

speculation in addition to the discussion of various games of chance and other such canonical subjects for treatises on probabilities. As many topics are touched upon, they can naturally not all be more than merely touched, and the author has been good enough to indicate many references where the different subjects may be further pursued. The elementary character, the clear style, the varied topics, the careful references, all combine to make the work useful and thoroughly to be recommended to a wide range of readers who have some, not necessarily much, knowledge of mathematics.

E. B. WILSON.

NOTES.

THE April meeting of the AMERICAN MATHEMATICAL SOCIETY will be held at the University of Chicago on Friday and Saturday, April 28–29. At this meeting Professor MAXIME BÔCHER will deliver his Presidential Address, the provisional title of which is: “Charles Sturm’s Published and Unpublished Work on Differential and Algebraic Equations.” Except for the summer meetings, this will be the first united meeting of the whole Society since 1896. A large attendance is expected from all sections of the country. Titles and abstracts of papers to be presented at this meeting should be sent to the Secretary of the Society at an early date.

THE January number (volume 12, number 2) of the *Annals of Mathematics* contains the following papers: “Rationality groups in prescribed domains,” by S. EPSTEEN; “Envelopes of one parameter families of plane curves,” by W. J. RISLEY and W. E. MACDONALD.

AT the meeting of the London mathematical society held on February 9 the following papers were read: By E. CUNNINGHAM, “The application of the mathematical theory of relativity to the electron theory of matter”; by G. B. MATHEWS and W. E. H. BERWICK, “The reduction of arithmetic binary forms which have a negative discriminant”; by H. BATEMAN, “Certain vectors associated with an electromagnetic field and the reflection of light at the surface of a perfect conductor.”

THE royal academy of sciences of Turin announces the following conditions for the Vallauri prize: "A prize will be awarded by the Academy, without distinction of nationality, to the author, who, in the interval from January 1, 1915, to December 31, 1918, shall have published the most extensive and celebrated work in the domain of the physical sciences, the word being understood in its broadest sense. The amount of the prize is twenty-six thousand lire, to be paid one year after being awarded. Members of the Academy may not compete. No notice will be taken of memoirs in manuscript."

THE royal academy of sciences of Bologna announces the following prize problem: "To investigate by critical and historical methods the organic development of the theory of elliptic functions and the various points of view under which the theory has been considered from the end of the eighteenth century until the present. Indicate the influence which these various views have had upon other branches of analysis." Competing memoirs should be plainly written in Italian and sent, under the usual conditions, to the secretary of the academy before December 31, 1912.

THE Dutch scientific society announces the following prize problems, the award to be made January 1, 1912:

1. It is required to determine the prime numbers p which satisfy the congruence $g^{p-1} - 1 \equiv 0 \pmod{p^a}$, in which g and a are given integers larger than unity.

2. The society desires an experimental and theoretical study of the phenomena of critical opalescence, either in gases or in mixed liquids, and the particularities in the characteristic equation which can be attributed to the same causes as critical opalescence.

Competing memoirs should be sent, under the usual conditions, to the secretary, Dr. J. P. Lotsy, in Harlem. The prize is either a gold medal or a cash award of 150 florins, in the option of the successful competitor. In the case of a memoir of exceptional value, an extra sum of 150 florins may also be awarded.

THE Macmillan Company announces the following work as in press, to appear in a few weeks: *Fundamental Concepts of Algebra and Geometry*, by Professor J. W. YOUNG, of the University of Kansas.

THE next annual meeting of the British association for the advancement of science, will be held at Portsmouth, beginning August 30, under the presidency of Sir WILLIAM RAMSEY; Professor H. H. TURNER is chairman of the section of mathematical and physical sciences.

BEGINNING with volume 13 (1911), the *Enseignement Mathématique* will be published jointly by Gauthier-Villars in Paris, Georg and Co. in Geneva, and Teubner in Leipzig.

THE following doctorates in mathematics were conferred by the German universities during the academic year 1909-10:

Breslau.

DITTRICH, R. "Abstandsörter im Polarraume."

JURETZKA, E. "Die Entwicklung unstetiger Funktionen nach den Eigenfunktionen des schwingenden Stabes auf Grund der Theorie der Integralgleichungen."

NEUMANN, NELLY. "Ueber das Flächennetz 2. Ordnung und seine korrelative Beziehung auf einen Strahlenbündel."

Erlangen.

BALDUS, R. "Über Strahlensysteme, welche unendlich viele Regelflächen 2. Grades enthalten."

GERSTENMEIER, C. "Beiträge zur Theorie der linearen Differentialgleichungen mit 4 und 5 singulären Stellen."

GEUS, A. "Die eindeutigen Transformationen der ebenen Kurve dritter Ordnung in sich, invarianten- und funktionentheoretisch behandelt."

Giessen.

WEHRHEIM, H. "Über das kombinatorische Produkt dreier Kollineationen in der Ebene."

Göttingen.

BIEBERBACH, L. "Zur Theorie der automorphen Funktionen."

COURANT, R. "Ueber die Anwendung des Dirichletschen Prinzips auf die Probleme der konformen Abbildung."

FREUNDLICH, E. "Analytische Funktionen mit beliebig vorgeschriebenem unendlich-blättrigem Existenzbereiche."

JAEGER, M. "Graphische Integrationen in der Hydrodynamik."

KAHN, GRETE." "Eine allgemeine Methode zur Untersuchung der Gestalten algebraischer Kurven."

LÖBENSTEIN, KLARA. "Ueber den Satz, dass eine ebene, algebraische Kurve 6. Ordnung mit 11 sich einander ausschliessenden Ovalen nicht existiert."

WINK, A. "Über die Diskontinuitätsbereiche der Gruppen aus linearen nicht infinitesimalen Substitutionen."

Greifswald.

BEYER, T. "Die Integration der simultanen linearen Differentialgleichungen mit konstanten Koeffizienten."

Halle.

LEHMANN, P. "Beiträge zur Theorie der Darstellung der stetigen Funktionen durch Reihen von ganzen rationalen Funktionen."

ROESER, E. "Die Verfolgungskurve auf der Kugel."

Heidelberg.

CARLEBACH, J. "Lewi ben Gerson als Mathematiker."

Kiel.

KOCH, W. "Beiträge zur affinen Geometrie der Flächen zweiten Grades."

Königsberg.

GAEDECKE, W. "Die inversen Flächen der Mittelpunktsflächen 2. Ordnung."

SCHIMANSKI, E. "Die algebraischen Invarianten der projektiven Gruppen der Ebene und die geometrische Charakterisierung dieser Gruppen."

Leipzig.

ALBERTI, H. "Die Grundlagen des Systems Spinozas in Lichte der kritischen Philosophie und der modernen Mathematik."

FEYER, W. "Über die Höldersche Funktion

$$Fu = e^u \cdot \prod_{n=-\infty}^{+\infty} (1 - u/n)^n \cdot e^{u + \frac{1}{2}u^2/n}$$

und einige verwandte Transcendente."

München.

ASHTON, C. H. "Die Heineschen *O*-Funktionen und ihre Anwendungen auf die elliptischen Funktionen."

LOEHL, A. "Über konforme und äquivalente Transformationen im Raum. Ein Beitrag zur Geometrie der Kugeln."

ROSENTHAL, A. "Untersuchungen über gleichflächige Polyeder."

Münster.

FERRARI, F. "Die geometrische Lösung der Aufgaben dritten und vierten Grades mittels des Lineals und einer festen Kurve dritter Ordnung mit Rückkehrpunkt oder reellem Doppelpunkte."

Rostock.

DÜKER, W. "Über Beziehungen der Strahlenkomplexe zweiten Grades zu den Flächen zweiter Ordnung."

NADLER, C. "Über den Zusammenhang der Raumkurve vierter Ordnung erster Spezies mit ihrem Polartetraeder."

WOLFF, H. "Behandlung des Vorganges, dass eine ebene elektromagnetische Welle, die auf die ebene Oberfläche eines Körpers, insbesondere eines Leiters auftrifft, von diesem reflectiert wird, auf Grund der Maxwellschen Gleichungen unter ausführlichen Eingehen auf die Art der stattfindenden Energiefortpflanzung."

Strassburg.

BRAUN, WANDA. "Bestimmung der Körperdiskriminante in einem kubischen Zahlkörper."

BURGWEDEL, R. "Über die Eulerschen und Gauss'schen Methoden der Primzahlbestimmung."

GIROD, L. "Das sphärische Analogon der Hypocykloidenbewegung des Cardanus und sein Zusammenhang mit der Theorie eines verallgemeinerten Hooke'schen Gelenkes."

KIEFER, A. "Die Einführung der homogenen Koordinaten durch K. W. Feuerbach."

PLATE, H. "Punktausgleichung und Fehlerbestimmung nach graphischen Methoden in ihrer Anwendung auf Ortsbestimmung durch Standlinien."

STAMPFLI, O. "Der Zweiteilungskörper der elliptischen Funktionen."

Tübingen.

BLUM, F. "Die infinitesimale Biegung von Flächen bei vollständiger Starrheit eines Kurvensystems."

Würzburg.

GRÄBNER, G. "Algebraische Bertrand-Kurven und algebraische Kurven konstanter Torsion."

DR. W. SIERPINSKI, of the University of Lemberg, has been promoted to an associate professorship of mathematics.

PROFESSOR A. SOMMERFELD, of the University of Munich, has been elected a member of the Bavarian academy of sciences.

PROFESSOR P. STÄCKEL, of the technical school at Karlsruhe, has been elected to membership in the Heidelberg academy of sciences.

PROFESSOR M. PASCH, of the University of Giessen, will retire at the end of the present semester.

PROFESSOR W. F. MEYER, of the University of Königsberg, has received the title of Geheimer Regierungsrat.

PROFESSOR L. SCHLESINGER, of the University of Klausenburg, has accepted the professorship of mathematics at the University of Budapest.

PROFESSOR H. W. KUHN, of the University of Ohio, has been granted leave of absence during the second half of the present academic year, to study in Europe.

DR. ANNA J. PELL has been appointed instructor in mathematics at Mount Holyoke College.

PROFESSOR A. W. PHILLIPS, of Yale University, will retire from active service at the close of the present academic year. Professor Phillips has taught in Yale College since 1876, becoming professor of mathematics in 1891. Since 1895 he has been the dean of the graduate school.

MR. C. J. WHITE, professor of mathematics at Harvard University from 1885 to 1894, has been appointed professor emeritus.

PROFESSOR CHARLES MÉRAY, of the University of Dijon, died February 7, at the age of 75 years.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

- BARBETTE (E.). Le dernier théorème de Fermat. Liège, Gnuse. 8vo. 19 pp.
- BERZOLARI (L.). Geometria analitica, I: Il metodo delle coordinate. (Collection Manuali Hoepli.) Milan, Hoepli. 16mo. 409 pp. L. 3.00
- FABRY (E.). Théorie des séries à termes constants. Paris, Hermann, 1910. 8vo. 200 pp. Fr. 6.50
- FESTSKRIFT, H. G. ZEUTHEN. Fra venner og elever i anledning af hans 70 aars fødselsdag. Kjöbenhavn, Høst, 1910. 8vo. 156 pp.
- FREUNDLICH (E.). Analytische Funktionen mit beliebig vorgeschriebenen unendlich-blättrigen Existenzbereichen. (Diss.) Göttingen, 1910. 8vo. 40 pp.
- FRICKE (R.) und KLEIN (F.). Vorlesungen über die Theorie der automorphen Funktionen. 2ter Band: Die funktionentheoretischen Ausführungen und die Anwendungen. 2te Lieferung: Kontinuitätsbetrachtungen im Gebiete der Hauptkreisgruppen. Leipzig, Teubner, 1911. 8vo. pp. 283-438. M. 7.00
- HUYGENS (C.). Tome XII: Travaux de mathématiques pures. Paris, Gauthier-Villars. Fr. 20.00
- JÜTTE (O.). Die Schmiegunskugel einer Flächenkurve. (Diss.) Halle, 1910. 8vo. 8+143 pp.
- KLEIN (F.). See FRICKE (R.).
- KNESER (A.). Die Integralgleichungen und ihre Anwendungen in der mathematischen Physik. Vorlesungen an der Universität zu Breslau gehalten. Braunschweig, Vieweg, 1911. 8vo. 8+243 pp. M. 7.00
- LEHMANN (F. J.). Harmonic analysis. Oberlin, Comings, 1910. 8vo. 9+156 pp. \$1.50
- MEDUGNO (M.). Della trasformazione birazionale [2-4]. Napoli, Accademia delle Scienze, 1910. 8vo. 188 pp.
- MERKENS (E.). Ueber gewisse räumliche Punktmengen, die sich als stetige Flächen auffassen lassen. (Diss.) Königsberg, 1910. 8vo. 86 pp.
- SPANO (D.). Sulla identità degli sviluppi in serie del Wronski e del Lagrange. Napoli, Accademia delle Scienze, 1910. 8vo. 10 pp.
- VIVANTI (G.). Lezioni di analisi infinitesimale. Puntata I. Pavia, Mattel, 1910. 8vo. 304 pp. L. 15.00