

Grassmann's work, pointed out its necessary limitations (see, for instance, Lie and Engel's "Theorie der Transformationsgruppen," vol. III, Leipzig, Teubner, 1893, p. 534 and p. 748, Study's "Methoden zur Theorie der ternären Formen," Leipzig, Teubner, 1889, p. 202, and Study's "Massbestimmung extensiver Grössen, Wien, 1885). This critical spirit pervades the notes to the present volume and makes them really helpful to the student (see, in particular, the note on pp. 404-406). It is the modern theory of transformation-groups which furnishes the final criterion for a judicious estimate of the Ausdehnungslehre.

A. Z.

Jahresbericht der Deutschen Mathematiker-Vereinigung.
Vol. III (1893). Berlin, Reimer.

While this volume does not seem to have appeared as yet, a brief extract has been sent out which contains the general report on the Munich meeting, the financial report up to the spring of the present year, and the list of members. Besides an obituary of the late E. E. Kummer, by E. LAMPE, the third volume will contain two longer reports, viz.: "On the development of the theory of algebraic functions in the past and up to the present time," by BRILL and NÖTHER, and "On the development and main problems of the theory of girder-frames (einfaches Fachwerk)," by HENNEBERG. Abstracts will also be given of the following papers read at the meeting:

DYCK (Munich): Introductory address on the mathematical exhibition.

HAAS (Vienna): On an apparatus exhibiting precession.

HILBERT (Königsberg): Two new proofs of the possibility of resolving the numbers of a "Körper" into "Primideale."

MEHMKE (Darmstadt): On calculating-machines and similar appliances.

BJERKNES (Christiania): Analogies between physical (in particular electrical and magnetic) and purely mechanical phenomena.

JUKOVSKY (Moscow): Geometrical interpretation of the case discussed by Hess in the motion of a heavy rigid body about a fixed point.

H. WIENER (Halle): Further remarks on the foundations and the systematic development of geometry.

M. SIMON (Strassburg): Proof of the proposition that a Lobachevsky space contains a double infinity of spheres of infinite radius.

PRINGSHEIM (Munich): On Taylor's series.

BRUNN (Munich): Contribution to the *analysis situs*.

BAUSCHINGER (Munich): On the testing of the strength of materials.

FREYBERG (Dresden): Töpler's apparatus for illustrating the statics and dynamics of rigid bodies.

VON LOMMEL (Munich): On lines of magnetic force.

SCHAPIRA (Heidelberg): Iteration as the fundamental idea in mathematical operations.

FRICKE (Göttingen): On the moduli of a Riemann surface.

DOEHLEMANN (Munich): On the theory of the null-system.

BURKHARDT (Göttingen): On the theory of Cremona transformations.

SCHAPIRA (Heidelberg): On symmetric and alternating quadratic forms.

A. Z.

Proceedings of the American Association for the Advancement of Science for the forty-second meeting, held at Madison, Wis., August, 1893. Salem, 1894. 8vo. cxvi + 384 pp.

Besides Professor C. L. Doolittle's vice-presidential address to Section A on "Variations of latitude," this volume contains brief abstracts of a paper by Professor F. H. Loud, "A construction for the imaginary points and branches of algebraic loci," of a paper by Professor E. W. Hyde, "The screw as a unit in a Grassmannian system of the sixth order" (published in full in the *Annals of Mathematics*, vol. 8), and of a paper by Professor Mansfield Merriman, "On the possibility of the algebraic solution of the general equation of the fifth degree." Several other papers read before Section A are given only by title.

A. Z.

Le Livret de l'Étudiant de Paris. Publié sous les auspices du Conseil générale des Facultés. 1894-1895. Paris, Delalain Frères, 1894. 12mo. 158 pp.

A small volume bearing the above title has just been published by the General Council of the Faculties of Paris on behalf of those institutions which taken together are regarded as constituting the *Académie de Paris*. In the preface we read: "The General Council of the Faculties deems it useful to bring together the various information necessary for each student. . . . In giving to the students of Paris greater facilities for informing themselves as to both the rules to which they are subject and the means of study which are at their disposal, in showing them all the resources which the faculties and schools offer for higher intellectual culture, the publishers hope to contribute, on their part, to the rapidly-progressing development of the *University of Paris*." The matters presented are: (1) programmes of the several faculties and the school of pharmacy; (2) announcements of other institutions of higher instruction; (3) academic regulations;