The salient features of the work are, however, commend-able, and it is hoped that its publication in France may awaken new interest in a phase of the subject in which that country at one time excelled all others.

DAVID EUGENE SMITH.

NOTES.

THE Ninth Summer Meeting of the AMERICAN MATHE-MATICAL SOCIETY will be held at Northwestern University, Evanston, Ill., in the first week of September. A prelim-inary circular in regard to the meeting will be issued about May 20th.

THE first meeting of the Pacific Section of the AMERICAN MATHEMATICAL SOCIETY was held at San Francisco, May 3. A report of the meeting will appear in a later number of the BULLETIN.

THE Librarian acknowledges the gift to the AMERICAN MATHEMATICAL SOCIETY of six volumes of mathematical works presented by M. C. Naud, Paris, and one volume by Delalain Frères, Paris.

THE seventy-fourth general meeting of the Gesellschaft Deutscher Naturforscher und Aerzte will be held at Karls-bad, September 21–27. Section I includes mathematics, astronomy and geodesy ; section III, applied mathematics and physics.

THE twenty-third general meeting of the Deutscher Geo-meter-Verein will be held at Düsseldorf, July 20–23.

THE annual stated meeting of the National Academy of Sciences was held at Washington, D. C., April 15–17. Among the papers presented was one on "The postulates of geometry," by Mr. C. S. PEIRCE.

THE second (April) number of volume 24 of the *Amer-ican Journal of Mathematics* contains the following articles : "Canonical form of a linear homogeneous transformation in an arbitrary realm of rationality," by L. E. DICKSON ; "A new theory of collineations and their Lie groups," by

H. B. Newson; "Infinitesimal deformation of surfaces," by L. P. Eisenhart.

The April number (second series, volume 3, number 3) of the *Annals of Mathematics* contains: "Space of constant curvature (conclusion)," by F. S. Woods; "Brilliant points and loci of brilliant points," by W. H. Roever; "Problems in infinite series and definite integrals, with a statement of certain sufficient conditions which are fundamental in the theory of definite integrals," by W. F. Osgood; "Note on the product of linear substitutions," by H. B. Newson.

The *Zeitschrift für mathematischen und naturwissenschaftlichen Unterricht*, founded by Dr. J. C. V. Hoffmann in 1869, will be edited in the future by Dr. H. Schotten, assisted by a board of twenty-three collaborators. The new form is a larger octavo than that of the former series and is now uniform with the other mathematical publications of the Teubner press. The last number, the first of the thirty-third volume, is accompanied by a portrait of Dr. Hoffmann and an account of his services to secondary education in Germany.

University of Chicago.—The following advanced courses in pure and applied mathematics are announced for the summer quarter.—By Professor E. H. Moore: Differential calculus, five hours; Foundations of geometry, five hours. —By Professor H. Maschke: Higher plane curves, five hours; Elliptic functions, five hours.—By Professor L. E. Dickson: Theory of substitutions, five hours.—By Mr. A. C. Lunn: Advanced integral calculus.—By Mr. O. Veblen: Differential equations.—By Dr. F. R. Moulton: The problem of three bodies.

Harvard University.—The following advanced mathematical courses are offered during the academic year 1902–1903:—By Professor J. M. Pierce: Triangular coördinates and algebraic plane curves, especially cubics; Quaternions (second course); † Linear associative algebra; † Algebra of logic.—By Professor W. E. Byerly: † Dynamics of a rigid body; Trigonometric series, spherical harmonics, and potential function.—By Professor W. F. Osgood: Calculus (second course); † Algebra, Galois's theory of equations; Theory of functions (first course); † Theory of functions (advanced course), transcendental integral and fractional functions.—By Professor M. Bôcher: Modern geometry; † Infinite series and products; † Introduction to partial

differential equations ; † Theory of functions (advanced course), definite integrals.—By Dr. C. L. BOUTON : Differential equations, with introduction to Lie's theory of continuous groups.—By Mr. J. K. WHITTEMORE : † Differential geometry of curves and surfaces ; Hydrostatics, hydrokinematics, hydrokinetics.—By Mr. J. L. COOLIDGE ; † Theory of equations, invariants ; Geometry of position.

These courses will involve three lectures a week throughout the year, except those preceded by †, which involve about half this number of lectures.   Professors OSGOOD and BÔCHER, Dr. BOUTON and Mr. COOLIDGE also offer courses in reading and research on Theory of functions, Theory of differential equations, Theory of continuous groups, and Geometry, respectively.

The mathematical conference will meet twice a month.

The several foreign universities below offer during the summer semester of the current academic year, courses in mathematics as follows :

UNIVERSITY OF BERLIN.—By Professor L. FUCHS : Introduction to the theory of functions, four hours ; Introduction to the theory of differential equations, four hours, seminar.—By Professor H. A. SCHWARZ : Synthetic geometry, four hours ; Theory of elliptic functions, four hours ; Theory of analytic functions, two hours ; Colloquium, two hours ; Seminar.—By Professor G. FROBENIUS : Analytical geometry, four hours ; Seminar.—By Professor K. HENSEL : Differential calculus, four hours ; Higher theory of numbers, four hours ; Axioms of geometry, two hours.—By Professor J. KNOBLAUCH : Integral calculus, four hours ; Approximate calculation of definite integrals, one hour ; Theory and application of determinants, four hours.—By Professor G. HETTNER : Infinite series, products and continued fractions, two hours.—By Professor R. LEHMANN-FILHÉS : Analytical mechanics, four hours ; Exercises in mechanics, one hour.—By Dr. E. LANDAU : Higher algebra four hours, with exercises, two hours ; Determination of class numbers of binary quadratic forms.

UNIVERSITY OF BONN.—By Professor R. LIPSCHITZ : Elements of differential and integral calculus, four hours ; Exercises in seminar, two hours.—By Professor H. KORTUM : Theory of functions, four hours ; Infinite series, two hours ; Exercises in seminar, two hours.—By Professor L. HEFFTER : Theory of linear differential equations, four hours ; Descriptive geometry, with exercises, five hours.

UNIVERSITY OF HALLE-WITTENBERG.—By Professor G. CANTOR : Selected chapters from the theory of elliptic functions, two hours ; Higher algebra, three hours ; Seminar, two hours fortnightly.—By Professor A. WANGERIN : Differential calculus, with exercises, five hours ; Theory of space curves and surfaces, five hours ; Analytical mechanics, II, one hour ; Seminar, two hours fortnightly.—By Professor V. EBERHARD : Higher algebraic curves, two hours ; Theory of invariants, three hours.

UNIVERSITY OF INNSBRUCK.—By Professor O. STOLZ : Real differential and integral calculus, four hours ; Complex numbers and introduction to the general theory of functions, three hours.—By Professor W. WIRTINGER : Algebraic functions and their integrals (continuation), five hours ; Seminar, two hours.—By Dr. K. ZINDLER : Differential equations, three hours ; Selected chapters of elementary mathematics for students of natural science, two hours ; Seminar, one hour.

UNIVERSITY OF KIEL.—By Professor L. POCHHAMMER : Analytical geometry of space, four hours ; Selected chapters of the theory of partial differential equations, four hours ; Seminar, one hour.—By Professor P. HARZER : Selected chapters of celestial mechanics, three hours.—By Professor P. STÄCKEL : Differential calculus and introduction to analysis, four hours ; Algebraic curves and surfaces, four hours ; Life and work of Abel, one hour ; Seminar in the algebraic memoirs of Abel.

UNIVERSITY OF KÖNIGSBERG.—By Professor F. MEYER : Differential calculus, three hours, with exercises, one hour ; Higher algebra, four hours ; Seminar, one hour.—By Professor A. SCHOENFLIES : Elliptic functions, four hours ; Seminar, two hours.—By Professor L. SAALSCHÜTZ : Bernouilli's numbers, two hours ; Theory of definite integrals, two hours.

UNIVERSITY OF LEIPSIC.—Professor W. SCHEIBNER offers no lectures and those of Professor A. MAYER may be announced later.—By Professor C. NEUMANN ; Constructive geometry, in particular conic sections. four hours ; Seminar, two hours.—By Professor O. HÖLDER : General theory of functions of a complex variable, two hours ; Theory of numbers, two hours ; Seminar, one hour.—By Professor F. ENGEL : Application of the differential and integral cal-

culus to geometry, four hours ; Introduction to the theory
of transformation groups, two hours ; Transformation
groups and the theory of invariants, one hour ; Seminar,
one hour : exercises in the theory of groups, one hour.—By
Professor F. HAUSDORFF : Ordinary differential equations,
four hours, with exercises, one hour ; Non-euclidean geome-
try, two hours.—By Dr. H. LIEBMANN : Plane analytical
geometry, four hours, with exercises, one hour ; Graphical
statics, two hours.

UNIVERSITY OF PRAGUE.—By Professor G. PICK : Alge-
braic equations, three hours ; Algebraic functions, two hours ;
Seminar, two hours.—By Professor J. A. GMEINER : Dif-
ferential and integral calculus, four hours ; Introduction to
the theory of functions of a complex variable, one hour.

UNIVERSITY OF VIENNA.—By Professor G. v. ESCHERICH :
Theory of functions, five hours ; Proseminar, one hour ;
Seminar, two hours ; Theory of probability, three hours.—
By Professor L GEGENBAUER : Elements of differential and
integral calculus (continuation), five hours, with exercises,
one hour ; Proseminar, one hour ; Seminar, two hours.—By
Professor F. MERTENS : Algebra (continuation), five hours ;
Seminar, two hours ; Proseminar, one hour ; Mathematical
statistics, three hours.—By Professor G. KOHN : Analytical
geometry (continuation), four hours, with exercises, one
hour ; Plane algebraic curves, two hours.—By Dr. K. ZSIG-
MONDY : Surfaces of second order, one hour.—By Dr.
D. v. STERNECK : Theory of numbers, four hours.—By Dr.
K. CARDA : Applications of the theory of groups to integra-
tion problems and infinitesimal geometry.

A CIRCULAR recently sent out by the "Commission du
Répertoire Bibliographique des Sciences Mathématiques"
gives some information concerning the actual state of prog-
ress of this enterprise. The object in view is a complete
subject catalogue of all mathematical periodicals of the 19th
century. The classification used is that of the "Index du
répertoire bibliographique," of which an abstract is found
in every number of the *Revue semestrielle*. The catalogue is
made up of slips, 14 x 8.5 cm., each containing about ten
titles and marked at the top with the symbol (such as A1a,
R8d, etc.) indicating the subdivision of the "Index" to
which the memoirs and papers recorded on the slip belong.
These slips are sold in sets of 100 ; eleven such sets, com-
prising about 1,100 titles, are now ready and can be obtained

from the publishers, Messrs. Gauthier-Villars, of Paris, at
the price of 2 francs a set. The Commission, of which M.
Poincaré is the president, C.-A. Laisant the permanent sec-
retary, has engaged the collaboration of mathematicians of
all civilized nations to compile lists of titels. Among the
few countries that have so far contributed nothing we find
Great Britain, Greece, Sweden and the United States. The
delay in getting contributions from this country is probably
due to the recent decease of Professor Craig; Professor J.
H. Gore, Columbian University, Washington, D. C., is now
in charge of the work for the United States.

THE German Bureau for international bibliography in
Berlin began last autumn the publication of a bibliography
of the German mathematical and scientific literature. The
bibliography appears weekly, and is arranged according to
the plan adopted for the international scientific catalogue.

DR. B. S. EASTON, of the University of Pennsylvania, has
in press a bibliography of the theory of substitutions, com-
prising about five hundred and eighty titles with a collec-
tion of theorems and definitions.

THE University of Christiana is preparing to celebrate,
September 5–7, the hundredth anniversary of the birth of
N. H. ABEL.

THE Royal Institute of Lombardy offers a prize of 1200
lire for the best contribution to or noteworthy and original
improvement in the theory of groups of transformations.
Papers may be written in Italian, French, or Latin, and
must be presented anonymously not later than March 31,
1903.

PROFESSOR H. W. TYLER has been appointed head of the
mathematical department of the Massachusetts Institute of
Technology.

A LABORATORY is to be founded at the University of Edin-
burg in honor of the late Professor P. G. TAIT.

RECENT catalogues of second hand mathematical works :
Oscar Schack, Königstrasse 15, Leipzig, Verzeichniss 95,
445 titles on the theory and history of mathematics and
physics.—Raffaello Ginsti, Livorno, Italy, catalogue No.
19, 289 titles.—A. Thury, 5 Rue Petitot Geneva, Switzer-
land, catalogue 10, 1018 titles.