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ABSTRACTS

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 Glen Van Brummelen, Bennington College, Bennington, VT 05201, U.S.A. (E-mail: gvanbrum@bennington.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.

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 20, Number 1, are numbered: 20.1.1, 20.1.2, 20.1.3, 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 Victor Albis (Bogotá, Colombia), Joe Albree (Montgomery, AL), Thomas L. Bartlow (Villanova, PA), Randy Elzinga (Hamilton, Canada), John Fauvel (Milton Keynes, UK), Louise S. Grinstein (Brooklyn, NY), Herbert Kasube (Peoria, IL), Niwas Lawot (Bennington, VT), Micah Leamer (Bennington, VT), Albert Lewis (Indianapolis, IN), Elena Marchisotto (Northridge, CA), Shazia Farooq Rahim (Bennington, VT), Peter Ross (Santa Clara, CA), Sourya Shrestha (Bennington, VT), Kevin VanderMeulen (Hamilton, Canada), David Zitarelli (Philadelphia, PA), and Glen Van Brummelen.

Abeles, Francine. Henry John Stephen Smith at Oxford, in #27.1.166, pp. 21–30. Synopsis of Smith's career with an outline of his 1876 address to the London Mathematical Society. (TLB) #27.1.1

Ackerberg-Hastings, Amy. John Farrar: Forgotten Figure of American Mathematics, in #27.1.166, pp. 63–68. Examines the importance of an early 19th-century professor of natural philosophy at Harvard and translator of French mathematics and physics texts. (TLB) #27.1.2

Actualité et Universalité de la Pensée Scientifique d'Adolphe Quetelet: Actes du Colloque Organisé à l'Occasion du Bicentenaire de sa Naissance, Brussels: Académie Royale de Belgique, 1997, 236 pp. A multi-disciplinary collection of essays on the life and work of Adolphe Quetelet, the 19th-century statistician. Some of the essays are abstracted separately. (GVB) #27.1.3

Adams, Rebecca. Kurt Lewin's Application of Topology of Psychology, in #27.1.166, pp. 69–76. Explains Lewin's use of rudimentary topology to describe patterns of behavior. (TLB) #27.1.4

Adhikari, M. R. *See* #27.1.119.

Adhikari, Swapan Kumar. Babylonian Mathematics, *Indian Journal of History of Science* **33** (1) (1998), 1–23. A survey of old Babylonian mathematical texts. See the review by H. W. Guggenheimer in *Mathematical Reviews* **99h**:01007. (HEK) #27.1.5

Alder, Ken. Making Things the Same: Representation, Tolerance and the End of the Ancien Régime in France, *Social Studies of Science* **28** (1998), 449–545. The efforts of state military engineers of late 18th-century France to produce functionally identical artifacts were resisted by artisans and merchants of the *ancien régime*. Engineers

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turned to projective geometry, over alternative representations, to bind the users' eyes to a common vision of objects. Thus technical drawing became one of the pedagogical subjects defining the stratified cognitive order. (JGF) #27.1.6

Allaire, Patricia. The Roots of British Symbolical Algebra in "The Problem of Negatives," in #27.1.166, pp. 77–84. Discusses the creation of symbolical algebra as a response to the predominant view in Britain that negative numbers were inauthentic. (TLB) #27.1.7

Anderson, C. Anthony. Alonzo Church's Contributions to Philosophy and Intensional Logic, *Bulletin of Symbolic Logic* **4** (2) (1998), 129–171. A comprehensive survey of Church's philosophical views and contributions. Jon M. Cogburn in his highly favorable review (*Mathematical Reviews* **99i**:01030) provides a detailed list of contents. (ACL) #27.1.8

André, Robert. Adolphe Quetelet, Académicien, in #27.1.3, pp. 23–45. Adolphe Quetelet (1796–1884) was elected to the Académie Royale de Belgique in 1820 and was its permanent secretary from 1834 to 1874. It was from the Académie that he initiated the first census of the Netherlands (1825) and of Belgium (1846), and brought together the first International Congress of Statisticians in 1853. (JGF) #27.1.9

Anonymous. History of Computer Developments in Romania, *IEEE Annals of the History of Computing* **21** (3) (1999), 58–65. Computer developments in Romania from the building of first-generation computers in the 1950s to the 1990s, when Romania started to develop a market economy and became connected to the Internet. (LSG) #27.1.10

Armatte, Michel, and Droesbeke, Jean-Jacques. Quetelet et les Probabilités: Le Sens de la Formule, in #27.1.3, pp. 107–135. Qualities evident in Quetelet's writings on probability are the literary value of his work, his ability to use mathematical language, his didactic abilities, and the semantic richness of his analyses. (JGF) #27.1.11

Arora, Virendra; Goel, Vivek; and Chand, Ramesh. A Critical Study of Fractions in *Ganitatilaka, The Mathematics Education (Siwan)* **31** (1997), 192–202. *Ganitatilaka*, by the 11th-century Indian mathematician and astronomer Sripati, was a work devoted to the eight fundamental operations of arithmetic. This paper examines Sripati's different methods of operations on fractions. See the review by A. I. Volodarskiĭ in *Mathematical Reviews* **99e**:01006. (JA) #27.1.12

Arora, Virendra, and Goel, Vivek. Life and Works of Sripati, *Gurukula Kangri Vijnana Patrika Aryabhata* **1** (1998), 105–110. This paper discusses mathematics of the Vedic tradition and gives an account of the life and works of Sripati. (HEK) #27.1.13

Aschbacher, Michael; Bender, Helmut; Feit, Walter; and Solomon, Ronald. Michio Suzuki (1926–1998), *Notices of the American Mathematical Society* **46** (1999), 543–551. Remembrances of Michio Suzuki, an early investigator into the classification of finite simple groups who spent most of his professional life at the University of Illinois. (DEZ) #27.1.14

Ascher, Marcia. *See* #27.1.63.

Baltus, Christopher. Lagrange and the Fundamental Theorem of Algebra, in #27.1.166, pp. 85–96. Examines Lagrange's proof and suggests that Gauss's claim to have supplied the first valid proof needs to be reevaluated. (TLB) #27.1.15

Barbeau, Evelyne J. *See* #27.1.100.

Barbin, Evelyne J., and Caveing, Maurice, eds. *Les Philosophes et les Mathématiques*, Paris: Ellipses, Édition Marketing, 1996, 320 pp., 140 F. Attempts to make philosophy accessible to teachers and learners of mathematics, providing a historical introduction to philosophy, and analyzing the role of mathematics in the works of major philosophers. See the review by Eduard Glas in *Mathematical Reviews* **99g**:01038. (EAM) #27.1.16

Barrow-Green, June. "A Corrective to the Spirit of Too Exclusively Pure Mathematics": Robert Smith (1689–1768) and his Prizes at Cambridge University, *Annals of Science* **56** (1999), 271–316. Established in 1768, the Smith's Prize competition fostered an interest in the study of applied mathematics which contributed toward Cambridge's 19th-century renown in mathematical physics and to the formalization of postgraduate research in the 20th century. Prize winners 1769–1883 are listed, as are prize essays 1885–1940. (JGF) #27.1.17

Bartol, Wiktor. Hilbert's Second Problem (The Consistency of Arithmetic) [in Polish], in Wieslaw, Witold (ed.), *Hilbert's Problems* [in Polish], Warsaw: Polska Akademia Nauk, 1997, pp. 27–34. Particular attention is paid to the role of Gödel's incompleteness results and of Gentzen's consistency proof. Reviewed by Roman Murawski in *Mathematical Reviews* **99i**:01024. (ACL) #27.1.18

Bartol, Wiktor. Hilbert's First Problem (The Continuum Hypothesis) [in Polish], in Wieslaw, Witold (ed.), *Hilbert's Problems* [in Polish], Warsaw: Polska Akademia Nauk, 1997, pp. 19–25. In Polish with an English summary, this history begins with Cantor's formulation of the hypothesis and his attempts to solve the problem. It includes the results of Gödel on the consistency and of Paul Cohen on the independence of the continuum hypothesis. See the review by Roman Murawski in *Mathematical Reviews* **99i**:01023. (ACL) #27.1.19

Batterson, Steve. *Stephen Smale: The Mathematician Who Broke the Dimension Barrier*, American Mathematical Society, 2000, 265 pp., hardbound, $35 ($28 for AMS members). A biography of Stephen Smale, the 1966 Fields medalist who solved the higher-dimensional Poincaré conjecture; introduced the horseshoe map; and showed that it is possible to turn a sphere inside out without cutting, tearing, or crimping. In addition to Smale's mathematics, the book touches on his involvement in a program of civil disobedience with respect to the Vietnam War and his interest in mineralogy. (GVB) #27.1.20

Bauer, Friedrich L. Pringsheim, Liebman, Hartogs—Schicksale Jüdischer Mathematiker in München, *Bayerische Akademie der Wissenschaften. Mathematisch-Naturwissenschaftliche Klasse. Sitzungsberichte* 1997, 1–32. Sketches the lives and works of prominent Jewish mathematicians in Munich who were victimized, either directly or indirectly, by the National Socialist Regime (1933–1945). The author primarily focuses on the mathematicians in the title. See the review by Michael von Renteln in *Mathematical Reviews* **99g**:01031. (EAM) #27.1.21

Beckers, Danny. Come Children! Some Changes in Dutch Arithmetic Textbooks, 1750–1850, *Paradigm* **27** (1999), 18–25. Developments in mathematics education, curriculum and didactics, in the Netherlands around 1800 (related to the French occupation and its aftermath) can be seen by comparing two textbooks used in middle-class secondary schools, Willem Bartjens' *Cyfferinghe* (early 17th century to 1840s) and Jacob de Gelder's *Cijferkunst* (1812–1814 onward). (JGF) #27.1.22

Belhoste, Bruno. Pour une Réevaluation du Rôle de l'Enseignement dans l'Histoire des Mathématiques, *Revue d'Histoire des Mathématiques* **4** (1998), 289–304. Argues that the teaching of mathematics plays a vital role in its socialization and eventual constitution, and should not be ignored by historians. (GVB) #27.1.23

Beller, Eliyahu. A Newly-Discovered Ancient Value for the Length of the Year, *Archive for History of Exact Sciences* **52** (1) (1998), 91–98. On the basis of indirect evidence the author determines that a Rabbi Avahu (fl. 300 CE) could have made the most accurate determination in his time of the length of the year. Jens Høyrup, in his review (*Mathematical Reviews* **99i**:01013), points out that it seems equally likely that the value was among the poorest of the time. (ACL) #27.1.24

Ben-Chaim, Michael. Doctrine and Use: Newton's 'Gift of Preaching', *History of Science* **36** (1998), 269–298. The scientific article as a form for communicating knowledge came into existence in the late 17th century. Seeing Newton's 1672 article on light and colors as within the context of Puritan sermonical preaching helps us understand the rhetoric he employed and sheds light on the discipline which empiricists sought to impose upon the literary transactions of knowledge claims. (JGF) #27.1.25

Bender, Helmut. *See* #27.1.14.

Bentaleb, Farès. Réflexions sur l'Apport des Dictionnaires Bilingues à la Traduction des Termes Mathématiques: Les Cas d'*al-Manhal* et d'*al-Mounged*. *Bulletin d'Études Orientales* **49** (1997), 75–113. Lists and compares mathematical terms found in two modern French–Arabic dictionaries. See the review by Julio Samsó-Moya in *Mathematical Reviews* **99g**:01009. (EAM) #27.1.26

Berggren, J. L. *See* #27.1.46.

Berlioz, Dominique, and Drapeau Contim, Filipe. Un Essai Logique de Leibniz, "Le Calcul des Ingrédients": Présentation et Traduction, *Revue d'Histoire des Sciences* **51** (1) (1998), 35–64. Presents a French translation of the essay of the title which was written by Leibniz circa 1690. See the review by Eberhard Knobloch in *Mathematical Reviews* **99g**:01015. (EAM) #27.1.27

Bertoloni Meli, Domenico. Shadows and Deception: From Borelli's *Theoricae* to the *Saggi* of the Cimento, *British Journal for the History of Science* **31** (1998), 383–402. Borelli's 1666 work on the Medicean planets was written with an eye to a composite audience, Sicilian readers, Roman Jesuits, and Parisian Copernicans. Its reception was accordingly complex, with his Medici patrons emerging as prince-practitioners. (JGF) #27.1.28

Biermann, Kurt-R., Ich bin im Innersten Erschüttert.: Neuer Versuch zur Aufklärung von Wachters Tod [I Am Profoundly Shaken: New Attempt at Clarifying Wachter's Death], *Gauss-Gesellschaft e. V. Göttingen* **35** (1998), 41–43. Ludwig Wachter (b. 1792) was a student of Gauss of whom the latter thought very highly. Wachter's sudden death in April of 1817 caused Gauss to utter the words in the title of this paper. The author discusses some of the circumstances surrounding Wachter's mysterious death. The present paper is a summary of a more detailed manuscript. See the review by R. L. Cooke in *Mathematical Reviews* **99h**:01034. (HEK) #27.1.29

Bøgeskov, Tom. Early Rectification of Curves—With a View to the Ellipse in Particular [in Danish], *Normat* **46** (3) (1998), 110–121, 144. During the 1650s the lengths of various curves were found, but not the length of an ellipse. With the emergence of the calculus, it was recognized that an elliptic integral is required to find the length of an ellipse. (GVB) #27.1.30

Bradley, Margaret. *A Career Biography of Gaspard Clair François Marie Riche de Prony, Bridge-builder, Educator and Scientist.* Lewiston, NY: Edwin Mellen Press, 1998, xii+441 pp., $109.95. This revised edition of a Ph.D. thesis is a survey of the life and work of the French savant de Prony (1755–1839), best known for his production of a set of logarithmic and trigonometric tables. Extensive appendixes provide extracts from letters and other documents concerning the École des Ponts et Chaussées and the École Polytechnique, the institutions he spent his career with. Also included are lists of his manuscripts and publications. In his detailed review, Lloyd G. Chambers maintains that the book, though worthwhile, "will appeal more to those interested in the history of education and the history of France, rather than mathematicians" (*Mathematical Reviews* **99i**:01031). (ACL) #27.1.31

Brasselet, Jean-Paul. *See* #27.1.82.

Brooke, John Hedley. Does the History of Science Have a Future? *British Journal for the History of Science* **32** (1999), 1–20. Contains a case study of Mary Somerville, as a test case of how a woman interested in mathematical and physical sciences was perceived and functioned on a cultural island occupied by men. (JGF) #27.1.32

Burnett, Charles. King Ptolemy and Alchandreus the Philosopher: The Earliest Texts on the Astrolabe and Arabic Astrology at Fleury, Micy and Chartres, *Annals of Science* **55** (1998), 329–368. Chartres Cathedral, and two Benedictine monasteries at Orléans, played a key role in the initial diffusion of Arabic astronomical learning at the beginning of the 11th century. Already by the turn of the millennium the elements were in place for a corpus of a new, mathematically based, practical science of the stars based on Arabic and Greek elements. (JGF) #27.1.33

Cardoso Dias, Penha Maria. Euler's 'Harmony' between the Principles of 'Rest' and 'Least Action': The Conceptual Making of Analytical Mechanics, *Archive for History of Exact Sciences* **54** (1999), 67–86. In 1751 Euler established harmony between Maupertuis's two principles of rest and of least action, thus establishing the foundations of analytical mechanics, through disclosing the physical bases of the general ideas, concepts, and motivations of the formalism. The picture was recast in Lagrange's 1788 justification of the formalism. (JGF) #27.1.34

Caveing, Maurice. *See* #27.1.16.

Chambers, Lloyd G. *See* #27.1.31 and #27.1.76.

Chand, Ramesh. *See* #27.1.12.

Chemla, Karine. Lazare Carnot et la Generalité en Géometrie. Variations sur le Théorème Dit de Menelaus, *Revue d'Histoire des Mathématiques* **4** (1998), 163–190. Using Menelaus' Theorem as an example, this paper examines how Carnot approached the problem of introducing generality into a geometrical field. (GVB) #27.1.35

Chen, Xian. Dispersion, Experimental Apparatus, and the Acceptance of the Wave Theory of Light, *Annals of Science* **55** (1998), 401–420. From 1835, Baden Powell, Savilian professor at Oxford, published papers developing a wave theory account of dispersion of light based on work of Cauchy. This led to vigorous debates with wave theory opponent Sir David Brewster, focusing on how the evidence should be used. Historiographically, the role of instrumentation and experimental style was crucial. (JGF) #27.1.36

Ciesielski, Krzysztof. *See* #27.1.135.

Clarke, F. W.; Everitt, W. N.; Littlejohn, L. L.; and Vorster, S. J. R. H. J. S. Smith and the Fermat Two Squares Theorem, *American Mathematical Monthly* **106** (1999), 652–665. After addressing the history of the Fermat Two Squares Theorem, this paper gives H. J. S. Smith's 1855 elementary proof and its Latin original. It follows with a new uniqueness proof of the two squares representation. (ML) #27.1.37

Cogburn, Jon M. *See* #27.1.8.

Cohen, Edward L. Elisabeth Achelis: Calendar Reformer, in #27.1.166, pp. 97–109. A review of the Achelis's life, personality, and proposal for calendar reform in the second quarter of the 20th century. (TLB) #27.1.38

Cook, Roger. Pierre-Simon de Laplace: 1748–1827, *Mathematical Spectrum* **31** (3) (1998/1999), 49–51. A brief survey of Laplace's life and work which presents some unflattering glimpses of his character. Includes some anecdotes about his vacillating relationship with Napoleon. (PR) #27.1.39

Cooke, R. L. *See* #27.1.29 and #27.1.54

Crépel, Pierre. *See* #27.1.171.

Curtis, Bruce. From the Moral Thermometer to Money: Metrological Reform in Pre-Confederation Canada, *Social Studies of Science* **28** (1998), 547–570. By the 1870s, Canada had a uniform metrological system of decimal currency and imperial weights and measures. This consolidated the administrative infrastructure; standardized money, for example, served as an instrument that markedly increased government capacity to know, administer, and tax local activities. (JGF) #27.1.40

Curtis, Charles W. *Pioneers of Representation Theory: Frobenius, Burnside, Schur, and Brauer*, American Mathematical Society/London Mathematical Society, 1999, 292 pp., hardbound, $49 ($39 for AMS/LMS members). Traces the early history of representations of finite groups, beginning with the independent work of Frobenius and Burnside at the turn of the century, and tracing its development through Issai Schur and Richard Brauer. (GVB) #27.1.41

Dalitz, R. H. *See* #27.1.128.

Dawson, John W., Jr. What Hath Gödel wrought? *Synthese* **114** (1) (1998), 3–12. The author discusses the reception of Gödel's incompleteness theorems and the impact of Gödel's work on logic, philosophy, computer science, and cosmology. Reviewed by Roman Murawski in *Mathematical Reviews* **99i**:01025. (ACL) #27.1.42

Dawson, John W., Jr. *See also* #27.1.53.

Décaillot, Anne-Marie. L'Arithméticien Édouard Lucas (1842–1891): Théorie et Instrumentation, *Revue d'Histoire des Mathématiques* **4** (1998), 191–236. Examines Lucas's life and work in computation, especially Fermat's Little Theorem and primality testing. (GVB) #27.1.43

Densmore, Dana. *Newton's Principia: The Central Argument*, Santa Fe: Green Lion Press, 1996, xlviii+425 pp., $42. This guidebook for undergraduates consists of a careful analysis of the most fundamental and easily accessible sections of Newton's *Principia*. The author explains how the book should be used in the classroom. The emphasis is on encouraging students to construct Newton's proofs in their original geometric form, rather than translating them into the more familiar symbolic calculus. In addition to being interesting for teaching purposes, this book has a great deal to offer historians of science. See the review by Niccolo Guicciardini in *Mathematical Reviews* **99h**:01021. (HEK) #27.1.44

Descotes, Dominique. Genèse des Corollaires 1 et 2 de la "Lettre à Carcavy" de Blaise Pascal, *Revue d'Histoire des Sciences* **51** (1) (1998), 127–138. Proposes that Pascal revised his manuscript formulating a general method for finding centers of gravity after he learned of Christopher Wren's rectification of the cycloid, a result which gave him an important application of his method. See the review by Craig G. Fraser in *Mathematical Reviews* **99g**:01016. (EAM) #27.1.45

De Young, Gregg. Al-Jawharī's Additions to Book V of Euclid's *Elements*, *Zeitschrift für Geschichte der Arabisch-Islamischen Wissenschaften* **11** (1997), 153–178, 10 (Arabic paging). Al-Jawharī (9th century) attempted

to prove Definitions 5 and 7 of Book V of Euclid's *Elements* as part of a longer work. Arabic text, English translation, and commentary. See the review by J. L. Berggren in *Mathematical Reviews* **99e**:01005. (JA) #27.1.46

Diek, Adel, and Kantowski, R. Some Clifford Algebra History, in *Clifford Algebras and Spinor Structures*, Dordrecht: Kluwer, 1995, pp. 3–12. Clifford's paper of 1876 is discussed in detail from a modern point of view and tied to applications in 20th-century physics. Reviewed by Karl-Heinz Schlote in *Mathematical Reviews* **99i**:01003. (ACL) #27.1.47

Dirichlet, P. G. L. *Lectures on Number Theory*, trans. John Stillwell, American Mathematical Society/London Mathematical Society, 1999, 275 pp., paperbound, $49 ($39 for AMS/LMS members). Dirichlet's *Lectures*, suitable as a text for a modern first course on number theory, also includes his theorems on class numbers and primes in arithmetic progressions. (GVB) #27.1.48

Di Sieno, Simonetta; Guerraggio, Angelo; and Nastasi, Pietro. *Italian Mathematics after Unity* [in Italian], Milan: Marcos y Marcos, 1998, xxxii+970 pp., L 65,000. The various papers in this collection describe mathematics in Italy between the two world wars, by mathematical subdiscipline. (GVB) #27.1.49

Drapeau Contim, Filipe. *See* #27.1.27.

Droesbeke, Jean-Jacques. *See* #27.1.11.

Duda, Roman. The Centenary of *Wiadomości Matematyczne* [in Polish], *Wiadomości Matematyczne* **33** (1997), 111–135. The history and influence of *Wiadomości Matematyczne* since its inception in 1897. (GVB) #27.1.50

Dujnic, Josef; Frištacký, Norbert; Molnár, Ludovit; Plander, Ivan; and Rovan, Branislav. On the History of Computer Science, Computer Engineering, and Computer Technology Development in Slovakia, *IEEE Annals of the History of Computing* **21** (3) (1999), 38–48. Discusses the history of computer developments in Czechoslovakia from the end of World War II until the country split into the Czech Republic and Slovakia in 1993. When the area was one country, information is given about the entire national picture, but in this article, particular emphasis is placed on those events occurring in Slovakia. (LSG) #27.1.51

Dunham, William. *Euler: The Master of Us All*, Mathematical Association of America, 1999, xxviii+185 pages, paperbound, $29.95 ($23.95 to MAA members). A popular exposition of some of Euler's greatest work in, and impact upon, eight fields: number theory, logarithms, infinite series, analytic number theory, complex variables, algebra, geometry, and combinatorics. See the review by Ed Sandifer at *MAA Online* [http://www.maa.org/reviews/master.html]. (GVB) #27.1.52

Enderton, H. B. Alonzo Church and the Reviews, *Bulletin of Symbolic Logic* **4** (1998), 172–180. A survey of some of Church's "most important contributions" to mathematical logic, namely the editing of the reviews section of the *Journal of Symbolic Logic*, 1936 to 1979. See the review by John W. Dawson, Jr., in *Mathematical Reviews* **99e**:01024. (JA) #27.1.53

Ermolaeva, N. S., Yakov Davydovich Tamarkin, In America He Was Known as J. D. [in Russian], *Priroda* 1998 (8), 75–87. This article contains an account of the famous Russian–American mathematician, with an emphasis on his earlier experiences in Russia, where he led a most varied life, full of music and a number of other activities in addition to mathematics. See the review by R. L. Cooke in *Mathematical Reviews* **99h**:01035. (HEK) #27.1.54

Ernest, Paul. *See* #27.1.130.

Everitt, W. N. *See* #27.1.37.

Feit, Walter. *See* #27.1.14.

Fenster, Della Dumbaugh. Leonard Eugene Dickson (1874–1954): An American Legacy in Mathematics, *The Mathematical Intelligencer* **21** (4) (1999), 54–59. Seeks to explain Dickson's remarkable energy and achievement in terms of the influence of his frontier parents. (TLB) #27.1.55

Fenster, Della Dumbaugh. Why Dickson Left Quadratic Reciprocity out of His *History of the Theory of Numbers. American Mathematical Monthly* **106** (1999), 618–627. Describes in detail why the theory of quadratic reciprocity was left out of Leonard Eugene Dickson's *History of the Theory of Numbers*, illustrating that extramathematical factors can affect the publication and development of mathematics. (RE) #27.1.56

Field, J. V. When Is a Proof Not a Proof? Some Reflections on Piero Della Francesca and Guidobaldo Del Monte, in R. Sinisgalli (ed.), *La Prospettiva: Fondamenti Teorici Ed Esperienze Figurative dall'Antichità al Mondo Moderno*, Firenze: Edizioni Cadmo, 1998, pp. 120–132, figs. pp. 373–375. In the first book of his treatise on perspective, Piero della Francesca (c. 1412–1492) proves that the perspective images of lines perpendicular to the picture plane converge to a point. However, although the diagrams show this special case, Piero's proof is more general and actually establishes that the images of any set of parallel lines (not parallel to the picture plane) will converge. A proof of this theorem is first given, as such, by Guidobaldo del Monte in 1600. The paper considers the proofs, what Piero may have known, and the difficulty of making deductions about an author's knowledge from "practical" texts addressed to pupils. (JGF) #27.1.57

Field, J. V. Why Translate Serlio? in Ames-Lewis, F. (ed.), *Thomas Gresham and Gresham College: Studies in the Intellectual History of London in the Sixteenth and Seventeenth Centuries*, Aldershot: Ashgate, 1999, pp. 198–221. An English version of Serlio's books on architecture appeared in 1611. Serlio's work is a good example of mid-16th-century Italian "practical" mathematics, and its appearance in English is an indication of the increasing interest in mathematics in England during the period following the foundation of Gresham College. (JGF) #27.1.58

Fraser, Craig G. *See* #27.1.45.

Frištacký, Norbert. *See* #27.1.51.

Fudali, Stanislaw. Hilbert's Fourth Problem (On the Straight Line as the Shortest Distance between Two Points) [in Polish], in Wieslaw, Witold (ed.), *Hilbert's Problems* [in Polish], Warsaw: Polska Akademia Nauk, 1997, pp. 45–54. An account of Hilbert's fourth problem, showing the solution given by G. Hamel in 1901. Developments stemming from a generalization from the 1920s are also discussed. (DEZ) #27.1.59

Galuzzi, Massimo. *See* #27.1.70.

García Lapresta, José Luis. *See* #27.1.112.

Garciadiego, Alejandro. Philip Jourdain, Historiador de las Matemáticas [Philip Jourdain, Historian of Mathematics], *LLULL* **22** (1999), 193–199. The author discusses the relation between Jourdain's views on the "nature of mathematics and his conception of the history of mathematics, which, apparently and at first sight, are inconsistent." (VA) #27.1.60

Garro, Ibrahim. The Paradoxes of Yahya ibn Adi and Bertrand Russell (A Summary), in #27.1.166, pp. 110–115. Argues that paradoxes of unity advanced by the 10th-century Iraqi logician are similar to Russell's. (TLB) #27.1.61

Gérard, Adriana. *See* #27.1.62.

Gérard, Elena, and Gérard, Adriana. La Matemática en *Ingeniería*, Revista del Centro de Estudiantes de Ingeniería de Montevideo [Mathematics in *Ingeniería* (Journal of the Engineering Students Center)], *LLULL* **22** (1999), 107–144. From the authors' abstract: "Founded in the 1920's and published by the Engineering Students Center, it contained 'abstracts of the lectures given by European visiting professors (Rey Pastor, Borel, Terradas, ...) and transcriptions of chapters of scientific books (Hadamard, ...) ... and students' original works and notes.'" (VA) #27.1.62

Gerdes, Paulus. On Ethnomathematics and the Transmission of Mathematical Knowledge in and outside Schools in Africa South of the Sahara, in Barrère, Martine (ed.), *Sciences et Développement*, Orstom, Paris: L'Institut Français de Recherche Scientifique pour le Développement en Coopération, 1996, pp. 229–246. The author briefly introduces some challenges to education in Africa, presents examples of arithmetic ideas outside the school setting, summarizes the history of ethnomathematics, and discusses some further researches by the author and others in Africa. Marcia Ascher in her review (*Mathematical Reviews* **99i:**01007) takes issue with the "selected and limited" view of ethnomathematics the author presents. (ACL) #27.1.63

Glas, Eduard. *See* #27.1.16.

Gleizer, G.D. On the Number π in the Old Testament [in Russian], *Voprosy Istorii Estestvoznaniya i Tekhniki* 1998 (2), 45–48, 204. It is usually assumed that the description of the water basin in Solomon's temple (I Kings

7:23) is based on the value $\pi = 3$. The author notes that the written text reads qwh (probably an archaic possessive, his cord referring to an ornamental line). If we take the usual numerical values of the written (111) and the vocalized (106) word, we get $\frac{30}{10} \cdot \frac{111}{106} = 3.1415$ as a good approximation to π. See the review by H. W. Guggenheimer in *Mathematical Reviews* **99h**:01008. (HEK) #27.1.64

Godard, Roger. An Historical Analysis of Time Series, in #27.1.166, pp. 116–132. Traces the development of theoretical tools for studying time series in the 1930s and 1940s. (TLB) #27.1.65

Goel, Vivek. *See* #27.1.12 and #27.1.13.

Golomb, Solomon. Mathematics after Forty Years of the Space Age, *The Mathematical Intelligencer* **21** (4) (1999), 38–44. A memoir of Golomb's working life and views on pure and applied mathematics. (TLB) #27.1.66

Grabiner, Judith V. "Some Disputes of Consequence": Maclaurin among the Molasses Barrels, *Social Studies of Science* **28** (1998), 139–168. Maclaurin's memoir on the volume of molasses barrels lies at the center of the relationship between science and society in 18th-century Britain, in the creation and use of mathematics to resolve socially divisive disputes. This is done in two ways: replacing arbitrary local practices by objective rules, and using the prestige of mathematics to quell unrest and achieve consensus. (JGF) #27.1.67

Grant, Hardy. Hobbes and Mathematics, in Sorell, Tom (ed.), *The Cambridge Companion to Hobbes*, Cambridge Univ. Press, Cambridge, UK, 1996, pp. 108–128. Contemporary and subsequent dismay over the mathematical weakness revealed in Hobbes's rash arguments with Wallis should be balanced by recognizing his insight into the relevance of mathematics and the wider role of geometry as the model science. (JGF) #27.1.68

Gray, Jeremy. Mathematicians as Philosophers of Mathematics, *For the Learning of Mathematics* **18** (3) (1998), 20–24, and **19** (1) (1999), 28–31. Firm distinctions between mathematics, the philosophy of mathematics, and the history of mathematics are hard to sustain. Mathematicians can act as philosophers in doing mathematics. Thus Kronecker and Molk advocated a radical epistemological position, and the next generation of algebraic geometers engaged in a genuinely ontological debate about concepts such as point and variety. (JGF) #27.1.69

Gray, Jeremy. *See also* #27.1.72, #27.1.128, #27.1.136, #27.1.145, and #27.1.154.

Griffiths, H. B.; Galuzzi, Massimo; Neubrand, Michael; and Labord, Colette. The Evolution of Geometry Education Since 1900, in Mammana, C. and Villani, V. (eds.), *Perspectives in the Teaching of Geometry for the 21st Century*, Dordrecht: Kluwer, 1998, pp. 193–234. The roles of geometry in the curriculum over the past century in England, Italy, Germany, and France are compared as a considered exercise in understanding the past better in order to avoid future mistakes of education policy. (JGF) #27.1.70

Grigor'yan, A. T., ed. *Studies in the History of Physics and Mechanics. 1991–1992* [in Russian], Moscow: Nauka, 1997, 283 pp. A collection of papers from ancient to modern physics and mechanics, including O. V. Kuznetsova's "On the History of the Many-Worlds Interpretation of Quantum Mechanics," A. V. Dubinskiĭ's "Development of the Theory of Local Interaction," and G. E. Kurtik's "The Concept of Velocity in Ancient Science: Aristotle and Ptolemy." For a complete list of the contents see *Mathematical Reviews* **99g**:01002. (GVB) #27.1.71

Guerraggio, Angelo. *See* #27.1.49.

Guggenheimer, H. W. *See* #27.1.5, #27.1.64, and #27.1.172.

Guicciardini, Niccolo. *See* #27.1.44.

Guo, Shi Rong. *See* #27.1.167.

Hadamard, Jacques. *Non-Euclidean Geometry in the Theory of Automorphic Functions*, trans. Jeremy Gray and Abe Shenitzer, American Mathematical Society/London Mathematical Society, 1999, 95 pp., paperbound, $19 ($15 for AMS/LMS members). English translation of Jacques Hadamard's Russian account of Henri Poincaré's theory of automorphic functions, the first significant application of non-Euclidean geometry. (GVB) #27.1.72

Hald, Anders. *A History of Mathematical Statistics from 1750 to 1930.* New York: Wiley, 1998, xx+795 pp. A sequel to the author's *A History of Probability and Statistics and Their Applications Before 1750* (1990). In his detailed, favorable review in *Mathematical Reviews* **99i**:01004, Eugene Seneta gives a synopsis of the contents.

Both the notation and viewpoint are modern. The index and comprehensive coverage of the literature are singled out for praise. (ACL) #27.1.73

Hankins, Thomas L. Blood, Dirt, and Nomograms: A Particular History of Graphs, *Isis* **90** (1999), 50–80. A sketch of the origins of various graphs and charts in the 18th and 19th centuries with a focus on the nomogram, used by L. J. Henderson, to illustrate a function containing more than three variables. (KVM) #27.1.74

Hansen, Frank-Peter. *G. W. F. Hegel: Wissenschaft der Logik. Ein Kommentar*, Würzburg: Königshausen & Neumann, 1997, 192 pp., DM 38.00. A detailed commentary on Hegel's *Wissenschaft der Logik* (1812–1816). Included is a bibliography of the German editions of *Wissenschaft der Logik* and a list of books and papers on Hegel's work. Reviewed by Roman Murawski in *Mathematical Reviews* **99i**:01017. (ACL) #27.1.75

Harman, Peter M. *The Natural Philosophy of James Clerk Maxwell*, Cambridge: Univ. of Cambridge Press, 1998, xiv+232 pp., $59.95. A discussion of Maxwell's research, including electromagnetic theory, thermodynamics, and electric and magnetic fields. See the review by Lloyd G. Chambers in *Mathematical Reviews* **99g**:01021. (GVB) #27.1.76

Hawkins, Thomas. From General Relativity to Group Representations: The Background to Weyl's Papers of 1925–26, in *Matériaux Pour l'Histoire des Mathématiques au XXe Siècle*, Paris: Societé Mathématique de France, 1998, pp. 69–100. The author describes the origins of vector algebra in Hermann Weyl's analysis of the space-time structure. Weyl regarded this to be a more fruitful approach compared with the then-prevalent invariant theory. A detailed review is given by Hans P. Kunzle in *Mathematical Reviews* **99i**:01026. (ACL) #27.1.77

Hayashi, Takao. *See* #27.1.108, #27.1.144, #27.1.151, and #27.1.152.

Hein, Wolfgang. *See* #27.1.90.

Henrion, Claudia. *Women in Mathematics: The Addition of Difference*, Bloomington: Indiana Univ. Press, 1997, xxxiv+294 pp., hardbound, $39.95, paperbound, $16.95. Challenges myths and misconceptions about mathematicians and mathematics. The author focuses on the accomplishments of 11 women mathematicians, with the goal of breaking down stereotypes and encouraging more women to pursue mathematics. She examines the practices and ideology of the mathematical community in relation to the support and acceptance of women mathematicians. See the review by S. Zdravkovska in *Mathematical Reviews* **99g**:01046. (EAM) #27.1.78

Hildebrandt, Stefan. Remarks on the Life and Work of Fritz John, *Communications on Pure and Applied Mathematics* **51** (1998), 971–989. The life and mathematical work of Fritz John (1910–1994), from studies at Göttingen, 1929–1933, to his career at New York University. His earliest work concerned the Radon transform and Morse theory. The emphasis here is on his work during the 1960s. Reviewed by Michael von Renteln in *Mathematical Reviews* **99i**:01033. (ACL) #27.1.79

Hill, Katherine. Mathematics as a Tool for Social Change: Educational Reform in Seventeenth-Century England, *The Seventeenth Century* **12** (1997), 23–36. Reformers such as Hartlib, Webster, and Dury wanted to replace the study of classical geometry with practical, skill-based, mathematics as a means for effecting social change and raising living standards. But by the 1650s Parliament was more interested in bringing the universities under control than in changing their curriculum. (JGF) #27.1.80

Hoare, G. T. Q. Stanislaw Ulam 1909–1984, *Mathematical Gazette* **83** (1999), 10–24. The abiding characteristics of the genius and humanity of the Polish-born mathematician Stanislaw Ulam are his courage to explore new domains, ability to inspire others, and depth of thought. (JGF) #27.1.81

Houzel, Christian. Histoire de la Théorie des Faisceaux, in *Matériaux pour l'Histoire des Mathématiques au XXe Siècle*, Paris: Societé Mathématique de France, 1998, pp. 101–119. This account treats the history of the theory of sheaves from Jean Leray just after the Second World War, through the reformulation, applications, and extensions by Henri Cartan and Jean-Pierre Serre. It also covers the later work of Grothendieck and Sato. Reviewed by Jean-Paul Brasselet in *Mathematical Reviews* **99i**:01027. (ACL) #27.1.82

Høyrup, Jens. *See* #27.1.24 and #27.1.98.

Jackson, Allyn. Mathematical Treasures of the Smithsonian Institution, *Notices of the American Mathematical Society* **46** (1999), 528–534. An account of two different types of collections preserved at the Smithsonian

Institution in Washington, DC: the Dibner Library, containing some 600 rare books in mathematics, and an unnamed collection of about 5000 objects in mathematics and computer science. (DEZ) #27.1.83

Jackson, Allyn. Interview with Henri Cartan, *Notices of the American Mathematical Society* **46** (1999), 782–788. In an interview conducted in March 1999, French-born mathematician Henri Cartan talks about peers and colleagues in the mathematics world between the two world wars, the beginnings of Bourbaki, and his current involvement in politics and human rights. (NL) #27.1.84

Jaeger, Arno. *Mathematik und Leben—Eine Seltene Gleichung, Memoiren eines Hochschullehrers auf vier Kontinenten.* [Mathematics and Life—An Odd Equation, Memoirs of a University Teacher on Four Continents], Berlin: Verlag Frieling & Partner GmbH, 1997, 319 pp., DM 24.80. The author reviews his academic life. See the review by Wilfried Schröder in *Mathematical Reviews* **99h**:01037. (HEK) #27.1.85

Jha, Parmeshwar. Calculus—Its Use and Development in Ancient India, *Gurukula Kangri Vijnana Patrika Aryabhata* **1** (1998), 111–118. The origin of calculus in India can be traced back to the period of the Vedas. The Atharva Veda Parisista contains a number of Sutras which deal with the application of principles of differential and integral calculus. Later, methods of differentiating trigonometric functions were used and a process of integration was used to determine the surface area and volume of a sphere. (HEK) #27.1.86

Joel, J. S. *See* #27.1.90 and #27.1.164.

Kak, Subhash C. Three Old Indian Values of π, *Indian Journal of History of Science* **32** (1997), 307–314. "The author describes three hitherto neglected references to π, one from *Śatapatha Brāhmana* where π equals 25/8, and two from *Baudhāyana Śulbasūtra* where π equals 900/289 and 1156/361, respectively." See the review by A. I. Volodarskiĭ in *Mathematical Reviews* **99e**:01007. (JA) #27.1.87

Kantowski, R. *See* #27.1.47.

Kenessey, Zoltan. Quetelet and the Beginnings of International Statistics, in #27.1.3, pp. 137–159. Quetelet's contribution was seminal in establishing formal international cooperation in the modern world; he also influenced the education of Prince Albert in 1836. (JGF) #27.1.88

Kessel, Cathy. Another Geometrical Object Associated with Borromeo, *The Mathematical Intelligencer* **21** (4) (1999), 13–14. A description of the copy of Guido Grandi's *Flores Geometrici* in the Bancroft Library at the University of California at Berkeley. (TLB) #27.1.89

Killing, Wilhelm. *Briefwechsel mit Friedrich Engel zur Theorie der Lie-Algebren*, Hein, Wolfgang (ed.), Berlin: Deutsche Mathematiker Vereinigung; Braunschweig: Vieweg, 1997, vi+247 pp. The 87 letters, presented here, between Engel and Killing and dating from 1885 to 1917, "treated the early development of the theory of Lie algebras, as well as transformation groups and Lie groups, extending further to foundations of geometry." See the review by J. S. Joel in *Mathematical Reviews* **99e**:01017. (JA) #27.1.90

Klainerman, S. On the Work and Legacy of Fritz John, 1934–1991, *Communications on Pure and Applied Mathematics* **51** (1998), 991–1017. The author was a student and collaborator of Fritz John during the latter part of his life but the extensive account of John's work given here begins with the earliest work on Radon transformation in 1934. Other topics include nonlinear elasticity and nonlinear wave equations. Reviewed by Michael von Renteln in *Mathematical Reviews* **99i**:01034. (ACL) #27.1.91

Kleiner, Israel. Early Stages in the Evolution of Field Theory, in #27.1.166, pp. 31–42. Discusses the emergence of the algebraic concept of field in the theory of equations, number theory, and algebraic geometry, as well as its appearance in the study of congruences and in British symbolical algebra. (TLB) #27.1.92

Kleiner, Israel. Field Theory: From Equations to Axiomatization, Part 1, *American Mathematical Monthly* **106** (1999), 677–684. Describes the emergence of abstract algebra and field theory through Galois theory, algebraic number theory, and algebraic geometry. (SS) #27.1.93

Klimenko, Stanislav V. Computer Science in Russia: A Personal View, *IEEE Annals of the History of Computing* **21** (3) (1999), 16–30. This article is based on the author's experience during 1965–1995. An outline of Russian computer science's vertical integration structure is presented, as is a description of its regional structure. A listing is given of the various research topics under investigation by Russian computer science institutions. Factors that

led to the crash of the computer industry are discussed. Reasons and driving forces that led to the appearance and flourishing of computer science and technology in the Soviet Union, as well as to its crash, are summarized under the headings of militarization, ideology, centralism and monopolism, and feudalism. (LSG) #27.1.94

Knobloch, Eberhard. *See* #27.1.27 and #27.1.129.

Kreyszig, Erwin. Tendencies of Functional–Analytic Developments during the Last Quarter of the 19th Century, in #27.1.166, pp. 43–54. Discusses the growth of functional analysis within set theory, the calculus of variations, and the study of integral equations. (TLB) #27.1.95

Kubli, Fritz. Historical Aspects in Physics Teaching: Using Galileo's Work in a New Swiss Project, *Science and Education* **8** (1999), 137–150. A questionnaire about incorporating historical material in their physics program was sent to students in Swiss high schools, canvassing different types of intervention (e.g., sporadic recounting, original texts, reconstructed historical experiments). Early results show a difference in the responses of male and female students. (JGF) #27.1.96

Kunoff, Sharon. Hilbert's Problems and His Contributions to 19th Century Mathematics, Briefly! in #27.1.166, pp. 55–62. A synopsis of David Hilbert's early research in mathematics and an effort to link each of his problems to that research. (TLB) #27.1.97

Kunzle, Hans P. *See* #27.1.77.

Labord, Collette. *See* #27.1.70.

Langermann, Y. Tzvi. Peurbach in the Hebrew Tradition, *Journal for the History of Astronomy* **29** (1998), 137–150. This paper deals with the last chapter of the medieval engagement of the Jews with astronomy, describing the five complete or partial Hebrew translations of Peurbach's *Theoricae novae planetarum.* It also discusses four Hebrew commentaries on the same work written about 1550. The author points out that as far as astronomy is concerned—and it was in astronomy more than any other science, in which the Jews, in their own self-perception, distinguished themselves in the Medieval period—historians of Jewish thought and culture must face up to a notorious problem of decline, similar in many ways to what is encountered in Islamic civilization. See the review by Jens Høyrup in *Mathematical Reviews* **99h**:01019. (HEK) #27.1.98

Lascar, Daniel. Perspective Historique sur les Rapports Entre la Théorie des Modèles et l'Algèbre. Un Point de Vue Tendancieux, *Revue d'Histoire des Mathématiques* **4** (1998), 237–260. Presents the history of the theory of models from Peirce in 1870 to Morley's Theorem in 1965, emphasizing the role played by universal algebras. (GVB) #27.1.99

Laubenbacher, Reinhard, and Pengelley, David. *Mathematical Expeditions. Chronicles by the Explorers*, New York: Springer-Verlag, 1999, x+275 pp., $32. Annotated excerpts from original texts, accompanied by mathematical and historical introductions, are given on the following topics: the parallel postulate and non-Euclidean geometry; set theory and infinity (Bolzano, Cantor, Zermelo); infinitesimal analysis (quadratures of Archimedes and Cavalieri, calculus of Leibniz and Cauchy, Robinson's nonstandard analysis); Fermat's last theorem (Euclid to Euler, Germain, and Kummer); and solvability by radicals (culminating in Galois). The exercises and bibliography make this an excellent text for a history-based undergraduate course according to Evelyne J. Barbeau (*Mathematical Reviews* **99i**:01005). (ACL) #27.1.100

Laugwitz, Detlef. Riemann's Dissertation and Its Effect on the Evolution of Mathematics, *American Mathematical Monthly* **106** (1999), 463–469. In Riemann's doctoral dissertation (1851), he introduced the "Riemann surface" and other ideas which were to have a powerful long-term influence. Contemporary responses were amazingly slight, not the least among which was Gauss's report as examiner, which failed to point explicitly to its novelty and power. (JGF) #27.1.101

Laverty, David. Predictivism in Hermann Weyl's *Das Kontinuum*, in #27.1.166, pp. 143–150. Discusses Weyl's attempt to construct the real number system and argues against the claim by Jairo Jose Da Silva that Weyl was under the philosophical influence of Husserl. (TLB) #27.1.102

Lee-Chua, Queena N. The Road to the International Math Olympiad: The Philippine Experience, *The Mathematical Intelligencer* **21** (4) (1999), 45–53. A history of mathematics contests in the Philippines. (TLB) #27.1.103

Lehoux, Daryn. Egyptian Astrometeorology, in #27.1.166, pp. 151–163. Evidence of the use of astronomical phenomena to make weather predictions in Egypt in the 4th century BCE. (TLB) #27.1.104

Leiser, Eckart. Matemáticos en Fuga de Hitler: Hechos, Mitos y sus Investigaciones [Mathematicians Fleeing from Hitler: Facts, Myths and Their Research], *LLULL* **22** (1999), 199–209. The author expounds some interesting and well-founded critical opinions on Reinhard Siegmund-Schultze's book *Mathematiker auf der Flucht vor Hitler. Quellen und Studien zur Emigration einer Wissenschaft* (Wiesbaden: Viewg/DMV, 1998). (VA) #27.1.105

Lightfoot, J. L. An Early Reference to Perfect Numbers? Some Notes on Euphorion, SH 417, *Classical Quarterly* **48** (1998), 187–194. An apparent reference to perfect numbers, in the work of the 3rd-century B.C. poet Euphorion, may be one of our earliest references to Euclid (vii.23), or to a pre-Euclidean tradition in number theory. The line is ". . . equal to his [or their] limbs, with the result that they are called perfect." (JGF) #27.1.106

Littlejohn, L. L. *See* #27.1.37.

Lombardi, Olimpia. Aristotelian Physics in the Context of Teaching Science: A Historical–Philosophical Approach, *Science and Education* **8** (1999), 217–239. Aristotelian physics for didactic purposes is sometimes presented in a too fragmentary and overly simplistic way. Reading the original texts is a richer intellectual experience and shows the author's thought in action. (JGF) #27.1.107

Madhukar Mallayya, V. Arithmetic Operation of Division with Special Reference to Bhāskara II's *Līlāvatī* and Its Commentaries, *Indian Journal of History of Science* **32** (1997), 315–324. A "summary of the history of the operation of division in India from the Vedas (ca. 1200–800 B.C.)" to the 15th- to 17th-century commentaries on the *Līlāvatī* (ca. A.D. 1150). Special attention is given to certain products and quotients containing zero(es). See the review by Takao Hayashi in *Mathematical Reviews* **99e**:01008. (JA) #27.1.108

Madhukar Mallayya, V. Various Methods of Squaring with Special Reference to the *Līlāvatī* of Bhaskara II and the Commentary *Kriyakramakari* of Sankara and Narayana, *Ganita Sandesh* **11** (1) (1997), 31–36. The Sanskrit term for the square of a number is karga or kriti. While the process of squaring was not explicitly mentioned in the Vedas, as a special case of multiplication the knowledge of squaring numbers can be traced back to the Vedas. Brahmagupta was the first to enunciate some methods of squaring. See the review by A. I. Volodarskiĭ in *Mathematical Reviews* **99h**:01016. (HEK) #27.1.109

Mai, B. *See* #27.1.129.

Mancha, J. L., On Ibn al-Kammad's Table for Trepidation, *Archive for History of Exact Sciences* **52** (1) (1998), 1–11. Trepidation, also called the theory of accession and recession, offered geometrical models justifying the different historical estimations of the precession of equinoxes and was a distinctive feature of Islamic astronomy. One of the most complete formulations of the theory was written by the Toledan astronomer Ibn al-Zarqalluh/Azarquiel. Ibn al-Kammad was probably a direct disciple of Ibn al-Zarqalluh and he revised the theory of his master. Mancha edits a fragment of a Castilian translation of a lost work of al-Kammad which gives a brief description of his trepidation model. See the review by Julio Samsó-Moya in *Mathematical Reviews* **99h**:01011. (HEK) #27.1.110

Manekin, Charles H. When the Jews Learned Logic from the Pope: Three Medieval Hebrew Translations of the *Tractatus* of Peter of Spain, *Science in Context* **10** (3) (1997), 395–430. Explores the popularity of the *Tractatus* of Peter of Spain (who became Pope John XXI) and analyzes the medieval Hebrew translations of it by Shemaryah ha-Ikriti, Abraham Abigdor, and Judah b. Samuel Shalom. (EAM) #27.1.111

Martínez Panero, Miguel, and García Lapresta, José Luis. El Matemático Ilustrado José Isidoro Morales y sus Aportaciones a la Teoría de la Elección Social [The Spanish Mathematician José Isidoro Morales and His Contributions to the Social Choice Theory], *LLULL* **22** (1999), 165–191. The choice and election method for members of the Institut National de France, known today as Borda's rule (Jean Charles Borda), was endorsed and analyzed by Morales in *Memoria Matemática Sobre el Cálculo de Opinión en las Elecciones (1797).* (VA) #27.1.112

Maurer, Bertram. Der Gaußschüler Ludwig Christoph Schnürlein, *Gauss-Gesellschaft e. V. Göttingen* **35** (1998), 17–39. The German mathematician Schnürlein (1792–1852) studied under Gauss in Göttingen from 1821 to 1824. He had a high reputation as school teacher; among his students were Ludwig Seidel and Karl Culmann. Reviewed by Dirk Jan Struik in *Mathematical Reviews* **99i**:01035. (ACL) #27.1.113

McCleary, John. An Appreciation of the Work of Jim Stasheff, in McCleary, John (ed.), *Higher Homotopy Structures in Topology and Mathematical Physics*, Providence: American Mathematical Society, 1999, pp. 1–16. Included is a curriculum vitae, a list of publications, and the names of students together with the titles of their theses, including relevant publication information. (ACL) #27.1.114

Melville, Duncan J. Weighing Stones in Ancient Mesopotamia, in #27.1.166, pp. 164–178. An interpretation of YBC 4652 as an exercise tablet in the use of substitution, false position, and the conversion of units of weight. (TLB) #27.1.115

Miguel, Antonio. As Potencialidades Pedagógicas da História da Matemática em Questão: Argumentos Reforçadores e Questionadores, *Zetetiké* **8** (1997), 73–105. Survey of arguments found in various journals and books reinforcing the pedagogical potentialities of the history of mathematics, noting also the counterarguments and other difficulties with such a position. (JGF) #27.1.116

Millás, Eduardo *See* #27.1.142.

Molland, George. Roger Bacon's Knowledge of Mathematics, in Hackett, J. (ed.), *Roger Bacon and the Sciences*, Leiden: E. J. Brill, 1997, pp. 151–174. In Bacon's historical picture of mathematics, Euclid played a pivotal role. Other ancient authors mentioned in his *Communia Mathematica* are Theodosius, Vitruvius, Ptolemy, Boethius, and works from various commentators, along with a number of his contemporaries. His classification of mathematics was pedagogically related. (JGF) #27.1.117

Molland, George. *See* also #27.1.179.

Molnár, Ludovit. *See* #27.1.51.

Mower, Pat. Mathematical Fiction, *Humanistic Mathematics Network Journal* **19** (1999), 39–46. Students in the history of mathematics class at Washburn University developed their understanding of mathematics and its history through creating imaginative fiction including "a day in the life of Diophantus" and a newspaper report on the discovery of an ancient document by Diophantus. (JGF) #27.1.118

Mukhopadhyay, A., and Adhikari, M. R. A Step Towards Incommensurability of π and Bh$\bar{a}$skara (I). An Episode of the Sixth Century AD, *Indian Journal of History of Science* **33** (2) (1998), 119–129. From 500 B.C. to A.D. 1039 one of the approximations used for π was $\sqrt{10}$. Bhaskara I criticized this approximation. Reviewed by A. I. Volodarskiĭ in *Mathematical Reviews* **99i:**01012. (ACL) #27.1.119

Murawski, Roman. *See* #27.1.18, #27.1.19, #27.1.42, and #27.1.75.

Musselman, Elizabeth Green. Swords into Ploughshares: John Herschel's Progressive View of Astronomical and Imperial Governance, *British Journal for the History of Science* **31** (1998), 419–435. Herschel's astronomical expedition to the Cape of Good Hope in 1834–1838 provided him with the language and desire to advance both astronomy and the imperial economy from primitive hunting to harvesting activities in a more rationalized agriculture. (JGF) #27.1.120

Nastasi, Pietro. *See* #27.1.49.

Netz, Reviel. Archimedes Transformed: The Case of a Result Stating a Maximum for a Cubic Equation, *Archive for History of Exact Sciences* **54** (1999), 1–47. Eutocius's attribution to Archimedes of a passage in Doric dialect on the problem of cutting a line is probably right, though Eutocius added his own commentary and mathematical thoughts in such a way as to flatten the mathematical registers and transform the mathematical style. As part of the process by which Greek geometry came to be transformed into modern arithmetized mathematics, Eutocius (6th century A.D.) stumbled upon a new type of relation between objects, the functional relation. (JGF) #27.1.121

Netz, Reviel. Deuteronomic Texts: Late Antiquity and the History of Mathematics, *Revue d'Histoire des Mathématiques* **4** (1998), 261–288. Argues that "deuteronomic" texts (works that derive from earlier texts, such as commentaries) altered the practice of mathematics and eventually changed the nature of mathematics itself. (GVB) #27.1.122

Netz, Reviel. Greek Mathematical Diagrams: Their Use and Their Meaning, *For the Learning of Mathematics* **18** (3) (1998), 33–39. Greek mathematics relies on diagrams in an essential, logical way; diagrams are not just

pedagogic aids. Before writing down a proof, Greek mathematicians would have outlined it orally in front of a diagram. For them, letters were indices, not symbols: the identity of the object was visual. In Greek mathematics the diagram occupied the place of conceptual systems in modern mathematics. (JGF) #27.1.123

Neubrand, Michael. *See* #27.1.70.

Niederdrenk-Felgner, Cornelia. Frauen—Imaginäre Größen in der Mathematik? [Women—Imaginary Quantities in Mathematics?] *Mitteilungen der Mathematischen Gesellschaft in Hamburg* **16** (1997), 73–86. The author explores why women and girls in general are more skeptical about mathematics than men and boys. In the last part of this paper she outlines some perspectives for female mathematics students. See the review by Michael Otte in *Mathematical Reviews* **99h**:01044. (HEK) #27.1.124

Osserman, Robert. From Schwartz to Pick to Ahlfors and Beyond, *Notices of the American Mathematical Society* **46** (1999), 868–873. L. V. Ahlfors's insight into Pick's generalization of the Schwarz Lemma continues to bear fruit in surprising ways. (GVB) #27.1.125

Otte, Michael. *See* #27.1.124.

Palmieri, Paolo. Re-examining Galileo's Theory of Tides, *Archive for History of Exact Sciences* **53** (1998), 223–375. Galileo's quest for a physical proof of Copernican astronomy led him to investigate the flux and reflux of the sea as wavelike, with the geometry of the ocean basin the key to understanding the variety of phenomena. Despite the limitations of available mathematical resources he came up with a working principle of superposition of waves. (JGF) #27.1.126

Pambuccian, Victor V. *See* #27.1.141.

Peckhaus, Volker. 19th Century Logic: Between Philosophy and Mathematics, in #27.1.166, pp. 1–20. Discusses the development of symbolic logic in Victorian England in the context of philosophical and mathematical currents of the time in England and on the Continent. (TLB) #27.1.127

Peierls, Rudolf. *Selected Scientific Papers of Sir Rudolf Peierls*, Dalitz, R. H. (ed.), River Edge, NJ, and London: World Scientific and Imperial College Press, 1997, xxiv+805 pp. "Sir Rudolf Peierls was probably the most influential of the German mathematical physicists who migrated and settled in Britain during the Nazi era." This book contains 72 of his scientific papers and lectures, translations into English of some of his early work, and some personal history and commentary. See the review by H. S. Green in *Mathematical Reviews* **99e**:01035. (JA) #27.1.128

Pengelley, David. *See* #27.1.100.

Pieper, Herbert, ed. *Korrespondenz Adrien-Marie Legendre—Carl Gustav Jacob Jacobi*, reprint of "Correspondance Mathématique Entre Legendre et Jacobi" (1875) with German translation by Eberhard Knobloch and B. Mai, Stuttgart: Teubner, 1998, 245 pp., DM 88. The 11 letters from Jacobi to Legendre and 12 from Legendre to Jacobi published here were written between 1827 and 1833. Their main topic is elliptic functions. The accompanying essays by Pieper provide a detailed analysis and commentary. A bibliography, name index, and chronology of the correspondence are appended. Reviewed by Karl-Heinz Schlote in *Mathematical Reviews* **99i**:01022. (ACL) #27.1.129

Plander, Ivan. *See* #27.1.51.

Poovey, Mary. *A History of the Modern Fact. Problems of Knowledge in the Sciences of Wealth and Society.* Chicago: Univ. of Chicago Press, 1998, xxvi+419 pp., hardbound, $49; paperbound, $17. Poovey shows how modern objectivity in the sociopolitical life of "facts" relies on the way that accounting gives importance to numerical facts. Paul Ernest provides a fuller abstract of the book's thesis in *Mathematical Reviews* **99i**:01006. (ACL) #27.1.130

Porter, Theodore M. Was Quetelet a Positivist? in #27.1.3, pp. 199–209. In the sense that Quetelet imported into social science a style of reasoning driven by numerical data, employing concepts designed to summarize phenomena rather than get beneath appearances, he appears as a positivist *malgre lui*, a champion of science as the investigation of truth. (JGF) #27.1.131

Pourciau, Bruce. Reading the Master: Newton and the Birth of Celestial Mechanics, *American Mathematical Monthly* **104** (1997), 1–19. Comparing Newton's demonstration of the inverse square law with a modern vector account provides several insights into the geometric analysis of the *Principia*. (JGF) #27.1.132

Prokhorov, Sergei P. Computers in Russia: Science, Education, and Industry, *IEEE Annals of the History of Computing* **21** (3) (1999), 4–15. Deals with Russian computer development from the first experiments in 1948 to 1996. The period is divided into four stages corresponding to the changing generations of Russian computers. A chronology of main events is appended. (LSG) #27.1.133

Przeworska-Rolewicz, Danuta. Short Story of the Term "Algebraic Analysis," *Integral Transforms and Special Functions* **4** (1–2) (1996), 211–220. The term "algebraic analysis" has been used for three centuries, and during the past two or three decades it has had different meanings to different authors. This author outlines the history of the use of this term. (HEK) #27.1.134

Pytlik, Tadeusz. Hilbert's Fifth Problem [in Polish], in Wieslaw, Witold (ed.), *Hilbert's Problems* [in Polish], Warsaw: Polska Akademia Nauk, 1997, pp. 55–61. Hilbert's Fifth Problem is the problem of the generalization of the concept of Lie group for a continuous transformation group without the assumption of differentiability of the function which defines the group. This article gives Hilbert's comments on the origins of the problem and some illustrative examples. An overview of the solution in 1952 by Gleason, Montgomery, and Zippin is given. Reviewed by Krzysztof Ciesielski in *Mathematical Reviews* **99i**:01029. (ACL) #27.1.135

Rankin, Robert A. G. H. Hardy as I Knew Him, *Australian Mathematical Society Gazette* **25** (1998), 73–81. Personal recollections of Hardy, a family history, and lists of Hardy's students who won Smith or Rayleigh Prizes or were research students of his or of Littlewood's. See the review by Jeremy Gray in *Mathematical Reviews* **99e**:01028. (JA) #27.1.136

Raynaud, Michel. André Weil and the Foundations of Algebraic Geometry, *Notices of the American Mathematical Society* **46** (1999), 864–867. Describes Weil's proof of the Riemann hypothesis for the zeta function of curves over finite fields and explains how it fit into Weil's research. (GVB) #27.1.137

Redei, Miklos. "Unsolved Problems in Mathematics": J. von Neumann's Address to the International Congress of Mathematicians, Amsterdam, September 2–9, 1954, *The Mathematical Intelligencer* **21** (4) (1999), 7–12. Summarizes von Neumann's address to the ICM. (TLB) #27.1.138

Remmert, Volker R. *Ariadnefäden im Wissenschaftslabyrinth: Studien zu Galilei: Historiographie–Mathematik–Wirkung* [Ariadne Threads in the Labyrinth of Science: Studies on Galileo: Historiography–Mathematics–Influence], Bern: Peter Lang, 1998, 287 pp., $45.95. The subtitle of this doctoral dissertation clearly describes its contents. See the review by Christoph J. Scriba in *Mathematical Reviews* **99h**:01023. (HEK) #27.1.139

Rovan, Branislav. *See* #27.1.51.

Rusnock, Andrea. Correspondence Networks and the Royal Society, 1700–1750, *British Journal for the History of Science* **32** (1999), 155–169. During the 18th century the role of correspondence in the Royal Society's gathering and evaluating of knowledge became more prominent, especially through the efforts of James Jurin, Royal Society secretary 1721–1727. This method of acquiring knowledge prefigures the nonhierarchical fluid collaborative networks of the next century. (JGF) #27.1.140

Russo, Lucio. *La Rivoluzione Dimenticata* [The Forgotten Revolution], Milan: Giangiacomo Feltrinelli Editore, 1997, 384 pp., L 4200. Advances the claim that exact science was born in the Hellenistic civilization, challenging well-known theses, including the acknowledgment that Euclid's *Elements* was not his own invention. See the review by Victor V. Pambuccian in *Mathematical Reviews* **99g**:01005. (EAM) #27.1.141

Saliba, George. *See* #27.1.142.

Samsó-Moya, Julio, and Millás, Eduardo. The Computations of Planetary Longitudes in the Z$\bar{\text{i}}$j of Ibn al-Banna, *Arabic Sciences and Philosophy* **8** (2) (1998), 165, 167, 259–286. This paper documents a mathematical technique applied to astronomical tables in al-Andalus (medieval Islamic Spain). In addition, this paper documents the basic parameters that were used by the majority of the astronomers working in medieval Islamic Spain. This paper presents some interesting mathematical techniques now utilized to reconstruct the astronomical tradition of medieval Spain. See the review by George Saliba in *Mathematical Reviews* **99h**:01012. (HEK) #27.1.142

Samsó-Moya, Julio. *See also* #27.1.26 and #27.1.110.

Sánchez, Clara Helena. Forjadores del Desarrollo de la Matemática en Colombia. Una Charla con Mario Laserna [Builders of the Development of Mathematics in Colombia. An Interview with Mario Laserna], *Lecturas Matemáticas* **19** (1998), 53–61. Interview with Mario Laserna, who comments on his participation in the development of modern mathematics in Colombia since the 1950s. (VA) #27.1.143

Sandifer, Ed. *See* #27.1.52.

Sarma, Sreeramula Rajeswara. Some Medieval Arithmetical Tables, *Indian Journal of History of Science* **32** (1997), 191–198. A description of the oldest known arithmetical tables in India, from an 11th-century translation of Mahavira's *Ganitasārasamgraha* (ca. A.D. 850). See the review by Takao Hayashi in *Mathematical Reviews* **99e**:01009. (JA) #27.1.144

Sathyamurthy, T. V. Svayambhu: The Life and Work of Srinivasa Ramanujan, *Historia Scientiarum* **7** (1998), 235–241. "A review essay . . . on Robert S. Kanigel's book, *The Man Who Knew Infinity*" which also calls for "a full sociologically informed study of Indian scientific life under British colonialism." See the review by Jeremy Gray in *Mathematical Reviews* **99e**:01030. (JA) #27.1.145

Schechter, Bruce. *My Brain Is Open: The Mathematical Journeys of Paul Erdös*, New York: Simon & Schuster, 1998, 224 pp., $25. This biography is aimed at a general audience and discusses Erdös' personality as well as his mathematical accomplishments. There are many stories and a few theorems. The core of the book is Erdös himself. The author attempts to give a full picture of this special man. See the review by J. Spencer in *Mathematical Reviews* **99h**:01038. (HEK) #27.1.146

Schlote, Karl-Heinz. *See* #27.1.47 and #27.1.129.

Schröder, Wilfried. *See* #27.1.85.

Scriba, Christoph J. *See* #27.1.139.

Seldin, Jonathan P. Euclidean Geometry before Non-Euclidean Geometry, in #27.1.166, pp. 186–191. Urges the primacy of Euclidean geometry by a cross-cultural argument that the notions of rigid motion and scale models are innate human intuitions. (TLB) #27.1.147

Seneta, Eugene. Early Influences on Probability and Statistics in the Russian Empire, *Archive for History of Exact Sciences* **53** (1998), 201–213. French connections and influences on the work of P. L. Chebyshev (1821–1894). An important role in the contacts between him and I.-J. Bienaymé (1796–1878) was played by the former's translator Nikolai Khanykov (1819–1878). (JGF) #27.1.148

Seneta, Eugene. *See also* #27.1.73.

Shenitzer, Abe. *See* #27.1.72.

Sheynin, Oscar. Stochastic Thinking in the Bible and the Talmud, *Annals of Science* **55** (2) (1998), 185–198. This paper is a potpourri of ideas regarding randomness, probability and decision-making taken from the Bible, the Talmud, and the writings of Moses Maimonides. See the review by Zeno G. Swijtink in *Mathematical Reviews* **99h**:01045. (HEK) #27.1.149

Smith, Fenny K. C. Proportion in the *Summa de Arithmetica, Geometria, Proportione et Proportionalità* of Luca Pacioli, in Giusti, E. (ed.) *Luca Pacioli e la Mathematica del Rinascimento*, Petruzzi, 1998, pp. 103–125. Ideas of proportion are fundamental to the whole treatise, as its emphasis in the title indicates, exemplifying the way Pacioli combined the Latin tradition of geometry and number theory with the vernacular tradition of practical arithmetic and algebra. (JGF) #27.1.150

Solomon, Ronald. *See* #27.1.14.

Somayājī, Nīlakaṇṭha. *Tantrasaṃgraha* of Nīlakaṇṭha Somayājī [in Sanskrit, with English translation and exposition in terms of modern mathematics], *Indian Journal of History of Science* **33** (1998, supplement 2), 44 pp. The second part of a translation of Nīlakaṇṭha's lengthy work *Tantrasaṃgraha*. Part I is abstracted in #26.4.151. See the review by Takao Hayashi in *Mathematical Reviews* **99h**:01017. (DEZ) #27.1.151

Somayājī, Nīlakaṇṭha. *Tantrasaṃgraha* of Nīlakaṇṭha Somayājī [in Sanskrit, with English translation and exposition in terms of modern mathematics], *Indian Journal of History of Science* **33** (1998, supplement 3), 58 pp. The third part of a translation of Nīlakaṇṭha's lengthy work *Tantrasaṃgraha*. Part 1 is abstracted in #26.4.151. See the review by Takao Hayashi in *Mathematical Reviews* **99h**:01018. (DEZ) #27.1.152

Sorrenson, Richard. George Graham, Visible Technician, *British Journal for the History of Science* **32** (1999), 203–221. Instrument makers in the 18th century cemented their reputation at the Royal Society with major contributions to natural philosophy, mixed mathematics, and rational instrument design. George Graham is a good example: his observant behavior, mechanical understanding, exactness, and avoidance of theory made him an exemplary and highly visible FRS. (JGF) #27.1.153

Spearman, T. D. William Rowan Hamilton 1805–1865, *Proceedings of the Royal Irish Academy. Section A. Mathematical and Physical Sciences* **95** (1995), suppl., 1–12. Provides a summary of the life of William Rowan Hamilton, reviewing his work on optics and conical refraction, on dynamics, and on quaternions. See the review by Jeremy Gray in *Mathematical Reviews* **99g**:01023. (EAM) #27.1.154

Spencer, J. *See* #27.1.146.

Srinivasa Rao, K. *Srinivasa Ramanujan: A Mathematical Genius*, Chennai: East West Books (Madras) Pvt. Ltd., 1998, xviii+231 pp., Rs. 175. Provides a description of the life and mathematical works of Indian mathematician Srinivasa Ramanujan. The author examines Ramanujan's influence on the famed astrophysicist S. Chandrasekhar and reproduces an 1987 address given by Chandrasekhar at a meeting commemorating the centenary of Ramanujan's birth. A detailed listing of papers pertaining to Ramanujan is given. (EAM) #27.1.155

Staley, Richard. On the Histories of Relativity: The Propagation and Elaboration of Relativity Theories in Participant Histories in Germany, 1905–1911, *Isis* **89** (1998), 263–299. The early participant histories of relativity, from Einstein, Planck, Minkowski, and others, shaped understandings of relativity, and help us to see how a plurality of relativities became one theory and history in which Einstein's work stood out. (JGF) #27.1.156

Stewart, Larry. Other Centres of Calculation, or, Where the Royal Society Didn't Count: Commerce, Coffee-Houses and Natural Philosophy in Early Modern London, *British Journal for History of Science* **32** (1999), 133–153. The Royal Society's exclusivity had pushed it to the periphery of mathematical and scientific inquiry in London by the late 17th century. Other networks such as those found in coffeehouses and taverns, and near the Royal Exchange, transformed scientific principles into market commodities through teaching and lecturing upon mathematics and natural philosophy. (JGF) #27.1.157

Stigler, Stephen. Adolphe Quetelet: Statistician, Scientist, Builder of Intellectual Institutions, in #27.1.3, pp. 47–61. A significant "constant cause" in Quetelet's work is the chance of his meeting with Alexis Bouvard, rather than François Arago, when he visited the Paris Observatory in 1823. In consequence he became more of a meteorologist than an astronomer; his celebrated "social physics" can be seen as a "social meteorology." (JGF) #27.1.158

Stillwell, John. Exceptional Objects, *American Mathematical Monthly* **105** (1998), 850–858. Exceptional objects both have a certain unity and generality, and are important historically because of their exceptionality. Examples are the regular polyhedra, regular polytopes, division algebras, and projective configurations. There are connections: many objects inherit their classification from that of simple Lie groups; exceptional Lie groups inherit their exceptionality from the division algebra of octonions. (JGF) #27.1.159

Stillwell, John. *See also* #27.1.48.

Stolyarov, G. K. Computers in Belarus: Chronology of the Main Events, *IEEE Annals of the History of Computing* **21** (3) (1999), 61–65. Provides a listing of computer scientists active in Belarus in programming and hardware development. No discussion per se is given. (LSG) #27.1.160

Stopes-Roe, Mary. Barnes Wallis and Mathematics with Love, *Paradigm* **27** (1999), 2–17. The letters from the engineer Barnes Wallis (1887–1979) to his future wife from 1922–1924 constitute a lively correspondence course in mathematics. (JGF) #27.1.161

Struik, Dirk Jan. *See* #27.1.113.

Svitak, Sylvia M. The "Chicago Connection" in the Mathematical History of Factor Analysis, 1930–1948, in #27.1.166, pp. 192–201. Describes efforts at the University of Chicago to address problems associated with the use of matrices in factor analysis. (TLB) #27.1.162

Swijtink, Zeno G. *See* #27.1.149.

Szentgyörgyi, Zsuzsa. A Short History of Computing in Hungary, *IEEE Annals of the History of Computing* **21** (3) (1999), 49–57. A description of the history of Hungarian computing science, technology, and applications. Starting with the very roots in the 18th century, the article then deals with the period between World War I and World War II, followed by the years of Stalinist oppression. Comments are made about the persecution of prominent scientists and engineers and about the development of cybernetics. In the 1960s, a boom started in computing in the country, followed by continuous development until the present time. (LSG) #27.1.163

Tarrés Freixenet, Juan. History of the Topological Concept of Curve [in Spanish], *Gaceta de la Real Sociedad Matemática Española* **1** (1) (1998), 60–77. Traces the notion of curve in the works of Bolzano, Grassmann, Riemann, Cantor, Jordan, Peano, Urysohn, and Menger, exposing the development of the notion of space as well as the beginnings of dimension theory. See the review by J. S. Joel in *Mathematical Reviews* **99g**:01024. (EAM) #27.1.164

Tatarkiewicz, Krzysztof. Hilbert's Thirteenth Problem [in Polish], in Wieslaw, Witold (ed.), *Hilbert's Problems* [in Polish], Warsaw: Polska Akademia Nauk, 1997, pp. 153–162. The history and solutions to Hilbert's Thirteenth Problem, emphasizing analytical parts of the problem. (DEZ) #27.1.165

Tattersall, James J., ed. *Proceedings of the Canadian Society for the History and Philosophy of Mathematics*, Vol. 11, Ottawa, Canada: Univ. of Ottawa Press, 1998, paperbound, 201 pp. This volume contains most of the papers delivered at the 24th annual meeting of the Canadian Society for History and Philosophy of Mathematics, May 29–31, 1998. There was a special session on late 19th-century mathematics featuring talks by Volker Peckhaus, Francine F. Abeles, Israel Kleiner, Erwin Kreysig, and Sharon Kunoff. These and contributed papers by Amy Ackerburg-Hastings, Rebecca Adams, Patricia Allaire, Chirstopher Baltus, Edward L. Cohen, Ibraham Garro, Roger Godard, David Laverty, Daryn Lehoux, Duncan Melville, and Sylvia Svitak are abstracted separately. (TLB) #27.1.166

Te, Gu Si. Late Qing Mathematicians' Knowledge about the Properties of Dijia Numbers [in Chinese], *Neimenggu Shida Xuebao Ziran Kexue Hanwen Ban* 1997 (2), 62–68. Examines eight properties of dijia numbers, which can be viewed as binomial coefficients with rational powers, extracted from the works of 19th-century Chinese mathematicians. See the review by Shi Rong Guo in *Mathematical Reviews* **99g**:01008. (EAM) #27.1.167

Tee, Garry J. Professor and Mrs. Aldis: Mathematics, Feminism and Astronomy in Victorian Auckland, *Southern Stars* **38** (1998), 18–27. William Aldis (1839–1928) was first professor of mathematics at Auckland University College, in 1884; he and his wife Mary played an influential role in the intellectual, cultural, and moral life of Auckland until 1893, when he was unfairly dismissed. (JGF) #27.1.168

Teets, Donald. The Discovery of Ceres: How Gauss Became Famous, *Mathematics Magazine* **72** (1999), 83–93. An account of Gauss's method of solution to the problem of finding the orbit of Ceres. In solving this great problem Gauss employed simple mathematical tools, the details of which are often omitted from historical works. In addition to presenting Gauss's solution in detail, the paper gives an overview of the history of the problem before Gauss was confronted with it in 1806. (SFR) #27.1.169

Telksnys, Laimutis, and Žilinskas, Antanas. Computers in Lithuania, *IEEE Annals of the History of Computing* **21** (3) (1999), 31–37. Computers, computer science, and computer engineering have had more than 50 years of history in Lithuania. Described here are the main directions of research and industrial applications, as well as the development of education in computer science and engineering (i.e., informatics) in Europe and Lithuania. (LSG) #27.1.170

Toyoda, Toshiyuki. Essay on Quetelet and Maxwell: From la *Physique Sociale* to Statistical Physics, *Revue des Questions Scientifiques* **168** (3) (1997), 279–302. Reviews Quetelet's results and compares them with those of Maxwell. The author also attempts to illustrate the influence of John Herschel's article "Quetelet and Probability" (Edinburgh Review, July 1850) on Maxwell. See the review by Pierre Crépel in *Mathematical Reviews* **99g**:01025. (EAM) #27.1.171

Troesch, Albert. Droites Discrètes et Calendriers [Discrete Straight Lines and Calendars], *Mathématiques Informatique et Sciences Humaines* **141** (1998), 11–41. The author notes that integer-truncated linear functions that are found in computer graphics systems to represent straight lines are very well adapted to the study of calendars. This paper contains a valuable algorithm for the recognition of segments of a computer line and an in-depth study of properties of these quasi-affine functions in addition to a very exhaustive discussion of various calendars. See the review by H. W. Guggenheimer in *Mathematical Reviews* **99h**:01046. (HEK) #27.1.172

Tweddle, Ian. The Prickly Genius: Colin McLaurin (1698–1746), *Mathematical Gazette* **82** (1998), 373–378. Although much of the large output of the great Scottish mathematician Colin McLaurin is forgotten, his name is still linked with various results in textbooks. (JGF) #27.1.173

Tzanakis, Constantinos. Unfolding Relations between Mathematics and Physics, in a Presentation Motivated by History: Two Examples, *International Journal of Mathematics Education, Science and Technology* **30** (1999), 103–118. History plays a prominent role in a genetic approach revealing interrelations between physics and mathematics. The two examples are the derivation of Newton's law of gravitation from Kepler's laws as an application of differential calculus, and the foundations of special relativity as an example of the use of matrix algebra. (JGF) #27.1.174

Volodarskiĭ, A. I. *See* #27.1.12, #27.1.87, #27.1.109, and #27.1.119.

Von Renteln, Michael. *See* #27.1.21, #27.1.79, and #27.1.91.

Vorster, S. J. R. *See* #27.1.37.

Wang, Rongbin. On Liu Yi's Positive–Negative Root Extraction Algorithm, *Wuhan University Journal of the Natural Sciences* **2** (1) (1997), 1–8. Liu Yi's (ca. A.D. 1080) algorithm was the first to permit negative coefficients in an equation and is hence a key step in Chinese research on solving algebraic equations of higher degree. (GVB) #27.1.175

Wilson, Robin. Stamp Corner: Calendars, *The Mathematical Intelligencer* **21** (4) (1999), 62. A brief history of calendars with stamps from England, Germany, Italy, Dubai, the Vatican, and the Soviet Union. (TLB) #27.1.176

Yamaguti, Kiyosi. 'Self-Study of English Mathematics' and 'Exposition of Terms Used in Western Mathematics' by Kan-ichi Hashizume—How Hashizume Seleted Some of the Mathematical Terms in These Books [in Japanese], *Journal of the Faculty of International Studies of Culture, Kyushu Sangyo University* **10** (1997), 57–68. Demonstrates that many of the mathematical signs and terms described in Kan-ichi Hashizume's two works (1871–1872) come from the same unknown original text that was used as the source for the supplements to two English–Japanese dictionaries from the same decade. (GVB) #27.1.177

Yamaguti, Kiyosi. 'Vocabulary of Mathematical Terms in English and Japanese' (1889) by R. Fujisawa—A Comparison with 'Translation of Mathematical Terms' by Translation Committee of Tokyo Mathematical Society [in Japanese], *Journal of the Faculty of International Studies of Culture, Kyushu Sangyo University* **11** (1998), 115–134. A comparison of two works that translated western mathematical terms into Japanese in the late 19th century. The former is seen to be more advanced than the latter. (GVB) #27.1.178

Yavetz, Ido. On the Homocentric Spheres of Eudoxus. *Archive for History of Exact Sciences* **52** (3) (1998), 221–278. The author argues that the reconstruction of Eudoxus's theory of celestial motions that Giovanni Schiaparelli put forward in the 19th century is not the only one consistent with the evidence. A. G. Molland describes Yavetz's presentation of his alternative theory as erudite and impressive (*Mathematical Reviews* **99i**:01009). (ACL) #27.1.179

Zdravkovska, S. *See* #27.1.78.

Žilinskas, Antanas. *See* #27.1.170.