

atic corrections. The weights here assigned are rather a rude approximation; this is pardonable where the object is mainly to make sure of the existence and general direction of the proper motion. But when the purpose in view is to obtain the most probable values of the motions, the systematic corrections and the weights should be rather more strictly applied.

Lalande's zones, for example, usually deserve no more than about $\frac{1}{10}$ of the weight of the Pulkova catalogue of 1855, while here we find $\frac{1}{4}$ employed instead. But this secondary correction is, as above stated, here of quite subordinate importance.

T. H. SAFFORD.

NOTES

A REGULAR meeting of the NEW YORK MATHEMATICAL SOCIETY was held Saturday afternoon, November 5, at half-past three o'clock, the president in the chair. The following persons, having been duly nominated, and being recommended by the council, were elected to membership: Professor Cleveland Abbe, U. S. Weather Bureau; Professor Henry S. White, Northwestern University; Mr. Gardner Ladd Plumley, Home Life Insurance Company of New York. It was announced that the president and secretary had been made members of the international committee on the proposed joint memorial to Gauss and Weber at Göttingen. No formal papers having been announced, a general discussion upon mathematical topics was in order. Miss Williams made some remarks, in which she stated that Steiner's method of proving, that the circle has a greater area than any other plane figure having an equal perimeter, appeared to lack rigor, because he took for granted that a maximum exists, and the latter proposition had not been demonstrated. Edler has found a rigorous proof of this proposition relating to the circle; but for the corresponding proposition with reference to the sphere, no rigorous proof by elementary geometrical methods seems to be known. Steiner himself objects to a similar method of proof, which Lhuilier applies to triangles. After stating his objection, Steiner gives a concise and rigorous proof of this proposition. When he goes on to the circle, he seems to forget his objection and to adopt a somewhat similar method. Most of the discussion which followed Miss Williams's remarks turned on this point. Dr. Fiske made some general remarks upon a recent paper* treating of the mathematical theory of

* Mathematical Investigations in the Theory of Value and Prices, by Dr. Irving Fisher, Yale University. *Transactions of the Connecticut Academy*, vol. ix., July, 1892.

value and prices. Professor Pupin presented a preliminary note on the analytical properties of the kinetic energy function in a system for which the principles of least action and of conservation of energy are both true.

THE University of Padua announces a *fête* for December 7, 1892, in honor of the three-hundredth anniversary of the day when Galileo became a professor in that institution.

THE senate of the University of Cambridge recently discussed a proposal to establish a mechanical sciences tripos for engineering students. The result was unexpectedly favorable to the scheme, and it is probable that the new tripos will meet with no opposition from the more mathematical members of the council who at first objected to it.

DR. C. H. CHAPMAN, recently of the department of mathematics at Johns Hopkins University, has been appointed conductor of the Wisconsin Teachers' Institute at Milwaukee.

T. S. F.

A CIRCULAR has been issued asking for subscriptions to aid in striking a portrait medal of M. Hermite, to be presented to him in commemoration of his approaching seventieth birthday. Professor Simon Newcomb is a member of the committee having the matter in charge.

DR. ARTHUR A. RAMBAUT has been elected royal astronomer of Ireland, and professor of astronomy in the University of Dublin. He succeeds Sir R. S. Ball, now at Cambridge.

WE have to record the death of Robert Grant, F.R.S., late professor of astronomy at the University of Glasgow, and that of Dr. Löwenherz, director of the Imperial Physical Institute of Berlin.

H. J.

AMONG the recent announcements of B. G. Teubner, of Leipzig, the theory of differential equations and the closely allied subject of continuous groups of transformations are most prominently represented. Thus, in addition to the third and last part of Sophus Lie's *Theorie der Transformationsgruppen*, edited by Dr. F. Engel, we are promised in 1892 the same author's *Vorlesungen über kontinuierliche Gruppen, zur Einführung in die Theorie derselben*, edited by Dr. G. Scheffers, and at least the first of the two volumes of Dr. L. Schlesinger's *Handbuch der Theorie der linearen Differentialgleichungen*, while for 1893 a work by Dr. L. Heffter, *Einführung in die Theorie der gewöhnlichen linearen Differentialgleichungen*, is in preparation, as well as a German translation,

by H. Maser, of A. R. Forsyth's *Theory of differential equations*, part I.

The publication of the works of the late L. Kronecker will begin in 1893. The first volume will contain Kronecker's lectures on determinants (never before printed), edited by Dr. K. Hensel ; this is to be followed by a volume comprising the collected papers of Prof. Kronecker on the theory of determinants and algebraic forms. At the same time Dr. E. Netto has undertaken the edition of Kronecker's lectures on definite integrals. A work by O. Stolz on the infinitesimal calculus, *Grundzüge der Differential- und unbestimmten Integralrechnung*, will be welcomed in particular by those acquainted with the same author's excellent *Vorlesungen über allgemeine Arithmetik* (1885 and 1886). Like this latter work the new one will be divided into two parts, one being devoted to real functions with real variables, the other to complex functions of real and complex variables. The first part is to appear in 1893. P. Bachmann, *Elemente der Zahlentheorie*; H. Stahl and V. Kommerell, *Die Grundformeln der allgemeinen Flächentheorie*; and R. Sturm, *Die Gebilde ersten und zweiten Grades der Liniengeometrie in synthetischer Behandlung*, part II., *Die Congruenzen erster und zweiter Ordnung*, are other announcements for 1892 by the same house.

On applied mathematics we may mention C. Neumann's *Beiträge zu einzelnen Theilen der mathematischen Physik*, and the continuation of Steinheil and Voit's *Handbuch der angewandten Optik*, of which the second volume is promised for 1893, the third for 1894.

A. Z.

At the annual meeting of the London Mathematical Society, which was held on November 10, the following officers were elected for the coming year: president, A. B. Kempe; vice-presidents, A. B. Basset, E. B. Elliott, and A. G. Greenhill; treasurer, J. Larmor; secretaries, M. Jenkins and R. Tucker; other members of the council, H. F. Baker, A. R. Forsyth, J. W. L. Glaisher, J. Hammond, M. J. M. Hill, E. W. Hobson, A. E. H. Love, Major Macmahon, and J. J. Walker. The address of the retiring president, Professor A. G. Greenhill, had for its subject collaboration in mathematics.

DURING the present term the following advanced courses in pure mathematics are being given at Johns Hopkins University,—by Professor Craig: partial differential equations, twice a week; linear differential equations, three times a week; theory of functions and mathematical seminary, twice a week; by Professor Franklin: modern algebra and higher plane curves, five times a week; determinants, theory of equations, and advanced analytical geometry, three times a

week ; calculus (special topics), twice a week ; by Mr. Hurlburt : theory of substitutions, three times a week.

DR. WILLIAM H. METZLER has been appointed instructor in mathematics at the Massachusetts Institute of Technology.

DR. ASAPH HALL, Jr., recently of the U. S. Naval Observatory, has been appointed director of the "Detroit Observatory" and professor of astronomy at the University of Michigan, Ann Arbor.

T. S. F.

MR. GEORGE P. METZLER, Ph.D. (Johns Hopkins), lately of Clark University, has been appointed instructor of mathematics at the University of Michigan.

It will be interesting to our readers to learn that the lectures delivered by Professor Felix Klein, at the University of Göttingen, in the course of the last three years, have been lithographed, and can be obtained by applying to Mr. Fr. Schilling, Cand. math., Nikolausberger Weg 19, Göttingen. The whole set consists of six parts, covering as many semesters, viz., 1889-90, *Nicht-Euklidische Geometrie* (Mk. 11.50); 1890-91, *Ausgewählte Kapitel aus der Theorie der linearen Differentialgleichungen zweiter Ordnung* (Mk. 11.50); 1891-92, *Riemann'sche Flächen* (Mk. 10.00).

A. Z.

ERRATA in article "On the Non-Euclidian Geometry," in the BULLETIN for November: p. 21, l. 23, for "lectures" read "lecture"; p. 25, l. 32, for k^2 read k^{-2} ; p. 27, last line, also p. 28, l. 5 from bottom, for r^2 read r^{-2} ; p. 29, line 15, for a read b ; p. 33, footnote, for "Richard" read "R. S."

E. M.

THE committee of publication begs to announce that, beginning with the present number, it will enjoy the coöperation of Professor Alexander Ziwet in the editorial work of the BULLETIN.