

MATHEMATICAL QUOTATION BOOKS.

Memorabilia Mathematica or the Philomath's Quotation-Book.

By ROBERT EDOUARD MORITZ. New York, Macmillan, 1914. xiv + 410 pp. Price \$3.00.

THE United States has now joined France and Germany in contributing to this class of literature.

It is some twenty-five years since A. M. Rebière published a pioneer work entitled: *Mathématiques et mathématiciens. Pensées et curiosités*.^{*} The second edition (in later editions there is practically no change) was divided into five parts, headed: *Morceaux choisis et pensées* (pages 1-178), *Variétés et anecdotes* (179-340), *Paradoxes et singularités* (341-470), *Problèmes curieux et humoristiques* (471-526), *Note bibliographique, index and table des matières* (527-566).

The textual parts contain, mainly, short quotations or translations (the whole book is in French) from writings ancient and modern. When there is any indication of the source nothing is given, except in rare cases, but the name of the author; the composition of the numerous unsigned paragraphs is attributable to the editor. The work is not, then, strictly a book of quotations but a sort of admixture of quotations, history, mathematical recreations, and table-talk. In defense of his mixture of things gay and serious the author makes appeal to the authority of Pascal: "Les matières de géométrie sont sérieuses d'elles-mêmes, qu'il est avantageux qu'il s'offre quelque occasion pour les rendre un peu divertissantes."

Ahrens's *Scherz und Ernst in der Mathematik*† differs essentially from the work of Rebière. In the first place the former is strictly a book of quotations; secondly, each quotation is invariably given in the original language, spoken or written; thirdly, exact bibliographical data are provided for all quotations; fourthly, the quotations follow one another consecutively from pages 1 to 495 without grouping under subject headings. A 24-page detailed index of subjects and authors provides the means for rapid orientation. Names of living mathematicians are rarely met with, but references to

^{*} Deuxième édition, revue et augmentée, Paris, 1893. 2+566 pp.; 4^e éd., Paris, 1911.

† W. Ahrens, *Scherz und Ernst in der Mathematik. Geflügelte und ungeflügelte Worte*. Leipzig, 1904.

the "old masters" such as Abel, Euclid, Euler, Gauss, Helmholtz, Lagrange, Laplace, Steiner, and Weierstrass, are very numerous.

The whole constitutes a most admirable piece of work and must long serve as a desirable model for works of like nature.

The book under review is also a quotation book. The author tells us that ten years were devoted to its preparation and that as a result there have been brought together some 1,200 "more or less familiar passages* pertaining to mathematics, by poets, philosophers, historians, statesmen, scientists, and mathematicians. These have been gathered from over three hundred authors and have been grouped under twenty heads and cross indexed under nearly seven hundred topics." The headings are: Definition and object of mathematics; The nature of mathematics; Estimates of mathematics; The value of mathematics; The teaching of mathematics; Study and research in mathematics; Modern mathematics; The mathematician; Persons and anecdotes; Mathematics as a fine art, as a language; Mathematics and logic, and philosophy, and science; Arithmetic; Algebra; Geometry; The calculus and allied topics; The fundamental concepts of time and space; Paradoxes and curiosities.

Apart from classification in this way the method of Rebière is followed by giving a translation of all quotations in a foreign language, and in probably not more than a score of cases is the original also given. This departure from the scheme of Ahrens must be considered as a great defect, when the book is employed as a work of reference. No scholar is likely to use the translation of a quotation unless he can test its faithfulness by comparison with the original. It is indeed true that exact reference is usually given for this, but then some of the desirable usefulness of the single volume has disappeared.

The compiler has avoided as far as possible traversing the ground that has been trodden already by Rebière and Ahrens. "Thus certain topics, as the correspondence of German and French mathematicians, so excellently treated by Ahrens, have purposely been omitted. The repetitions are limited to a small number of famous utterances whose absence from a work of this kind could scarcely be defended on any grounds."

* This total is about the same as in Ahrens's work. It is no doubt due to the special method of numbering the quotations that some reviewers estimated the total to exceed 2,000; cf. *Mathematical Gazette*, vol. 8 (March, 1915), p. 57; *Nature*, vol. 94 (Oct. 8, 1914), p. 144.

The number of quotations from contemporary or living mathematicians is large. Appended to numerous quotations from the writings of Americans, the names of Bôcher, Cajori, Emerson, Keyser, Myers, B. Peirce, D. E. Smith, W. F. White, E. B. Wilson, J. W. Young, and J. W. A. Young, each of which occurs at least three times, may be noted. John Wesley Young is referred to as *Charles* Wesley Young on page 6. To De Morgan 50 quotations are attributed; to Sylvester 38, to Klein 20, to Shakespeare 3, and so on. As recent biographies have been drawn upon for anecdotes, Sylvanus P. Thompson's *Life of Lord Kelvin* has not been overlooked. It may be of interest to make a single quotation. First note that elsewhere in this BULLETIN,* I have called attention to the integral

$\int_0^{\infty} e^{-x^2} dx$ which plays an important rôle in the theory of errors, to its connection with certain other integrals studied by Euler and with the curve named by Cesàro the clothoïde, which was considered by Jacob Bernoulli, and by Fresnel in discussing the diffraction of light. The quoted footnote near the end of Thompson's biography is as follows:

"Once when lecturing to a class he [Lord Kelvin] used the word 'mathematician,' and then interrupting himself asked his class: 'Do you know what a mathematician is?' Stepping to the blackboard he wrote upon it:

$$\int_{-\infty}^{+\infty} e^{-x^2} dx = \sqrt{\pi}.$$

Then putting his finger on what he had written, he turned to his class and said: 'A mathematician is one to whom *that* is as obvious as that twice two makes four is to you. Liouville was a mathematician.' Then he resumed his lecture."

While Mr. Moritz's work seems to have been very carefully compiled, it is by no means free from at least minor errors (or misprints) and misrepresentations. For example in quotation no. 1043, Mr. Macfarlane is said to have written: "Maxwell denoted Thomson by T and Tait by T': so that it became customary to quote Thomson and Tait's *Treatise on Natural Philosophy* as T and T'." Instead of T' should of course be T'. In his sketch of Tait, J. S. MacKay refers to "*T and T'* (Thomson et Tait), la notation prolongée T''

* Vol. 20 (June, 1914), pp. 488-489.

servant, chez les amis de Tait, à designer le professeur Tyn-dall.”*

In no. 1049 we read: “His only reply was that he could impossibly interrupt his work”; in 1858 the name of the translator of Dante should be given as Cary; the original of A. C. Orr’s mnemonic for π has “In rhymes unapt,” not “inapt”; on page 405 of the index for Reid, M. read Reid, T.; all the references after Pope on page 404 are wrong; and on page 410 two quotations are incorrectly attributed to J. W. A. Young instead of J. W. Young.

To state (no. 1007) that Alexander Pope’s “Epitaph intended for Sir Isaac Newton” was:

Nature and Nature’s laws lay hid in night:
God said, “Let Newton be!” and all was light.

is inaccurate. It would have been an easy matter to have turned to the standard edition of Pope’s works and found† that the intended epitaph for Westminster Abbey was as follows:

ISAACUS NEWTONUS
QUEM IMMORTALEM
TESTANTUR TEMPUS, NATURA, COELUM:
MORTALEM
HOC MARMOR FATETUR
Nature and Nature’s laws lay hid in night:
God said, *Let Newton be!* and all was light.

Again J. Spence and James Porton are given as authorities for statements (nos. 1023 and 1024) by Newton. Had Sir David Brewster’s standard Life of Newton been consulted‡ it would have been found that the first line of 1023 was inaccurate while no. 1024 is made to convey an entirely wrong idea. Instead of “I don’t know what I may seem to the world” of the former should be, “I do not know what I may appear to the world.” No. 1024 is given as: “If I have seen farther than Descartes, it is by standing on the shoulders of giants.” In the course of a letter addressed to Robert Hooke and dated “Cambridge, February 5, 1675–6,” occur the sentences: “But, in the mean time, you defer too much to my ability in searching into this subject. What Descartes did was a good step. You have added much several ways, and especially in considering the colours of thin plates. *If I have seen farther, it is by standing on the shoulders of giants.*”

* *L’Enseignement mathématique*, vol. 7, 1905, p. 7.

† Works, edited by Elwin and Courthope, vol. 4, London, 1882, p. 300.

‡ *Memoirs of the Life, Writings and Discoveries of Sir Isaac Newton*. 2 vols. Edinburgh, 1855, vol. 1, p. 142; vol. 2, p. 407.

But this selection from examples must suffice to illustrate the criticisms made above with regard to errors and careless presentation.

As to additions, I suggest two or three, at random, in connection with things geometrical.

Why not give a reference for Hamilton's "letter to De Morgan (1852)" with regard to the construction of the regular polygon of 17 sides?* And would not the reproduction of Gauss's original announcement of the discovery of the possibility of construction of such a polygon, with ruler and compass,† be worth while?

Why leave out Prior's

"Circles to square, and cubes to double,
Would give a man excessive trouble;"‡

And finally, might not the plan of the work permit the inclusion of the verses of the British Museum MS. which shows that Euclid was studied in England as far back as 924-940 A. D.?

The clerk Euclide on this wyse hit fonde
Thys craft of gemetry yn Egypte londe
Yn Egypte he tawghte hut ful wyde,
Yn dyvers londe on every syde.
Mony erys afterwarde y vnderstonde
Gher that the craft com ynto thys londe.
Thys craft com ynto England, as y ghow say,
Yn tyme of good kyng Adelston's day.§

R. C. ARCHIBALD.

BROWN UNIVERSITY,
PROVIDENCE, R. I.

SHORTER NOTICES.

The Development of Arabic Numerals in Europe. By G. F. HILL. Oxford, Clarendon Press, 1915. 125 pp. Price 7 shillings 6 pence.

It is a commonplace remark that noteworthy achievements in this world often have their inception in the most trivial incidents, and this semiparadoxical law is well illustrated in the work under review. Mr. Hill is the curator of the depart-

* Graves's *Life of Sir Wm. R. Hamilton*, vol. 3 (1889), pp. 433-435.

† *Intelligenzblatt der allgem. Literatur-Zeitung*, Nr. 66, 1 Junius, 1796, col. 554.

‡ In *Alma*, canto 3, lines 366-7, published in 1717. Or in *Poetical Works of Matthew Prior* in 2 volumes, London, 1779, vol. 1, p. 404.

§ J. O. Halliwell, *Rara Mathematica*, second ed., London, 1841, p. 56.