

ing the use of diagrams in proving results that depend on so-called imaginaries.

I may add that in this strictly formal geometry metric relations must of course be introduced independently, by specifying an absolute configuration in the given domain, and classing as metric all relations of any form to this absolute configuration.

CHARLOTTE ANGAS SCOTT.

BRYN MAWR, PENNSYLVANIA,
October, 1899.

NOTES.

THE presidential address of Professor R. S. WOODWARD, which appears in the present number of the BULLETIN, is also published separately in reprint form. Copies may be obtained from the Secretary at twenty-five cents each.

THE advisory board for mathematics at Cambridge University has recommended to the Senate of that institution a number of changes in the regulations relating to the mathematical tripos. It is proposed to omit entirely from Part I. the following subjects:—calculus of variations, elliptic functions, besselian functions, hydrodynamics, and sound, and to limit the extent of the requirements in rigid dynamics, electricity, optics, astronomy, and other subjects. The arrangement of the examination papers is to be changed. No papers are to be devoted exclusively to problems. At least half of the questions set throughout the examination shall be of an elementary character. The classic general restrictions as to methods of solutions for certain papers are to be no longer maintained. The ancient order of merit is to be abandoned. The successful candidates are to be arranged in three classes (wranglers, senior and junior optimes) of three divisions each, the names in each division being placed in alphabetical order. Corresponding changes are proposed for Part II. of the tripos. The Senate returned the proposals to the board for revision.

At one time the largest tripos at Cambridge, the mathematical tripos is now smaller than either the classical or the natural science tripos. For the four years 1869–72, one in eighteen of the resident undergraduates passed the mathematical tripos, Part I.; while for the five years 1895–99, the average falls to one in thirty-five.

ABOUT Easter 1900 the Berlin academy of sciences will mark the 200th anniversary of its foundation by a special celebration to which foreign delegates will be invited. Professor A. HARNACK is preparing an elaborate history of the academy for this occasion.

IN a recent circular the Society for the promotion of quaternions and allied mathematics is announced as now established. The coöperation of Americans in this international organization is solicited, not alone financially but also in the direction of original contributions to the literature of the subject. All communications should be addressed to the secretary for the United States, Professor A. S. HATHAWAY, Rose Polytechnic Institute, Terre Haute, Indiana.

A FAC-SIMILE reprint of Legendre's *Théorie des Nombres* has just been issued by M. Hermann, of Paris.

THE publishing house of William Ernst and Son, of Berlin, has recently published a historical memoir entitled "Die reine Mathematik in den Jahren 1884-1899," by Professor E. LAMPE. The paper is intended as a memorial monograph of the centennial jubilee of the Technische Hochschule of Berlin celebrated this year. The second part of the memoir presents a short account of the life of SIEGFRIED ARONHOLD, who was professor of mathematics at the Hochschule during the period from 1860 to 1883; the monograph is accompanied by a portrait of Aronhold. The same firm issued the *Festschrift* of the centennial, a separate volume.

A CATALOGUE of the mathematical library, of the late Professor H. SCHAPIRA, of Heidelberg, has been issued by Gustav Fock, of Leipzig. It is number 164 of the series of catalogues of the latter firm, and contains the titles of about twenty-two hundred different works.

M. A. HERMANN, of Paris, has just published an extensive catalogue, No. 65, of new and second-hand publications in the mathematical sciences. The catalogue contains nearly thirty-seven hundred numbers in mathematics and astronomy.

THE Munich academy of sciences has elected Professors G. DARBOUX, of Paris, and E. BELTRAMI, of Rome, corresponding members.

PROFESSOR P. STÄCKEL has been promoted to an ordinary professorship at the University of Kiel.

PROFESSOR A. SOMMERFELD, of the Clausthal School of Mines, has accepted a call to the Aachen Polytechnic School as professor of mechanics.

PROFESSOR WILLIAM HARKNESS, astronomical director of the U. S. Naval Observatory, was retired on December 17, 1899, and is succeeded by Professor S. J. BROWN.

DR. W. H. MALTBIE has been promoted to a professorship of mathematics in the Woman's College of Baltimore, Md.

MR. N. M. PARRISH has been made professor of mathematics at the State Normal College, Florence, Ala.

DR. N. A. PATILLO has been elected to a professorship in mathematics in the Randolph-Macon Woman's College, Lynchburg, Va.

THE following appointments in mathematics have been recently made: MR. W. D. CAIRNS to an instructorship, and MR. W. H. SHERK, to a tutorship at Oberlin College; MR. R. T. HOUSE, to a tutorship in Miami University; Miss BROOKS, to a tutorship at McGill University.

THE seventieth anniversary of the birth of Professor B. CHRISTOFFEL, professor emeritus of mathematics, was recently celebrated at the University of Strassburg.

DR. E. M. BLAKE, who has recently returned from study abroad, has been appointed honorary fellow in mathematics at Cornell University.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

ABHANDLUNGEN zur Geschichte der Mathematik. Heft IX: Festschrift zu M. Cantors siebzigsten Geburtstage, herausgegeben von M. Curtze und S. Günther. (F. Cajori, Notes on the history of logarithms; S. Dickstein, Zur Geschichte der Principien der Infinitesimalrechnung; S. Günther, Nicolaus von Cusa und seine Beziehungen zur mathematischen und physikalischen Geographie; K. Hunrath, Des Rhetici Canon doctrinae triangulorum und Vieta's Canon mathematicus; F. Müller, Zur Terminologie der ältesten mathematischen Schriften in deutscher Sprache; A. Nagi, die Rechenmethoden auf dem griechischen Abacus; P. Stäckel, F. A. Taurinus, ein Beitrag zur Vorgeschichte der nichteuklidischen Geometrie; F. A. Unger, Einige Additionsmaschinen; E. Wohlwill, Entdeckung der Parabelform der Wurffinie; F. Rosenberger, Die Geschichte der exakten Wissenschaften und der Nutzen ihres Studiums; etc.). Leipzig, Teubner, 1899. 8vo. 8 + 657 pp., 2 plates, 1 portrait. M. 20.00