

and encouraged the formation of schools. The best work was done during the next 375 years, and it was in that time that such additions as the Arabians were able to make to the subject were achieved. From 1275 on, the scientific men were chiefly employed in designing new kinds of astrolabes and quadrants and in the writing of text-books.

Interesting as Arabian science may be to the general historian it is not of very great importance to the mathematician. But the Arabians did a great service in keeping alive the works of their predecessors during a dark period in Europe. Many of the discoveries of the Greeks have been preserved in the numerous manuscripts which the Arabians left and which have escaped destruction. And not the least of their contributions was the introduction of our present number system which they obtained from India and used in preference to the cumbrous Greek and Roman methods. If for no other reason, they deserve to be remembered for this.

ERNEST W. BROWN.

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#### NOTES.

THE eighth summer meeting of the AMERICAN MATHEMATICAL SOCIETY will be held at Cornell University, Ithaca, N. Y., beginning Monday, August 19, 1901. Members of the Society will thus be enabled to attend both the summer meeting and the meeting of the American association for the advancement of science which is held at Denver, Col., beginning August 24. In connection with the summer meeting of the Society, arrangements are being made for a colloquium. Professor E. W. BROWN has consented to give a course of six lectures on "Modern methods of dealing with the problems of dynamics and especially those of celestial mechanics, consisting mainly of the work of Poincaré in this direction." The precise title of these lectures will be announced later. A second course of lectures will also be arranged.

AT a meeting of the Cambridge philosophical society, held on November 26, 1900, the following mathematical papers were read: By Mr. T. J. F. A. BROMWICH: "Some theorems in regard to matrices."—By Mr. J. H. GRACE: "On the rational space curve of the fourth order."

THE Cracow academy of sciences, at its general meeting

on May 18, 1900, awarded to Dr. G. A. Miller, of Cornell University, the prize, amounting to two hundred and sixty dollars, offered by the academy for the treatment of the following subject :

“To find all the groups of a system of ten letters ; or at least to increase the number of the known groups of this degree. (Prize, three hundred florins, with interest from May 15, 1886.)”

This would appear to be the first prize in pure mathematics awarded by a foreign academy to an American.

PARIS ACADEMY OF SCIENCES.—At the regular meeting of the academy, December 10, 1900, M. PAUL PAINLEVÉ, of the École normale, was elected to membership in the section of geometry to the portfolio of Professor G. Darboux who recently became perpetual secretary for the mathematical sciences as successor to the late Joseph Bertrand. The other candidates nominated by the section of geometry were MM. GOURSAT and HUMBERT in the second line, and MM. BOREL and HADAMARD in third line.

At the annual meeting of the academy held December 17, 1900, the following prizes, among others, were awarded : Grand prize of the mathematical sciences to M. MATHIAS LERCH ; the Francoeur prize to M. EDMOND MAILLET ; the Poncelet prize to M. LÉON LECORNU ; the Montyon prize (in mechanics) to M. LEROSEY ; the Lalande prize to M. GIACOBINI ; and the Janssen prize to M. BARNARD. The Bordin prize was not awarded.

THE capital of the fund for the SYLVESTER medal, held in trust by the London royal society (see BULLETIN, volume 4 (1898), p. 239) now amounts to about four thousand dollars. The following announcement is made in the Royal society yearbook for 1900 : The Sylvester medal, which is accompanied by a grant of the balance of the income of the Sylvester medal fund, is awarded triennially for the encouragement of pure mathematical research, irrespective of nationality.

A FUND has been presented to Johns Hopkins University for the annual award of a mathematical prize, to bear the name of SYLVESTER, professor at the University from 1876 to 1883. The prize will consist of a bronze medallion bearing the likeness of Sylvester.

THE University of Kazan has awarded its Lobachevsky prize, consisting of a medal and two thousand roubles, to Professor W. KILLING of Münster for excellent work in the field of mathematics.

VOLUME VIII of C. F. Gauss's Werke has just appeared. It contains papers and fragments on arithmetic, higher analysis, the theory of probability, and geometry. Three other volumes are in preparation. Volume VII will contain a reprint of the *Theoria motus* and a complete exposition of Gauss's extensive work on the calculation of perturbations. Volume IX will be devoted to mathematical physics and geodesy, especially Gauss's work in connection with the triangulation of Hannover. In Volume X it is intended to collect all biographical material, including extracts from Gauss's correspondence. B. G. Teubner, of Leipzig, is the publisher. (Compare BULLETIN, volume 4 (1898), p. 554.)

ONE of the most recent series of mathematical text-books is the "Sammlung Schubert," which is being published by G. H. Göschen of Leipsic under the direction of Professor H. SCHUBERT of Hamburg. Of the forty volumes of the series twelve have thus far appeared. The latest is by Professor L. SCHLESINGER, *Einführung in die Theorie der Differentialgleichungen mit einer unabhängigen Variablen*. The German mathematical publishing houses are beginning to adopt the English plan of issuing their books bound in cloth. This is done in the "Sammlung Schubert," in Teubner's new series, and in some of Veit and Company's new books.

GRUNERT'S *Archiv für Mathematik und Physik* will henceforth be published by B. G. Teubner, of Leipzig. The editors will be Professors E. LAMPE, of Berlin, W. FRANZ MEYER, of Königsberg, and Dr. E. JAHNKE, of Berlin.

COLLEGE OF FRANCE.—The following courses in mathematics and mathematical physics are announced for the first semester of the present academic year, the lectures beginning December 3, and each course consisting of two lectures per week: By Professor M. BRILLOUIN: A critical exposition of some recent attempts at an electro-mechanical theory of voltaic, electro-dynamic, and optical phenomena, after the works of Wiechert, Riecke, Drude, Lorentz, Larmor and others.—By Professor J. HADAMARD: Partial differential equations of mechanics.—By Professor C. JORDAN: Construction of solvable groups.—By Professor E. MASCART: The relations between light and electricity.—By M. É. BOREL: The theory of series with positive terms and integrals with positive elements.

M. HERMANN, of Paris, has issued a new catalogue, No. 69, containing some twenty-three hundred titles of works in mathematics, physics, and astronomy.

CERTAIN of the several scientific posts held by the late Professor Joseph Bertrand have been filled as follows: M. BERTHELOT was elected to the vacant chair in the French academy; Professor G. DARBOUX became perpetual secretary of the Paris academy of sciences; M. BRILLOUIN has been appointed professor of mathematical physics at the College of France; and Professor H. POINCARÉ has been made a member of the council of the Observatory of Paris.

*Nature* for November 29 contains an abridgment of the address delivered at the opening meeting of the Society of arts on November 21 by Sir JOHN EVANS, entitled "The origin and progress of the scientific societies of Great Britain."

PROFESSOR CELORIA, heretofore assistant astronomer at the observatory of Milan has been appointed director. He succeeds Professor SCHIAPARELLI, who retired from the directorship on November first. Professor Schiaparelli has been connected with the observatory at Milan for the last forty years.

PROFESSOR H. POINCARÉ has been elected a foreign member of the Munich academy of sciences.

PROFESSOR ADOLF KNESER of Dorpat has accepted a call to the Berlin School of Mines.

PROFESSOR G. BAUER of Munich will not lecture again after the close of the present winter semester.

MR. R. W. H. T. HUDSON has been appointed to a fellowship in mathematics at St. John's College of Cambridge University. Mr. Hudson was senior wrangler in 1898, Smith's prizeman of 1900 and is the son of Professor Hudson of King's College, London.

MR. J. A. McCLELLAND, of Cambridge University, has been appointed to the chair of natural philosophy in University College, Dublin, made vacant by the recent death of Professor Thomas Preston.

PROFESSOR A. G. WEBSTER, of Clark University, has been promoted to a full professorship of physics.

PROFESSOR W. W. CAMPBELL has been appointed director of the Lick observatory, succeeding the late Professor J. E. Keeler.