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REVIEWS

The Association for Symbolic Logic publishes analytical reviews of selected books and articles in the field of symbolic logic. The reviews were published in ***The Journal of Symbolic Logic*** from the founding of the JOURNAL in 1936 until the end of 1999. The Association moved the reviews to this BULLETIN, beginning in 2000.

The Reviews Section is edited by Steve Awodey (Managing Editor), John Burgess, Mark Colyvan, Anuj Dawar, Noam Greenberg, Rahim Moosa, Ernest Schimmerling, Alex Simpson, Kai Wehmeier, and Matthias Wille. Authors and publishers are requested to send, for review, copies of books to *ASL, Box 742, Vassar College, 124 Raymond Avenue, Poughkeepsie, NY 12604, USA.*

In a review, a reference "JSL XLIII 148," for example, refers either to the publication reviewed on page 148 of volume 43 of the JOURNAL, or to the review itself (which contains full bibliographical information for the reviewed publication). Analogously, a reference "BSL VII 376" refers to the review beginning on page 376 in volume 7 of this BULLETIN, or to the publication there reviewed. "JSL LV 347" refers to one of the reviews or one of the publications reviewed or listed on page 347 of volume 55 of the JOURNAL, with reliance on the context to show which one is meant. The reference "JSL LIII 318(3)" is to the third item on page 318 of volume 53 of the JOURNAL, that is, to van Heijenoort's *Frege and vagueness*, and "JSL LX 684(8)" refers to the eighth item on page 684 of volume 60 of the JOURNAL, that is, to Tarski's *Truth and proof*.

References such as 49***5*** or 280***1*** are to entries so numbered in *A bibliography of symbolic logic* (the JOURNAL, vol. 1, pp. 121–218).

JAN KRAJÍČEK. ***Forcing with random variables and proof complexity.*** London Mathematical Society Lecture Note Series, vol. 232. Cambridge University Press, 2011, xvi + 247 pp.

Bounded arithmetic has many intimate connections with feasible computational complexity and questions related to the P versus NP problem. Indeed, the original definition of bounded arithmetic, in the form of $I\Delta_0$, by R. Parikh was motivated by connections with linear space computation. It was subsequently recognized that the Δ_0-definable sets are exactly the sets computable in the linear time hierarchy (a subclass of linear space, but not known to be a proper subclass). The early research by C. Dimatracopoulos, J. Paris, A. Wilkie, and others found many connections between bounded arithmetic and computational complexity. With the definition of the bounded arithmetic theories PV by S. Cook, and S^i_2 and T^i_2 by this reviewer, and many subsequent works, the connections between bounded arithmetic and computational complexity became central. In these theories, the core motivations were to characterize the provably total functions of logical theories in terms of computational complexity: the complexity classes considered are feasible, or near-feasible, such as log space, polynomial time, non-deterministic polynomial time, polynomial space, etc.

Bounded arithmetic is also closely connected to propositional proof complexity. There are two primary connections. First, J. Paris and A. Wilkie showed that certain proofs in bounded arithmetic can be translated into polynomial size, or quasipolynomial size, constant depth propositional proofs. A different kind of correspondence between PV (and S^1_2) and

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