tial equation of second order, we may still further rid ourselves of its third term, the equation so reduced being said to be in its *canonical form*. There are also certain *associate equations* $(n - 2)$ in number, the solutions of each of which consist in a set of variables dependent upon the integrals of equation (1) and possessing relative to the transformation mentioned, the invariantive property of returning into themselves multiplied by a power of z', among these equations being found the well-known equation of the n^{th} order on which depends the determination of an integrating factor for (1).

The volume concludes with a short chapter on equations with uniform doubly-periodic coefficients, a subject which the author expresses his intention of resuming in his second volume. Supposing w and w' to be the periods of our coefficients, by the substitution of $x + w$ or $x + w'$ for x, they will remain unaltered and the integrals will transform into linear functions of one another. By analogy the general theory already given suggests that the characteristic equations corresponding to these substitutions may give us constants s and s', by which the respective transformations multiply some integral u. When the general integral happens to be uniform such proves to be the case, there being at least one integral u which by the substitutions $x + w$ and $x + w'$ for x respectively transforms into $s\,u$ and $s'u$, and for the determination of such integrals, as also of the other integrals of the equation, methods are given. J. C. FIELDS.

NOTES.

AT the meeting of the NEW YORK MATHEMATICAL SOCIETY held Saturday afternoon, October 3d, at half-past three o'clock, the Council announced that Professor Henry B. Fine had been appointed to fill the vacancy in their body. The following persons having been duly nominated, and being recommended by the Council, were elected to membership: Professor Thomas Craig, Johns Hopkins University; Dr. A. V. Lane, Dallas, Texas; Professor L. A. Wait, Cornell University; Professor George Egbert Fisher, University of Pennsylvania; Mr. William H. Metzler, Clark University; Professor Ellen Hayes, Wellesley College; Professor George A. Miller, Eureka College; Mr. Charles Nelson Jones, Milwaukee, Wisconsin; Dr. J. Woodbridge Davis, New York; Mr. Charles H. Rockwell, Tarrytown, N. Y.; Professor J. Burkitt Webb, Stevens Institute of Technology.

The following original papers were read: The Determination of Azimuth by Elongations of Polaris, by Mr. Harold Jacoby; On Powers of Numbers whose Sum is the Same Power of Some Number, by Dr. Artemas Martin; A Classification of Logarithmic Systems, by Professor Irving Stringham.

Professor Stringham's paper will be published in the *American Journal of Mathematics*, and Mr. Jacoby's has been communicated to the *Royal Astronomical Society of London*.

T. S. F.

IN the course of his paper mentioned above Dr. Martin presented the following very remarkable series of numbers recently found by him:

$$4^5+5^5+6^5+7^5+9^5+11^5 = 12^5$$
$$5^5+10^5+11^5+16^5+19^5+29^5 = 30^5$$
$$12^5+13^5+15^5+16^5+17^5+\ldots.$$
$$+23^5+25^5+27^5+28^5+29^5+\ldots+35^5 = 50^5$$
$$1^6+2^6+4^6+5^6+6^6+7^6+9^6+12^6+13^6$$
$$+15^6+16^6+18^6+20^6+21^6+22^6+23^6 = 28^6$$

The paper will be published elsewhere *in extenso*.

IN connection with Professor Merriman's article, it may be of interest to note that Professor Wright, also a contributor to the present number, gives a different treatment of the same problem in his "Treatise on the Adjustment of Observations," p. 206.

WILLIAM FERREL, the eminent meteorologist, died on Friday, September 18, at Maywood, Wyandotte County, Kansas. He was born in Bedford County, Pennsylvania, January 29, 1817. He studied at Franklin and Marshall College, and at Bethany College, being graduated from the latter in 1844. In 1857 he became an assistant in the office of the *American Ephemeris and Nautical Almanac*, and held that position for ten years. Thereafter, until 1882, he held a special appointment in the United States Coast Survey. In that year he was made assistant, with the rank of professor, in the Signal Service Bureau, where he remained until October, 1886, when he made his home in Kansas City, Missouri. He invented the maxima and minima tide predicting machine, which is now used by the Coast Survey in predicting the tides. Professor Ferrel received honorary elections to the Austrian, English, and German meteorological societies, and in 1868 was elected to membership in the National Academy of Sciences. Some of his principal works are "Motions of Fluids and Solids Relative

to the Earth's Surface," published in 1859; "Determinations of the Moon's Mass from Tidal Observations," 1871; "Converging Series Expressing the Ratio between the Diameter and the Circumference of a Circle," 1871; "Tidal Researches," 1874; "Tides of Tahiti," 1874; "Meteorological Researches," in three parts, published consecutively, in 1875, 1878, and 1881; "Recent Advances in Meteorology," 1883, and "Temperature of the Atmosphere and the Earth's Surface," 1884.

IT is with regret that we learn of the death of our member, Asher Benton Evans. He died at Lockport, the place of his late residence, September 24, 1891. He was an alumnus of Madison (now Colgate) University of the class of 1860. He was widely known as an educator, and had been a contributor to the *Mathematical Monthly*.

THE Cambridge University Press announces: *Catalogue of Scientific Papers Compiled by the Royal Society of London*, new series for the years 1874–1883; *The Collected Mathematical Papers of Arthur Cayley, Sc. D., F. R. S., Sadlerian Professor of Mathematics in the University of Cambridge*, Vol. IV.; *A History of the Theory of Elasticity and of the Strength of Materials*, by the late I. Todhunter, F. R. S., edited and completed by Carl Pearson, Professor of Applied Mathematics, University College, London, Vol. II.

The Clarendon Press promises: *Mathematical Papers of the late Henry J. S. Smith, Savilian Professor of Geometry in the University of Oxford*, with portrait and memoir, 2 vols.; *A Treatise on Electricity and Magnetism*, by G. Clerk Maxwell, new edition.

THE October number of the *American Journal of Mathematics* begins the fourteenth volume. It contains as a frontispiece an excellent likeness of Professor Felix Klein of Göttingen.

JOHN WILEY & SONS have in preparation "A New Elementary Synthetic Geometry, Plane and Solid, especially adapted to high-school work, with numerous examples," by George Bruce Halsted, Professor of Mathematics in the University of Texas. T. S. F.

THE *Inland Press* (The Register Publishing Company, Ann Arbor, Mich.) has just issued: "Practical astronomy," by W. W. Campbell, a short treatise mainly intended for the use of surveyors and civil engineers; also "Logarithmic and other mathematical tables" (to five places), by W. J. Hussey. The same house announces as in preparation two translations

from the German: O. Dziobek's "Mathematical theories of planetary motions," translated by Prof. M. W. Harrington; and E. Netto's "Theory of substitutions and its applications to algebra," translated by Dr. F. N. Cole. It is to be noticed that Dr. Netto has not only authorized the present translation, but has furnished the translator with a large amount of new material in the form of corrections and additions, so that some of the chapters of the original are almost entirely rewritten, and the whole work will be considerably increased. The work will appear early in 1892.

PROFESSOR M. W. HARRINGTON having been appointed chief of the U. S. Weather Bureau, the astronomical observatory of the University of Michigan is temporarily in charge of the newly appointed instructor in astronomy, Mr. W. J. Hussey. The former instructor, Mr. W. W. Campbell, has accepted a position as assistant at the Lick Observatory, Mt. Hamilton, Cal. A. Z.

PROFESSOR CLARENCE A. WALDO, recently of the Rose Polytechnic Institute, is now at De Pauw University, Greencastle, Indiana. T. S. F.