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Review

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accompaniment of a general paralysis of intellectual activity. We hope that M. Mascart will be able to induce M. Gauthier-Villars to publish Professor Zeuthen's earlier work on the theory of Conics in antiquity.

Comptes rendus du deuxième congrès international des mathématiciens. (Paris, Aug. 6-12, 1900.) Edited by E. Duporcq. Pp. 450. 16fr. 1902. (Gauthier-Villars.)

This volume consists of the proceedings at the last Congress over which the illustrious Hermite presided. Space forbids our drawing attention to more than a few of the lectures and communications made to the Congress. Of the five formal lectures, one is by M. Mittag-Leffler on the correspondence between Weierstrass and Sophie Kowalevski. Incidentally the distinguished Swedish mathematician narrates the first words addressed to him on presenting himself as a student to attend Hermite's course at Paris: "Vous avez fait erreur, Monsieur; vous auriez dû suivre les cours de Weierstrass à Berlin. C'est notre maître à tous." This observation, three short years after *la funeste année*, 1870, shows how far the instincts of the Savant were wrought to finer issues than the purely local and patriotic sentiment of the day. M. Hilbert's lecture on the problems which are at present awaiting their solution by the hands of competent mathematicians has been translated into English by Dr. Mary Newson for the Bull. Math. Soc. (July, 1902). The problems are as follows: Cantor's problem of the cardinal number of the continuum; the compatibility of the axioms of arithmetic; the equality of the volumes of two tetrahedra of equal bases and equal altitudes; the problem of the straight line as the shortest distance between two points; Lie's concept of a continuous group of transformations without assuming that the functions defining the group are capable of differentiation; the treatment of the axioms of physics as we treat the axioms of mathematics, placing in the first rank probabilities and mechanics; the irrationality and transcendence of certain numbers; that the zero points of $\sum_{n=0}^{n=\infty} \frac{1}{n^s}$ have all the real part $\frac{1}{2}$, except the negative integral real zeroes; Riemann's prime number formula; Goldback's theorem, that every integer is expressible as the sum of two primes; is there an infinite number of pairs of primes differing by 2? is $ax+by+c=0$ soluble in prime numbers x and y , where a, b are integral and a prime to b ? to apply the results obtained for the distribution of rational prime numbers to the theory of the distribution of ideal primes in a given number field k ; and so on. M. Poincaré discoursed on the rôle of intuition and logic in mathematics, showing how, while intuition is often the source of discovery, it is logic which harmonises and consolidates the creations of intuition. This address is also published in a separate form (lfr.). Mr. H. Hancock's paper on Kronecker's Modular Systems defines congruences between algebraical integral numbers which are generalisations of the congruences of our elementary theory of numbers. That veteran American, Mr. Artemus Martin, gives new series for the calculation of logarithms, some of which converge with quite unusual rapidity. He also deals with expressions of the form $x^4+y^4+z^4+\dots+u^4=k^4$. The Italians are following the lead of Professor Peano in their discussions on mathematical logic. Signor A. Padoa contributes two papers, one on a new irreducible system of postulates for algebra—seven in number, based on the (undefined) integer, its consecutive, and its image (symétrique)—and the other on a new system of definitions for Euclidean geometry—two in number, point and "may be superposed." Signor Veronese pleads for the reduction to a minimum of the postulates in teaching geometry. Professor A. Macfarlane applies space analysis to curvilinear co-ordinates; and Professor Stringham discusses orthogonal transformations in elliptic space. Signor Galdeano advocates the addition to the branches of Mathematics as taught at the Universities the principles of "Mathematical Criticism." It would consist of the study of the historical developments and the ties of kinship which link together the historical and the logical genesis of our knowledge. In a synthetic study of different branches "l'enchaînement des idées" must be fruitful of result. Signor A. Gallardo writes on the application of Mathematics to a complex subject, such as Biology. We must not forget to mention Mr. Fujisawa's engaging article on the Mathematics of the Old Japanese School. Few readers will be unable to discover in this *Compte Rendu* some paper or article in which they will be interested. It is a delightful collection.