The book contains a helpful discussion of two of Quine's doctrines: holism and naturalism. Colyvan uses these doctrines to defend the indispensability argument against various critics, such as Hartry Field and Penelope Maddy.

A doctrine of Quine which Colyvan tacitly assumes is that to be is to be a value of a bound variable. Long ago Arthur Prior attacked this doctrine. Prior made a distinction between referential quantification and non-referential quantification, maintaining that it is only the former which has ontological import. There is no mention of Prior's criticism of Quine in this book. However, that criticism is relevant to the indispensability argument. For if Prior's point is sound and if mathematical quantification used in science is not referential quantification, then that quantification is not ontological.

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*Reason's Nearest Kin. Philosophies of Arithmetic from Kant to Carnap*
By MICHAEL POTTER
Oxford University Press, 2000. x + 306 pp. £30.00 cloth, £14.99 paper

The title of Michael Potter's book, *Reason's Nearest Kin*, is a reference to Gottlob Frege's *Foundations of Arithmetic (Grundlagen der Arithmetik)*. There, Frege claimed that in arithmetic we are concerned with "objects given directly to our reason and, as its nearest kin, utterly transparent to it" (Frege, §105). Potter's book focuses on the fifty-year period from Frege's *Grundlagen* in 1884 to Carnap's *Logische Syntax der Sprache* in 1934, but includes a first chapter on Kant as background. The topic is focused as well: the subject is the arithmetic of the natural numbers and the question whether it is possible to give an account of arithmetic that does not make its truth depend upon contingent facts about the world, yet does not leave the fact that it applies to the world mysterious.

Potter points out that most of the authors he discusses—Kant, Frege, Dedekind, Russell, Wittgenstein, Ramsey, Hilbert, Gödel and Carnap—were either mathematicians or knew a lot of mathematics, excepting only Wittgenstein (p. 3). The remark about Wittgenstein's relative lack of advanced mathematical background is interesting, for it is Wittgenstein who broke from his contemporaries in employing the notion of an operation and—rightly or wrongly (Potter thinks the latter)—insisted it was important not to confuse the notions of operation and function. Although it is not yet well-known in philosophy, a notion of operation applicable to a situation was employed in the proof that provided a purely logical basis for the methodology of experimental engineering models in a way that allowed the highly mathematical field of theoretical hydrodynamics to be united with practical hydraulic engineering research, and that the institution in Manchester, England where Wittgenstein was an engineering research student prior to going to Cambridge to study philosophy with Russell was important historically in bringing that union about (see S.G. Sterrett, 'Physical Pictures: Engineering Models circa 1914 and in Wittgenstein's *Tractatus*', in Michael Heidelberger and Friedrich Stadler (ed.) *History and Philosophy of Science: New Trends and Perspectives*, Vienna Institute Yearbook 2001/9, Kluwer, 2002.)

Putting Potter's project in longer perspective, something the mathematicians and philosophers he discusses have in common is that their work relates to problems in analytic philosophy of language; even the chapter on Dedekind discusses questions in philosophy of language such as what Dedekind's 'structuralist' approach would have to say about the meaning of 'slithy toves' in Lewis Carroll's 'Jabberwocky' (p. 85). Berkeley, Hume, Mill and Poincaré, however, appear only in passing. The mathematician Georg Cantor is not included, either, even though Cantor described his accomplishment in defining ordinal types and cardinal numbers as "the natural extension of the concept of number" and, he thought, one that could not be further generalised (Cantor, *Contributions to the Founding of the Theory of Transfinite Numbers* (Dover 1955), p. 117). Given the importance of the foundations of set theory to many of the authors discussed, and that Frege was unsettled by some of Cantor's methods, I was looking forward to seeing Cantor discussed in the book. This disappointment, however, is a matter of wishing to hear more from the book's author than it is a criticism of the book he has chosen to write.

Potter's book covers an amazing amount in under 300 pages, and covers it extremely well. It provides stimulating critical analysis as well as clear expositions of Kant, Frege, Dedekind, Russell, Wittgenstein, Ramsey, Hilbert, Gödel and Carnap on providing foundations for arithmetic. The discussions are informed by a wide range of sources on each writer, including correspondence and posthumously published manuscripts. Because Potter's expositions and critical analyses are put so clearly and concisely, the discussions are accessible, but don't be surprised if it takes some time to reach the end of the book. I found myself stopping to re-read primary sources frequently, as Potter's discussion made me see a previously unappreciated insight or problem, or made me rethink something I had previously thought uncontroversial.

Even on the points with which I disagree, Potter's discussion is helpful in clarifying those points. One of the things I especially appreciate about the book is that Potter is generally very clear about what a writer he is discussing has actually said, and what is a matter of interpretation or the spinning out of consequences of a claim. The book is written in tightly formulated paragraphs and progresses quickly and smoothly from one incisive point to the next. It ends with a chapter summarising how well Potter thinks the various views discussed in the book do in answering the questions with which he opened it. He concludes that none of the proffered accounts of sources of arithmetical truth accounts for both its necessity and its applicability. He proffers an account of his own that he thinks does, but admits it is problematic.

Potter's philosophical conclusions are largely negative. Philosophically, the book is more a ground-clearing effort than a blueprint for a new edifice. But it is unusually incisive and focused. Secondary literature is not much discussed. The emphasis is on the investigations in which the mathematician-philosophers discussed were engaged, in evaluating their results, and, finally, in reflecting on what can be learned from surveying them. Thus, although philosophers who specialise in the subject will find the discussions in this book broadening and thought-provoking, advanced undergraduate and graduate students who have not yet read the secondary literature can profitably read it alongside the primary texts. One might want to supplement it with a bibliography of relevant secondary sources when recommending it to such students. However, it is wonderful that there is now such a book to recommend, and that it is such a good one. A corrected edition was published in 2002; *kudos* to Oxford University Press for making it available as a reasonably priced paperback.

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