Review
Source: *The Mathematical Gazette*, Vol. 8, No. 116 (Mar., 1915), pp. 57-58
Published by: Mathematical Association
Stable URL: http://www.jstor.org/stable/3604463
Accessed: 29-11-2015 01:28 UTC

the statistician, and to all who are interested in calculation." The contributors have certainly gathered within the covers of the book a considerable body of information which otherwise would have to be gathered painfully from sources which to many people are practically inaccessible. It certainly emphasises the debt that is owed by the mathematical laboratory of this century to the invention of logarithms and to the marvels of mechanical ingenuity that eventually were to transform the labours of the calculators.

Memorabilia Mathematica, or The Philomath's Quotation-Book. By R. E. MORITZ. Pp. vii + 410. 12s. 6d. net. 1914. (Macmillan Co.)

There are few mathematicians who will not be grateful to Prof. Moritz for the collection of over 2000 notable passages which fill 383 pages of his *Memorabilia Mathematica*. For ten years he has been gathering passages dealing with mathematics and its various branches, and with mathematicians as men of science and as men of flesh and blood. One could fill pages of the *Gazette* with delightful samples of enthusiastic descriptions of our science, its influence on the individual mind, its value to the progress of mankind, the cause of its unpopularity, its relations to the other sciences, its aims, its permanency, and so forth. There is hardly a page on which is not to be found something to instruct or to titillate. Here and there, no doubt, the most learned among us will be struck by the abnormal depth of his own ignorance outside his special field—as, for instance, when Pierce gives the names of the first five poets in a biographical dictionary as Aagard, Abeille, Abulola, Abunowas, and Accords. The spasm of mingled astonishment and annoyance to which the five names may legitimately give rise will be at once dispelled for some by learning of the respective ages of these poets at their deaths, viz. 48, 76, 84, 48, 45; that: (*a*) the difference of the two digits 4 and 8, 7 and 6, etc., divided by 3 leaves *one*; (*b*) that $4^8 \div 3$, $7^6 \div 3$, etc., have remainders each *one*; (*c*) the sum of the prime factors of each age (including *one* as a prime factor) is a multiple of *three*. If we wonder how on earth Pierce found himself in this *galère*, we find that the passage is quoted from p. 163 of a work entitled "A Theory of Probable Inference." By this time one's senses are so rapidly dissipating that it is with furtive joy we note that the number of the page divided by *three* leaves a remainder *one*, and that the annoying 8's in 1883 add to 16, giving a remainder *one* on division by *three*, and thus leave us with a 1 and a 3. If we wonder what is the probable inference to be drawn from these alarming facts, the next page or so, p. 379 (also a number which divided by *three* leaves a *one*), reminds us that Pope was torn by a similar curiosity when in the *Dunciad* he makes Oldmixon in "naked majesty" exclaim:

"Ah! why, ye Gods, should two and two make four?"

It will be gathered from the above nonsense that the book is one which may be dipped into for amusement. But the reader can pull himself up in a moment if desired. We turn at random to p. 347 (also giving remainder ...), and we find nothing risible in the majestic solemnity of Schopenhauer's *Predicabilia a priori* (19 letters, also giving ...), or in a quotation of topical interest from the Platonic views as to the necessity of geometry to the soldier. Readers will be particularly grateful to Prof. Moritz for the catholicity of his selections, which range from Aeschylus to our new President, and for the many excellent quotations from familiar and unfamiliar American sources. He certainly appreciates to the full the flamboyant ecstasies of Sylvester and trenchant wit of De Morgan, for he seems to quote more from them than from any other writers. Not the least of the benefits he has conferred on us is the excellent Index of 27 pages.

Introduction Géométrique à quelques Théories Physiques. By E. BOREL. Pp. vii + 140. 5 frcs. 1914. (Gauthier-Villars.)

The first part of Prof. Borel's brochure consists of an elementary exposition of the theories of 4 and of n-dimensional geometry (n very large) as far as they serve for investigations in the theory of relativity and in statistical mechanics. The second part consists of seven papers reprinted from various sources and dealing with the following subjects: The principles of the Kinetic Theory of Gases; Statistical Mechanics and Irreversibility; Poincaré and the Relativity of Space; Some remarks on the Theory of Resonators; On a

Problem in Geometrical Probability ; Kinematics in the Theory of Relativity ; and Molecular Theories and Mathematics.

The author laments that in the French secondary instruction there is still far too great a gap between mathematics and reality. The aim of the mathematical discipline is to abstract from realities their common elements and to handle them so as to serve for the extension and creation of theories of as wide as possible a field of application. The child who knows that three trees with four apples a piece on them are bearing 12 apples, and yet is unable to utilise that fact in another domain, is far less advanced than the child who is not only aware that 3 times 4 are twelve, but can apply this result to simple problems. The essential characteristic of our science is this stripping from the formulae of experience their concrete content, and in their subsequent application to other and different concrete questions. Nowhere has this been found more fruitful than in the domain of Physics. The ball is being tossed backwards and forwards from the one science to the other. The mathematical theory of physical origin is developed in a purely abstract manner by the mathematician. It is used in its new form by the physicist and from it in time a new or extended mathematical theory emerges, and so the cycle of action and reaction goes on. But there may come a time when physical theories advance so rapidly that there has been hardly time enough for them to react upon Pure Mathematics. Such a time is the present, when we are more or less restricted to investigations of which the utility in physics is immediate. And with regard to these investigations, it must be remembered that their value persists long after the theories that inspired them, and provided them with material, have passed into the limbo that awaits so much of human speculation. Mathematical research on Laplace's equation is useful to the physicist long after he has abandoned Coulomb's electrostatics. The mathematical theory of periodical phenomena does not vanish with the mechanical theory and luminous phenomena which called it into existence. It is with this in mind, continues the author, that this little book is offered to the young mathematician, to induce him to interest himself in Mathematical Physics and those questions in Pure Mathematics which are connected with it. It is needless to add that, like most work from the pen of this brilliant mathematician and philosopher, this little volume is full of stimulus. Should one at times feel that he is giving one something on which "furieusement à penser," we at any rate are grateful for the conspicuous lucidity with which his argument is set out.

Lectures on the Icosahedron. By Felix Klein. Translated by Dr. G. G. Morrice. Pp. xvi + 289. 10s. 6d. net. Revised Edition. 1914. (Kegan, Paul & Co.)

Mathematicians with slenderly lined pockets—why not brush modesty aside, and say all mathematicians who have not this volume upon their shelves—will thank Dr. Morrice for bringing out this revised edition of a famous book. In the revision, the translator has had the advantage of the experience of Prof. Burnside, and it may be fairly said that we have now the definitive edition of the *Ikosaeder* in our tongue. The substance of the book appeared originally in papers contributed to the *Mathematische Annalen*, that publication with which the name of Klein has been so long and so honourably associated. It is a signal instance of the breadth of treatment so characteristic of the work of this distinguished mathematician, and marks a stage in his approach to the wide field of modular functions which he was at a subsequent period so thoroughly to explore. It would be interesting to have been honoured with the friendship of Klein in those young days when a bright future lay before him. His promise was recognised at an early date. Before he entered his twentieth year he was editing Plücker's posthumous work on Line Geometry. He had his doctorate as soon as this duty was discharged, and with Sophus Lie at Berlin he began what was to be a valued intimacy. At Berlin and in Paris they "jointly conceived the scheme of investigating geometric or analytic forms capable of transformation by means of groups of changes. This purpose has been of directing influence in our subsequent labours, though these may have appeared to lie far asunder. Whilst I primarily directed my attention to groups of discrete operations, and was thus led to the investigation