

At the Iowa State College the following changes have been made in the department of mathematics: Miss A. FLEMING has been promoted to an assistant professorship; Mr. J. R. SAGE, Miss F. FARNUM, and Miss M. MILLER have been appointed instructors; Miss N. MADSON has been appointed assistant.

PROFESSOR H. L. RIETZ, of the University of Illinois, has been appointed by Governor Dunne a member of the committee to investigate the operation of national and foreign pension systems.

PROFESSOR W. H. H. HUDSON, of King's College, London, died September 21, at the age of 76 years.

PROFESSOR E. JANISCH, of the technical school at Prague, died August 11, 1915, at the age of 46 years.

PROFESSOR J. KNOBLAUCH, of the University of Berlin, died July 22, 1915, at the age of 59 years.

PROFESSOR F. LECONTE, of the University of Ghent, died October 11, 1915, at the age of 50 years.

PROFESSOR H. GANTER, of the cantonal school at Aargau, died July 29, 1915, at the age of sixty-seven years.

DR. L. ORLANDO, of the University of Rome, was killed in battle in August.

DR. R. TORELLI, of the University of Pisa, was killed in battle August 10, 1915, at the age of thirty-one years.

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## NEW PUBLICATIONS.

### I. HIGHER MATHEMATICS.

BERZOLARI (L.). See ENCYCLOPÉDIE.

BESSEVE (A.). *Le cercle et les surfaces cerclées en géométrie conforme.* (Thèse.) Paris, Gauthier-Villars, 1915. 4to. 8+162 pp. Fr. 9.00

BÔCHER (M.). *Plane analytic geometry.* New York, Holt, 1915. 12mo. 13+235 pp. \$1.60

BROWN (E. H.). See BURN (J.).

BURN (J.) and BROWN (E. H.). *Elements of finite differences; also solutions to questions set for part 1 of the examinations of the Institute of actuaries.* London, Layton, 1915. 10s. 6d.

- CARRUS (S.). See ENCYCLOPÉDIE.
- CARSE (G. A.) and SHEARER (G.). A course in Fourier's analysis and periodogram analysis for the mathematical laboratory. (Edinburgh Mathematical Tracts No. 4.) London, Bell, 1915. 8vo. 8+66 pp. 3s. 6d.
- CARTAN (E.). See ENCYCLOPÉDIE.
- CHARLES (R. L.). See FRANKLIN (W. S.).
- DINGELDEY (F.). See ENCYCLOPÉDIE.
- ENCYCLOPÉDIE des sciences mathématiques pures et appliquées. Tome III, volume 1, fascicule 2: Les notions de ligne et de surface par H. von Mangoldt et L. Zoratti; Exposé parallèle du développement de la géométrie synthétique et de la géométrie analytique pendant le 19ième siècle par G. Fano et S. Carrus; Géométrie énumérative par H. G. Zeuthen et M. Pieri; La théorie des groupes continus et la géométrie par G. Fano et E. Cartan. Paris, Gauthier-Villars et Leipzig, Teubner, 1915. Gr. 8vo. Pp. 161-352. M. 7.20
- , Tome III, volume 3, fascicule 2: Systèmes de coniques par F. Dingeldey et E. Fabry; Théorie générale des courbes planes algébriques par L. Berzolari. Paris, Gauthier-Villars et Leipzig, Teubner, 1915. Gr. 8vo. Pp. 161-304. M. 5.40
- FABRY (E.). See ENCYCLOPÉDIE.
- FANO (G.). See ENCYCLOPÉDIE.
- FORD (L. R.). An introduction to the theory of automorphic functions. (Edinburgh Mathematical Tracts No. 6.) 8vo. 8+96 pp. 3s. 6d.
- FRAENKEL (A.). Ueber die Teiler der Null und die Zerlegung von Ringen. (Dissertation.) Marburg, 1914.
- FRANKLIN (F. W.). Thoughts on ultimate problems. London, David Nutt, 1915. 150 pp. 1s. 6d.
- FRANKLIN (W. S.), MACNUTT (B.) and CHARLES (R. L.). Calculus supplement. To take the place of pages 1-41 of the 1913 edition. South Bethlehem, Pa., New Era Printing Co., 1915. 8vo. 51 pp. Paper.
- GIBB (D.). A course in interpolation and numerical integration for the mathematical laboratory. (Edinburgh Mathematical Tracts No. 2.) London, Bell, 1915. 8vo. 8+90 pp. 3s. 6d.
- GLENN (O. E.). Treatise on the theory of invariants. Boston, Ginn, 1915. 8vo. 10+245 pp. Cloth. \$2.75
- KAMPÉ DE FÉRIET (J.). Sur les fonctions hypersphériques. (Thèse.) Paris, Gauthier-Villars, 1915. 4to. 112 pp. Fr. 6.00
- KEYSER (C. J.). Science and religion: the rational and the supernatural. Address delivered before the Phi Beta Kappa Association in the City of New York. New Haven, Yale University Press, 1914. 12mo. 75 pp. \$0.75
- , The new infinite and the old theology. New Haven, Yale University Press, 1915. 12mo. 117 pp. \$0.75
- KÖNNEMANN (W.). Rationale Lösungen von Aufgaben aus dem Gebiete der gesamten Elementarmathematik in funktionaler Abhängigkeit. Berlin, Winkelmann, 1915. 112 pp. M. 3.00
- MACNUTT (B.). See FRANKLIN (W. S.).
- MANGOLDT (H. VON). See ENCYCLOPÉDIE.

- PÉRÈS (J.). Sur les fonctions permutables de première espèce de M. Vito Volterra. (Thèse.) Paris, Gauthier-Villars, 1915. 4to. 100 pp. Fr. 5.00
- PIERI (M.). See ENCYCLOPÉDIE.
- PRANGE (G.). Die Hamilton-Jacobische Theorie für Doppelintegrale (mit einer Uebersicht der Theorie für einfache Integrale). (Dissertation.) Göttingen, 1915.
- SHEARER (G.). See CARSE (G. A.).
- SCHMIDT (M. C. P.). Kulturhistorische Beiträge zur Kenntnis des römischen Altertums. 1tes Heft: Zur Entstehung und Terminologie der elementaren Mathematik. 2te Auflage. Leipzig, Dürr, 1914. 269 pp. M. 5.00
- TOWNSEND (E. J.). Functions of a complex variable. (American mathematical series.) New York, Holt, 1915. 7+384 pp. \$4.00
- WILDBRETT (A.). Analytische Geometrie und Elemente der Differentialrechnung. Lehrbuch mit Aufgabensammlung für die Oberklasse von Gymnasien und Realgymnasien. Nürnberg, Korn, 1915. 124 pp. M. 2.00
- ZEUTHEN (H. G.). See ENCYCLOPÉDIE.
- ZORETTI (L.). See ENCYCLOPÉDIE.

## II. ELEMENTARY MATHEMATICS.

- BELL (H.). A course in the solution of spherical triangles for the mathematical laboratory. (Edinburgh Mathematical Tracts No. 5.) London, Bell, 1915. 8vo. 8+66 pp. 2s. 6d.
- BEINHORN (H.). Lehrbuch der Mathematik. Berlin, Weidmann, 1915. Ausgabe A für Realanstalten, 4 Bände. 165+197+216+234 pp. M. 2.00+2.20+2.40+2.80. Ausgabe B für Gymnasialanstalten, 3 Bände. 274+175+211 pp. M. 3.00+2.20+2.40.
- BORCHARDT (W. G.). Revision papers in algebra. London, Rivingtons, 1915. 2s.
- BORCHARDT (W. G.) and PERROTT (A. D.). Key to geometry for schools. London, Bell, 1915. 294 pp. 8s. 6d.
- CRANTZ (P.). Arithmetische Aufgaben für Oberlyzeen sowie die mittleren und oberen Klassen der Studienanstalten. 2te Auflage. Leipzig, Teubner, 1913. 88 pp. M. 1.40
- DUPUIS (N. F.). Elementary synthetic geometry of the point line and circle, in the plane. 4th reprint. New York, Macmillan, 1914. 290 pp. \$1.10
- . Elements of synthetic solid geometry. 3d reprint. New York, Macmillan, 1914. 12mo. 239 pp. \$1.60
- FISHER (G. E.) and SCHWATT (I.). Complete secondary algebra. 3d reprint. New York, Macmillan, 1914. 12mo. 504 pp. \$1.35
- GERBER (L.). Rechenunterricht und Krieg. Strassburg, Strassburger Druckerei und Verlagsanstalt, 1915. 80 pp. M. 1.00
- GNAGA (A.). Sulla estrazione di radice quadrata e cubica col procedimento delle medie. Brescia, tip. F. Apollonio, 1914. 8vo. 15 pp.
- HUN (J. G.) and MACINNES (C. R.). The elements of plane and spherical trigonometry. 3d reprint. New York, Macmillan, 1915. \$0.90

- INGOLD (L.). See KENYON (A. M.).
- KENYON (A. M.) and INGOLD (L.). Plane and spherical trigonometry. 2d reprint. New York, Macmillan, 1914. 132 pp. \$1.35
- LESSER (O.). See SCHWAB (K.).
- LISTER (S.). A first book of arithmetic. London, Macmillan, 1915. 28+239 pp. 1s. 6d.
- MACINNES (C. R.). See HUN (J. G.).
- MILNE (R. M.). Mathematical papers for admission into the Royal Military Academy and the Royal Military College, February-June, 1915. London, Macmillan, 1915. 8vo. 24 pp. 1s.
- PERROTT (A. D.). See BORCHARDT (W. G.).
- ROBBINS (E. R.). New plane geometry. New York, American Book Co., 1915. 6+264 pp.
- ROTHROCK (D. A.). Elements of plane and spherical trigonometry. 7th reprint. New York, Macmillan, 1915. 147 pp. \$1.10
- SAMMLUNG mathematischer Formeln. Herausgegeben vom bayerischen Mathematiker-Verein. Ausgabe A für Gymnasien, Realgymnasien, Realschulen. Ausgabe B für Oberrealschulen. München, J. Lindauer, 1915.
- SCHNEIDER (A.). See SCHWAB (K.).
- SCHULTZE (A.). Advanced algebra. 12th reprint. New York, Macmillan, 1915. 12mo. 562 pp. \$1.25
- SCHWAB (K.) and LESSER (O.). Mathematisches Unterrichtswerk: A. Schneider, Lehr- und Übungsbuch der Geometrie. Für Lehrer- und Lehrerinnenbildungsanstalten. 2ter Teil (Ebene Trigonometrie, Stereometrie und sphärische Trigonometrie). Leipzig, Freytag, 1915. 262 pp. M. 3.40
- SCHWATT (I.). See FISHER (G. E.).
- SMITH (C.). Elementary algebra. Complete edition, revised and adapted to American schools by I. Stringham. 5th reprint. New York, Macmillan, 1915. 12+672 pp. \$1.20
- STRINGHAM (I.). See SMITH (C.).
- STUCKEY (J. J.). Table of compound interest at  $\frac{1}{2}$  per cent. and of anti-logarithms to sixty figures to base 1.00125. London, G. Allen and Unwin, 1915. 4to. 116 pp. 1£ 1s.
- TABLES for converting shillings and pence and farthings into 7 places of decimals of a pound and for the reconversion of decimals. London, Layton, 1915. 8 pp. 1s.
- THAER (A.) und WIMMENAUER (T.). Arithmetische Aufgaben für höhere Schulen. Ausgabe B, für Oberrealschulen, Realgymnasien und verwandte Anstalten. 1ter Teil: Unterstufe; 2ter Teil: Oberstufe. Leipzig, Hirt, 1915. 146+152 pp. M. 1.75+1.75
- URAGUCHI (Y.). Handy logarithmic tables. Tokyo, Y. Uraguchi, 1915. 12 sen
- WENZEL (G.). Geometrie (Hilfsbücher zur Vorbereitung für die Bürgerschullehrerprüfung, V. Band). Wien, Tempsky, 1915. 404 pp. K. 5.00
- WIMMENAUER (T.). See THAER (A.).

ZICHEROW (—). Das abgekürzte Rechnen, für Eltern und Schüler dargestellt. Rawitsch, Birkenstock, 1915. 15 pp. M. 0.35

### III. APPLIED MATHEMATICS.

ABETTI (A.). Osservazioni astronomiche fatte all'equatoriale di Arcetri nel 1914, ed appendice di M. Maggini. Firenze, tip. Galletti e Cocci, 1915. 4to. 105 pp.

ANDERSON (A. J.). The romance of Leonardo da Vinci. New York, Brentano, 1915. \$3.75

ANNUARIO astronomico pel 1916, pubblicato dal r. osservatorio di Pino Torinese. Torino, tip. s. Giuseppe degli Artigianelli, 1915. 8vo. 165 pp. +1 tavola.

BARTON (E. H.). An introduction to the mechanics of fluids. London, Longmans, 1915. 14 +249 pp. 6s.

BIGOURDAIN (G.). Petit atlas céleste précédé d'une introduction sur les constellations, sur les moyens de les reconnaître, . . . Paris, Gauthier-Villars, 1915. 60 pp. +5 cartes. Fr. 2.75

BLUMENTHAL (O.). See BORN (M.).

BORN (M.). Dynamik der Kristallgitter. (Fortschritte der mathematischen Wissenschaften in Monographien. Herausgegeben von O. Blumenthal. Heft 4.) Leipzig, Teubner, 1915. Gr. 8vo. 7 + 122 pp. M. 7.60

CASSINIS (G.). See REINA (V.).

CONNAISSANCE des temps ou des mouvements célestes pour le méridien de Paris à l'usage des astronomes et des navigateurs pour 1917 publiée par le Bureau des longitudes. Paris, Gauthier-Villars, 1915. 8vo. 30 +824 pp. Cartonné. Fr. 4.75

CONWAY (A. W.). Relativity. (Edinburgh Mathematical Tracts No. 3.) London, Bell, 1915. 8vo. 8 +43 pp. 2s.

COOK (T. A.). The curves of life, being an account of spiral formations and their application to growth in nature, to science and to art; with special reference to the manuscripts of Leonardo da Vinci. New York, Holt, 1915. Gr. 8vo. 30 +479 pp. \$5.00

DARIÈS (G.). Cubature des terrasses et mouvement des terres. 2e édition. Paris, Gauthier-Villars, 1914. 8vo. 196 pp. Cartonné. Fr. 3.00

DREYER (I. L. E.). See TYCHONIS BRAHE.

GREENHILL (G.). Report on gyroscopic theory. (Advisory committee for aeronautics, Reports and memoranda No. 146.) London, Darling and Son, 1914. Folio. 277 pp. Boards. 10s.

GREGORY (R. A.) and HADLEY (H. E.). A manual of mechanics and heat. London, Macmillan, 1915. 8 +309 pp. 3s.

GROAT (B. F.). Chemi-hydrometry and its application to the precise testing of hydro-electric generators. (*Proceedings of the American Society of Civil Engineers*, vol. 41, No. 9, pp. 2103-2427.) New York, 1915.

HADLEY (H. E.). See GREGORY (R. A.).

HAUSSNER (R.). Darstellende Geometrie. 2ter Teil: Perspektive ebener Gebilde; Kegelschnitte. 2te verbesserte und vermehrte Auflage. Berlin, Göschen, 1914. M. 0.90

- HIGBEE (F. G.). The essentials of descriptive geometry. New York, Wiley, 1915. 6+204 pp. \$2.00
- INCE (E. L.). A course of descriptive geometry and photogrammetry for the mathematical laboratory. (Edinburgh Mathematical Tracts No. 1.) London, Bell, 1915. Svo. 8+79 pp. 2s. 6d.
- JOHNSON (J. F.). Practical shop mechanics and mathematics. New York, Wiley, 1915. 9+130 pp. \$1.25
- KOPPE (M.). Die Bahnen der beweglichen Gestirne im Jahre 1915. Eine astronomische Tafel nebst Erklärung. Berlin, 1915. M. 0.40
- LEONARDO DA VINCI. See COOK (T. A.)
- MAGGINI (M.). See ABETTI (A.)
- MELINAT (G.). Astronomische Schullektionen. Leipzig, Dürr, 1914. 62 pp. M. 1.60
- MURANI (O.). Proprietà cardinali dei sistemi diottrici; strumenti d'ottica. (Biblioteca tecnica.) Milano, Hoepli, 1915. Svo. 11+266 pp. L. 6.50
- ORR (M. A.). Stars of the southern skies. London, Longmans, 1915. 12+92 pp. 2s.
- PEASE (C. A.). First year course in general science. New York, Merrill, 1915. 315 pp. \$1.20
- POPPELWELL (W. C.). The elements of surveying and geodesy. London, Longmans, 1915. Svo. 12+244 pp. 7s. 6d.
- REINA (V.) e CASSINIS (G.). Determinazioni di latitudine astronomica e di gravità relativa eseguita in Umbria e in Toscana nel 1913 (r. Commissione geodetica italiana). Roma, tip. Nazionale, di G. Bertero, 1915. 4to. 58 pp.
- RYAN (W. T.). Continuous and alternating current machinery problems. New York, Wiley, 1915. 37 pp. \$0.65
- SEYRIG (T.). Statique graphique des systèmes triangulés. I: Exposés théoriques. 3e édition. Paris, Gauthier-Villars, 1915. 21 planches. Cartonné. Fr. 3.00
- STORMER (C.). The solar eclipse of August 21, 1914. Kristiania, J. Dybwad, 1915. 6 pp. +4 plates.
- TAYLOR (E. H.). Mathematics in the lower and middle commercial and industrial schools of various countries represented in the International commission on the teaching of mathematics. (United States Bureau of Education Bulletin, 1915, No. 35.) Washington, Government Printing Office, 1915. 96 pp. \$0.15
- THOMPSON (S. P.). Elementary lessons in electricity and magnetism. New edition completely revised and in many parts rewritten. London, Macmillan, 1915. Svo. 4s. 6d.
- TYCHONIS BRAHE Dani opera omnia edidit I. L. E. Dreyer. Tomus 2. Hauniae, Libraria Gyldendaliana, 1915. 461 pp.
- VENTURA (T.). Tavole tacheometriche centesimali complete; calcolo delle coordinate piane rettangolari; riduzione all'orizzonte delle distanze lette sulla stadia verticale; calcolo delle differenze del livello. Torino, tip. Doyen, di L. Simondetti, 1915. 4to. 11+12 pp. L. 3.50
- WEATHERHEAD (R.). The star pocket-book: or how to find your way at night by the stars. London, Longmans. 92 pp. 1s.