

BIBLIOGRAPHIC NOTES

by

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Peter ACKROYD, *The road to Wonderland*, The New York Times Book Review, November 12, 1995, p. 13. Review of Morton N. Cohen, *Lewis Carroll: A biography*. Cohen's biography, the reviewer says, "asks" and "answers" the question: "What turned the mathematician Charles Dodgson into the storyteller Lewis Carroll? Go ask Alice." (See note on [Cohen 1995].)

Irving H. ANELLIS, *Non-euclidean geometry in the pre-Principia development of Russell's logical program, from An Essay on the Foundations of Geometry (1897) to "The Axioms of Geometry" (1899)*, in A. P. Shirokov (editor), *In Memoriam N. I. Lobachevskii*, vol. III, pt. 2. *Collection des mémoires présentés par les savants de divers pays à la Société Physico-Mathématique de Kazan à l'occasion de la célébration du bicentenaire de N. I. Lobachevsky* (Kazan, Izdat. Kazanskogo Universiteta, 1995), 104–115. Argues that "Russell's studies of non-euclidean geometry in the 1890's was a very important prelude to his later work in logic and foundations of mathematics, leading up to his work with Whitehead on the *Principia Mathematica*."

В. А. БАЖАНОВ, *Прерванный полет. История "Университетской" философии и логики в России* (Москва, Издат. Московского Государственного Университета, 1995). This monograph is a slightly expanded version of the paper originally appearing as *История "Университетской" философии и логики в России. Взгляд из Казани* in *Modern Logic* 4 (1994), 109–147.

George BOOLOS, *Gödel's second incompleteness theorem explained in words of one syllable*, *Mind* 103 (1994), no. 409, 1–3. Shows how to derive the formalized Gödel second incompleteness theorem from the Hilbert-Bernays derivability conditions using the diagonalization lemma.

George BOOLOS, *Frege's theorem and the Peano postulates*, *Bulletin of Symbolic Logic* 1 (1995), 317–326. Argues and sets out to prove that Frege "provided a consistent theory of natural numbers altogether different from those of Dedekind, Russell and Whitehead, Zermelo, von Neumann, and the several founders of combinatory logic and the lambda-calculus" since Frege derived arithmetic from Frege arithmetic, which is "equi-consistent with full second-order arithmetic" (p. 317).

Nathalie CHARRAUD, *Infini et inconscient. Essai sur Georg Cantor. Psychanalyse* (Paris, Anthropos, 1994). The author attempts to psychoanalyze Cantor and his work and to provide a psychological history of Cantor's work and its origins.

Morton N. COHEN (editor), *Lewis Carroll: Interviews and recollections* (Iowa City, University of Iowa Press, 1989). A wide-ranging miscellany of anec-

dotes, recollections and reminiscences about Lewis Carroll (Charles Lutwidge Dodgson), many focussing on his personality and personal life, some on the circumstances and background of his popular writings. It makes for easy and fast reading, but quickly becomes tiresomely gossipy. Only two give any attention to his more serious output. One of these are the excerpts by T. B. Strong, bishop of Oxford, here titled "Stories True and False" (pp. 35–39) excerpted from Strong's "Mr. Dodgson: Lewis Carroll at Oxford" (*The Times*, 27 Jan 1932, pp. 11–12), which considers, albeit briefly and in a nontechnical manner "His system of logic" (esp. pp. 36–37). The other, here titled "He 'sorely tried the patience of his publisher'" (pp. 250–256), are excerpted selections from Charles Morgan's history of the Macmillan Publishing Company, *The House of Macmillan* (1944), in which Morgan — a journalist and in no position to plausibly judge Dodgson's mathematical output — wrote (p. 254) that, "with the possible exception of his *Euclid*, none of his mathematical works was of much value to mathematicians, [although] his devotion to logic brought him in the end some reward." As a partial corrective to Morgan's uninformed judgment, see the comments on [Cohen 1995] that follow.

Morton N. COHEN, *Lewis Carroll: A biography* (New York, Alfred A. Knopf, 1995). The biographer, who is evidently not a mathematician, manages nevertheless to weave a discussion and evaluation of Charles Lutwidge Dodgson's work in mathematics and logic, its influences and its connections with Dodgson's teaching, into a biography of the life of Dodgson's alter ego Lewis Carroll. Although Cohen does not provide any mathematical detail, he assesses Dodgson's work by writing (p. xx): "Dodgson published mathematical treatises for the serious student and specialist. [. . . T]his last publication [*Symbolic Logic, Part II*] has led mathematicians and philosophers to reassess more favourably Dodgson's contributions to both mathematics and logic." He also cites (p. 498) W. W. Bartley's estimate (see pp. 31–32 of Bartley's "Editor's Preface", *Lewis Carroll's Symbolic Logic*, New York, Clarkson N. Potter, 1977) of Dodgson's innovations, including 'the "Method of Trees" to determine "the validity of what were. . . highly complicated arguments",' and semantic tableaux. Cohen also quotes (at p. 257) Francine Abeles ("Determinants and Linear Systems: Charles L. Dodgson's View", *British Journal of the History of Science* 19 (1986), 331–335) to convey something of the value of Dodgson's work in linear algebra, especially the theory of determinants.

B. J. COPELAND, *Prior's role in the development of temporal logic and the possible worlds semantics*, *Bulletin of Symbolic Logic* 1 (1995), 357–358. Abstract of a talk given at the 1994 meeting of the Australasian Association for Logic. Modal operators were invented by Arthur Prior. He and his collaborator Carew Meredith discovered possible-worlds semantics "several years ahead of Kripke" in connection with Prior's work on tense logic.

Martin DAVIS, *American logic in the 1920s*, *Bulletin of Symbolic Logic* 1 (1995), 273–278. Touches very briefly and unsystematically on some of the contributions of C. I. Lewis, Emil Post, Alonzo Church, C. H. Langford, and

Haskell Curry, and offers the lesson that should be learned is that "the development of the outlook on our subject that today we take for granted was attained only with great difficulty" (p. 277).

DEPARTMENT OF MATHEMATICS, UNIVERSITY OF CALIFORNIA AT BERKELEY, *Emeriti Legacies: Raphael M. Robinson, 1911 – 1995, Professor of Mathematics, Emeritus*, Berkeley Mathematics Newsletter III, no. 1 (Fall 1995), 12–13. Obituary of logician Raphael M. Robinson, discussing his life and major accomplishments.

DEPARTMENT OF MATHEMATICS, UNIVERSITY OF CALIFORNIA AT BERKELEY, *Emeriti Legacies: Alfred L. Foster, 1904 – 1994, Professor of Mathematics, Emeritus*, Berkeley Mathematics Newsletter III, no. 1 (Fall 1995), 13. Obituary of algebraist and algebraic logician Alfred L. Foster, discussing his life and major accomplishments.

Е. С. ДЫХ (ред.), *Логический словарь «ДЕФОРТ»* (Москва, «МЫСЛЬ», 1994). A dictionary of terms for the basic concepts, principles, and techniques used in traditional and contemporary logic conceived as deductive formal theory (hence "DEFORT"). Some of the entries include historical sketches of varying length.

Miriam FRANCHHELLA, *Heyting's contribution to the change in research into the foundations of mathematics*, History and Philosophy of Logic 15 (1994), 149–172. Heyting's contributions to investigations in foundations of mathematics at the end of the 1930s were (1) to set aside questions in philosophy of mathematics about the nature of mathematics in favor of undertaking to clarify and classify the formalist, intuitive, logical, and platonistic aspects of classical mathematics, and (2) to show that there are degrees of evidence for mathematical statements.

Miriam FRANCHHELLA, *L. E. J. Brouwer: Toward intuitionistic logic*, Historia Mathematica 22 (1995), 304–322. The evolution of Brouwer's ideas on logic is traced in order to better understand how his conception of intuitionism permitted construction of logical systems and to enable understanding of how some statements of intuitionistic logic which are now considered to be obvious came to be formulated in their correct form only after considerable work in reformulating them. In addition to a general consideration of Brouwer's ideas on logic attention is given in particular to the laws of excluded middle, testability, and reciprocity of complementarity (double negation).

Martin GARDNER, *Fuzzy logic*, Skeptical Inquirer (September/October 1995), 9–11, 56. From his column "Notes of a Fringe-Watcher", a nontechnical exposition and history of fuzzy logic and review of Daniel McNeil & Paul Freiberger's *Fuzzy logic* and Bart Kosko's *Fuzzy thinking*, focussing in particular on Kosko.

Robert GRAY, *Georg Cantor and transcendental numbers*, American Mathematical Monthly 101 (1994), 819–832. After noting that various commentators disagree as to whether or not Cantor's demonstration of the existence of transcendental numbers, in terms of his proof that the real numbers are denumerably infinite, is constructive, it is noted that Cantor produced two different

proofs of the denumerability of the reals, both of which are constructive. It is also suggested that the reason Cantor's proofs were viewed as being non-constructive was that Felix Hausdorff gave a nonconstructive proof in 1895.

Leon HENKIN, *In memoriam: Raphael Mitchel Robinson*, *Bulletin of Symbolic Logic* 1 (1995), 341–343. A brief account of Robinson's life and his most important work on recursive functions and r.e. sets, on decision problems, and on problems of definability.

Robert V. HINE, *Josiah Royce: From Grass Valley to Harvard* (Norman, Okla./London, University of Oklahoma Press, 1992). This biography of Harvard philosopher Josiah Royce (better known for his work in philosophy than for his work in logic), the son of a fruit peddler in California, takes its perspective from Royce's own attestation (made shortly before he died in 1916) that all of his most basic values were formed as the product of his childhood in the American frontier West.

Darryl JUNG, *The vicious-circle principle*, *Bulletin of Symbolic Logic* 1 (1995), 383. Abstract of a talk given at the 1994-1995 annual meeting of the Association for Symbolic Logic. After noting that Russell put forth his vicious circle principle as a solution to the modern paradoxes under the prodding of Poincaré, the author defends the principle against criticisms by Gödel and Quine.

Kenneth Laine KETNER (editor), *Peirce and contemporary thought: Philosophical inquiries* (New York, Fordham University Press, 1995). This collection contains papers based on the plenary talks delivered at the Charles S. Peirce Sesquicentennial International Congress held at Harvard University on 5–10 September 1989. Of special interest are: Hilary Putnam, "Peirce's Continuum", pp. 1–22, in which Peirce's views on the continuum, infinitesimals, and the metaphysics of potentiality is contrasted with Aristotle's views and Peirce's work in set theory is placed within the context of the then-contemporary work of Dedekind and Cantor; W. V. Quine, "Peirce's Logic", pp. 23–31, in which Quine argues that Peirce participated in developing a number of important results (in particular quantification), and that, even if he did not always come in first, he was in his day sometimes more influential than those who did, and that he did anticipate Shannon's application of Boolean algebra to switching theory; Randall R. Dipert, "Peirce's Underestimated Place in the History of Logic: A Response to Quine", pp. 32–58 (note a typo on p. 33, where ' π ' should be ' Π '), in which it is declared that Peirce has been given short shrift in history of logic in favor of Frege, Peano, and Russell, but which also duly warns that caution must be exercised by those who would otherwise redress the balance too far in favor of Peirce. Also of interest are: Isaac Levi, writing on "Induction According to Peirce" (pp. 59–93) and Joseph S. Ullian's "On Peirce on Induction: A Response to Levi" (pp. 94–99), Carolyn Eisele's "Charles S. Peirce, Mathematician" (pp. 120–131), Helena M. Pycior's "Peirce at the Intersection of Mathematics and Philosophy: A Response to Eisele" (pp. 132–145), and Joseph W. Dauben's "Peirce and History of Science" (pp. 146–195).

Saunders MAC LANE, Letter to the Editor: Comment on Davis's Letter,

Notices of the American Mathematical Society **42** (1995), 1117. Mac Lane mentions that, while he was at Göttingen, “my good friend Gerhard Gentzen [. . .] helped me translate my thesis into German [. . .].”

Saunders MAC LANE, *Mathematics at Göttingen under the Nazis*, Notices of the American Mathematical Society **42** (1995), 1134–1138. Mac Lane gives an account of his impressions and experiences of the political and social situation while studying at Göttingen in 1931–33, with mentions that Bernays, an *ausserordentlich Professor* was at that time working with Hilbert in logic and “on the preparation of the prospective Hilbert-Bernays book *Grundlagen der Mathematik*” (p. 1134) while there were also working at Göttingen “many young *Privatdozenten and Assistenten*, including. . . Arnold Schmidt (logic) [. . .] and eager students, including Gerhard Gentzen (logic) . . .” (p. 1135).

Anthony J. MACULA, *Lewis Carroll and the enumeration of minimal covers*, Mathematics Magazine **68** (October 1995), 269–274. An application of Dodgson’s set diagrams (called by the author “Lew k -grams”) to find and depict the solution of the problem in combinatorics of computing the minimal ordered covers of finite sets with k -many members. The Lew k -grams are just the counter diagrams used by Carroll in *The Game of Logic* (1886).

Caroline MOOREHEAD, *Bertrand Russell: A life*, New York, Viking and London/Victoria/Toronto/Auckland, Penguin Books, 1993. Most of the 28 pages of Chapter 4, “*Aristoteles Secundus*” deal with Russell’s work on logic. The treatment is non-technical. Nothing new will be learned either about Russell’s work or his relations with Whitehead or others, although it is worth comparing Moorehead’s treatment of work on *Principia Mathematica* and the Whitehead-Russell collaboration with the extensive and informed treatment accorded to these topics in Victor Lowe’s biography of Whitehead (*cf.* Lowe, *Whitehead: The Man and His Work*, vol. I: 1861 – 1910, Baltimore/London, Johns Hopkins University Press, 1985, esp. pp. 221–294). The bulk of the nearly 600 pages are concerned with Russell’s private and public life rather than with his work *per se*. The portrait that emerges of Russell’s personality and character is not altogether flattering.

Ш. Ф. МУРТАЗИН, «О круговых диаграммах Эйлера», in В. S. Chendov (editor-in-chief), *Methodology of Mathematical Modelling/Методология математического моделирования. Seventh International Interdisciplinary Symposium on Methodology of Mathematical Modelling*, June 10–15, 1994), V (Sofia, Никольская, 1994), 161–162. An interpretation of Euler diagrams for traditional categorical syllogisms in terms of first-order logic.

Graham PRIEST, *On an observation of Hilbert and Bennays [sic]*, Bulletin of Symbolic Logic **1** (1995), 357. Abstract of a talk given at the 1994 meeting of the Australasian Association for Logic. Discussion of a result found in Hilbert and Bernays’ *Grundlagen der Mathematik* which is similar to the standard interpretation of Tarski’s theorem.

W. V. QUINE, *Selected logic papers* (Cambridge, Mass., Harvard University Press, enlarged edition, 1995). See Jonathan Weinberger’s review, THIS ISSUE. In addition to the material that Weinberger mentions, this new edition also includes

Quine's paper, of interest to historians of logic, "Peano as Logician", which is a reprint, with emendations, of a paper appearing in vol. 8, 1987 of *History and Philosophy of Logic* and which was first printed by the mathematics department of the University of Turin in 1986 for their Proceedings of the 1982 conference *Celebrazione in Memoria di Giuseppe Peano*. The paper "Peirce's Logic" included in this new edition and analyzed by Weinberger in his review is a slightly abridged version of the same paper appearing in Kenneth Laine Ketner (editor), *Peirce and Contemporary Thought: Philosophical Inquiries* (New York, Fordham University Press, 1995), pp. 23-31.

N. Ya. VILENKIN (Abe Shenitzer, transl.), *In search of infinity* (Basel/Boston/Berlin, Birkhäuser, 2nd, enlarged, ed., 1995). Popular history of infinity in mathematics and physics.

Philip YAM, *Profile: Martin Gardner, the mathematical gamester*, *Scientific American* 273 (no. 6, December 1995), p. 14. A highly personal portrait of the popular doyen of recreational mathematics and logic and puzzle inventor.

Е. А. ЗАЙЦЕВ, *Семантическая структура логики Дж. Пеано, Историко-математические исследования* 32-33 (1990), 146-157. Argues that the Italian logic school of Peano can be understood only in terms of the analytic structure of its calculus. (First listed in "Bibliographic Notes" without an abstract in *Modern Logic* 3 (1992), 54.)