the grade on account of the large masses of results which
have been published in degree measure and the trouble of
continual comparison between the two systems   He thinks,
that for navigational and geodetic purposes, the decimal
division is far easier to handle. and that the trouble re-
quired to make the change is not prohibitive.

Finally, M. Janssen gives his annual report of the work
done in the Observatory at the summit of Mont Blanc.
This time, he adds to it the history of the foundation of
the observatory.   It is interesting to notice that the lowest
temperature hitherto recorded by the self-registering instru-
ments (−45° C.) was obtained last year.

                                           ERNEST W. BROWN.

_____

                        NOTES.

THE spring meeting of the Chicago Section of the AMER-
ICAN MATHEMATICAL SOCIETY will be held at the University
of Chicago on Saturday, March 29.

THE library of the AMERICAN MATHEMATICAL SOCIETY is
now bound and catalogued and ready for use.   Members
desiring to draw books may do so on applying to the Libra-
rian.   Books will be sent, express due, and must be returned
within four weeks, express prepaid.   Letters of inquiry
concerning books, publishers, prices, etc., will be answered
by the Librarian, so far as the facilities of the Society's li-
brary or of the library of Columbia University permit.   It
is the desire of the Council and of the Librarian to make
the library as helpful as possible to the members.   Circulars
have been sent to learned societies and institutions, to edi-
tors of mathematical journals. and to publishers, asking for
coöperation in the plans for enlarging the collection.

It would be fortunate if this library could become an ex-
ponent of the mathematical work of the Society.   To this
end members are invited to contribute copies of their publi-
cations, whether of books or of monographs, and to con-
tinue to do this as new works appear.   Such a library would
soon, with slight sacrifice on the part of each member, be-
come an invaluable record of the advance of mathematical
thought in America.   The Librarian will be glad to ac-
knowledge the receipt of any works of this nature, to in-
scribe the information that they are gifts from the author to
the Society, and to state this fact in the catalogues as they

appear. If members will give this matter immediate atten-
tion the library will begin substantial growth at once.

THE preliminary programme of the meeting of the Lon-
don mathematical society, to be held February thirteenth,
announced papers '' On the density of linear sets of points,''
by Mr. W. H. YOUNG, and '' On plane cubics,'' by Professor
A. C. DIXON.

AN international congress of the historical sciences is to
be held in Rome in April of this year. Professor V. CER-
RUTI, of the University of Rome. is president of the section
devoted to the mathematical and natural sciences, and Pro-
fessor A. FAVARO, of the University of Padua, of the sub-
section on mathematics and physics.

THE French ministry of public instruction has recently
issued the minutes of the Paris congress of mathematicians,
drawn up by the general secretary, Professor E. DUPORCQ.
The brochure contains in seventeen pages a brief summary
of the scientific and business proceedings ; but a list of those
participating in the Congress is not included.

THE proceedings of the Berlin mathematical society are
to be published in the *Archiv der Mathematik und Physik.*
The *Jahresbericht* of the German mathematical society re-
ports the titles and authors of papers read before many
mathematical associations ; in particular it contains brief ab-
stracts of the proceedings of the Göttingen mathematical
society. The *Jahresbericht* also publishes the tables of con-
tents of the current numbers of mathematical journals.

A COURSE of six public lectures will be delivered by Dr.
ALEXANDER MACFARLANE at Lehigh University, March 14–
25, on the life and work of the following British mathe-
maticians : Maxwell, H. J. S. Smith, Rankine, Sylvester,
Tait and Kelvin.

CORNELL UNIVERSITY.—The announcement for the sum-
mer session, July 7 to August 16, includes the following
advanced courses in mathematics :—By Professor L. A.
WAIT : Differential calculus, two hours.—By Dr. J. I.
HUTCHINSON : Integral calculus, five hours ; History of
mathematics, five hours.—By Dr. H. F. STECKER : Differ-
ential equations, five hours ; Non-euclidean geometry, three
hours ; Theory of functions, three hours.—By Dr. .W. B.
FITE : Introduction to the theory of groups, three hours.

UNIVERSITY OF MUNICH.—The following courses in mathematics are announced for the summer semester of 1902 :—By Professor F. LINDEMANN : Integral calculus ; Theory of substitutions and of higher algebraic equations ; Mechanics of deformable bodies ; Mathematical seminary.—By Professor A. PRINGSHEIM : Selected chapters from the theory of algebraic functions ; Fourier series.—By Dr. H. BRUNN : Elements of higher mathematics for students of all faculties.—By Dr. K. DÖHLEMANN : Descriptive geometry, with exercises ; Selected chapters from modern geometry.—By Dr. E. VON WEBER : Solid analytical geometry with exercises ; Theory and applications of determinants.

UNIVERSITY OF PARIS.—The following mathematical courses are announced by the faculty of sciences for the semester opening March 1, 1902, each course consisting of two lectures per week :—By Professor E. PICARD : Functions of several variables, especially the algebraic functions of two variables and the associated transcendentals.—By Professor E. GOURSAT : Differential equations continued.—By Professor P. APPELL : General laws of motion of systems, analytic mechanics, hydrostatics and hydrodynamics.—By Professor J. BOUSSINESQ : Theory of light.—By Professor G. KOENIGS : Theory of elasticity.—By Professor L. RAFFY : Integral calculus and its applications to mechanics and physics.

Conferences are conducted by Professor RAFFY in the integral calculus, Professor J. HADAMARD in the calculus and in higher analysis, by Professor P. PUISEUX in mechanics and astronomy, and by Professor H. ANDOYER, Professor HADAMARD, and Dr. E. BLUTEL preparatory to the agrégation.

UNIVERSITY OF TÜBINGEN.—The following mathematical courses are announced for the summer semester of 1902 :—By Professor H. STAHL : Elementary analysis, three hours ; Theory of functions, three hours ; Seminar, one hour.—By Professor A. VON BRILL : Analytical mechanics, five hours ; Selected chapters from the theory of curves of double curvature, two hours ; Seminar, one hour.—By Professor L· MAURER : Higher analysis, four hours ; Theory of invariants of binary forms, two hours ; Exercises in higher analysis, two hours.

THE Belgian academy of sciences proposes the following prize question for 1902 :

A contribution to the algebraic and geometric theory of forms in $n > 3$ variables.

Papers may be written in French or Flemish, and should be sent under the usual conditions as to anonymity to the permanent secretary of the Academy at Brussels. The value of the prize is 600 francs.

THE Amsterdam scientific society has recently issued its annual list of prize questions. Fifteen subjects in mathematics and physics are proposed. Copies of the announcement may be obtained from the secretary of the society, Professor D. J. KORTEWEG, Vondelstraat, 104, Amsterdam.

THE second number of the third volume of *Bibliotheca Mathematica*, which appeared recently, contains an elaborate account of the mathematical work of the late Professor E. Beltrami. The article is written by Professor G. LORIA, of the University of Genoa, and is illustrated by a portrait of Beltrami.

THE *Archiv der Mathematik und Physik* contains in each number a Sprechsaal for the Encyclopædia of the mathematical sciences, to which it invites contributions in the way of additions and corrections.

PRELIMINARY to the publication of the works of Leibniz, the Berlin academy of sciences has entrusted to Dr. W. KABITZ and Dr. P. RITTER the preparation of a complete list of Leibniz's writings.

BEGINNING with the year 1905, the Ecole polytechnique at Paris will discontinue the use of sexagesimal trigonometric tables, replacing them by centesimal tables with five places which are held to suffice completely for the daily use of the officers and engineers.

A NEW associate professorship of mathematics is to be established at the Vienna technical high school.

THE University of Strassburg conferred four doctorates in mathematics, out of a total of fourteen in all subjects, during the summer semester of 1901.

PROFESSOR G. PEANO, of the University of Turin, assisted by a number of Italian mathematicians, has in preparation a dictionary of mathematics.

AT the celebration of the twenty-fifth anniversary of the founding of the Johns Hopkins University, the honorary degree of doctor of laws was conferred upon Professor SIMON NEWCOMB.

ON the fourteenth of December a formal farewell reception was held at the Ecole polytechnique in honor of Pro-

fessor A. MANNHEIM upon his retirement from the chair of geometry, which he has filled since 1864, and which he now relinquishes under the age limit. The reception, which was held in the large amphitheater of the school, was arranged by a representative committee and was attended by the minister of war and many prominent scientists and officials. Several addresses were made, M. E. Rouché and the minister of war being among the speakers. The former dwelt particularly upon M. Mannheim's contributions to science in his Principes et développements de la géométrie cinématique. The occasion was further marked by the presentation to M. Mannheim of a token of remembrance in the form of a bronze by Coutan.

PROFESSOR G. MITTAG-LEFFLER has recently been elected foreign associate of the Royal society of Naples and associate of the Royal academy of Belgium.

MR. T. J. I'A BROMWICH, fellow of St. John's College, Cambridge, has been appointed professor of mathematics in Queen's College, Galway, in succession to Professor A. C. DIXON, now professor of mathematics in Queen's College, Belfast.

MR. R. J. PARANJPYE, senior wrangler at Cambridge University three years ago, and recently fellow of St. John's College, has returned to his native country to accept a professorship at Fergusson College, Poona.

MR. FREDERICK PURSER has been elected to the chair of natural philosophy in Trinity College, Dublin, lately vacated by Dr. TARLETON.

SEVERAL scientific societies will unite in tendering a reception to Lord KELVIN at Columbia University on the evening of April 21.

DR. C. M. GULDBERG, professor of mathematics in the technical school at Christiania, Norway, died on January 14.

NEW PUBLICATIONS.

I. HIGHER MATHEMATICS.

BASS (E. W.). Elements of differential calculus. 2d edition revised. New York, Wiley, 1902. 12mo. 8 + 356 pp. Cloth.
$4.00