and part ii. 1867), give the values of li 10*x* from *x = -* 15 to 3∙5 at intervals of ∙01 to 18 places. Glaisher, in *Phil. Trans.,* 1870, p. 367, gives Ei(±*x*), Si *x*, Ci *x* from *x*=0 to 1 at intervals of ∙01 to 18 places, from *x=*1 to 5 at intervals of Ί and thence to 15 at intervals of unity, and for *x=* 20 to 11 places, besides seven-place tables of Si *x* and Ci *x* and tables of their maximum and minimum values. See also Bellavitis, “Tavole Numeriche Logaritmo-Integrale ” (a paper in *Memoirs of the Venetian Institute,* 1874). Bessel calculated the values of li 1000, li 10,000, li 100,000, li 200,000,... li 600,000, and li 1,000,000 (see *Abhandlungen,* vol. ii. p. 339). In Glaisher, *Factor Table for the Sixth Million* (1883), § iii., the values of li *x* are given from *x* = 0 to 9,000,000 at intervals of 50,000 to the nearest integer.

*Values* ∫x0 *and ex2J'xc~x~dx.—*These functions are em­

ployed in researches connected with refractions, theory of errors, conduction of heat, &c. Let *J'xe ~ x"idx 3λv∖e ~ x"dx* be denoted

by Erf *x* and Erfc *x* respectively, standing for “error function” and “error function complement,” so that Erf *x*+Erfc *x=½√π (Phil. Mag.,* Dec. 1871 ; it has since been found convenient to transpose as above the definitions of Erf and Erfc). The tables of the functions, and of the functions multiplied by *ex2,* are as follows. Kramp, *Analyse des Réfractions* (Strasburg, 1798), has Erfc *x* from *x=*0 *to* 3 at intervals of ∙01 to 8 or more places, also log10 (Erfc *x*) and log10(ex2Erfc *x)* for the same values to 7 places. Bessel, *Funda­menta Astronomiae* (Königsberg, 1818), has log10(ex2Erfc *x*) from *x=*0 to 1 at intervals of ∙01 to 7 places, likewise for argument log10*x*, the arguments increasing from 0 to 1 at intervals of ∙01. Legendre, *Traité des Fonctions Elliptiques* (1826), vol. ii. p. 520, contains Γ(½,*e*-χ2), that is, 2 Erfc *x* from *x=*0 to ∙*5* at intervals of ∙01 to 10 2 places. Encke, *Berliner Ast. Jahrbuch for* 1834, prints 2/√π

Erf*x*

from *x*=0 to 2 at intervals of ∙01 to 7 places and Erf (*ρx*) from

*x*=0 to 3∙4 at intervals of ∙01 and thence to 5 at intervals of Ί to 5 places, ρ being ∙4769360. Glaisher, in *Phil. Mag.,* December 1871, has calculated Erfc *x* from *x*=3 to 4∙5 at intervals of Ό1 to 11, 13, or 14 places. Encke’s tables and two of Kramp’s were reprinted in the *Encyclopædia Metropolitana,* art. “Probabilities.”

*Tables of Integrals, not Numerical.—*Meyer Hirsch, *Integral­tafeln* (1810 ; Eng. trans., 1823), and Minding, *Integraltafeln* (Berlin, 1849), give values of indefinite integrals and formulæ of reduction ; both are useful and valuable works. De Haan, *Nouvelles Tables d'intégrales Définies* (Leyden, 1867), is a quarto volume of 727 pages containing evaluations of definite integrals, arranged in 485 tables. The first edition appeared in vol. iv. of the *Transactions* of the Amsterdam Academy of Sciences. This, though not so full and accurate as the second edition, gives references to the original memoirs in which the different integrals are considered.

*Tables relating to the Theory of Numbers.—*These are of so tech­nical a character and so numerous that a full account cannot be attempted here. The reader is referred to Cayley’s paper in the *Brit. Assoc. Rep.* for 1875, where a full description with references is given. Three tables may, however, be briefly noticed on account of their importance and because they form separate volumes : (1) Degen, *Canon Pcllianus* (Copenhagen, 1817), relates to the inde­terminate equation *y*2 *- ax*2 = 1 for values of *a* from 1 to 1000. It in fact gives the expression for √*a* as a continued fraction ; (2) Jacobi, *Canon Arithmeticus* (Berlin, 1839), is a quarto work contain­ing 240 pages of tables, where we find for each prime up to 1000 the numbers corresponding to given indices and the indices corre­sponding to given numbers, a certain primitive root (10 is taken whenever it is a primitive root) of the prime being selected as base ; (3) Reuschle, *Tafeln complexer Primzahlen, welche aus Wurzeln der Einheit gebildet sind* (Berlin, 1875), includes an enormous mass of results relating to the higher complex theories. A table of χ(*n*), where χ(n) denotes the sum of the complex numbers which have *n* for their norm for primes up to n=13,000 (cf. *Quart. Journ.,* vol. xx. p. 152), has been published since the date of Cayley’s report. Some tables that belong to the theory of numbers have been described above under “ Factor Tables ” (p. 7).

*Bibliography.—*Full bibliographical and historical information relating to tables is collected in *Brit. Assoc. Bep.* for 1873, p. 6. The principal works are : —Heilbronner, *Historia Matheseos* (Leipsic, 1742), the arithmetical portion being at the end ; Scheibel, *Einleitung zur mathematischen Bücherkenntniss* (Breslau, 1771-84); Kästner, *Geschichte der Mathematik* (Göttingen, 1796-1800), vol. iii. ; Murhard, *Bibliotheca Mathematica* (Leipsic, 1797-1804), vol. ii.; Rogg, *Bibliotheca Mathematica* (Tübingen, 1830), and continuation from 1830 to 1854 by Sohnke (Leipsic and London, 1854) ; Lalande, *Bibliographie Astronomique* (Paris, 1803), a separate index on p. 960. A great deal of accurate information upon early tables is given by Delambre, *Histoire de l' Astronomie Moderne* (Paris, 1821), vol. i. ; and Nos. xix. and xx. of Hutton’s *Mathematical Tracts* (1812). For a complete list of logarithmic tables of all kinds from 1614 to 1862, see De Haan, “lets over Logarithmentafels,” in *Verslagen en Mededeelingen der Koning. Akad. van* *Wetenschappen* (Amsterdam, 1862), pt. xiv. De Morgan’s article “Tables,” which appeared first in the *Penny Cyclopaedia,* and afterwards with additions in the *English Cyclopaedia,* gives not only a good deal of bibliographical informa­tion but also an account of tables relating to life assurance and annuities, astronomical tables, commercial tables, &c. (J. W. L. G.)

TABOO (also written Tabu and Tapu) is the name given to a system of religious prohibitions which attained its fullest development in Polynesia (from Hawaii to New Zealand ; see vol. xix. p. 426), but of which under different names traces may be discovered in most parts of the world.

The word “ taboo ” is common to the different dialects of Polynesia, and is perhaps derived from *ta,* “ to mark,” and *pu,* an adverb of intensity. The compound word “taboo” (tapu) would thus originally mean “marked thoroughly.” Its ordinary sense is “sacred.” It does not, however, imply any moral quality, but only “ a connexion with the gods or a separation from ordinary purposes and exclusive appropriation to persons or things considered sacred ; sometimes it means devoted as by a vow.” Chiefs who trace their lineage to the gods are called *arii tabu,* “ chiefs sacred,” and a temple is called a *wahi tabu,* “place sacred.” The converse of taboo is *noa* (in Tonga *gnofoóa*)*,* which means “general” or “common.” Thus the rule which forbade women to eat with men, as well as, except on special occasions, to eat any fruits or animals offered in sacrifice to the gods, was called *ai tabu,* “ eating sacred ” ; while the present relaxation of the rule is called *ai noa,* eating generally, or having food in common. Although it was employed for civil as well as religious purposes, the taboo was essentially a religious observance. In Hawaii it could be imposed only by priests ; but elsewhere in Polynesia kings and chiefs, and even to a certain extent ordinary individuals, exercised the same power. The strictness with which the taboo was observed depended largely on the influence of the person who imposed it : if he was a great chief it would not be broken ; but a powerful man often set at nought the taboo of an inferior.

A taboo might be general or particular, permanent or temporary. A general taboo applied, *e.g.,* to a whole class of animals ; a particular taboo was confined to one or more individuals of the class. Idols, temples, the persons and names of kings and of members of the royal family, the persons of chiefs and priests, and the property (canoes, houses, clothes, &c.) of all these classes of persons were always taboo or sacred. By a somewhat arbitrary exten­sion of this principle a chief could render taboo to *(i.e.,* in favour of) himself anything which took his fancy by merely calling it by the name of a part of his person. Thus, if he said “ That axe is my backbone,” or “ is my head,” the axe was his ; if he roared out “ That canoe ! my skull shall be the baler to bale it out,” the canoe was his likewise. The names of chiefs and still more of kings were taboo, and could not be uttered. If the name of a king of Tahiti was a common word or even resembled a common word, that word dropped out of use and a new name was sub­stituted for it. Thus in course of time most of the common words in the language underwent considerable modifications or were entirely changed.

Certain foods were permanently taboo to *(i.e.,* in favour of or for the use of) gods and men, but were forbidden to women. Thus in Hawaii the flesh of hogs, fowls, turtle, and several kinds of fish, cocoa-nuts, and nearly everything offered in sacrifice were reserved for gods and men, and could not, except in special cases, be consumed by women. In the Marquesas Islands human flesh was tabooed from women. Sometimes certain fruits, animals, and fish were taboo for months together from both men and women. In the Marquesas houses were tabooed against water : nothing was washed in them ; no drop of water might be spilled in them. If an island or a district was tabooed, no canoe or person might approach it while the taboo lasted ; if a path was tabooed, no one might walk on it. Seasons generally kept taboo were the approach of a great religious ceremony, the time of preparation for war, and the sickness of chiefs. The time during which they lasted varied from