HISTORIA MATHEMATICA **20** (1993), 223–235

ABSTRACTS

Edited by DAVID E. ZITARELLI

The purpose of this department is to give sufficient information about the subject matter of each publication to enable users to decide whether to read it. It is our intention to cover all books, articles, and other materials in the field.

Books for abstracting and eventual review should be sent to this department. Materials should be sent to Prof. David E. Zitarelli, Department of Mathematics, Temple University, Philadelphia PA 19122, U.S.A. (e-mail: V5319E @ TEMPLEVM. BITNET or V5319E @ VM.TEMPLE.EDU)

Readers are invited to send reprints, autoabstracts, corrections, additions, and notices of publications that have been overlooked. Be sure to include complete bibliographic information, as well as transliteration and translation for non-European languages. We need volunteers willing to cover one or more journals for this department.

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In order to facilitate reference and indexing, entries are given abstract numbers which appear at the end following the symbol #. A triple numbering system is used: the first number indicates the volume, the second the issue number, and the third the sequential number within that issue. For example, the abstracts for Volume 17, Number 1, are numbered: 17.1.1, 17.1.2, 17.1.3, etc.

For reviews and abstracts published in Volumes 1 through 13 there are an *author index* in Volume 13, Number 4, and a *subject index* in Volume 14, Number 1.

The initials in parentheses at the end of an entry indicate the abstractor. In this issue there are abstracts by Irving Anellis (Ames, IA), Thomas L. Bartlow (Villanova, PA), Donald W. Bushaw (Pullman, WA), Barry Cipra (Northfield, MN), Ivor Grattan-Guinness (Middlesex), Rebecca Herb (College Park, MD), Frederick Homann (Philadelphia), Victor J. Katz (Washington), Albert C. Lewis (Hamilton), Jeff Ondich (Northfield, MN), Karen V. H. Parshall (Charlottesville), James V. Rauff (Decatur, IL), Peter Ross (Santa Clara, CA), Lynn Arthur Steen (Northfield, MN), and David E. Zitarelli.

ALBERS, DONALD J., ALEXANDERSON, GERALD L., AND REID, CONSTANCE. 1990. *More mathematical people*. xvii + 375 pp. Hardbound; 29.95. A sequel to the pioneering *Mathematical people* containing 18 BIOGRAPHICAL INTERVIEWS with famous mathematicians of the 20TH CENTURY. [Adapted with permission from *The American Mathematical Monthly* **99**(5) (1992), 490.] (LAS) #20.2.1

ALEXANDERSON, GERALD L. *See* #20.2.1.

ANG, TIAN SE. *See* #20.2.56.

ANGLIN, W. S. 1992. Mathematics and history. *The Mathematical Intelligencer* **14**(4), 6–12. A critique of HISTORY OF MATHEMATICS TEXTBOOKS. Expresses the opinion that all the standard textbooks are deficient for one of the following reasons: mathematics is treated as untarnished good; there is too much emphasis on individuals; there is too much emphasis on nationalities; treatment of women mathematicians is unbalanced; chronological periods are artificially identified and treated prejudicially; computational mathematics is slighted; mathematics is treated as being above the mundane matters of life; rigor is not treated in a balanced way; there is no humor; mathematics is portrayed as in conflict with religion. (TLB) #20.2.2

0315-0860/93 $5.00

ARTMANN, BENNO. 1991. Euclid's *Elements* and its prehistory. Pp. 1–47 in #20.2.72. In his discussion of the prehistory of the *Elements*, the author argues, among other things, that "the construction of the regular pentagon is the core of Book IV of the *Elements* and that the classification of the REGULAR SOLIDS provided the impetus to write Book IV [p. 2]." GREEK GEOMETRY. (KVHP) #20.2.3

ASCHBACHER, MICHAEL. 1992. Daniel Gorenstein (1923–1992). *Notices of the American Mathematical Society* **39**(10), 1190–1191. Obituary of DANIEL GORENSTEIN, who is known for his work in the classification of finite SIMPLE GROUPS. (DEZ) #20.2.4

BAPTIST, PETER. 1992. Christian Heinrich von Nagel (1803–1882): Elementargeometer und Lehrer. Pp. 77–90 in *Bausteine zur Tübinger Universitätsgeschichte*, Series 6 (Tübingen: Attempto Verlag.) An account of the 19th-century geometer and teacher CHRISTIAN HEINRICH VON NAGEL. (ACL) #20.2.5

BARKER, ANDREW. 1991. Three approaches to canonic division. Pp. 49–83 in #20.2.72. The author examines the approaches of Thrasyllus, Plato and Archytas, and Ptolemy to producing MUSICAL HARMONIES associated with the device known as the monochord, a string stretched between two bridges and supported by a rigid base upon which a measuring strip lies. The problem of dividing the *kanōn* or ruler involved determining where to divide the string in order to produce the notes of the musical scale. ANCIENT GREECE. (KVHP) #20.2.6

BASS, HYMAN, AND CASSIDY, PHYLLIS. 1992. Ellis Kolchin (1916–1991). *Notices of the American Mathematical Society* **39**(6), 599–600. Obituary of ELLIS ROBERT KOLCHIN, who devoted most of his career at Columbia University to DIFFERENTIAL ALGEBRA. (DEZ) #20.2.7

BERGGREN, J. L. 1985. The origins of al-Bīrūnī's "Method of the *Zījes*" in the theory of sundials. *Centaurus* **28**, 1–16. From the introduction: "In his great work on MATHEMATICAL GEOGRAPHY the Central Asian scholar ABU L-RAYḤĀN AL-BĪRŪNĪ (fl. 1010) described a method for finding the azimuth of one locality relative to another and called it 'method of the *zījes*'. ... This study ... contains evidence to suggest that the origin of [this method] lies in the THEORY OF SUNDIALS." (ACL) #20.2.8

BERGGREN, J. L. 1991. Greek and Islamic elements in Arabic mathematics. Pp. 195–217 in #20.2.72. An analysis of five ways—preservation, extension, criticism, systematization, and philosophical reflection—in which ARABIC MATHEMATICS related and responded to the mathematics of classical GREEK ANTIQUITY. ISLAM. (KVHP) #20.2.9

BERNOULLI, JOHANN. 1992. *Der Briefwechsel von Johann Bernoulli.* Vol. 3. Basel/Boston/Berlin: Birkhäuser Verlag. With commentary by Pierre Costabel and Jeanne Peiffer. xxxv + 610 pp. 248 SFR. This handsome and well produced volume presents the second half of the correspondence between JOHANN BERNOULLI and PIERRE VARIGNON dating from 1702 to 1714 and includes some 90 letters with detailed mathematical and historical commentary. (KVHP) #20.2.10

BITTANI, SERGIO, LAUB, ALAN J., AND WILLEMS, JAN C. (Eds.) 1991. *The Riccati equation.* New York/Berlin/Heidelberg: Springer-Verlag. x + 338 pp. Hardbound; $98. A self-contained presentation of the history of the RICCATI EQUATION and the state of the art of its solution. DIFFERENTIAL EQUATIONS. [Adapted with permission from *The American Mathematical Monthly* **99**(5) (1992), 492.] (JO) #20.2.11

BOTTAZZINI, UMBERTO (Ed.) 1990. *Augustin-Louis Cauchy: "Cours d'analyse de l'École Royale Polytechnique, première partie, analyse algébrique."* Bologna: Cooperativa Libraria Universitaria Editrice. clxvii + 605 pp. Paperbound. This book is not just a reprinting of the revolutionary work of AUGUSTIN-LOUIS CAUCHY, as the editor provides a 167-page comparison of some aspects of 17th-century ANALYSIS with the corresponding statements in the *Cours*. After investigating Lagrange's *Analyse algébrique*, Bottazzini considers the development of infinite series with Euler and others, the

binomial expansion (including Abel's objections), continuity, Cauchy's theorem, and "the passage from the real to the imaginary." The editor discusses the *Cours* as a TEXTBOOK in a historical framework, asserting that "one even wonders whether the *Cours* was ever used at all by Cauchy himself as a textbook." (DEZ) #20.2.12

BOULET, GENEVIÈVE. 1992. Book review. *Historia Mathematica* **19**(4), 435–437. A review of the first volume of the Leibniz-Archiv project, *Mathematische Schriften,* edited by Eberhard Knobloch and Walter Contro [Berlin: Akademie-Verlag. 964 + xxxix pp.]. The volume contains about an eighth part of LEIBNIZ's writings from the years 1672–1676. (DEZ) #20.2.13

BRILLHART, JOHN. 1993. Derrick Henry Lehmer 1905–1991. *Notices of the American Mathematical Society* **40**(1), 31–32. Obituary of DERRICK HENRY LEHMER, who gained fame for his photo-electric sieve in computational NUMBER THEORY. (DEZ) #20.2.14

BRYDEN, D. J. 1992. *Napier's bones: A history and instruction manual.* London: Harriet Wynter Ltd. 23 pp. Softcover. An illustrated account of the history and use of Napier's "rods" or "bones," arithmetic CALCULATING DEVICES designed by the Scottish mathematician, JOHN NAPIER, and described in his *Rabdologia* of 1617. (KVHP) #20.2.15

BYCHKOV, S. N. 1990. On the particularities of the ancient method of exhaustion. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 11–20. Examines ARCHIMEDES' quadrature of parabolas by the method of EXHAUSTION. GREEK GEOMETRY. (IA) #20.2.16

CAJORI, FLORIAN. 1991. *A history of mathematics, fifth edition.* New York: Chelsea. xi + 524 pp. Hardbound; $29.50. Revisions since the fourth edition of this brief classic TEXTBOOK on the HISTORY OF MATHEMATICS, first published in 1919, are primarily in the chapter on Babylonian mathematics. [Adapted with permission from *The American Mathematical Monthly* **99**(6) (1992), 590.] (LAS) #20.2.17

CASSIDY, PHYLLIS. *See* #20.2.7.

CONTRO, WALTER. *See* #20.2.13.

COPERNICUS, NICHOLAS. 1992. *Minor works.* Baltimore and London: The Johns Hopkins Univ. Press. xv + 373 pp. Translation and commentary by Edward Rosen with the assistance of Erna Hilfstein. Softcover. A republication of the 1985 edition of the book by NICHOLAS COPERNICUS published by Polish Scientific Publishers. The collection includes Copernicus' translation of THEOPHYLACTUS SIMOCATTA, the *Commentariolus,* Copernicus' letter against WERNER, Copernicus' writings about money, his administrative documents, and seventeen letters written by him between 1518 and 1541. (KVHP) #20.2.18

COPERNICUS, NICHOLAS. 1992. *On the revolutions.* Baltimore and London: The Johns Hopkins Univ. Press. xxi + 452 pp. Translation and commentary by Edward Rosen. Softcover. A republication with a new introduction of the 1978 edition of the book by NICHOLAS COPERNICUS published by Polish Scientific Publishers. (KVHP) #20.2.19

COSTABEL, PIERRE. *See* #20.2.10.

CURCHIN, L., AND HERZ-FISCHLER, R. 1985. De quand date le premier rapprochement entre la suite de Fibonacci et la division en extrême et moyenne raison? *Centaurus* **28,** 129–138. The authors investigate who knew of the connections between the FIBONACCI SERIES and the EXTREME AND MEAN (GOLDEN) RATIO. Kepler knew of them but the authors attempt to make a distinction between who had the capability of proving them and who proved them. (ACL) #20.2.20

CURTIS, CHARLES W. 1992. Representation theory of finite groups: From Frobenius to Brauer. *The Mathematical Intelligencer* **14**(4), 48–57. Traces the development of the theory of FINITE GROUPS

from its origins in 19th-century number theory through the work of FROBENIUS, BURNSIDE, SCHUR, E. NOETHER, and BRAUER. (TLB) #20.2.21

D'AMBROSIO, UBIRATAN. 1992. Ethnomathematics: A research program on the history and philosophy of mathematics with pedagogical implications. *Notices of the American Mathematical Society* **39**(10), 1183–1185. The author, one of the main founders of ETHNOMATHEMATICS, describes some of the motivations and aims of the field. (DEZ) #20.2.22

DALE, A. I. 1992. On the authorship of "A calculation of the credibility of human testimony." *Historia Mathematica* **19**(4), 414–417. The author presents evidence that attributes the anonymous tract "A calculation of the credibility of human testimony" (1699) to GEORGE HOOPER (1640–1727). (DEZ) #20.2.23

DEMIDOV, S. S. 1990. Leibniz's law of continuity and the concept of continuous function in L. Euler. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 34–39. Looks at LEIBNIZ's 'Lex continuitatis' and its influence on the formation of EULER's concept of continuous function. (IA) #20.2.24

DOBROVOLSKII, V. A. 1990. The theory of ordinary differential equations in A. M. Lyapunov's manuscripts. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 74–90. An examination of the work on ordinary DIFFERENTIAL EQUATIONS from the *Nachlass* of A. M. LYAPUNOV. (IA) #20.2.25

EDWARDS, H. M. 1992. Kronecker's arithmetical theory of algebraic quantities. *Jahresbericht der Deutschen Mathematiker-Vereinigung* **94,** 130–139. KRONECKER's construction of the splitting field of a polynomial, "the heart of GALOIS THEORY," is described in detail. For a second topic Edwards selects Kronecker's generalization to arbitrary number fields of KUMMER's theory of IDEAL PRIME FACTORS for cyclotomic fields. In contrast, DEDEKIND's method (for algebraic number fields) "does not capture the essence of the matter in a way that generalizes to other cases." Edwards concludes with an account of how Kronecker's algorithmic approach in mathematics has been unjustly regarded in the history of mathematics as a failed approach of interest only for its oddity. (ACL) #20.2.26

ERLICHSON, HERMANN. 1992. Newton's solution to the equiangular spiral problem and a new solution using only the equiangular property. *Historia Mathematica* **19**(4), 402–413. A study of the proof of Proposition IX of Book I in ISAAC NEWTON's *Principia,* dealing with centripetal force in equiangular spirals. Newton provided an alternate proof that is also analyzed. (DEZ) #20.2.27

ERMOLAEVA, N. S. 1990. Mathematical cartography and D. A. Grave's method of solving a problem of Dirichlet. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 95–120. The third chapter of the doctoral dissertation of DMITRI ALEKSANDROVICH GRAVE (1863–1939) at the University of Saint Petersburg, "On the basic mathematical problems of creating geographical maps," gives a solution to DIRICHLET'S PROBLEM of closed algebraic curves. (IA) #20.2.28

EVANS, GILLIAN R. 1982–1983. Fractions and fraction-symbols in Boethius' *Musica. Centaurus* **26,** 215–217. Boethius invented a technical language for discussing semitones in his MUSIC THEORY that borrows from Greek proportion theory and the Roman fractional system. NUMERATION. (ACL) #20.2.29

FAUVEL, JOHN, GOWING, RONALD, GRATTAN-GUINNESS, IVOR, AND ROGERS, LEO. 1992. The first twenty-one years: 1971–1992. *Newsletter of the British Society for the History of Mathematics* **21,** 24 pp. A special issue devoted to this HISTORY OF MATHEMATICS SOCIETY, which is the only specialized such society in Europe and the oldest in the world. There are a list of meetings held and their themes (pp. 10–13), a list of speakers and the titles of their talks (pp. 13–24), and reproductions of various memos. It includes an article by Ivor Grattan-Guinness that is abstracted separately. (DEZ) #20.2.30

FISHER, STEPHEN D. 1992. Ralph P. Boas, Jr. (1912–1992). *Notices of the American Mathematical Society* **39**(10), 1189–1190. Obituary of RALPH PHILIP BOAS, JR., who is known mainly for his work in ANALYSIS. (DEZ) #20.2.31

FOWLER, DAVID. 1992. Dýnamis, mitḥartum, and square. *Historia Mathematica* **19**(4), 418–419. The author points out some ambiguities in the use of the ancient Greek word *dýnamis* and the old Babylonian term *mitḥartum* as related to the term *square*. (DEZ) #20.2.32

FRASER, CRAIG. 1985. D'Alembert's principle: The original formulation and application in Jean d'Alembert's *Traité de Dynamique* (1743). *Centaurus* **28,** 31–61. Though previous accounts by Truesdell and Szabó have helped to dispel misunderstandings of D'ALEMBERT'S PRINCIPLE in the history of mechanics, their accounts "remain unsatisfactory as a description of d'Alembert's original procedure." (ACL) #20.2.33

FÜHRER, LUTZ. 1991. Historical stories in the mathematics classroom. *For the Learning of Mathematics* **11**(2), 24–31. Three stories illustrate how the history of mathematics can be used in the classroom: earth measurement by Eratosthenes, the ideas of π, and the invention of complex numbers in connection with the irreducible case of the cubic equation. (This issue of the journal *For the Learning of Mathematics* is a special issue on history in MATHEMATICS EDUCATION containing papers from the International Conference on History in Mathematics Education, HIMED 90, held in Leicester in April 1990. (VJK) #20.2.34

GAIDUK, YU. M. 1990. The recognition of the scientific merits of P. Bohl by his contemporaries. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 120–137. Impressions of the Latvian mathematician PIERS BOHL (1865–1921), who worked on general HARMONIC ANALYSIS and DIFFERENTIAL EQUATIONS, by such contemporaries as Brouwer and Hadamard are related. Includes letters of A. KNESER, Bohl's professor and colleague at Dorpat. LATVIA. (IA) #20.2.35

GILES, G. J. 1992. University history in the new German states: The condition of the archives. *German History* **10,** 366–391. Survey and impressions of the ARCHIVES in the former German Democratic Republic: rich holdings, current conditions, and future prospects. "In general the situation ... is encouraging." GERMANY. (IGG) #20.2.36

GONZÁLES-VELASCO, ENRIQUE A. 1992. Connections in mathematical analysis: The case of Fourier series. *The American Mathematical Monthly* **99**(5), 427–441. An examination of the steps that led from the work of FOURIER on the series named after him to the development of the pillars of classical ANALYSIS. (DEZ) #20.2.37

GOWING, RONALD. *See* #20.2.30.

GRATTAN-GUINNESS, IVOR. 1992. A tale of a tub: On the Society's first 21 years. Pp. 1–9 in #20.2.30. An account of the BSHM, The British Society for the History of Mathematics, from 1970 to the present, including its meetings, publications, professional recognition, and future prospects. (DEZ) #20.2.38

GRATTAN-GUINNESS, IVOR. *See also* #20.2.30.

HARTSHORNE, ROBIN. 1992. Book review. *The American Mathematical Monthly* **99**(5), 482–486. A review of *The unreal life of Oscar Zariski* by Carol Parikh. (*See* #18.4.66.) The reviewer, a student in one of ZARISKI'S freshman classes in 1955, provides insight into the man behind the mathematics. (DEZ) #20.2.39

HERZ-FISCHLER, R. *See* #20.2.20.

HILFSTEIN, ERNA. *See* #20.2.18.

HILL, CLAIRE ORTIZ. 1991. *Word and object in Husserl, Frege and Russell. The roots of twentieth-century philosophy*. Athens, OH: Ohio State Univ. Press. xv + 213 pp. Notes, bibliography. Revisionist

view of the influence and place of EDMUND HUSSERL (1859–1938): FREGE denoted, BOLZANO and LOTZE revised. Perspectives on history of LOGIC and ANALYTICAL PHILOSOPHY. (IGG) #20.2.40

HOGENDIJK, JAN P. 1992. Bibliography of publications of Aḥmad Salīm Saʿīdān (1914–1991) on the history of mathematics and astronomy in ISLAMIC civilization, and list of MEDIEVAL ARABIC tests published by him. *Historia Mathematica* **19**(4), 439–443. The writings of AḤMAD SALĪM SAʿĪDĀN. (DEZ) #20.2.41

HØYRUP, JENS. 1991. Changing trends in the historiography of Mesopotamian mathematics: An insider's view. *Filosofi og Videnskabsteori på Roskilde Universitetscenter* **3**, 1–45. The author sketches the paradigm shifts and controversies in the study of MESOPOTAMIAN MATHEMATICS from the work of Neugebauer and Thureau-Dangin in the 1930s and 1940s to the current work of Schmandt- Besserat, Friberg, Damerow, Englund, Nissen, Powell, and Høyrup. Recent advances in the understanding of Mesopotamian mathematics are attributed, in part, to a new orientation that studies mathematics in relation to its historical context. (JVR) #20.2.42

HØYRUP, JENS. 1991. Mathematics and early state formation, or The Janus face of early Mesopotamian mathematics: Bureaucratic tool and expression of scribal professional autonomy. *Filosofi og Videnskabsteori på Roskilde Universitetscenter* **2**, iii + 64 pp. A discussion of scribal mathematics during the rise of states in southern Mesopotamia. It is suggested that pure mathematics in the OLD BABYLONIAN PERIOD was disguised as applied mathematics because "higher algebra" was an expression of scribal virtuosity in mathematics. This virtuosity served scribal pride in a profession that was computational and practical. It is also argued that Old Babylonian mathematics depended on a "school-and-bureaucracy complex" that inhibited the emergence of theoretical mathematics. (JVR) #20.2.43

HØYRUP, JENS. 1991. "Oxford" and "Cremona": On the relation between two versions of Al-Khwarizmi's algebra. *Filosofi og Videnskabsteori på Roskilde Universitetscenter* **1**, 1–29. The author argues that Gherardo di Cremona's Latin translation of AL-KHWARIZMI's *Algebra* is more faithful to the original than the Oxford Arabic version. The argument is based upon the agreement/disagreement between letterings of diagrams and the structures of proofs, and the use of grammatical persons in the two texts. MEDIEVAL ALGEBRA. (JVR) #20.2.44

HØYRUP, JENS. 1992. Babylonian miscellanies: Five preprints on Babylonian mathematics. *Filosofi og Videnskabsteori på Roskilde Universitetscenter* **3**(2), 1–196. A collection of five articles on BABYLONIAN MATHEMATICS. Each article is abstracted separately. (FH) #20.2.45

HØYRUP, JENS. 1992. Mathematical Susa Texts VII and VIII. A reinterpretation. Pp. 179–196 in #20.2.45. Høyrup gives a geometrical reinterpretation of the texts to correct Bruins' arithmetical one (TMS 52–62) of the reduction of LINEAR EQUATIONS in two unknowns into second degree equations. Susa VII solves a homogeneous indeterminate first degree problem, and VIII reduces the inhomogeneous case to it by a shift of variables with geometrical "appending" and "tearing out." Both give clues to methods and conceptualizations of OLD BABYLONIAN MATHEMATICS in general. (FH) #20.2.46

HØYRUP, JENS. 1992. On subtractive operations, subtractive numbers, and purportedly negative numbers in Old Babylonian mathematics. Pp. 159–178 in #20.2.45. Høyrup identifies two main Babylonian "subtractions" (identity conserving subtraction, and comparison), some other subtractive operations, and the evidence for a category of "subtractive number" found in BM 13901, YBC 4663, *et al.*, and concludes that BABYLONIAN CALCULATORS had a notion of "numbers with a subtractive role," but no incipient concept of negative number. Their vocabulary was imprecise, their concepts more clear cut. (FH) #20.2.47

HØYRUP, JENS. 1992. "Remarkable numbers" in Old Babylonian mathematical texts. A note on the psychology of numbers. Pp. 149–158 in #20.2.45. Høyrup studies use of 4, 7, 11, 13, 17, 19, in BM 13901 and Susa Texts V, VII, XVI, as irregular numbers in the partitive domain, to get complex

variants of basic problem types. Save 4, these, more clearly than sexagesimally reducible numbers, represent number in general. With them the texts could display algebraic virtuosity in problem solving, and, in cases where "remarkable" parts appear, became a pretext for training practical computational skills. BABYLONIAN NUMBERS. (FH) #20.2.48

HØYRUP, JENS. 1992. The Babylonian cellar text BM 85200 + VAT 6599. Retranslation and analysis. Pp. 1–54 in #20.2.45. To study third degree problems in BM 85200 + VAT 6599, Høyrup uses his new interpretation of Babylonian second degree ALGEBRA based on "structural analysis" of solved problems and "close reading" of term contexts. The methodology uncovered a geometric mode in the processes, but the "cut and paste" techniques needed two auxiliary constructive procedures for specific third degree (volume) problems found in the Cellar text. Even so, the general third degree problem eluded the Babylonians. POLYNOMIAL EQUATIONS. BABYLONIAN MATHEMATICS. (FH) #20.2.49

HØYRUP, JENS. 1992. The Old Babylonian square texts BM 13901 and YBC 4714. Retranslation and analysis. Pp. 55–148 in #20.2.45. With reinterpretation of terminology and techniques by "structural analysis" and "close reading," Høyrup shows that BM 13901 represents a mature subdisciplinary algebraic study of "square," a new genre created for and adopted from Akkadian surveyors by the Old Babylonian scribal school. Tablet YBC 4714 does not give procedures, but shows careful organization of each problem group, and progression from group to group. No new mathematics here, but the level of organization is new. BABYLONIAN ALGEBRA. (FH) #20.2.50

HUSSEY, EDWARD. 1991. Aristotle on mathematical objects. Pp. 105–133 in #20.2.72. An analysis of ARISTOTLE's views on the nature of mathematical objects as presented primarily in *Metaphysics* M 3. (KVHP) #20.2.51

ILIFFE, ROB. 1992. 'In the warehouse': Privacy, property and priority in the early Royal Society. *History of Science* **30,** 29–68. Discusses the role of the ROYAL SOCIETY in dealing with priority disputes in its early days. Careful attention is given to the dispute between HUYGENS and HOOKE over the invention of the balance-spring watch. Leibniz' complaint that Hooke acted improperly when Leibniz' calculator was demonstrated and Huygens's argument with several Englishmen about priority in rectification of curves are also mentioned. There is a brief discussion of methods of protecting mathematical property in the 17th century. (TLB) #20.2.52

KAHL, GÜNTHER. 1992. Das Rechenbuch Wertema: Eine Handschrift aus Plurs/Piuro von 1593. Pp. 45–71 in *Jahresbericht 1991 des Rätischen Museums Chur.* A study of a 1593 arithmetic manuscript as a rare example of a German text of RENAISSANCE CALCULATING TECHNIQUES from this period. The book survived a 17th-century landslide in the town of Plurs (or Piuro) as part of the library in the home of the Wertema family. Reproductions of several pages illustrate the calligraphy. The special historical interest of the book is deemed to lie in its methods of DIVISION. (ACL) #20.2.53

KATZ, VICTOR. 1993. *A history of mathematics: An introduction.* New York: Harper Collins. xiv + 786 pp. Hardbound. A TEXTBOOK on the HISTORY OF MATHEMATICS appropriate for prospective school and college teachers of mathematics and for mathematics majors. The general approach is chronological, including contributions from China, India, and the Islamic world. There are emphases on original textbooks from various periods and on the development of astronomy. Biographies are given in boxes and special topics in side bars. (DEZ) #20.2.54

KNOBLOCH, EBERHARD. *See* #20.2.13.

KUSHNER, B. A. 1992. Markov and Bishop. [In Russian] *Voprosy Istorii Estestvoznaniya i Tekhniki* **1,** 70–81. A personalized account of the author's reminiscences of MARKOV and BISHOP and on the relationship of their styles of approach to CONSTRUCTIVE MATHEMATICS. The author speculates that their respective schools would have benefitted if their meeting in 1966 at the International Congress of Mathematicians in Moscow had been more open. (IA) #20.2.55

LAM, LAY YONG, AND ANG, TIAN SE. 1992. *Fleeting footsteps: Tracing the conception of arithmetic and algebra in ancient China*. Singapore: World Scientific Publishing Co. xvi + 199 pp. Hardcover; $24. This study traces the development of NUMBERS and NUMERALS, the fundamental operations of ARITHMETIC, the use of common fractions, and the extraction of square roots in ANCIENT CHINA. As one of its principal primary sources, it draws on the *Sun Zi Suanjing* (*The Mathematical Classic of Sun Zi*), a text believed by many to date from the fifth century A.D. The authors also provide an English translation of the *Sun Zi Suanjing* with brief explanatory comments. (KVHP) #20.2.56

LAM, T. Y. 1992. Book review. *The American Mathematical Monthly* **99**(10), 970–972. A review of *Numbers* [New York: Springer-Verlag. 1990. xviii + 391 pp.], which contains fourteen chapters on NUMBER SYSTEMS written by eight authors and two editors (Ebbinghaus, Hermes, Hirzebruch, Koecher, Mainzer, Neukirch, Prestel, and Remmert). The reviewer concludes, "Richly textured with historical details and quotations from original sources, the book unfolds a wonderful pageant of events, ideas, viewpoints, controversies, failures and triumphs, foresights, hindsights and oversights which surround the 'long march' of the concept of numbers." (DEZ) #20.2.57

LANGERMANN, Y. T. 1985. The book of bodies and distances of Habash al-Ḥāsib. *Centaurus* **28,** 108–128. The author presents a portion of the Arabic text, with English translation and analysis, of a ninth-century Muslim ASTRONOMICAL TREATISE that he discovered. HABASH AL-ḤĀSIB. (ACL) #20.2.58

LANGLANDS, ROBERT P. 1985. Harish-Chandra. *Biographical Memoirs of Fellows of the Royal Society* **31,** 197–225. The most complete biography of HARISH-CHANDRA (1923–1983) available. Includes extensive comments on his work in REPRESENTATION THEORY of semisimple GROUPS. *See also* #18.4.46. (RH) #20.2.59

LARSEN, M. E. 1984. On the possibility of a pre-Euclidean theory of proportions. *Centaurus* **27,** 1–25. From the author's introduction: "This is an attempt to reconstruct the pre-Euclidean THEORY OF PROPORTIONS as it was suggested by O. Becker in 1933 to be based on the Euclidean algorithm. The main problem is whether such a theory could easily contain a theorem of alternating proportions." (ACL) #20.2.60

LAUB, ALAN J. *See* #20.2.11.

LAUBENBACHER, REINHARD C., AND PENGELLEY, DAVID J. 1992. Great problems of mathematics: A course based on original sources. *The American Mathematical Monthly* **99**(4), 313–317. A description of a lower-division honors COURSE that examines the evolution of selected GREAT PROBLEMS from five mathematical subjects. The problems are supplemented with cultural, biographical, and mathematical history. (DEZ) #20.2.61

LAUGWITZ, DETLEF. 1992. "Das letzte Ziel ist immer die Darstellung einer Funktion": Grundlagen der Analysis bei Weierstrass 1886, historische Wurzeln und Parallelen. *Historia Mathematica* **19**(4), 341–355. WEIERSTRASS regarded his work of 1886 on APPROXIMATION THEORY as confirmation of the Eulerian conception of a function as represented by an expression. In spite of Weierstrass' expressions of belief in the importance of history he and his school show a lack of understanding, or even an awareness, of the earlier French work, in particular that of CAUCHY. (ACL) #20.2.62

LINDBERG, DAVID C. 1992. *The beginnings of Western science: The European scientific tradition in philosophical, religious, and institutional context, 600 B.C. to 1450*. Chicago and London: The Univ. of Chicago Press. xviii + 455 pp. Softcover. A TEXTBOOK intended both for classroom use and for the general reader, it covers Greek and Roman scientific and medical developments, science in Islam and the problem of transmission, the formation of the medieval world view, and medieval cosmology, physics, medicine, and natural history. ANCIENT GREECE AND ROME. ISLAM. MEDIEVAL AGES. (KVHP) #20.2.63

LUMPKIN, BEATRICE. 1992. *Senefer: A young genius in Old Egypt*. Trenton, NJ: Africa World Press. 32 pp. Paperbound; $8.95. Illustrated by Linda Nickens. A novella for children (and others) that was inspired by the life and times of the scribe Ah'mose. The central character is Senefer, who becomes a famous mathematician and engineer. (DEZ) #20.2.64

LYSENKO, V. I. 1990. Differential equations in the work of A. J. Lexall. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 39–52. Survey of the work on DIFFERENTIAL EQUATIONS of ANDREI IVANOVICH LEXALL (1740–1784), a member of the Saint Petersburg Academy of Sciences. (IA) #20.2.65

MARTZLOFF, JEAN-CLAUDE. 1992. Li Shanlan (1811–1882) and Chinese traditional mathematics. *The Mathematical Intelligencer* **14**(4), 32–37. Discusses the mathematical career of LI SHANLAN who practiced traditional CHINESE MATHEMATICS and was an important figure in the TRANSMISSION of European mathematics to China. "Of interest here ... is the existence of two enduring mathematical traditions based on two different conceptualizations of the NATURE OF MATHEMATICS, the admissible MODES OF INFERENCE (logical or not), and the way in which mathematics should be WRITTEN and TAUGHT." (TLB) #20.2.66

MATIJASEVICH, YURI. 1992. My collaboration with Julia Robinson. *The Mathematical Intelligencer* **14**(4), 38–45. Describes the separate work by JULIA ROBINSON and YURI MATIJASEVICH leading up to the proof that HILBERT'S TENTH PROBLEM is unsolvable and their subsequent collaboration, largely by mail, on problems of DIOPHANTINE EQUATIONS. There are several personal ANECDOTES. (TLB) #20.2.67

MEDVEDEV, F. A. 1990. Corniform angles in Euclid's *Elements* and Proclus' *Commentary*. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 20–34. Survey of work on horned angles in the work of EUCLID and PROCLUS. GREEK GEOMETRY. (IA) #20.2.68

MERRILL, FLOYD. 1992. *Sign, textuality, world*. Bloomington and Indianapolis: Indiana Univ. Press. xviii + 264 pp. Hardcover; $37.50. A study of CHARLES SANDERS PEIRCE's views on SEMIOTICS in light particularly of recent discussions of post-structuralism, textualism, rhetoric, and the philosophy of science. (KVHP) #20.2.69

MORAWETZ, CATHLEEN S. 1992. Giants. *American Mathematical Monthly* **99**(9), 819–828. Reminiscences of some "giants" of APPLIED MATHEMATICS: GREGORY INGRAM TAYLOR, THEODORE VON KARMAN, NORBERT WIENER, JOHN VON NEUMANN, the author's thesis advisor, KURT FRIEDRICHS, and her father, JOHN L. SYNGE. Photograph of the author and her father on his 90th birthday. (DEZ) #20.2.70

MUELLER, IAN. 1991. Mathematics and education: Some notes on the Platonic program. Pp. 85–104 in #20.2.72. An essay exploring mathematical EDUCATION in classical Athens and focusing on arithmetic and logistic in PLATO's writings, geometry and the notion of commensurability, the mathematical lesson in *Theaetetus,* and the curriculum of the *Epinomis*. ANCIENT GREECE. (KVHP) #20.2.71

MUELLER, IAN (Ed.) 1991. *Peri Tōn Mathēmatōn: Essays on ancient mathematics and its later development*. Vol. 24. *Aperion: A Journal for Ancient Philosophy and Science*. Edmonton: Academic Printing and Publishing. vii + 251 pp. Softcover; $23.95. A collection of seven essays on the history of Greek mathematics, six of which were presented at a conference held at the Mathematisches Forschungsinstitut in Oberwolfach, Germany in August of 1990. The individual essays are abstracted separately. ANCIENT GREECE. (KVHP) #20.2.72

NARASIMHAN, RAGHAVAN. 1992. Book review. *The American Mathematical Monthly* **99**(4), 382–385. A review of *The man who knew infinity: A life of the genius Ramanujan* by Robert Kanigel. The reviewer takes the author to task on several aspects of the life of SRINIVASA RAMANUJAN. "[H]is understanding of the customs of south Indian Brahims is incomplete." The reviewer also considers Ramanujan as mathematician. *See* #19.2.47. (DEZ) #20.2.73

PEIFFER, JEANNE. *See* #20.2.10.

PENGELLEY, DAVID J. *See* #20.2.61.

PETROV, YU. P. 1990. From the history of the calculus of variations and the theory of optimization. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 53–73. Traces the history, from Euler to Pontryagin, of OPTIMIZATION using CALCULUS OF VARIATIONS. (IA) #20.2.74

PICKERING, ANDREW (Ed.) 1992. *Science as practice and culture.* Chicago and London: Univ. of Chicago Press. viii + 474 pp. Softcover; $65. A collection of fifteen essays divided into the two categories of "Positions," or "self-contained pieces that aim to represent individual perspectives on practice [p. 8]," and "Arguments," or articles on SCIENCE AS PRACTICE as opposed to studies more strictly in the sociology of scientific knowledge. Of the individual essays, only one deals with mathematics per se ("Constructing quaternions: On the analysis of conceptual practice" by Andrew Pickering and Adam Stephanides abstracted separately); several deal with the laboratory sciences. (KVHP) #20.2.75

PICKERING, ANDREW, AND STEPHANIDES, ADAM. 1992. Constructing quaternions: On the analysis of conceptual practice. Pp. 139–167 in #20.2.75. Taking the discovery of QUATERNIONS as a case in point, Pickering and Stephanides examine the issue of CONCEPTUAL PRACTICE in mathematics and argue that the analyses developed to better understand experimental and sociotechnical practice are also amenable to mathematical practice. (KVHP) #20.2.76

PIKUS, D. L. *See* #20.2.77.

POPOVA, N. YA., AND PIKUS, D. L. 1990. On a generalization of a problem of Riemann by Lappo-Danilevskii. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33,** 90–94. Lappo-Danilevskii's generalized Hilbert's twenty-first problem for a special class of linear DIFFERENTIAL FUCHSIAN EQUATIONS of period n. RIEMANN. LAPPO-DANILEVSKII. (IA) #20.2.77

PRESTON, RICHARD. 1992. The mountains of PI. *The New Yorker,* March 2, 36–67. A portrait of the brothers Gregory and David CHUDNOVSKY, two Soviet emigrés who have designed and built a supercomputer from mail-order parts to generate, and to check for patterns in, the two billion digit expansion of π. COMPUTERS. (DEZ) #20.2.78

PRICE, G. BALEY. 1993. The seventy-fifth anniversary celebration. *The American Mathematical Monthly* **100**(1), 4–15. An account of the founding of *The American Mathematical Monthly* by BENJAMIN FRANKLIN FINKEL in 1894, including its becoming the official JOURNAL of the Mathematical Association of America in 1916. (DEZ) #20.2.79

RAINA, DHRUV. 1992. Mathematical foundations of a cultural project or Ramchandra's treatise "Through the unsentimentalised light of mathematics." *Historia Mathematica* **19**(4), 371–384. An examination of the book *A treatise on the problems of maxima and minima* by the 19th-century Indian mathematician Y. RAMCHANDRA (1821–1880). The book is distinct for its attempt to present calculus within the INDIAN TRADITION of algebra. Reasons for its failure are described. (DEZ) #20.2.80

RASHED, ROSHDI. 1991. Archimède dans les mathématiques arabes. Pp. 173–193 in #20.2.72. A study of the Archimedean tradition particularly on the determination of INFINITESIMALS in the works of BANŪ MŪSĀ, THĀBIT IBN QURRA, IBRĀHĪM IBN SINĀN, AL-ÀLÁ' IBN SAHL, ABŪ SAHL AL-QŪHĪ, and IBN AL-HAYTHAM. (KVHP) #20.2.81

REID, CONSTANCE. *See* #20.2.1.

ROGERS, LEO. *See* #20.2.30.

ROSEN, EDWARD. *See* #20.2.18 and #20.2.19.

ROSENFELD, BORIS Q. 1992. Aḥmad Salīm Saʿīdān (1914–1991). *Historia Mathematica* **19**(4), 438–439. Synopses of the writings of the historian of MEDIEVAL ARABIC mathematics AḤMAD SALĪM SAʿĪDĀN, who was expelled from Israel in 1981. (DEZ) #20.2.82

SABIDUSSI, GERT. 1992. Correspondence between Sylvester, Petersen, Hilbert, and Klein on invariants and the factorisation of graphs 1889–1891. *Discrete Mathematics* **100**, 99–155. JULIUS PETERSEN's work of 1891 marks a beginning of GRAPH-THEORETIC STUDIES. It came from a mix of collaboration and competitive race between Petersen and J. J. SYLVESTER. Sabidussi gives full transcriptions with annotations of 27 Sylvester letters to Petersen. The story is supplemented by annotated transcriptions or translations (not all of them full) of 20 other letters between DAVID HILBERT and FELIX KLEIN, Petersen and Klein, Sylvester and Klein, and Hilbert and Petersen. An early FINITE BASIS THEOREM for invariants of binary forms by Hilbert was a starting point for the Petersen–Sylvester work. It is a fascinating footnote that a paper on this topic by ARTHUR CAYLEY in spite of everyone, including the author, knowing that its proof was flawed, was published as it stood (though not in his collected papers). (ACL) #20.2.83

SAGAN, HANS. 1991. Some reflections on the emergence of space-filling curves: The way it could have happened and should have happened but did not happen. *Journal of the Franklin Institute* **328**(4), 419–430. An outline of the history of SPACE-FILLING CURVES that presents three general procedures, suggested by the historical facts, for "churning out" such curves. The leading players are Peano, Cantor, Lebesgue, Hilbert, and I. J. SCHOENBERG (1903–1990). (DWB) #20.2.84

SAMSÓ, JULIO. 1992. *Las ciencias de los antiguos en Al-Andalus*. Madrid: Editorial Mapfre, 501 pp. Softcover. A study of the development of science in ANDALUSIA, beginning with the influx of Arabic science from 711 to 821 and moving through the end of the 15th century. Astrology, astronomy, the natural sciences, the exact sciences and mathematics, and technology, among other topics, are treated. (KVHP) #20.2.85

SAUNDERS, SAM. 1992. The amazing products of John Wallis. *Mathematics Notes from Washington State University* **35**(3), 1–2. An explanation of the derivations of several infinite expansions, including the famous one for $\pi/2$, by JOHN WALLIS. (DEZ) #20.2.86

SCHABAS, MARGARET. 1990. *A world ruled by number: William Stanley Jevons and the rise of mathematical economics*. Princeton: Princeton Univ. Press. xii + 192 pp. $29.95. A historical account of the pivotal role played by WILLIAM STANLEY JEVONS in the 19th-century origins of MATHEMATICAL ECONOMICS. *See also* #16.4.91. [Adapted with permission from *The American Mathematical Monthly* **99**(5) (1992), 495.] (BC) #20.2.87

SCHOT, STEVEN H. 1992. Eighty years of Sommerfeld's radiation condition. *Historia Mathematica* **19**(4), 385–401. ARNOLD JOHANNES WILHELM SOMMERFELD introduced a RADIATION CONDITION for certain boundary value problems in MATHEMATICAL PHYSICS. This note traces the motivation and reasoning that led to his original formulation and surveys the extensions and modifications that have occurred since then. WAVE PROPAGATION. (DEZ) #20.2.88

SESIANO, JACQUES. 1984. Une Arithmétique médiévale en langue provençale. *Centaurus* **27**, 26–75. A 15TH-CENTURY MANUSCRIPT in the Bibliothèque Nationale appears to be the only extant mathematical manuscript in the language of the old French province of LANGUEDOC. The author indicates some points of resemblance to other manuscripts of the time and transcribes, with notes and glossary, a substantial part. A photographic reproduction of the first page is given. (ACL) #20.2.89

SHARIPOVA, T. YA. (Ed.) 1989. *A short history of the Scientific Research Institute of Mathematics and Mechanics named after N. G. Chebotarev*. [In Russian] Kazan: Kazan Univ. Press. Various papers of institutional history of the Scientific RESEARCH INSTITUTE of Mathematics and Mechanics named after N. G. CHEBOTAREV at KAZAN UNIVERSITY in honor of the institute's 50th anniversary in 1984. (IA) #20.2.90

SIERKSMA, GERARD. 1992. Johann Bernoulli (1667–1748): His ten turbulent years in Groningen. *The Mathematical Intelligencer* **14**(4), 22–31. JOHANN BERNOULLI was a professor in the Dutch city of GRONINGEN from 1695 to 1705. This article describes his relations with LEIBNIZ and DE L'HOSPITAL prior to his appointment there and the CONTROVERSIES (political, religious, scientific, and with his brother) which engaged him during his tenure. (TLB) #20.2.91

SPEISER, DAVID. 1992. The Bernoulli Edition: The collected scientific papers of mathematicians and physicists in the BERNOULLI FAMILY. *The Mathematical Intelligencer* **14**(4), 63–64. A progress report and call for help by the general editor of this ambitious project, begun in 1935. (TLB) #20.2.92

SPEISER, DAVID. 1992. The Bernoullis in Basel. *The Mathematical Intelligencer* **14**(4), 46–47. Describes sites in the city of BASEL associated with the BERNOULLI FAMILY, hence of interest to the mathematical tourist. (TLB) #20.2.93

STEPHANIDES, ADAM. *See* #20.2.76.

TAISBAK, CHRISTIAN MARINUS. 1991. Elements of Euclid's *Data*. Pp. 135–171 in #20.2.72. Using Euclid's *Data* as his principal primary source, the author examines the meaning of the predicate "is given." He argues that one of Euclid's goals in the text is to, in some sense, axiomatize its meaning in a mathematical context. ANCIENT GREECE. EUCLID. (KVHP) #20.2.94

TATTERSALL, J. J. 1992. Nicholas Saunderson: The blind Lucasian Professor. *Historia Mathematica* **19**(4), 356–370. A description of the life and accomplishments of NICHOLAS SAUNDERSON (1682–1739), who was blinded by smallpox at the age of one. He was noted for both his popular lectures on natural science and his expertise in tutoring mathematics. His two TEXTBOOKS, *The elements of algebra* and *Method of fluxions*, were published posthumously. (DEZ) #20.2.95

TIKHOMIROV, V. M. 1990. Eduard Helly. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33**, 137–145. Sketches the life and mathematical work of EDUARD HELLY. (IA) #20.2.96

VAN MAANEN, JAN A. 1984. Hendrick van Heuraet (1634–1660?): his life and mathematical work. *Centaurus* **27**, 218–279. Presents several new facets of the life and work of HENDRICK VAN HEURAET and discusses the interactions among Sluse, Huygens, van Schooten, Hudde, and van Heuraet on properties of curves and especially the relationship between the work of van Heuraet and HUYGENS on the RECTIFICATION OF THE PARABOLA. HOLLAND. (ACL) #20.2.97

WEBSTER, ROGER. 1991/92. Charles Babbage: The man behind the machines. *Mathematical Spectrum* **24**(2), 33–41. Much of this article focuses on the life of CHARLES BABBAGE. It also discusses his difference engine and analytical engine, which the author considers to be the first automatic calculating device and the first general-purpose computing machine, respectively. (PR) #20.2.98

WILLEMS, JAN C. *See* #20.2.11.

WILSON, ROBIN. 1992. Greek Mathematics II. *The Mathematical Intelligencer* **14**(4), 74. This instance of Wilson's Stamp Corner column shows Greek STAMPS commemorating Democrites, Plato, Aristotle, and the Cretan maze. GREECE. (TLB) #20.2.99

ZAITSEV, E. A. 1990. The semantic structure of G. Peano's logic. [In Russian] *Istoriko-matematicheskie issledovaniya* **32–33**,146–157. Argues that the Italian LOGIC school of PEANO can be understood only in terms of the analytic structure of its calculus. (IA) #20.2.100

ZIEGLER, RENATUS. 1992. *Mathematik und Geisteswissenschaft: Mathematische Einführung in die Philosophie als Geisteswissenschaft in Anknüpfung an Plato, Cusanus, Goethe, Hegel und Steiner.* Dornach: Philosophisch-Anthropologischer Verlag. 318 pp. Hardcover; 49 SFR. A nontechnical study

for mathematicians, educators, and the general reader which explores mathematics from a philosophical point of view. Among the topics treated are the circle as a philosophical and a mathematical problem, Plato's use of mathematics in the training of the mind, the infinite, and the philosophical ideas of Cusanus, Goethe, Hegel, and Steiner relative to mathematics. PHILOSOPHY OF MATHEMATICS. (KVHP) #20.2.101