are the names of 9 German libraries owning copies of Kepler's work with (c). Where are copies with (c) in other countries? Tables in this Appendix, as well as in the Rudolphine Tables, are of value as exhibiting the spread of Napier's ideas on the continent, and as the basis of the final edition of a volume containing material due to Kepler and Bartsch, and published at Strassburg in 1700.

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