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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: ZIT@VM.TEMPLE.EDU)

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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 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 Víctor Albis (Bogotá), Thomas L. Bartlow (Villanova, PA), Ronald Calinger (Washington), Ivor Grattan-Guinness (Middlesex), Louise S. Grinstein (Brooklyn), Patti Wilger Hunter (Charlottesville), Victor Katz (Washington), Wilifred Lagler (Tübingen), Albert C. Lewis (Hamilton), and David E. Zitarelli.

ALLEN, MICHAEL J. *Nuptial Arithmetic: Marsilio Ficino's Commentary on the Fatal Number in Book VIII of Plato's Republic*, Berkeley: Univ. of California Press, 1994. (RC) #22.3.1

ARNOLD, V. I. On A. N. Kolmogorov, pp. 129–153 in #22.3.93. This article begins with a sketch of the work of Andrei Nikolaevich Kolmogorov, and continues with reminiscences that reflect various aspects of Kolmogorov's life and work. Included are fragments of letters from Kolmogorov to the author. *See also* #16.4.108, #17.3.54, and #22.3.81. (DEZ) #22.3.2

ASCHER, MARCIA, AND D'AMBROSIO, UBIRATAN. Ethnomathematics: A Dialogue, *For the Learning of Mathematics* **14** (2) (1994), 36–43. An edited version of a conversation between the two authors describing how they came to ethnomathematics, their visions of the future of ethnomathematical research, and the use of ethnomathematics in mathematics education. (VJK) #22.3.3

ASPRAY, WILLIAM, AND WILLIAMS, BERNARD O. Arming American Scientists: NSF and the Provision of Scientific Computing Facilities for Universities, 1950–1973, *IEEE Annals of the History of Computing* **16** (4) (1994), 60–74. A description of the role of the U.S. National Science Foundation (NSF) in providing scientific computing facilities for academia from 1950 to 1973. During these years the NSF played an important role in establishing computing facilities on American campuses for scientific research and science education. By the end of this period, NSF concentrated its support for computing on the establishment of a theoretically oriented discipline called computer science. (LSG) #22.3.4

0315-0860/95 $12.00

BACON, FRANCIS, *Novum Organum: With Other Parts of the Great Instauration*, Chicago: Open Court, 1994. This classic work has been translated and edited by Peter Urbach and John Gibson. (RC) #22.3.5

BASHMAKOVA, I. G., AND RUDAKOV, A. N. The Evolution of Algebra 1800–1870, *The American Mathematical Monthly* **102** (1995), 266–270. Brief mention of some developments in group theory, linear algebra, and invariants in the 19th century. (DEZ) #22.3.6

BASSANEZI, RODNEY C. Modelling as a Teaching–Learning Strategy, *For the Learning of Mathematics* **14** (2) (1994), 31–35. Mathematical modelling is used in several mathematics courses, for junior high school students, for university students, and for adult learners, to enable students to appreciate better the mathematical concepts. The models take into account the specific realities of the students' interests and the regions (in Brazil) where they live. (VJK) #22.3.7

BECK, ANATOLE. The Decimal Dysfunction, *The Mathematical Intelligencer* **17** (1) (1995), 5–7. The author discusses some of the cultural influences on systems of measurements in the past in an opinion piece that argues for the gradual abandonment of decimal numeration and measures in favor of a "binaricized system." (TLB) #22.3.8

BENZI, MARGHERITA. Dubbiezze e controversie: Il dibattito su logica e probabilità in Italia nei primi anni del Novecento [Doubts and Controversy: The Debate on Logic and Probability in Italy at the Turn of the Twentieth Century], *Historia Mathematica* **22** (1995), 43–63. An analysis of work done on the foundations of probability in Italy from 1900 to 1915 that shows that logic, in various guises, played a decisive role in the development of the subject. The work of Peano is examined in detail. (DEZ) #22.3.9

BETSCH, GERHARD. Praktische Geometrie zur Zeit Mercators, in Irmgard Hantsche (ed.), *Mercator—Ein Wegbereiter neuzeitliche Denkens: Referate des 2. Mercator-Symposiums, Duisberg, 8.–9. März 1993* (Duisberger Mercator-Studien, Vol. 2.), Bochum: Brockmeyer, 1994, pp. 121–139. The work of the cartographer Gerhardus Mercator in the 16th century can be regarded as part of practical geometry in the widest sense. Since very little happened in the development of this subject in Mercator's time this account places him in the wider context of developments from the 15th through the 17th centuries. (WL) #22.3.10

BISHOP, ALAN J. Cultural Conflicts in Mathematics Education: Developing a Research Agenda, *For the Learning of Mathematics* **14** (2) (1994), 15–18. A description of a research agenda in mathematics education, taking into account three aspects of recent work on ethnomathematics: mathematical knowledge in traditional cultures, mathematical knowledge in non-Western societies, and mathematical knowledge of different groups in society. (VJK) #22.3.11

BÖLLING, REINHARD (ed.) *Briefwechsel zwischen Karl Weierstraß und Sofja Kowalewskaja*, Berlin: Akademie-Verlag, 1993, 504 pp. The correspondence from Karl Weierstrass to Sofia Kovalevski, including an introduction and commentary by the editor. See the review by Roger Cooke in *Historia Mathematica* **22** (1995), 73–77. (DEZ) #22.3.12

BOSTON, NIGEL. A Taylor-Made Plug for Wiles' Proof, *The College Mathematics Journal* **26** (1995), 100–105. The section "Status" on page 104 reveals some historical tidbits surrounding the announcement by Andrew Wiles of his proof of Fermat's Last Theorem. (DEZ) #22.3.13

BRESSOUD, DAVID. *A Radical Approach to Real Analysis*, Washington, DC: Mathematical Association of America, 1994, 336 pp., paperbound, $29. A textbook on real analysis whose aim is to "let history inform pedagogy." It treats Fourier's introduction of trigonometric series, Cauchy's attempts to establish a firm foundation for calculus, Dirichlet's proof of the validity of the Fourier series, and the counterintuitive examples of Riemann and Weierstrass. (DEZ) #22.3.14

BUCK, GEORGE, AND HUNKA, STEVE. Development of the IBM 1500 Computer-Assisted Instructional System, *IEEE Annals of the History of Computing* **17** (1995), 19–31. Efforts to adapt computers for

instructional purposes can be traced back to the 1950s. The IBM 1500 Instructional System was the only commercial system produced by a single manufacturer that had an integrated student terminal configuration with a keyboard and light pen response mode, CRT-based graphics, audio, and static film projection. (LSG) #22.3.15

BURMANN, H.-W. *See* #22.3.61.

CARNOT, LAZARE. *Saggio sulle macchine in generale*, translated and edited by Antonio Drago and Salvatore D. Manno, textual control by V. de Luise, Naples: CUEN, 1994, xxiv + 117 pp. A translation into Italian of the very rare but seemingly influential *Essai sur les machines en général* (1783), with an informative introduction. (IGG) #22.3.16

CAVEING, MAURICE. *See* #22.3.19.

COATES, J. H., AND VAN DER PORTEN, A. J. Kurt Mahler, 1903–1988, *Historical Records of Australian Science* **9** (1993), 369–385. Biographical comments on Kurt Mahler. *See also* #21.4.22. (RC) #22.3.17

COOK, ROGER J. Fermat's Last Theorem—A Theorem at Last, *Mathematical Spectrum* **26** (3) (1993/94), 65–73. See the review by Peter Ross in *The College Mathematics Journal* **26** (1995), 165. (DEZ) #22.3.18

COOKE, ROGER. *See* #22.3.12.

COUCHOUD, SYLVIA. *Mathématiques égyptiennes. Recherches sur les connaissances mathématiques de l'Égypte pharaonique*, Paris: Éditions le léopard d'or, 1993, 208 pp., 150 Fr. A linguistic study of 64 texts taken from various works from ancient Egypt, mainly from the Rhind Papyrus and the Berlin Papyrus. See the review by Maurice Caveing in *Historia Mathematica* **22** (1995), 80–83. (DEZ) #22.3.19

COWLISHAW, MIKE. The Early History of REXX, *IEEE Annals of the History of Computing* **16** (4) (1994), 15–24. REXX is a procedural language developed with a strong emphasis on making programming easier for people to use. This article details the early history of REXX, with references to the electronic mail record and other contemporary documents. (LSG) #22.3.20

D'AMBROSIO, UBIRATAN. *See* #22.3.3.

DAUBEN, JOSEPH W. *Abraham Robinson: The Creation of Nonstandard Analysis, a Personal and Mathematical Odyssey*, Princeton: Princeton Univ. Press, 1995, 540 pp., hardbound, $49.50. A biography of Abraham Robinson that reveals a dramatic life shaped by war and ethnic repression, with a vivid description of his nonlinear odyssey from Hitler's Germany to the U.S. The work also discusses Robinson's revolutionary achievements in pure and applied mathematics, particularly his development of nonstandard analysis. There is a forward by Benoit B. Mandelbrot. (DEZ) #22.3.21

DAUBEN, JOSEPH W. *See also* #22.3.94.

DAVIS, PHILIP J. The Rise, Fall, and Possible Transfiguration of Triangle Geometry: A Minihistory, *The American Mathematical Monthly* **102** (1995), 204–214. An overview of the lofty role played by triangle geometry throughout the 19th century, its demise during World War I, and its reemergence with computers. (DEZ) #22.3.22

DE LUISE, V. *See* #22.3.16.

DEMIDOV, S. S. A Brief Survey of the Literature on the Development of Mathematics in the USSR, pp. 245–262 in #22.3.93. An annotated "introduction to a bibliography of Soviet literature on the history of mathematics in the USSR" that includes caveats on how to read social history in articles by Soviet historians. *See also* #22.3.24. (DEZ) #22.3.23

DEMIDOV, S. S. Bibliography [in Russian], pp. 263–271 in #22.3.93. A listing of the sources cited in #22.3.23 in Russian. (DEZ) #22.3.24

DEMIDOV, S. S. The Moscow School of the Theory of Functions in the 1930s, pp. 35–53 in #22.3.93. The title is somewhat misleading because the paper describes the background of the Moscow school of the theory of functions from its inception with D. F. Egorov in 1911 through the school of N. N. Luzin in the 1920s. However, the central part of this fascinating paper concerns the scurrilous attacks on Egorov and Luzin by Ernest Kolman in the 1930s. There are photos of Egorov, Luzin, A. Ya. Khinchin, and O. Yu. Schmidt. (DEZ) #22.3.25

DRAGO, ANTONIO. *See* #22.3.16.

DUREN, PETER A. *See* #22.3.93.

FEFFERMAN, CHARLES. Selected Theorems by Eli Stein, in Charles Fefferman, Robert Fefferman, and Stephen Wainger (eds.), *Essays on Fourier Analysis in Honor of Elias M. Stein*, Princeton: Princeton Univ. Press, 1995, pp. 1–35. A survey of the scope and originality of E. M. Stein's contributions to representation theory, classical Fourier analysis, and partial differential equations. The book contains 14 other articles from the proceedings of a conference held in 1991 to celebrate Stein's impact on mathematics. (DEZ) #22.3.26

FENSTER, DELLA DUMBAUGH, AND PARSHALL, KAREN HUNGER. A Profile of the American Mathematical Research Community: 1891–1906, pp. 179–227 in #22.3.46. By culling information from the first 15 volumes of the *Bulletin of the New York* (later *American*) *Mathematical Society*, from James McKeen Cattell's *American Men of Science*, and from publications in other American mathematics research journals, this study provides quantitative evidence for the existence at the turn of the 20th century of a broadly based American mathematical research community with active contributors all over the country, and with significant participation by foreign mathematicians. (PWH) #22.3.27

FENSTER, DELLA DUMBAUGH, AND PARSHALL, KAREN HUNGER. Women in the American Mathematical Research Community: 1891–1906, pp. 228–261 in #22.3.46. The authors analyze the participation of women in the emerging community of American mathematical researchers. They argue that while smaller and less productive than its male counterpart, a group of women made vital contributions to turn-of-the-century American mathematics. (PWH) #22.3.28

FERREIRÓS, JOSÉ. "What Fermented in Me for Years": Cantor's Discovery of Transfinite Numbers, *Historia Mathematica* **22** (1995), 33–42. A discussion of two aspects of Cantor's discovery of transfinite numbers: the context related to the Cantor–Bendixson theorem, and "a reconceptualization of Cantor's previous ideas in *ordinal* terms." (DEZ) #22.3.29

FOLKERTS, MENSO. *See* #22.3.84.

FUCHS, D. B. On Soviet Mathematics of the 1950s and 1960s, pp. 213–222 in #22.3.93. The author begins with a view of the "Jewish problem," then talks about life in Mekh-Mat at Moscow State University in the 1950s and 1960s, as well as the types of topology developed there. He ends with a discussion of the Esenin–Volpin case and the "Letter of the 99." There is a photo of Vinogradov. (DEZ) #22.3.30

GEBHARDT, RAINER. *Einblicke in die Coß von Adam Ries*, Leipzig: Teubner, 1994, 201 pp., paperback, DM 24,80. Facsimiles of excerpts from Adam Riese's *Coß*, a textbook on algebra completed in 1518 but not published until 1992. (DEZ) #22.3.31

GERDES, PAULUS. Reflections on Ethnomathematics, *For the Learning of Mathematics* **14** (2) (1994), 19–22. An analysis of several aspects of ethnomathematics, with particular attention to recent ethnomathematical research in Mozambique. (VJK) #22.3.32

GIBSON, JOHN. *See* #22.3.5.

GLAS, EDUARD. From Form to Function: A Reassessment of Felix Klein's Unified Programme of Mathematical Research, Education, and Development, *Studies in History and Philosophy of Science* **24** (1993), 611–631. (RC) #22.3.33

GOWING, RONALD. Halley, Cotes, and the Nautical Meridian, *Historia Mathematica* **22** (1995), 19–32. An examination of two 17th-century methods of calculating the spacing of the parallels of latitude on the Mercator chart. Edmund Halley used stereographic projection and a logarithmic spiral. In the only paper that Roger Cotes published, he took a logametric approach that fused his own ideas with Halley's, while avoiding the logarithmic spiral, to improve and simplify Halley's proof. However, Cotes's style was barely intelligible. (DEZ) #22.3.34

GRATTAN-GUINNESS, IVOR. "A New Type of Question": On the Prehistory of Linear and Non-linear Programming, 1770–1940, pp. 43–89 in #22.3.46. The author traces the history of linear programming from the late 18th century to World War II, looking not only at the intellectual developments that contributed to the formation of the field, but also at the false starts and missed opportunities, and at possible explanations for the slow evolution of the discipline. (PWH) #22.3.35

GRAY, JEREMY J. Poincaré, Einstein, and the Theory of Special Relativity, *The Mathematical Intelligencer* **17** (1) (1995), 65–67, 75. Reports on a debate held at the Colloque Henri Pioncaré at Nancy in May, 1994, on the merits of a claim by E. T. Whittaker that Poincaré rather than Einstein was the originator of the theory of special relativity. Gray concludes that the credit should go to Einstein. (TLB) #22.3.36

GÜNTHER, H.-G. *See* #22.3.61.

HAKFOORT, CASPER. *Optics in the Age of Euler: Conceptions of the Nature of Light, 1700–1785*, Cambridge, U.K.: Cambridge Univ. Press, 1995, 288 pp., hardbound, $64.95. An account of the origins, contents, and reception of the wave theory of light published by Leonhard Euler in 1746. Contrary to what has been assumed, the particle–wave debate only starts with Euler. (DEZ) #22.3.37

HEILBRON, JOHN L. A Mathematician's Mutiny, with Morals, in Paul Horwich (ed.), *World Changes: Thomas Kuhn and the Nature of Science*, Cambridge, MA: MIT Press, 1993, pp. 81–129. (RC) #22.3.38

HIGUARA ACEVEDO, CLARA LUCIA. La yupana: Un ejemplo de lo histórico como elemento pedagógico [The Yupana: An Example of a Historical Element as a Pedagogical One], *Lecturas Matemáticas* **15** (1994), 63–78. (VA) #23.3.39

HOGENDIJK, JAN P. Al-Mu'taman ibn Hūd, 11th Century King of Saragossa and Brilliant Mathematician, *Historia Mathematica* **22** (1995), 1–18. A description of the discovery and the structure of *Kitāb al-Istikmāl*, an 11th-century work by Abū'Āmir Yūsef ibn Ahmad ibn Hūd, Al-Mu'taman, who was the king of Saragossa from 1081 to 1085. The *Istikmāl* ("Perfection") is an example of an original scientific work in Islamic Spain, an area generally known only for transmitting science, including a proof of the "theorem of Ceva" 600 years before Ceva. *See also* #14.2.51. (DEZ) #22.3.40

HOLEMVIK, JAN RUNE. Compiling SIMULA: A Historial Study of Technological Genesis, *IEEE Annals of the History of Computing* **16** (14) (1994), 25–37. A description of the history of the SIMULA programming language from the 1950s to the 1970s, with particular attention given to the formative years, 1962 to 1967. No technical appraisal of the language is presented as such. Rather, the politics surrounding the project and the prehistory of SIMULA are emphasized. (LSG) #22.3.41

HOLZMAN, GOLDE. *See* #22.3.51.

HUNKA, STEVE. *See* #22.3.15.

JERISON, DAVID, AND STROOCK, DANIEL. Norbert Wiener, *Notices of the American Mathematical Society* **42** (1995), 430–438. An overview of Norbert Weiner's contributions to probability theory, harmonic analysis, stochastic processes, distribution theory, and cybernetics. (DEZ) #22.3.42

JOSEPH, GEORGE GHEVERGHESE. *See* #22.3.60.

KATZ, VICTOR J. Ethnomathematics in the Classroom, *For the Learning of Mathematics* **14** (2) (1994), 26–30. A description of how several mathematical ideas in combinatorics, arithmetic, and geometry,

which were developed in cultures around the world, can be adapted for use in mathematics classrooms at various levels. (VJK) #22.3.43

KATZ, VICTOR J. *See also* #22.3.64.

KLEINER, ISRAEL. The Roots of Commutative Algebra in Algebraic Number Theory, *Mathematics Maagazine* **68** (1995), 3–15. An examination of the birth of algebraic number theory in the work mainly of Kummer and Dedekind. The origins, stemming from Gauss, are three central problems in number theory: Fermat's Last Theorem, reciprocity laws, and binary quadratic forms. (DEZ) #22.3.44

KLOTZ, IRVING M. Number Mysticism in Scientific Thinking, *The Mathematical Intelligencer* **17** (1) (1995), 43–51. Gives several examples of efforts by scientists to impose integer values on scientific constants or to draw scientific conclusions from numerical patterns. (TLB) #22.3.45

KNOBLOCH, EBERHARD, AND ROWE, DAVID E. (eds.) *The History of Modern Mathematics, Volume III: Images, Ideas, and Communities*, Boston: Academic Press, 1994. xiv + 301 pp., hardbound, $54.95. The third in a series of books examining mathematics in the 19th and 20th centuries, this collection of essays represents three complementary approaches to the history of mathematics. Some essays consider conflicting perceptions of mathematics during the period; others look at important ideas arising in mathematics, particularly in the areas of analysis, differential geometry, and mechanics; the final group examine the evolution of mathematical communities, highlighting those of the United States and of China. Articles by J. Lützen and W. Purkert, I. Grattan-Guinness, V. Peckhaus, R. Tazzioli, P. Ullrich, D. D. Fenster and K. H. Parshall, and D. Zhang and J. W. Dauben are abstracted separately. (PWH) #22.3.46

KUSHNER, BORIS A. Markov and Bishop: An Essay in Memory of A. A. Markov (1903–1979) and E. Bishop (1928–1983), pp. 179–197 in #22.3.93. Reminiscences about "two of the most eminent creators of Constructive Mathematics," Andrei Andreevich Markov and Errett Bishop. The author studied under Markov, who was the second of four A. A. Markovs. Markov's artistic side is highlighted, as is the ill-fated meeting of the two creators. Bishop's program is explained and his two versions compared. There are photos of Markov alone, Markov with the author, and Errett Bishop. (DEZ) #22.3.47

LANDIS, E. M. About Mathematics at Moscow State University in the Late 1940s and Early 1950s, pp. 55–73 in #22.3.93. Anecdotal accounts of mathematicians the author encountered while a student at Moscow State University from 1945 to 1953, including a description of their mathematical achievements. Singled out are A. S. Kronrod, I. M. Gelfond, P. S. Novikov, and I. G. Petrovski. (DEZ) #22.3.48

LANG, SERGE. Mordell's Review, Siegel's Letter to Mordell, Diophantine Geometry, and 20th Century Mathematics, *Notices of the American Mthematical Society* **42** (1995), 339–350. The author discusses his contributions to number theory and algebraic geometry in light of criticism by L. J. Mordell and Carl Siegel. He concludes (p. 348) that "Mordell and Siegel were great mathematicians . . . [b]ut their lack of vision and understanding . . . obstructed the development of certain areas of mathematics." (DEZ) #22.3.49

LAUGWITZ, DETLEF. Ein Wendepunkt in der Auffassung vom Unendlichen: Riemann und die Mathematik als Denken in Begriffen, in G. Pickert and I. Weidig (eds.), *Mathematik erfahren und lehren: Festschrift für Hans-Joachim Vollrath*, Stuttgart: Ernst Klett, 1994, pp. 142–148. A turning point in the development of infinity: Riemann and mathematics as conceptual thinking. Riemann's notes explicitly suggest that an algorithmic expression for functions is not always needed. From this position emerges an increased emphasis on such concepts as continuity and convergence and hence on new conceptions of infinity. (ACL) #22.3.50

LEE, JOHN A. N., AND HOLZMAN, GOLDE. 50 Years After Breaking the Codes: Interviews with Two Bletchley Park Scientists, *IEEE Annals of the History of Computing* **17** (1995), 32–43. The work of scientists at Bletchley Park, Great Britain during World War II led to the breaking of enemy codes and also to the postwar development of computing systems. This article includes reminiscences of two participants in this effort, I. Jack Good and Donald Michie. (LSG) #22.3.51

LÜTZEN, JESPER, AND PURKERT, WALTER. Conflicting Tendencies in the Historiography of Mathematics: M. Cantor and H.G. Zeuthen, pp. 1–42 in #22.3.46. Compares the differing historiographical methods of Moritz Benedikt Cantor and Hieronymus Georg Zeuthen, two prominent historians of mathematics in the late 19th century. The authors place Cantor's encyclopedic surveys of the development of mathematics and Zeuthen's careful mathematical analysis of classical works in the broader context of their lives and work, and in the context of other works on the history of mathematics. (PWH) #22.3.52

MAHONEY, MICHAEL S. *The Mathematical Career of Pierre de Fermat, 1601–1665*, Princeton: Princeton Univ. Press, 1994, 438 pp., paperback, $18.95. A second edition, in paperback, of this classic biography of Pierre de Fermat, which has taken on more importance in light of Andrew Wiles's proof of Fermat's Last Theorem. This work discusses Fermat's contributions to analytic geometry, differential and integral calculus, and probability, as well as number theory. (DEZ) #22.3.53

MANNO, SALVATORE D. *See* #22.3.16.

MARTÍNEZ SANZ, JOSÉ LUIS. *Relaciones científicas entre España y América. Una introduction a la ciencia hispánica* [*Scientific Relations between Spain and America: An Introduction to Hispanic Science*], Madrid: Mapfre, 1992, 377 pp. (VA) #22.3.54

MAYORGA, BERNARDO. Lobachévski y la geometria no euclídian [Lobachevski and Non-Euclidean Geometry], *Lecturas Matemáticas* **15** (1994), 29–43. An account of Lobachevski's work on non-Euclidean geometry complemented with a translation into Spanish of some information previously available only in Russian. (VA) #22.3.55

MCPHERSON, JOHN. New Ways of Multiplying, *IEEE Annals of the History of Computing* **17** (1995), 44–46. An outline of the development of methods for performing multiplication using a tabulating machine. (LSG) #22.3.56

MELI, DOMENICO BERTOLONI. *Equivalence and Priority: Newton versus Leibniz—Including Leibniz's Unpublished Manuscripts on the Principia*, Cambridge, UK: Cambridge Univ. Press, 1993, 328 pp., hardbound, $82.50. An examination of hitherto unpublished manuscripts in Leibniz's hand illustrating his first reading of and reaction to Newton's *Principia*. (DEZ) #22.3.57

MOORE, CHARLES G. Research in Native American Mathematics Education, *For the Learning of Mathematics* **14** (2) (1994), 9–14. After noting differences in understanding of certain mathematical concepts between his Native American students and his Anglo students, the author began a research program which helped him to understand the cultural reasons for the differences and allowed him to develop new course materials that integrated relevant cultural elements with the subject matter. (VJK) #22.3.58

NAPOLES VALDÉS, JUAN, AND NEGRÓN SEGUR, CARLOS. De la mecánica analítica a las ecuaciones diferenciales ordinarias. Algunos apuntes históricos [From Analytic Mechanics to Ordinary Differential Equations: Some Historical Notes], *LLULL* **17** (1994), 190–206. A historical account of the deep relationships between analytic mechanics and ordinary differential equations. (VA) #22.3.59

NEGRÓN SEGURA, CARLOS. *See* #22.3.59.

NELSON, DAVID; JOSEPH, GEORGE GHEVERGHESE; AND WILLIAMS, JULIAN. *Multicultural Mathematics*, Cambridge, UK: Cambridge Univ. Press, 1993, 240 pp., paperbound, $13.95. A book written for parents and teachers to help schoolchildren in an elementary curriculum understand the universality of mathematics in a cultural context. (DEZ) #22.3.60

NEUENSCHWANDER, ERWIN, AND BURMANN, H.-W. Die Entwicklung der Mathematik an der Universität Göttingen, in H.-G. Günther (ed.), *Die Geschichte der Verfassung und der Fachbereiche der Georg-August-Universität zu Göttingen* (Göttinger Universitätsschriften: Ser. A, Schriften, Vol. 16), Göttingen: Vandenhoeck and Ruprecht, 1994, pp. 141–159. This essay on the development of mathematics at Göttingen University, and the collection of which it is a part, were originally published in 1987 for the 250th anniversary of Göttingen University. (*See* #15.4.39.) The authors have made slight revisions for

this reprint such as adding some recent items to the extensive bibliography. The account goes from J. A. von Segner in 1735 through the end of Hermann Weyl's tenure in 1933 and includes Gauss, Riemann, H. A. Schwarz, Klein, Hilbert, C. Runge, Courant, and E. Noether. (ACL) #22.3.61

PADILLA GÁLVEZ, JESÚS. Del jardín del placer a la habilidad del arte. De la maestría del cálculo a las matemáticas modernas [From the Garden of Joy to the Skill of Art: From the Mastery of Calculations to Modern Mathematics], *LLULL* **17** (1994), 206–217. A long review of I. Schneider's book, *Johannes Faulhaber 1580–1635: Rechenmeister in einer Welt des Umbruchs* (Basel/Boston/Berlin: Birkhäuser Verlag, 1993), which relates Faulhaber directly to Descartes. (VA) #22.3.62

PADILLA GÁLVEZ, JESÚS. Los inicios de la metalógica en los años treinta [Metalogic Beginnings in the Thirties], *LLULL* **17** (1994), 117–139. The Vienna Circle and the proof of Gödel's Theorem. Using unpublished correspondence between Zermelo and Gödel, the author discusses the differences between the Hilbertian program and Gödel's program on decidability and completeness. (VA) #22.3.63

PALTER, ROBERT. Afro-Centrism, and the History of Science, *History of Science* **31** (1993), 227–287. See the review by Victor J. Katz in *The College Mathematics Journal* **26** (1995), 163. (DEZ) #22.3.64

PARSHALL, KAREN HUNGER. *See* #22.3.27 and #22.3.28.

PASCOE, ROBERT S. V. *See* #22.3.85.

PECKHAUS, VOLKER. Hilbert's Axiomatic Programme and Philosophy, pp. 90–112 in #22.3.46. An examination of David Hilbert's view of philosophy and its role in mathematics. Peckhaus argues that the set-theoretic paradoxes treated by Bertrand Russell and Gottlob Frege caused Hilbert to shift the focus of his axiomatic program to set theory, and to regard the establishment of the foundations of axiomatic systems as a task for philosophers. In response to his new attitudes, Hilbert tried to secure jobs at Göttingen for Ernst Zermelo and Leonard Nelson, hoping to provide for a productive collaboration between philosophy and mathematics. (PWH) #22.3.65

PERFECT, HAZEL. Georg Cantor, 1845–1918: He Transposed Mathematics into a New Key, *Mathematical Spectrum* **27** (2) (1994/95), 25–28. A brief account of "one of the great pioneers in mathematics of the 19th century." (DEZ) #22.3.66

PESKINE, CHRISTIAN. Maurice Auslander 1926–1994, *Notices of the American Mathematical Society* **42** (1995), 450–453. Obituary of Maurice Auslander, noted mainly for his works in algebra. (DEZ) #22.3.67

PIATETSKI-SHAPIRO, ILYA. Étude on Life and Automorphic Forms in the Soviet Union, pp. 199–211 in #22.3.93. Recollections of this famous mathematician's life in Russia, including his obtaining an education in spite of restrictions on Jews, working under his advisor, A. O. Gelfond, working with I. R. Shafarevich, and emigrating with the help of V. M. Keldysh. The author's work on automorphic forms is sprinkled throughout his account. (DEZ) #22.3.68

PINXTEN, RIK. Ethnomathematics and Its Practice, *For the Learning of Mathematics* **14** (42) (1994), 23–25. Field work among Navajo Indian children and children of Turkish immirants to Belgium shows that these children have a different world view than the one implicit in our standard mathematics education curricula. The differences need to be made explicit so that these students can eventually move on to a successful understanding of standard mathematics. (VJK) #22.3.69

POSTNIKOV, M. M. Pages of a Mathematical Autobiography (1942–1953), pp. 155–178 in #22.3.93. The eminent algebraic topologist, Mikhail Mikhailovich Postnikov, describes his university education from 1942, when he was 15 years old, through the writing of his dissertation and the recognition of his work eleven years later. The author discusses L. Pontryagin as dissertation advisor and mentor, then describes the development of cohomology theory with Eilenberg, MacLane, J. H. C. Whitehead, and the author. There is a photo of Pontryagin. (DEZ) #22.3.70

PURKERT, WALTER. *See* #22.3.52.

RANDELL, BRIAN. The Origins of Computer Programming, *IEEE Annals of the History of Computing* **16** (4) (1994), 6–14. A description of the stages in the development of program control and the modern concept of a stored program. Early automatic devices are discussed, as well as Babbage's contributions and those of his early successors, such as Percy Ludgate and Torres Y Quevedo. (LSG) #22.3.71

ROSENFELD, BORIS. A. Religion and the Seven-Day Week, *LLULL* **17** (1994), 141–156. The author considers the history of the seven-day week and the names of the days of the week and their numerical origin. (VA) #22.3.72

ROSENFELD, BORIS A. Reminiscences of Soviet Mathematicians, pp. 75–100 in #22.3.93. The author, an esteemed historian of mathematics, interweaves autobiographical comments with brief accounts of the Russian mathematicians, J. N. Spielrein, A. P. Kotelnikov, G. M. Shapiro, V. V. Stepanov, V. F. Kagan, P. S. Aleksandrov, A. N. Kolmogorov, N. N. Luzin, L. S. Pontryagin, A. G. Kurosh, B. N. Delone (Delaunay), D. I. Perepelkin, A. I. Maltsev, S. A. Yanovskaya, M. Y. Vygodskii, and A. P. Yushkevich. He also discusses his advisors, A. P. Norden and P. K. Rashevakii, his examiners, Ya. S. Dubnov, V. V. Vagner, and S. P. Finikov, and fellow students, S. V. Fomin, G. E. Shilov, V. A. Roklin, I. M. Yaglom, and R. I. Pimenov. There is a photo of Delone. (DEZ) #22.3.73

ROSS, PETER. *See* #22.3.18.

ROWE, DAVID E. *See* #22.3.46.

RUDAKOV, A. N. *See* #22.3.6.

SINÈGRE, LUC. Les quaternions et le mouvement du solide autour d'un point fixe chez Hamilton, *Revue d'histoire des mathématiques* **1** (1995), 83–109. An investigation of W. R. Hamilton's work on quaternions and the rotation of a solid body about a fixed point. Hamilton's work began around 1848 and provides an opportunity to see how his study of physics, and optics in particular, related to his mathematics. (ACL) #22.3.74

SOSSINSKY, A. B. In the Other Direction, pp. 223–243 in #22.3.93. The author, a distinguished algebraic topologist, relates his personal odyssey from a childhood in Paris to an early education in New York, to a graduate education in Moscow. He remained in the topology section of Moscow State University during the golden era at Mekh-Mat, 1957–1968. He describes the workings of *Kvant* from 1975 to 1987. Included are vignettes of L. V. Keldysh, A. N. Kolmogorov, and "Bella Muchnik University." There is a photo of Keldysh. (DEZ) #22.3.75

STEPHENSON, BRUCE. *The Music of the Heavens: Kepler's Harmonic Astronomy*, Princeton: Princeton Univ. Pres, 1994, xi + 260, $39.50. A paperback printing of a book, originally published in 1987, that surveys early theories on the relationship between music and astronomy and analyzes Kepler's *Harmonices mundi*, especially Book 5, which treats "harmonies" that govern planetary motion. (DEZ) #22.3.76

STEWART, IAN. Four Encounters with Sierpiński's Gasket, *The Mathematical Intelligencer* **17** (1) (1995), 52–64. A brief review of Waclaw Sierpiński's professional life, of his introduction of the gasket, and of realizations of the gasket in Pascal's triangle, the Tower of Hanoi problem, and the chaos game of Michael Barnsley. (TLB) #22.3.77

STILLWELL, JOHN. *Elements of Algebra: Geometry, Numbers, Equations*, New York: Springer-Verlag, 1994, xi + 181 pp., hardbound, $34.95. A textbook that combines algebra with historical references that connect algebra with geometry, the theory of equations, and number theory. (DEZ) #22.3.78

STOUT, THOMAS M., AND WILLIAMS, THEODORE J. Pioneering Work in the Field of Computer Process Control, *IEEE Annals of the History of Computing* **17** (1995), 6–18. A discussion of the development of industrial computer control systems. Some early installations are described, as well as their successes and difficulties. These early systems were based on medium-sized digital computers. (LSG) #22.3.79

STROOCK, DANIEL. *See* #22.3.42.

TAZZIOLI, ROSSANA. Rudolf Lipschitz's Work on Differential Geometry and Mechanics, pp. 113–138 in #22.3.46. Considers the contributions of Rudolf Lipschitz and Wilhelm Killing to a fundamental stage in the development of mechanics that followed Bernhard Riemann's introduction of the concepts of "manifold" and "curvature." The author shows that the attempts of Lipschitz and Killing to extend such ideas in mathematical physics as Hamiltonian mechanics and potential theory led to mathematical expressions that later became the basis of the special theory of relativity. (PWH) #22.3.80

TIKHOMIROV, V. M. A. N. Kolmogorov, pp. 101–127 in #22.3.93. An account of the life and work of the Russian mathematician, Andrei Nikolaevich Kolmogorov, whose whole life was tied to the University of Moscow, except for an academic journey to Göttingen, Munich, and Paris. The author presents a convincing case that the breadth and depth of Kolmogorov's work in the major fields of mathematics—10 fundamental results are cited—make him a universal mathematician on the same plateau as Hilbert and Poincaré. There is also a list of Kolmogorov's students (including the author), a photo of him alone, and a photo of him with S. Sadikova-Prokhorova and the author. *See also* #16.4.108, #17.3.54, and #22.3.2. (DEZ) #22.3.81

ULLRICH, PETER. The Proof of the Laurent Expansion by Weierstrass, pp. 139–153 in #22.3.46. A discussion of Karl Weierstrass' 1841 proof of the existence of the Laurent expansion for functions on an annulus. This essay evaluates the proof in the context of the work of Augustin-Louis Cauchy and of Pierre Alphonse Laurent, and considers possible motivations behind Weierstrass' delay in publishing the work. (PWH) #22.3.82

ULLRICH, PETER. The Riemann Removable Singularity Theorem from 1841 Onwards, pp. 155–178 in #22.3.46. Traces the history of the Riemann Removable Singularity Theorem from an early proof by Karl Weierstrass through generalizations established in the 20th century. The discussions of independent proofs by Weierstrass and Georg F. B. Riemann, and of later, fallacious proofs by Riemann's students, illustrate the sometimes circuitous process of developments in mathematics. (PWH) #22.3.83

URBACH, PETER. *See* #22.3.5.

VAN DER PORTEN, A. J. *See* #22.3.17.

VOGEL, KURT. *Kleinere Schriften zur Geschichte der Mathematik*, Menso Folkerts (ed.), 2 vols., in (Boethius Texte und Abhandlungen zur Geschichte der Exakten Wissenschaften), Stuttgart: Franz Steiner, 1988, 884 pp., DM 148.00. A collection of the shorter publications of the historian of mathematics Kurt Vogel, who died in 1985. See *Zentralblatt* 969-01026. (ACL) #22.3.84

WHITING, PAUL G., AND PASCOE, ROBERT S. V. A History of Data-Flow Languages, *IEEE Annals of the History of Computing* **16** (4) (1994), 37–59. Data-flow refers to a language-level paradigm of computation as well as to a family of processor architectures based on this paradigm. This article deals with data-flow languages issues and the evolution of data-flow languages. Underlying architectural issues are discussed. Emphasis is given to those languages that specifically belong to this class and have been implemented for a data-flow machine. (LSG) #22.3.85

WILLIAMS, BERNARD O. *See* #22.3.4.

WILLIAMS, H. P. The Cornish Caveman Mathematician, *The Mathematical Intelligencer* **17** (1) (1995), 34 and 64. A brief report on Daniel Gump, 18th-century stonemason and mathematician who lived in a cave in Cornwall and left a proof of the Pythagorean theorem carved in stone. (TLB) #22.3.86

WILLIAMS, JULIAN *See* #22.3.60.

WILLIAMS, THEODORE J. *See* #22.3.79.

WILSON, ROBIN. Stamp Corner: Renaissance Mathematics Textbooks, *The Mathematical Intelligencer* **17** (1) (1995), 76. Displays and describes two German stamps commemorating Adam Riese, an Italian

stamp commemorating Luca Paciola's *Summa*, a Finnish stamp commemorating the invention of printing, and a Colombian stamp displaying the symbols for the four fundamental operations of arithmetic. (TLB) #22.3.87

WORTHY, JAMES C. Control Data Corporation: The Norris Era, *IEEE Annals of the History of Computing* **17** (1995), 47–53. This article chronicles the growth of Control Data Corporation under the leadership of its founder, William C. Norris. From its beginnings in 1957, the company became a major producer of computer and peripheral products. Its peak of achievement came in the early 1980s, but technological and financial crises have caused the company to struggle since that time. (LSG) #22.3.88

YUSHKEVICH, A. P. Encounters with mathematicians, pp. 1–33 in #22.3.93. The author, an esteemed historian of mathematics, describes his personal encounters with N. N. Luzin, P. S. Aleksandrov, A. N. Kolmogorov, and V. I. Smirnov. He reveals for the first time the details of Aleksandrov's view of the relations between Luzin and Suslin. He also describes an instance when Kolmogorov stood up for him after his dismissal. The discussion of Smirnov concerns a highly cultured mathematician, who was from St. Petersburg and not from the Moscow school, but who was charged with "worship of foreigners." There are photos of Luzin, Aleksandrov, and Smirnov. (DEZ) #22.3.89

YUSSUPOVA, GULNAVA. Zwei mittelalterliche arabische Ausgaben der "Sphaerica" des Menelaos von Alexandria, *Historia Mathematica* **22** (1995), 64–66. A description of two Arabic texts with commentaries on Menelaus' *Sphaerica*, one written by al-Ṭûsî in the 13th century and the other by the little-known 17th-century mathematician, al-Jazdî. (DEZ) #22.3.90

ZAITSEV, EVGENY A. Fedor Andreevich Medvedev (1923–1993), *Historia Mathematica* **22** (1995), 88–92. An obituary of the historian of mathematics, F. A. Medvedev, who is known for his work on the history of functions and set theory, functional analysis, and the foundations of mathematics. There is a bibliography of Medvedev's scientific books and articles. (DEZ) #22.3.91

ZASLAVSKY, CLAUDIA. *Africa Counts* and Ethnomathematics, *For the Learning of Mathematics* **14** (2) (1994), 3–8. A description of the motivation for and some of the research leading to the author's writing of *Africa Counts*, the now standard introduction to African mathematics. Zaslavsky notes that many of the ideas included in her book have not been adapted for use in school curricula. (VJK) #22.3.92

ZDRAVKOVSKA, SMILKA, AND DUREN, PETER A. (eds.), *Golden Years of Moscow Mathematics*, Providence/London: Amer. Math. Soc./London Math. Soc. 1993, ix + 271 pp., hardbound, $94. A collection of articles on Soviet mathematical history that focuses on mathematical developments during the 20th century, the personal lives of Russian mathematicians, and the political events that shaped the course of mathematical work in the Soviet Union. Articles by V. I. Arnold, S. S. Demidov, D. B. Fuchs, B. A. Kushner, E. M. Landis, Ilya Piatetski-Shapiro, M. M. Postnikov, B. A. Rosenfeld, A. B. Sossinsky, V. M. Tikhomirov, and A. P. Yushkevich are abstracted separately. There are also an annotated bibliography in English and a bibliography in Russian for further reading. (DEZ) #22.3.93

ZHANG, DIANZHOU, AND DAUBEN, JOSEPH W. Mathematical Exchanges between the United States and China, a Concise Overview (1850–1950), pp. 262–297 in #22.3.46. Briefly surveys the significance of Chinese–American contacts for the development of mathematics in China from 1850 to 1950. Looks at the influence of Elias Loomis's calculus textbooks; the part played by Cornell, Harvard, and Chicago in educating Chinese scholars; and the role of the Boxer Indemnity Scholarships of the 20th century. (PWH) #22.3.94