we are later told of the various philanthropic achievements Bowen was later involved in, especially with regards to universities and education in South Africa, this ambiguity is later cleared up. Weiss Malkiel's sensitive approach to Bowen's extramarital affair with a student is frank and honest, however, contemporary readers may not be fully convinced or persuaded by Weiss Malkiel's personal perspective.

It is, however, Weiss Malkiel's personal touch which makes the book all the more engaging, and by the end the reader truly feels that they have come to know Bill Bowen through the words of those who knew him best and through Weiss Malkiel's compassionate lens. This book is a wonderful achievement and celebration of a colossal figure in American education, and cements Bowen's earned legacy as a pioneer of modern education. While not necessarily applicable for learning about classroom practice, the stories of Bowen's use of Socratic method, his blending of interpersonal skills and data as well as his striving for outstanding performers, of all backgrounds, in education surely offer lessons in improving education for any reader. Additionally, Bowen's awareness of the power of online learning, long before its necessities were realised during Covid, further demonstrate his ability to look ahead in education with realism and optimism—offering a lesson for educators grappling with the introduction of new technologies today. For those who know Princeton, this will be an especially insightful read, and for those who are interested in learning more about the inner workings of Higher Education, including non-university foundations, this book is recommended without reserve.

Michael Quinn, 67 Oakfield Avenue, Glasgow G12 8LP; https://orcid.org/0009-0008-2896-4334; m.quinn.2@research.gla.ac.uk.

Foundations of Logic: Completeness, Incompleteness, Computability

Dag Westerståhl

Stanford, Calif.: Center for the Study of Language and Information, 2023; paperback, xiv + 451 pp., $45.00; ISBN 9781684000005

SAEED SALEHI

"The world is not short of good introductions to logic." So wrote Peter Smith as the first sentence of the preface to his *Introduction to Formal Logic* (Smith 2003); he has also written a good *Introduction to Gödel's* (incompleteness) *Theorems* (Smith 2007). Dag Westerståhl excuses himself for writing another introductory logic book, a big one indeed, by saying in his preface that "there never is a textbook that covers exactly what you would like it to cover, or in exactly the way you think is the right way, [so] the temptation to write your own book is strong" (xiii), which I do not fully agree with. The audience of this book constitutes "a wide variety of students [who ideally have] already

 pp. 460–463
DOI: 10.5840/teachphil2024473221

taken an introductory logic course [and may study] not only mathematics . . . but also . . . philosophy, linguistics, computer science, physics, and other subjects" (xiii).

The book's subtitle divides the foundations of logic into *completeness*, *incompleteness*, and *computability*. "Completeness" refers to the completeness of classical propositional and predicate logics with respect to some semantics, thus bridging the two subfields of logic, "proof theory" and "model theory." This book contains a good amount of another subfield of logic, "computability theory"; it leaves out the fourth pillar, "set theory," that used to be included traditionally in the old big books of logic, such as Mendelson's (1964). I shall not discuss what this book is missing, since I believe that the most difficult task of a book author is to decide what to *exclude* rather than what to *include*. Big books like this (that begin with elements of logic, prove the completeness and incompleteness theorems, and include some computability theory) date back to Enderton's classic (1972), though that is not a very big book; Hedman's (2004) is a more recent and bigger one. Even though Westerståhl's book contains some good explanations of the completeness theorem (87–88, 101–02), proved for propositional classical logic by Bernays in 1918—and independently by Post in 1920—and for first-order classical logic by Gödel in 1930, it does not explain why the celebrated incompleteness theorem is called such. One reason is that this fundamental result of Gödel (1931) implies that second-order classical logic (Exercise 12.10.33 on pp. 298–99) is not complete with respect to its standard semantics; hence the name. Before presenting my suggestions on the suitability of this book for teaching in classrooms or for self-studying, let me list some of the weak and strong points of the book, which are my very personal viewpoints and not necessarily shared by anyone else.

The language of the whole book is in urgent need of fine-tuning. A thorough editing by a native speaker or an author with a good command of the English language would have been a great help to the readers. The broken language of the book is not even consistent; I am not going into any details. As Hardy once said, "there is no permanent place in the world for ugly mathematics" (Hardy 1940: 85). Westerståhl uses some non-standard and rather untidy notation, e.g., for bounded quantifiers; these are a kind of distraction for following his text. The exercises show up almost always at the end of each chapter; the exercises are among the strong points of this book, by the way. Only in chapter 3, we have "Exercises for Chapter 3.1" (65) and "Exercises for Chapter 3.1" (80). In the appendix, which presents some prerequisites on "Sets, functions, relations," the exercises appear at the end of each section. I wish this was also practiced in the other chapters, thus making the book smoother and faster to study. Some easier exercises that help the reader understand the topics better could appear at the end of each section; the more difficult ones, most of the starred exercises, could come at the end of each chapter to challenge the learners and carve the subject into their brains. The book also needs a stylish repair (e.g., fixing the overfull lines on pp. 44, 68, 82, 327, 328, 352, and 420). I finish my criticisms with a couple of notes on mathematics and history. (*i*) Three rules are introduced for equality logic, as follows (64):

$$(=)_1 \frac{}{t=t}, \text{ and } (=)_2 \frac{s=t \quad \varphi(s)}{\varphi(t)} \quad \frac{t=s \quad \varphi(s)}{\varphi(t)}.$$

The second rule of $(=)_2$ is redundant since, for proving (17) $\forall x \forall y(x=y \rightarrow y=x)$, a few lines later, only $(=)_1$ and the first rule of $(=)_2$ are used. (*ii*) The function $\overline{sg}$, defined by $\overline{sg}(0) = 1$ and $\overline{\mathrm{sg}}\ (x) = 1$ for $x > 0$, is the dual of the *sign* function, defined by $sg(0) = 0$ and $sg(x) = 1$ for $x > 0$ (196–97). Later on, for every P.R. function f, the function $\bar{f}$ is defined differently (eq. 67, p. 210). This notation is not uniform; notice that $\bar{f}$ is later used in Fact 8.8.2 (210) and Exercise 8.9.26 (214). (*iii*) The term "Goldbach-like" *statement* was not invented by Torkel Franzén (286); Gödel talked about the "problems of Goldbach type" from the 1930s (whose variants appear in the first two volumes of his collected works).

Despite these shortcomings, the book has some good features too. A rather unique aspect is the inclusion of some sections on the back-and-forth technique and generalized quantifiers and a sketch of (a proof of) Lindström's theorem (sections 6.9–6.11), which do not appear in most of the other introductory logic books. I should note however that Hinman's book (2005) and the book of Ebbinghaus, Flum, and Thomas (1984) discuss these topics (especially Lindström's theorem) more extensively and, I believe, better than Westerståhl's. However, I very much like his explanation on decidability vs. undecidability (176) and the helpful list of arithmetization levels (262). The exercises in the book are also interesting and sometimes challenging; my favorites are Exercises 2.4.12, 6.13.40, 8.9.29, 12.10.9–10, and 15.14.21.

In conclusion, the book offers very little more than the other books, big, medium, or small, in or out of the market. I doubt if purchasing the book, which could have finished before Section 13.2 (318), pays off with this bit of extra material. I cannot even recommend a second edition; at most, a *reprint with corrections*, after tidying up the arguments and a thorough rewriting, could be a better choice for students or teachers. In fact, there are quite a number of strong and freely available expositions out there; for example, the two volumes by Zach (2021) and Hallett and Zach (2021) of the Open Logic Project (https://OpenLogicProject.org/), since 2015, cover the main topics of this book more clearly and in a more learner- and instructor-friendly manner.

Bibliography

Ebbinghaus, Heinz-Dieter, Jörg Flum, and Wolfgang Thomas. 1984. *Mathematical Logic*. Springer.

Enderton, Herbert Bruce. 1972. *A Mathematical Introduction to Logic*. Academic Press.

Hallett, Michael, and Richard Zach. 2021. *Intermediate Logic: An Open Introduction*. The Open Logic Project.

Hardy, Godfrey Harold. 1940. *A Mathematician's Apology*. Cambridge University Press. Reprinted with Foreword by C. P. Snow, 1967. Page reference is from the 2012 reprint. (See https://t.ly/C9WLr for the quoted text.)

Hedman, Shawn. 2004. *A First Course in Logic: An Introduction to Model Theory, Proof Theory, Computability, and Complexity*. Oxford University Press.

Hinman, Peter Greayer. 2005. *Fundamentals of Mathematical Logic*. CRC Press.

Mendelson, Elliott. 1964. *Introduction to Mathematical Logic*. D. van Nostrand Reinhold.

Smith, Peter. 2003. *An Introduction to Formal Logic*. Cambridge University Press. (See https://t.ly/jLuxL for the quoted text.)

Smith, Peter. 2007. *An Introduction to Gödel's Theorems*. Cambridge University Press.

Zach, Richard. 2021. *Incompleteness and Computability: An Open Introduction to Gödel's Theorems*. The Open Logic Project.

Saeed Salehi, Research Center for Bioscience and Biotechnology (BCRR), University of Tabriz, P.O. Box 51666–16471, Tabriz, Iran; root@SaeedSalehi.ir.

Kant, Race, and Racism: Views from Somewhere

Huaping Lu-Adler

New York: Oxford University Press, 2023; hardcover, 424 pp., $110.00; ISBN 978-0-19-768521-1

ALEXANDER SCHWITTECK

Huaping Lu-Adler's pioneering volume *Kant, Race, and Racism: Views from Somewhere* is the first book-length contribution that exclusively deals with Kant's raciology. For a long time, Kant scholars have largely ignored or downplayed the significance of the explicit racist comments made by Kant. It is only since the turn of the millennium that interpreters have increasingly dealt with these passages. This can be attributed to the fact that a broad, polyphonic, and controversial debate on the racist and colonialist legacy in Enlightenment philosophers' writings has been sparked in academic philosophy—not at least under the influence of the newly established Postcolonial Studies and Critical Race Theory. We are in debt to Lu-Adler and like-minded scholars for drawing attention to Kant's raciology, highlighting its often-neglected importance within his philosophical system, and posing the question of how we relate to Kant and his writings as scholars and educators.

Primarily, many interpreters were puzzled by the narrow hermeneutical question of how one can square Kant's racist beliefs with his universal moral philosophy. Lu-Adler straightforwardly tackles this question in her book by arguing that Kant is by no means contradicting himself and that his moral universalism and racist particularism can exist simultaneously. Concretely, she argues that "Kant held a consistent inegalitarian position through and through, a position that required no cognitive dissonance on his part. That is, he held and taught racist views without having to contradict the supposed core of his moral (or political) philosophy—when the latter is read literally."

 pp. 463–467
DOI: 10.5840/teachphil2024473222