

semble determines all the other members completely, and that the degenerate forms of the aggregate when the original triangle is birectangular or trirectangular are interesting.

Maudit's rules and those of our countryman, Nathaniel Bowditch, are susceptible of similar extensions and interpretations.

PRINCETON, NEW JERSEY,  
April 12, 1898.

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#### NOTES.

THE Colloquium in connection with the Fifth Summer Meeting of the AMERICAN MATHEMATICAL SOCIETY will be held at Harvard University, Cambridge, Mass., during the week beginning Monday, August 22d. The course of lectures offered by Professor Osgood is entitled: "On some methods and problems of the general theory of functions." The title of Professor Webster's course is: "The partial differential equations connected with wave propagation." Details in regard to the Colloquium are contained in the circular issued by the committee in charge.

THE preliminary programme for the coming meeting of Section A of the American Association for the Advancement of Science comprises thirty papers, including several reports on progress in different branches of mathematics. The meeting of the Association takes place August 22-27. Professor E. E. Barnard is the Vice-President, and Professor J. McMahon the Acting Secretary of Section A.

THE Göttingen Royal Society has taken active measures to resume and complete the publication of Gauss' collected works, the first six volumes of which appeared more than twenty years ago. The *Nachrichten* (No. 1, 1898) contains an account, by Professor F. Klein, of the plan in contemplation. The death of Professor Schering, to whom the publication was originally entrusted, has necessitated a distribution of the remaining work among a considerable number of editors. The astronomical material has been assigned to Professor M. Brendel, who also undertakes the general editorial supervision of the whole work. The other editors and their subjects are: Professor R. Fricke, analysis and the theory of numbers; Professor P. Stäckel, geometry; Professors Börsch and Krüger, geodesy; Professor Wiechert, mathematical physics. The work is to be completed in three volumes and a supplementary volume. Vol. 7 will be de-

voted exclusively to astronomy, and will contain all the astronomical material not already included in vol. 6 ; vol. 8 will contain the scientific supplement to the earlier volumes; vol. 9 will be devoted to the biographical material. The supplementary volume will contain the general index. It is hoped that the entire work may be completed in three years. The sale of the first six volumes has been transferred to B. G. Teubner.

M. L. LAUGEL'S French translation of B. Riemann's Mathematical Works has just appeared from the press of Gauthier-Villars of Paris. PROFESSOR M. CANTOR'S great work on the history of mathematics (up to the year 1758) has now reached its completion with the issue of the third part of the third volume. The first part of Professor T. Reye's Geometry of Position, translated by PROFESSOR T. F. HOLGATE of Northwestern University has just been published by The Macmillan Company.

PROFESSOR G. H. DARWIN'S lectures at the Lowell Institute, Boston, 1897, will soon appear in book form under the title: "The tides and kindred phenomena in the solar system." John Murray is the publisher.

DR. G. W. HILL is preparing a work on Planetary Motion, which is to be published by G. P. Putnam's Sons as a volume of their Science Series.

A NUMBER of printed papers and particularly two works of the mathematician Antonio Monforte, discovered by Professor Frederico Amodeo, furnish abundant proof that the Royal Academy of Sciences of Naples, hitherto supposed to date from about 1732, was in active existence as early as 1698.

PROFESSOR SIMON NEWCOMB has resumed his professorship of mathematics at the Johns Hopkins University. ASSOCIATE PROFESSOR A. S. CHESSIN has resigned his position.

DR. G. W. HILL has been appointed lecturer in celestial mechanics in Columbia University. A fund of five thousand dollars has been given to maintain this lectureship by Miss Catherine W. Bruce.

PROFESSOR E. B. FROST, of Dartmouth College, has been appointed professor of astrophysics at the Yerkes Observatory.

PROFESSOR ALEXANDER ZIWET, of the University of Michigan, has gone abroad for a year on leave of absence.

MR. E. A. LYMAN, instructor in mathematics at the University of Michigan, has been appointed professor of mathematics at the Michigan State Normal College, to succeed Professor D. E. Smith. MR. WM. H. BUTTS, formerly of the Orchard Lake Military Academy, and MR. A. W. WHITNEY, of the University of Nebraska, have been appointed instructors in mathematics at the University of Michigan.

PROFESSOR E. J. TOWNSEND, of the University of Illinois, will spend two years abroad on leave of absence. PROFESSOR G. W. MYERS, associate professor of mathematics and astronomy, has been promoted to a professorship of astronomy and applied mathematics.

DR. L. W. DOWLING has been promoted to an assistant professorship of mathematics in the University of Wisconsin.

DR. G. A. MILLER, of Cornell University, will conduct a seminar in permutations at the University of Chicago in the coming summer term.

PROFESSOR J. B. SHAW, of Illinois College, has resigned his position.

PROFESSOR SOPHUS LIE, of the University of Leipzig, has accepted a call to the University of Christiania.

MR. A. E. H. LOVE, F.R.S., and MR. R. PENDLEBURY, fellows and lecturers of St. John's College, Cambridge, have been appointed university lecturers in mathematics.

PROFESSORS H. A. LORENTZ, of Leyden, and ÉMILE PICARD, of Paris, have been elected honorary members of the London Mathematical Society to succeed the late Professors Brioschi and Hertz.

AT the recent meeting of the Royal Society PROFESSOR E. W. BROWN, MR. H. F. BAKER, and MR. M. H. TAYLOR were elected fellows of the Society.

THE University of California has conferred the degree of LL.D. on PROFESSOR J. M. SCHAEBERLE in recognition of his services to the Lick Observatory.

THE death is announced of PROFESSOR SOUILLART, professor of astronomy in the University of Lille and correspondent in the section of astronomy of the Paris Academy of Sciences.

THE REV. PERCIVAL FROST, F.R.S., D.Sc., died June 6th, at Cambridge, England, in his 81st year. In 1839 Dr. Frost was second wrangler and first Smith's prizeman at Cambridge, 1839 to 1841 fellow of St. John's College, 1847 to 1859 mathematical lecturer at Jesus College, 1859-1889 mathematical lecturer at King's College, Cambridge. Dr. Frost was the author of numerous papers appearing in the various British mathematical journals and of the well-known treatises on "Curve tracing," "Solid geometry," and, "The first three sections of Newton's Principia."

CORNELL UNIVERSITY. During the academic year 1898-99 the following advanced courses will be offered by the department of mathematics, each course occupying either two or three hours a week as indicated, and continuing through the year unless otherwise stated:—By Professor WAIT: Advanced analytic geometry, (*a*) plane, three hours, (*b*) solid, two hours; Advanced differential calculus, three hours, first two terms.—By Professor JONES: Higher algebra and trigonometry, three hours; Probabilities, etc., two hours.—By Professor McMAHON: Higher plane curves, two hours; Quaternions, two hours; Potential, and Spherical harmonics, two hours; Mathematical theory of sound, two hours:—By Professor TANNER: Binary quantics, two hours; Theoretical mechanics, two hours; German readings, two hours.—By Dr. MURRAY: Differential equations, three hours; Finite differences, etc., two hours; Astronomy, two hours.—By Dr. HUTCHINSON: Advanced integral calculus, two hours; Elliptic functions, three hours, first term, Surface and twisted curves, three hours, last two terms:—By Dr. SNYDER: Projective geometry, three hours; General function theory, three hours; Line geometry, two hours:—By Dr. MILLER: Substitution groups, three hours, first term; Continuous groups, three hours, last two terms; Theory of numbers, two hours.

The Oliver Mathematical club will hold fortnightly conferences.

JOHNS HOPKINS UNIVERSITY. During the coming year PROFESSOR SIMON NEWCOMB, LL.D., F.R.S., lately director of the U. S. nautical almanac, will resume his superintendence of the work in mathematics and astronomy. He will give especial attention to students desiring to pursue advanced work in celestial mechanics. Near the beginning of the year, Professor Newcomb hopes to give a short course of lectures on the Encyclopædia of the Mathematical Sci-

ences,—a course which will be open to graduate students in physics and astronomy as well as to those in mathematics.

The following advanced courses are announced by the department of mathematics, each course extending through the year unless otherwise noted :—Professor CRAIG : Theory of surfaces, three hours ; Advanced theory of functions and differential equations, three hours ; Mathematical conference, weekly. —By Dr. COHEN : Elementary theory of functions, two hours ; Theoretical mechanics, two hours ; Substitution groups, two hours, first half-year ; Elliptic functions, two hours, second half-year.

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## NEW PUBLICATIONS.

### I. HIGHER MATHEMATICS.

- ANDOYER (H.). Leçons élémentaires sur la théorie des formes et ses applications géométriques. (Autographié.) Paris, Gauthier-Villars, 1898. 4to. 6 and 184 pp. Fr. 8.00
- BAER (K.). Die Kugelfunction als Lösung einer Differenzgleichung. Berlin, Mayer and Müller, 1898. 4to. 25 pp. Mk. 1.50
- BAKER (W. M.). Examples in analytical conics for beginners. London, Bell, 1898. 8vo. 96 pp. 2s. 6d.
- BOURGET (H.). Sur une classe particulière de groupes hyperabéliens. [Diss.] Paris, Gauthier-Villars, 1898. 4to. 95 pp.
- CANTOR (M.). Vorlesungen über Geschichte der Mathematik. Dritter (Schluss-) Band : Von 1668–1758. Leipzig, Teubner, 1898. 14 pp. and pp. 473 to 893. Mk. 20.00
- ESCARY (M.). Remarques concernant les formules fondamentales de la trigonométrie. Paris, Hermann, 1898. 8vo. 11 pp. Fr. 0.60
- HOLGATE (T. F.). See REYE (T.).
- KLUG (L.). Die Configuration des Pascal'schen Sechsecks im Allgemeinen und in 4 speciellen Fällen. Wien, Eisenstein, 1898. 8vo. 132 pp., 3 plates. Mk. 3.00
- LA COUR (P.). Historisk Matematik. 2te gennemsette udgave. Hæfte 1. Copenhagen, 1898. 8vo. 32 pp. Mk. 0.80
- LAPLACE. Oeuvres complètes de Laplace, publiées sous les auspices de l'Académie des sciences. Vol. XII. Paris, Gauthier-Villars, 1898. 4to. 574 pp. Fr. 20.00.
- LEROY (E.). Sur l'intégration des équations de la chaleur. Paris, Gauthier-Villars, 1898. 4to. 264 pp.
- MILLER (G. A.). On the primitive substitution groups of degree sixteen. (*American Journal of Mathematics*, Vol. XX., No. 3.) 4to. Pp. 229–241.
- On the perfect groups. (*American Journal of Mathematics*, Vol. XX., No. 3.) 4to. Pp. 277–282.
- MOLK (J.). See TANNERY (J.).