

Abstracts

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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 Sloan Evans Despeaux, Department of Mathematics and Computer Science, Western Carolina University, Cullowhee, NC 28723, U.S.A. (e-mail: despeaux@email.wcu.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), Patti Wilger Hunter (Santa Barbara, CA), Calvin Jongsma (Sioux Center, IA), Herbert E. Kasube (Peoria, IL), Deborah Kent (Burnaby, BC), Jeffrey Lawson (Cullowhee, NC), Duncan J. Melville (Canton, NY), Laura Martini, and Sloan Evans Despeaux.

General

Brüning, Jochen; and Knobloch, Eberhard, eds. *Die mathematischen Wurzeln der Kultur. Mathematische Innovationen und ihre kulturellen Folgen* [The Mathematical Roots of Culture. Mathematical Innovations and Their Cultural Results], Munich: Wilhelm Fink Verlag, 2005, 193 pp. The papers in this collection are listed here separately as #34.1.2; #34.1.32; #34.1.49; #34.1.50; #34.1.51; #34.1.62; #34.1.92; and #34.1.136. (SED) #34.1.1

Brüning, Jochen. Die Stunde des Mathematikers [Mathematicians in their hours], in #34.1.1, pp. 77–89. #34.1.2

Burn, Bob. From Archimedes to limits: Understanding real analysis, *British Society for the History of Mathematics Bulletin* 21 (2) (2006), 75–85. Text of the author's 2006 Neil Bibby Lecture at the History of Mathematics in Education meeting in Loughborough, England. A brief account of information collected by the author for use in teaching undergraduate analysis by tracing the historical development of its main ideas, particularly the notion of completeness and the definition of limit. (PWH) #34.1.3

Burn, Bob. The Vice: Some historically inspired and proof-generated steps to limits of sequences, *Educational Studies in Mathematics* 60 (2005), 269–295. Based on the ideas of Euclid, Archimedes, Fermat, Wallis, and Newton, the author presents a development of the concept of the limit of a sequence. (SED) #34.1.4

Burn, Bob. Further reflections on “The Vice,” *Educational Studies in Mathematics* **61** (2006), 403–407. A follow-up to the article abstracted here as #34.1.3. (SED) #34.1.5

Damour, Thibault; Darrigol, Olivier; Duplantier, Bertrand; and Pivasseau, Vincent, eds. *Einstein, 1905–2005*, Basel: Birkhäuser Verlag, 2006. This volume presents papers from the seventh Poincaré Seminar held in Paris in 2005. Items in this collection with historical content are listed separately as #34.1.10; #34.1.88; and #34.1.121. (SED) #34.1.6

Darrigol, Olivier. *Worlds of Flow. A History of Hydrodynamics from the Bernoullis to Prandtl*, New York: Oxford University Press, 2005, pp. xiv+356. A thematic history of hydrodynamics covering the development of dynamical equations, water waves, viscosity, vortices, instability, and turbulence. The work is illustrated by many quotations from primary sources translated where necessary into English and given modern notation. See the review by D.H. Peregrine in *Mathematical Reviews* 2178164. (2006j:76001). (DJM) #34.1.7

Darrigol, Olivier. See also #34.1.6.

Davis, Chandler; and Ellers, Erich W., eds. *The Coxeter Legacy. Reflections and Projections*, Providence, RI: American Mathematical Society, 2006, xiv+320 pp. Items in this collection with historical content are listed separately as #34.1.11; #34.1.18; and #34.1.156. (LM) #34.1.8

Debnath, Lokenath. A brief introduction to fractional calculus, *International Journal of Mathematical Education in Science and Technology* **35** (4) (2004), 487–501. This paper introduces the history of fractional calculus, tracing back to l'Hôpital's query to Leibniz about the possibility of an n th derivative of a function, where $n = 1/2$. Leibniz's 1695 reply, “It will lead to a paradox. . . [but from] this apparent paradox, one day useful consequences will be drawn,” opened the door to research on fractional derivatives. The paper reviews the work primarily of Liouville, Fourier, and Riemann representing fractional calculus using special functions and integral equations. It concludes with a more contemporary complex variable approach. (JL) #34.1.9

Duplantier, Bertrand. Brownian motion, “diverse and undulating,” in #34.1.6, pp. 201–293. #34.1.10

Ellers, Erich W. See #34.1.8.

Emmer, Michele. The visual mind: Art, mathematics and cinema, in #34.1.8, pp. 281–296. The author discusses the encounter between Coxeter and M.C. Escher and the role Coxeter played in the making of the author's movie on Escher. (LM) #34.1.11

Ferreira, Eduardo Sebastiani. Onze avos, doze avos, . . . De onde vem este termo avo? [Onze avos, doze avos, . . . from where does the term “avo” come?], *Revista Brasileira de História da Matemática* **6** (2006), 97–108. The term “avo” appears in Portuguese and Spanish (as a suffix) to designate fractions, starting with one eleventh. The author proposes that it comes from “oitavo” (“one eighth”), driven from the latinization of the Pythagorean harmonic octave: διαπασών. (VA) #34.1.12

Hollings, Christopher David. The history of the 2-, 4-, and 8-square identities, *British Society for the History of Mathematics Bulletin* **21** (2) (2006), 111–118. Examines some historical examples of investigations of identities involving sums of squares (e.g., $(a^2 + b^2)(c^2 + d^2) = (ac + bd)^2 + (ad - bd)^2$), including work of Diophantus, Euler, D.F. Degen, and Adolf Hurwitz. (PWH) #34.1.13

Jensen, Gary R.; and Krantz, Steven G., eds. *150 years of Mathematics at Washington University in St. Louis*, Providence, RI: American Mathematical Society, 2006, xii+143 pp. This volume is a collection of articles that resulted from the October 2003 conference that celebrated the sesquicentennial of mathematics at Washington University. Papers with historical content are abstracted here separately as #34.1.94; and #34.1.114. (SED) #34.1.14

Lamnabhi-Lagarigue, Françoise. See #34.1.15.

Loría, Antonio; Panteley, Elena. Stability, told by its developers, in Loría, Antonio; Lamnabhi-Lagarigue, Françoise; and Panteley, Elena, eds., *Advanced Topics in Control Systems Theory*, London: Springer-Verlag, 2006, 199–258. Stability theory for ordinary differential equations from Lagrange to Lyapunov. See the review by Marat U. Akhmet in *Mathematical Reviews* 2208231. (2006k:34002). (DJM) #34.1.15

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