"Depending upon the character of the generatrix we have two classes of surfaces : first those which are generated by straight lines or those which have rectilinear elements; and second those which are generated by curved lines known as *surfaces of double curvature.*" * Professor Ferris also states in Chapter IV on " Double curved surfaces " that " double curved surfaces have no right line elements " and he classes warped surfaces by themselves.

Monge's original sharp classification of surfaces into planes, single curved or *developable* surfaces, and double curved surfaces† has been mangled by several American writers including Warren ‡ and Church.§ The present classification by Dr. Randall into single curved surfaces, § 222; surfaces of revolution, § 223; and double curved surfaces of revolution, § 224; seems without adequate foundation.

Professor Ferris has a brief chapter on shades and shadows and one on perspective.

<div align="right">L. I. HEWES.</div>

NOTES.

THE Thirteenth Annual Meeting of the AMERICAN MATHEMATICAL SOCIETY will be held in New York on Friday and Saturday, December 28–29. Friday morning will be devoted to a joint session with Section A of the American association for the advancement of science and the Astronomical and astrophysical society of America. President OSGOOD's address will probably be delivered at the opening of the Friday afternoon session. The Council will meet on Friday afternoon. The annual election of officers and other members of the Council will be held on Saturday morning. Special railroad rates will be available for this meeting.

THE concluding (October) number of volume 7 of the *Transactions* of the AMERICAN MATHEMATICAL SOCIETY contains the following papers : " Weierstrass' theorem and Kneser's theorem on transversals for the most general case of an extremum of a

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* See also Randall, §§ 223, 224.

† G. Monge, Géométrie descriptive. Paris, 1858, p. 120.

‡ S. Edward Warren, Descriptive geometry. New York, 1860, p. 4 and p. 194.

§ A. E. Church, Descriptive geometry and shades and shadows. New York, 1870, p. 41.

simple definite integral," by O. BOLZA; "Area of curved sur-
faces," by J. PIERPONT; "On multiply transitive groups," by
W. A. MANNING; "Zur Theorie der vollständig reduciblen
Gruppen, die zu einer Gruppe linearer homogener Substitu-
tionen gehören," by L. STICKELBERGER; "On commutative
linear algebras in which division is always uniquely possible,"
by L. E. DICKSON; "On the order of linear homogeneous
groups," by H. F. BLICHFELDT; "On automorphic groups
whose coefficients are integers in a quadratic field," by J. I.
HUTCHINSON; "A class of periodic solutions of the problem
of three bodies with applications to the lunar theory," by F. R.
MOULTON; "A problem in the reduction of hyperelliptic inte-
grals," by J. H. McDONALD; "On the differential invariants of
a plane," by C. N. HASKINS. Notes and errata, volumes 6, 7.

Professor W. F. OSGOOD has retired from the Editorial Com-
mittee of the *Transactions*, and is succeeded by Professor H. S.
WHITE.

THE opening (October) number of volume 8 of the *Annals
of Mathematics* contains the following papers : "The fundamen-
tal laws of addition and multiplication in elementary algebra,"
by E. V. HUNTINGTON; "On a criterion of Pringsheim's for
expansibility in Taylor's series," by M. B. PORTER; "Mul-
tiply perfect numbers of three different primes," by R. D.
CARMICHAEL.

AT the Stuttgart meeting of the Deutsche Mathematiker-Ver-
einigung, Professor A. VON BRILL, of the University of Tübin-
gen, was elected president ; Professors M. KRAUSE, of Dresden,
and A. SCHOENFLIES, of Königsberg, were elected to the Council.
The next meeting will be held at Dresden during the summer
of 1907. The society now numbers 688 active members.

THE Cambridge University Press announces that the follow-
ing works will soon appear : Theory of differential equations,
volume 5, by A. R. FORSYTH ; Theoretic mechanics, an intro-
ductory treatise on the principles of dynamics, with applications
and numerous examples, by A. E. H. LOVE.

THE following parts of the Encyklopädie der mathematischen
Wissenschaften are announced by the firm of B. G. Teubner,
Leipzig, to be in the press, and will probably appear in Decem-
ber : III, 1, Analysis situs, by P. HEEGARD and M. DEHN;
V, 1, Kinetische Theorie der Materie, by L. BOLTZMANN

and J. NABL; Kapillarität, by H. MINKOWSKI; V, 2, Beziehungen zwischen electrostatischen und magnetischen Zustandsänderungen einerseits und elastischen und thermischen andererseits, by F. POCKELS. Also those mentioned in the BULLETIN, volume 12, page 465, except III, 2, Abzählende Methoden, by H. G. ZEUTHEN; and Allgemeine Theorie der höheren ebenen algebraischen Kurven, by L. BERZOLARI, which have already appeared.

Of the French edition of the encyclopedia there have thus far appeared the first sections of volumes I 1, 3 and 4.

THE following Americans have received the doctorate from European universities, with mathematics as the major subject, during the six semesters ending August 1, 1906: J. W. BRADSHAW (Strassburg, 1904), "Ueber die Flächendichtigkeit der Elektricität auf unendlich langen Cylindern;" J. L. COOLIDGE (Bonn, 1904), "The dual projective geometry of elliptic and spherical space"; F. J. DOHMEN (Greifswald, 1904), "Darstellung der Berührungstransformationen in Konnexcoordinaten"; D. C. GILLESPIE (Göttingen, 1906), "Anwendungen des Unabhängigkeitsatzes auf die Lösung der Differentialgleichung der Variationsrechnung"; A. L. P. WERNICKE (Göttingen, 1904), "Ueber die Analysis Situs mehrdimensionaler Räume"; W. D. A. WESTFALL (Göttingen, 1905), "Zur Theorie der Integralgleichungen."

To the list of American doctorates for 1906 having mathematics for the major subject should be added the names of W. R. LONGLEY (Chicago), "A class of periodic orbits of an infinitesimal body subject to the attraction of n finite bodies;" and F. L. GRIFFIN (Chicago), "Certain periodic orbits of k finite bodies revolving about a relatively large central mass."

UNIVERSITY OF PARIS. — The following courses in mathematics are given during the present semester: — By Professor G. DARBOUX: Systems of curvilinear coördinates, two hours. — By Professor E. GOURSAT: Elements of the theory of analytic functions, two hours; Conference, one hour. — By Professor P. PAINLEVÉ: General laws of motion and equilibrium, two hours. — By Professor L. RAFFY: Applications of analysis to geometry, one hour; General mathematics, two hours. — By Professor H. POINCARÉ: Limitations of the newtonian law, two hours. — By Professor J. BOUSSINESQ: Cooling of

liquids, two hours. — By Professor G. KOENIGS : Dynamics of machines, two hours. — By Professor E. BOREL : Theory of functions, one hour. — By Professor J. HADAMARD : General mathematics, two hours ; Conference, four hours. — By Dr. P. PUISEUX : Conference on mechanics, two hours. — By Dr. E. BLUTEL : Conference on algebra, two hours. In the École Normale. — By Professor J. TANNERY : Calculus, two hours, and the courses mentioned above, by Professors Hadamard, Raffy and Borel.

PROFESSOR J. MOLK, of the University of Nancy, and Professor T. LEVI-CIVITA, of the University of Padua, have been elected to membersip in academy of sciences at Halle.

PROFESSOR G. ROST, of the University of Würzburg, has been promoted to a full professorship of mathematics.

PROFESSOR W. O. WIEN, of the University of Würzburg, has declined the invitation of the University of Berlin to be professor of theoretical physics, as successor to the late Professor Drude.

DR. M. BOHREN has been appointed docent in mathematics and theory of probabilities at the University of Bern.

PROFESSOR G. LANDSBERG, of the University of Breslau, has been appointed associate professor of mathematics at the University of Kiel.

PROFESSOR TH. SCHMID, of the technical school at Vienna, has been promoted to a full professorship of descriptive geometry.

PROFESSOR K. ZSIGMONDY, of the technical school at Prague, has been appointed professor of mathematics at the technical school of Vienna.

DR. H. REISSNER, of the technical school at Charlottenburg, has been appointed professor of mathematics at the technical school at Aachen.

AT the University College of London, Mr. N. G. DUNBAR has been appointed demonstrator in applied mathematics.

At the University of Michigan, Dr. J. W. GLOVER has been promoted to a junior professorship of mathematics and insurance. The insurance courses have been broadened by the addition of a seminary for advanced students.

AT Lehigh University, Mr. J. H. OGBURN has been appointed assistant professor of mathematics.

AT George Washington University, Mr. P. N. PECK has been promoted to an assistant professorship of mathematics, and Mr. G. A. ROSS has been appointed instructor in mathematics.

AT the College of the City of New York, Mr. S. J. MAGARGE has been appointed tutor in mathematics. Mr. R. F. DEIMEL has been transferred to the department of physics.

THE following academic appointments are also announced: DR. F. L. GRIFFIN as instructor in mathematics at Williams College, Williamstown, Mass.; Mr. R. M. BARTON and Mr. F. C. MOORE as instructors in mathematics at Dartmouth College; Mr. P. DORWEILAR and Mr. C. F. HAGENOW as instructors in mathematics at the Armour Institute of Technology; Mr. F. F. DECKER as instructor in mathematics at Syracuse University; Mr. L. WEEKS as instructor in mathematics at Purdue University; Mr. W. M. SMITH as tutor and Mr. J. W. COLLITON as instructor in mathematics at Lafayette College; Mr. W. S. PEMBERTON and Mr. P. F. HEDGES as assistants in mathematics at the University of Missouri.

PROFESSOR ERNESTO CESÀRO, of the University of Naples, died September 12, at the age of forty-seven years.

CATALOGUES of second-hand mathematical books: C. Winter, Dresden, Galleriestrasse 8, catalogue no. 97, 287 titles in pure and applied mathematics. — H. Sotheran and Co., London, 140 Strand, catalogue 666, 1437 titles in mathematics and sciences. — Carlo Clausen, Turin, Via Po 11, catalogue no. 128, 678 titles in mathematics, physics, and astronomy. — Karl W. Hiersemann, Leipzig, Königstrasse 3, Katalog 304, a few 16th–18th century works.