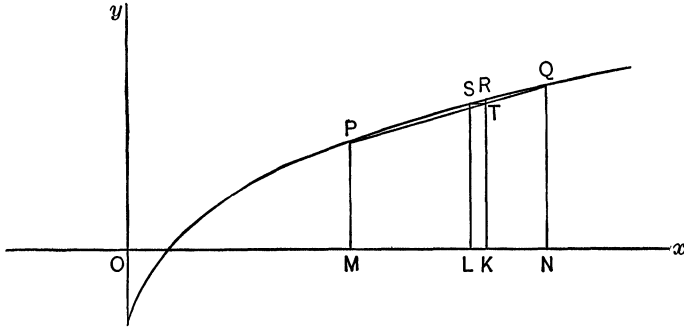The chord PQ being drawn meets KR at T, so that

$$KT = pf(v + s) + qf(v).$$

Through T draw TS parallel to the axis of x to meet the curve in S, and through S draw the ordinate SL meeting the axis of x in the point L; then since $SL = TK$, we have

$OL =$ fortune in possession whose moral value
    equals the moral value of the expectation.

$LN =$ premium which may, without disadvantage,
    be paid to insure S, represented by MN.

$KN =$ net premium for same.

$LK = ST =$ loading allowed.

OTTAWA, *July* 12, 1895.

NOTES.

A REGULAR meeting of the AMERICAN MATHEMATICAL SOCI-ETY was held in New York, Saturday afternoon, October 26, at three o'clock, the President, Dr. HILL, in the chair. There were nineteen members present. On the recommendation of the Council, the following persons, nominated at the preceding meeting, were elected to membership: Professor HENRY BYRON NEWSON, University of Kansas, Lawrence, Kas.; and Professor FREDERICK SHENSTONE WOODS, Massachusetts Institute of Technology, Boston, Mass. Seven nominations for membership were received. The President announced to the Society that an invitation had been received from the President of the Northwestern University, Evanston, Ill., inviting the Society to hold its next summer meeting at

Evanston under the auspices of the Northwestern University. He stated that he had replied to the invitation on behalf of the Society, expressing its appreciation of the offer, although it was not possible as yet to make any definite arrangements in regard to a meeting next summer.

The following paper, transmitted to the Society by Mr. J. C. GLASHAN, was presented: "On Moral Values," by Mr. R. HENDERSON. The paper was read by the Secretary. It appears in the present number of the BULLETIN. Professor R. S. WOODWARD communicated a note on an error in Church's Descriptive Geometry relative to the surface generated by the motion of a straight line tangent to a helix.

PROFESSOR FRANZ NEUMANN, well known through his works on mathematical physics, died at Königsberg, on the 23d of May, at the advanced age of 96.

THE director of the Astronomische Recheninstitut and professor of astronomy in the University of Berlin, Dr. F. Tietjen, died at Berlin on the 21st of June, aged 61.

PROFESSOR FRIEDRICH GUSTAV MEHLER, who died in July, was the author of several papers published in *Crelle's Journal* and of a widely used text-book of elementary mathematics (Hauptsätze der Elementar-Mathematik). At the time of his death he was professor in the Elbing Gymnasium.

THE mathematical prize of the Prince Jablonowski Society for 1894 (1000 marks) has been awarded to Dr. Paul Harzer, director of the Gotha Observatory. The problem proposed by the Society required *a new determination of the secular perturbations of at least the orbits of Mercury, Venus, the Earth, and Mars, having regard to the terms of higher order* (see BULLETIN OF THE AMERICAN MATHEMATICAL SOCIETY, Vol. I, p. 22). It appears from the Annual Report of the Prince Jablonowski Society, dated Leipzig, March, 1895, that while Dr. Harzer's memoir contains a complete solution of the theoretical part, the practical part of the problem is carried only through the preliminary calculations up to the actual integration. But as the calculations are carried sufficiently far to warrant a very favorable judgment concerning the adequacy of the method used by the author, the Society has decided to publish the memoir, urgently requesting the author to continue his work so as to effect the numerical evaluation of the secular perturbations.

THE University of the City of New York has appointed Mr. Arthur D. Frizell an assistant in mathematics.

THE organization of an "International Association for Promoting the Study of Quaternions and Allied Systems of Mathematics" has been suggested. Information in regard to the proposed society can be obtained from Messrs. P. Molenbroek, The Hague, Holland, and S. Kimura, Yale University, New Haven.

B. G. TEUBNER of Leipzig has an unusually large number of mathematical works in preparation.

To begin with the history of mathematics, the second part of Vol. III of MORITZ CANTOR's "Vorlesungen über Geschichte der Mathematik," covering the period from 1700 to 1726, is announced. The third part, which is to conclude this standard work, will carry the historical account to the year 1759. The excellent edition, by I. L. Heiberg and H. Menge, of the complete works of Euclid ("EUCLIDIS Opera omnia," Greek text with Latin translation) of which Vols. I–V and Vol. VII have appeared before, will be brought to a close this year by the appearance of Vol. VI, which contains the "Data" edited by Dr. Menge. As the second volume of Paul Tannery's edition of Diophantus ("DIOPHANTI ALEXANDRINI Opera omnia cum Graecis commentariis") is in press, we are now in possession of most carefully prepared texts of the four classics of Greek mathematics: Euclid, Archimedes, Apollonius, and Diophantus. A complete edition of the works of Ptolemy, by Berger, Boll, Heiberg, and others, is in preparation.

In modern mathematics Teubner is also publishing several sets of collected works. The second part of Vol. I of HERMANN GRASSMANN's mathematical writings, edited by Professor F. Engel, contains the "Ausdehnungslehre" of 1862, and will probably be out before the end of the present year. Two more volumes are to follow. The mathematical volume of JULIUS PLÜCKER's "Wissenschaftliche Abhandlungen," edited by Professor A. Schoenflies, has just appeared; the physical volume will be edited by Dr. F. Pockels. The first volume of LEOPOLD KRONECKER's "Vorlesungen," which appeared in 1894, has now been followed by the first volume of his "Gesammelte Werke"; each of these two series will consist of four volumes. P. STÄCKEL and F. ENGEL's "Theorie der Parallellinien von Euklid bis auf Gauss, eine Urkundensammlung," and O. BIERMANN's "Elemente der höheren Mathematik," appeared during the last few months. The following works are announced as in press: a German translation, by M. Lukat, of LUIGI BIANCHI's "Geometria differenziale"; a new work by Professor CARL NEUMANN, "Allgemeine Untersuchungen über das Newton'sche Princip der Fernwirkungen"; the first volume of a "Theorie der doppelt periodischen Funktionen einer Veränderlichen," by Professor MARTIN KRAUSE; the second part of Vol. II, as

well as Vol. III, of Professor ERNST SCHRÖDER's " Vorlesungen
über die Algebra der Logik " ; and the long expected "Geome-
trie der Zahlen," by Professor HERMANN MINKOWSKI.   The
printing of the first part of a new work by Professor SOPHUS
LIE and Dr. GEORG SCHEFFERS, "Geometrie der Berührungs-
transformationen," is nearly completed, and the work will
probably appear in December.

Among other works announced as soon forthcoming, we may
mention: L. SCHLESINGER, "Handbuch der Theorie der linearen
Differentialgleichungen," Vol. II ; O. STOLZ, " Grundzüge der
Differential- und Integralrechnung," Vol. II ; R. STURM, " Die
Gebilde ersten und zweiten Grades der Liniengeometrie in
synthetischer Behandlung," Vol. III ; P. GORDAN, "Vorlesungen
über Invariantentheorie," Vol. III ; and W. WIRTINGER, " Un-
tersuchungen über Thetafunktionen," a memoir which was
awarded the Benecke prize by the Philosophical Faculty of the
University of Göttingen in 1895.   A work on automorphic
functions, by Professor FELIX KLEIN and Dr. ROBERT FRICKE,
is also in preparation.

In applied mathematics Teubner announces the second vol-
ume of the fourth edition of WÜLLNER's " Experimental-Phy-
sik " ; Vol. VIII of FRANZ NEUMANN's "Vorlesungen über
mathematische Physik : Vorlesungen über die Wärme"; a sec-
ond part to Professor CARL NEUMANN's " Elektrische Kräfte ";
Vol. II of A. STEINHEIL and E. VOIT's " Handbuch der ange-
wandten Optik " ; and MARTIN, " Die Folgerungen der Boden-
reinertragstheorie " (in 3 vols.), Vol. II.

AMONG the announcements of MM. Gauthier-Villars et Fils
of Paris we notice the fourth (and last) volume of G. DARBOUX's
" Lecons sur la théorie générale des surfaces et les applications
géométriques du calcul infinitésimal " ; a first fascicule (352
pp.) of this volume has appeared.   Of MÉRAY's "Leçons nou-
velles sur l'analyse infinitésimale et ses applications géomé-
triques" the second volume has been issued, while the third
and fourth ("Questions analytiques classiques; applications
géométriques") are in preparation.   The third and last vol-
ume of FERMAT's works is in press.   CAUCHY's " Œuvres com-
plètes " are progressing slowly; vols. 1, 4, 5, 6, 7, 8 of series I,
and vols. 6, 7, 8, 9, 10 of series II have appeared so far; vol.
9 of the first series is nearly ready.   Eleven of the thirteen
volumes of the magnificent edition of LAPLACE's works are
ready; the twelfth is in press.   PICARD's valuable "Traité
d'analyse" is in its third volume, of which two parts (390 pp.)
have appeared; the fourth and final volume, on partial differ-
ential equations, is in preparation.   The second volume of J.
TANNERY and MOLK's " Éléments de la théorie des fonctions
elliptiques " is still in press; the whole work will comprise

four volumes. Of B. NIEWENGLOWSKI's "Cours de géométrie analytique," Vol. I was issued in 1894, Vol. II in 1895; the third ("Géométrie dans l'espace, avec une note sur les transformations en géométrie, par E. Borel") is in press. The fourth volume of TISSERAND's "Traité de mécanique céleste" has not yet appeared, but is printing; the second volume of BAILLAUD's "Cours d'astronomie" will soon be out; and a portion of the second volume of P. APPELL's "Traité de mécanique" has been issued, while the remaining part and Vol. III are in preparation.

IN the number of *Nature* for October 3 is a long list of forthcoming scientific works. Among the works announced are the following: "The year-book of scientific and learned societies of Great Britain and Ireland," comprising lists of the papers read before societies engaged in fourteen departments of research during 1895, to be published by C. Griffin & Co.; "The Indian calendar," containing complete tables for the verification of Hindu and Mohammedan dates for a period of 1600 years (A.D. 300 to 1900) for the whole of India, by ROBERT SEWELL, in collaboration with SANKARA BÂLKRISHNA DIKSHIT, with a table of eclipses by Dr. SCHRAM, to be published by Swan Sonnenschein & Co; "A practical trigonometry, for the use of engineers, architects, and surveyors," by HENRY ADAMS, to be published by Whittaker & Co.; "Miscellaneous papers," by the late Professor H. HERTZ, translated by D. E. Jones, "Elements of geometry," by GEORGE C. EDWARDS, "CHRISTIANSEN's mathematical physics," translated by W. F. Magie, "Rigid dynamics," by W. J. LOUDON, "Elements of co-ordinate geometry," by S. L. LONEY, and "Elementary trigonometry," by CHARLES PENDLEBURY, to be published by Macmillan & Co. "Dynamics," by P. G. TAIT, to be published by A. & C. Black; "An introduction to the algebra of quantics," by E. B. ELLIOTT, to be published by the Clarendon Press; and, to be published by the Cambridge University Press, "Catalogue of scientific papers, compiled by the Royal Society of London," 1874–1883, Vol. XI; "Scientific papers of JOHN COUCH ADAMS," Vol. I, edited by his brother, W. G. Adams, with a memoir by Dr. J. W. L. Glaisher; "Collected mathematical papers of ARTHUR CAYLEY," Vol. IX; "Treatise on spherical astronomy," by Sir ROBERT S. BALL; HEATH's "Treatise on geometrical optics," second edition; "Treatise on Abel's theorem," by H. F. BAKER; "Treatise on the Lunar theory," by E. W. BROWN; "Elementary treatise on electricity and magnetism," by J. J. THOMSON; "Treatise on geometrical optics," by R. A. HERMAN; "Euclid," Books XI and XII, by H. M. TAYLOR; and "Mechanics and hydrostatics; part 3, hydrostatics," by R. T. GLAZEBROOK.

THE announcements of Ginn & Co. include: "Problems in differential calculus," by W. E. BYERLY; "Molecules and the molecular theory of matter," by A. D. RISTEEN; and "Plane and solid geometry," by W. W. BEMAN and D. E. SMITH.

NEW PUBLICATIONS.

HIGHER MATHEMATICS.

ABRAHAM IBN ESRA.   Sefer Ha-Mispar.   Das Buch der Zahl.   Ein hebräisch-arithmetisches Werk aus dem 12ten Jahrhundert. Ueber-setzt und erläutert von M. Silberberg.   Frankfurt am Main, 1895. 8vo.   10 and 198 pp.   Illustrated.   Mk. 4.00

ANNUAIRE DE L'ÉCOLE POLYTECHNIQUE pour l'an 1895. Avec des notes scientifiques, historiques et statistiques et le Mémorial de l'École. Paris, 1895. 8vo. 308 pp.   Mk. 2.00

BLANK (F.).   Ueber die geodätischen Curven auf einem körperlichen Kreis-ringe. [Progr.] Gera, 1895. 4to. 24 pp. Illustrated.   Mk. 1.50

CALINON (A.).   Le géométrie à deux dimensions des surfaces à courbure constante. Paris, Gauthier-Villars, 1895. 8vo.   Fr. 2.50

CAYLEY (A.).   Collected mathematical papers. Vol. VIII. Cambridge, University Press (New York, Macmillan), 1895.   4to.   4 and 570 pp.   25s.

CHISHOLM (G.).   Algebraisch-gruppentheoretische Untersuchungen zur sphärischen Trigonometrie. [Diss.] Göttingen, 1895. 8vo. 68 pp. 3 plates.   Mk. 2.00

DARBOUX (G.).   Leçons sur la théorie générale des surfaces et les appli-cations géométriques du calcul infinitésimal.   (In 4 vols.)   Vol. IV: Déformation infiniment petite et représentation graphique.   Paris, Gauthier-Villars, 1895.   8vo.   1er fasc., pp. 1–352.   Whole vol-ume   Fr. 15.00

DELASSUS (E.).   Sur les équations linéaires aux dérivées partielles à caractéristiques réelles.   [Thèse.]   Paris, Gauthier-Villars, 1895. 4to.   67 pp.   Fr. 3.50

GRASSMANN (R.).   Die Formenlehre der Mathematik in strenger Formel-entwicklung.   4 Teile in 1 Bande, nebst Formelbuch.   Stettin, Grassmann, 1895.   8vo.   5 and 12 and 242 pp.; 12 and 189 pp.; 9 and 132 pp.; 3 and 39 pp.; Formelbuch: 24, 27, 14, and 5 pp. Illustrated.   Mk. 10.00

HŒFER (F.).   Histoire des mathématiques depuis leurs origines jusqu'au commencement du XIXe siècle. 4e édition. Paris, Hachette, 1895. 16mo.   3 and 609 pp.   Fr. 4.00

HURWITZ (J.).   Ueber eine besondere Art der Kettenbruch-Entwicklung complexer Grössen. [Diss.] Halle, 1895. 8vo. 50 pp. 1 plate.