pletes in a sense the conception of Weierstrass of the analytisches Gebilde by employing a suitable parameter of position on the whole Riemann surface.

F. R. MOULTON.

NOTES.

At the meeting of the London mathematical society held February 12 the following papers were read. By G. T. BENNETT, " Exhibition and explanation of some models illustrating kinematics"; by H. M. MACDONALD, " Formulae for the spherical harmonic $P_n - m(\mu)$, when $1 - \mu$ is a small quantity "; by E. W. HOBSON, " The representation of the symmetrical nucleus of a linear integral equation "; by W. F. SHEPPARD, " Fitting of polynomials by the method of least squares " (second paper); by H. BATEMAN, " The differential geometry of point transformations between two planes "; by M. MCKENDRICK, " Studies in the theory of continuous probabilities."

THE thirtieth anniversary of the foundation of the Circolo matematico di Palermo will be celebrated with appropriate ceremonies on Tuesday, April 14, in the aula of the University of Palermo. On this occasion a gold medal, provided by members' subscription, will be presented to Professor G. B. GUCCIA in recognition of his services as founder of the society and director of the *Rendiconti*. The Circolo has now nearly one thousand members, of whom it may be noted that one hundred and fifty are Americans. Thirty-seven volumes of the *Rendiconti* have been published.

THE tenth annual meeting of the Association of Ohio teachers of mathematics and science was held at Ohio State University on April 3–4. The programme included addresses by Mr. J. F. BARKER on technical training in the schools and by Professor H. E. SLAUGHT on the final report of the committee of fifteen on a geometry syllabus.

CAMBRIDGE UNIVERSITY.—The following mathematical courses are announced for the Easter term:—By Professor E. W. HOBSON: History of the invention of the calculus, three

hours.—By Professor H. F. BAKER: Existence theorems of automorphic functions, two hours.—By Mr. T. S. HERMAN: Differential geometry, three hours; Hydrodynamics, three hours.—By Dr. J. A. BROMWICH: Diffraction of electric waves, three hours.—By Mr. A. C. GRACE: Elements of Fourier analysis and calculus of variations, two hours.—By Mr. B. RUSSELL: Principles of mathematics, three hours.—By Mr. G. H. HARDY: Asymptotic relations in the theory of functions, three hours; Double limit problems, two hours.—By Mr. S. BIRTWISTLE: Thermodynamics, three hours.—By Mr. A. J. CUNNINGHAM: The principle of relativity and the mechanics of electric systems, three hours.—By Mr. G. A. CAMERON: Mechanics, three hours.

THE following university courses in mathematics are announced for the summer semester of 1914:

UNIVERSITY OF MUNICH.—By Professor F. LINDEMANN: Integral calculus, five hours; Theory of algebraic forms and invariants, four hours; Quadrature of the circle, two hours; Seminar, two hours.—By Professor A. PRINGSHEIM: Definite integrals and Fourier series, four hours; Applications of elliptic functions, three hours.—By Professor A. VOSS: Analytic geometry of space, four hours; Introduction to the theory of partial differential equations, four hours; Seminar, two hours.—By Professor F. HARTOGS: Descriptive geometry, II, five hours; with exercises, four hours.—By Professor H. BRUNN: Geometric morphology, three hours.—By Dr. H. DINGLER: Introduction to higher mathematics, three hours; Exercises in plane analytic geometry, two hours.—By Dr. F. BÖHM: Elements of life insurance, four hours; Seminar in statistics, two hours.—By Dr. A. ROSENTHAL: Synthetic geometry, II, four hours; with exercises, one hour; Seminar in analysis, two hours.

UNIVERSITY OF STRASSBURG.—By Professor G. FABER: Integral calculus, four hours; Theory of numbers, two hours; Seminar.—By Professor F. SCHUR: Theoretical mechanics, four hours; Theory of ordinary differential equations, two hours; Seminar.—By Professor M. SIMON: History of mathematics in the middle ages, two hours.—By Professor J. WELLSTEIN: Elliptic and hyperelliptic functions, four hours.—By Professor R. v. MISES: Technical mechanics, three hours;

Integral equations with applications, four hours; Seminar.
—By Professor P. EPSTEIN: Calculus of variations, two hours.
—By Dr. A. SPEISER: Theory of assemblages, two hours;
Equations of the fifth degree, one hour.

UNIVERSITY OF PARIS.—By Professor P. APPELL: Figures
of equilibrium of rotating fluid bodies, two hours.—By Pro-
fessor E. PICARD: Multiple integrals with applications to the
theory of analytic functions of several variables, two hours.
—By Professor E. GOURSAT: Ordinary and partial differential
equations, two hours.—By Professor C. GUICHARD: Theoretical
mechanics, two hours.—By MM. VESSIOT and MONTEL:
General mathematics, two hours.—By Professor H. ANDOYER:
Astronomy, two hours.—By Professor J. BOUSSINESQ: Tur-
bulent fluid motion, two hours.—By M. A. CAHEN: The
theorem of Fermat, two hours.

Conferences will be conducted by MM. LEBESGUE, DRACH,
VESSIOT, MONTEL, ANDOYER, and SERVANT.

In the Ecole Normale courses in mathematics are given by
Professors BOREL, CARTAN, and MM. VESSIOT, LEBESGUE,
and DRACH.

PROFESSOR M. FRÉCHET, of the University of Poitiers, will
give at the University of Illinois during the academic year
1914–15 a course of lectures on General analysis, including a
discussion of abstract sets and functional operations. He will
also conduct a seminar for students pursuing research in this
field.

PROFESSOR W. C. EELLS, of Whitworth College, has been
appointed instructor in mathematics and mechanics in the
U. S. Naval Academy.

PROFESSOR G. B. HALSTED has resigned his position in the
State Teachers College of Colorado.

PROFESSOR J. K. WHITTEMORE has resigned his assistant
professorship of mathematics in Adelbert College.

DR. C. F. CRAIG, of Cornell University, has been granted a
year's leave of absence for study in Europe.

BOOK catalogues: W. Engelmann, Unter den Linden 76a,

Berlin, catalogue no. 2,450 titles in exact sciences. W. Heffer and Sons, Cambridge, England, Catalogue no. 118, periodicals, 936 titles.—A. Hermann et Fils, 6 rue de la Sorbonne, Paris, 250 titles in science.—Mayer und Müller, Prinz Louis Ferdinand-strasse 2, Berlin, catalogue no. 282 about 150 mathematical titles.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

ALONSO-MISOL (F.). Analisis matematica. Madrid, 1913. 8vo.
Fr. 12.00

ANDERSON (J.). Ueber eine Klasse von Untergruppen einer Abelschen $G_n{}^m$. (*Arkiv för Matematik, Astronomi och Fysik.*) Stockholm, 1913. 8vo. 70 pp.　　　•　　　M. 1.80

ARCHIMEDES. Geometrical solutions derived from mechanics. A treatise recently discovered and translated from the Greek by J. L. Heiberg. English version by L. G. Robinson. Chicago, Open Court Co. 28 pp. Paper.　　　$0.30.

BÄCKLUND (A. V.). Ueber mehrdeutige Flächentransformationen. Stockholm, 1913. 4to. 88 pp.　　　M. 4.20

BAKER (R. P.). The problem of the angle-bisectors. (Diss.) Chicago, University of Chicago Press, 1911. 4to. 106 pp.　　　$1.25

BLOCK (H.). Sur les équations linéaires aux dérivées partielles à caractéristiques multiples. Note 4. (*Arkiv för Matematik.*) Stockholm, 1913. 8vo. 15 pp.　　　M. 1.00

BON (F.). Ist es wahr, dass $2 \times 2 = 4$ ist? Eine experimentelle Untersuchung. 1ter Band: Von den Begriffen, den Urteilen und der Wahrheit. Leipzig, E. Reinecke, 1913. 8vo. 28 +523 pp.　　　M. 12.00

BOOMSTRA (W.). De orthogonale en gelijkzijdige kwadratische oppervlakken in verband met het deelingsprobleem der elliptische functies. (Thèse.) Amsterdam, Olivier, 1913. 8vo. 238 pp.

BOREL (G.). Beweisführung des Fermatschen Satzes. Rotterdam, Nijgh & VanDitmar, 1913.

CAMERON (J. F.). Ueber die Zerlegung einer Primzahl in einem komponierten Körper. (Diss.) Marburg, 1912. 8vo. 38 pp.

CLARIANA Y RICART (L.). Rapida excursion a las altas regiones del analisis matematica. (Mem. Acad.) Barcelona, 1913. 4to. 13 pp. Fr. 2.50

CRUEWELL (E. R.). Der Satz des Fermat. 2te, vermehrte Auflage. Berlin, 1913. 8vo. 4 pp.　　　M. 2.40

ELTE (E. L.). The semiregular polytopes of the hyperspaces. (Diss.) Groningen, Gebroeders Hoitsema, 1912. 8vo. 136 pp.

GALDEANO (Z. G. DE). Sumario de mis cursos de calculo infinitesimal con arreglo al nuevo metodo de enseñanza. Zaragoza, Casanal, 1913. 8vo. 192 pp.　　　P. 4.00