Halle influenced the formation of Baumgarten's philosophical views, as Schwaiger, Dyck and others have already pointed out; but if Baumgarten is one of the Pietist critics of Wolffian rationalism, it is also the case that he is not a complete Leibnizian. Nuzzo, for one, is careful to draw attention to the differences between Baumgarten and Leibniz, but for the most part Baumgarten's departures from Leibniz are less attended to than those from Wolff.

That said, this collection does succeed in stripping Baumgarten of the label of a mere 'member of the Wolffian school', which has long been appended to him. The picture of Baumgarten that emerges from this collection is of a much more innovative, even lively thinker, in part as a result of his immersion in the competing intellectual traditions of his day. Thus this collection constitutes an important contribution to the ongoing Baumgarten renaissance.

Shiori Tsuda
Toyo University
Email: tsuda@toyo.jp

References

Aichele, Alexander, and Mirbach, Dagmar (2008) *Alexander Gottlieb Baumgarten: Sinnliche Erkenntnis in der Philosophie des Rationalismus. Aufklärung 20*. Hamburg: Meiner.

Allerkamp, Andrea, and Mirbach, Dagmar (2016) *Schönes Denken. Baumgarten im Spannungsfeld von Ästhetik, Metaphysik und Naturrecht. Zeitschrift für Ästhetik und Allgemeine Kunstwissenschaft, Sonderheft 15*. Hamburg: Meiner.

Baumgarten, Alexander Gottlieb (2013) *Metaphysics: A Critical Translation with Kant's Elucidations, Selected Notes, and Related Materials*. Ed. and tr. Courtney D. Fugate and John Hymers. London: Bloomsbury Publishing.

—— (2020) *Baumgarten's Elements of First Practical Philosophy: A Critical Translation with Kant's Reflections on Moral Philosophy*. Ed. and tr. Courtney D. Fugate and John Hymers. London: Bloomsbury Publishing.

Lange, Joachim (2019) 'Joachim Lange: A Modest and Detailed Disclosure of the False and Harmful Philosophy in the Wolffian Metaphysical System (1724)'. In Corey W. Dyck (ed. and tr.), *Early Modern German Philosophy (1690–1750)* (Oxford: Oxford University Press), 135–55.

Look, Brandon C. (2018) 'Baumgarten's Rationalism'. In Courtney D. Fugate and John Hymers (eds), *Baumgarten and Kant on Metaphysics* (Oxford: Oxford University Press), 10–22.

Carl Posy and Ofra Rechter (eds), *Kant's Philosophy of Mathematics*, vol. 1. *The Critical Philosophy and its Roots*. Cambridge: Cambridge University Press, 2020. Pp. x + 321. ISBN 9781107042902 (hbk) £75.00

Following a 1983 conference at Duke University, Carl Posy edited a volume titled *Kant's Philosophy of Mathematics: Modern Essays* (Posy 1992) that effectively launched a new subfield of Kant studies. Posy included the handful of already seminal treatments of Kant's theory of mathematics from the 1960s and 1970s as well as exciting new work from Michael Friedman, Jaakko Hintikka, Charles Parsons and several others. The volume collected papers on a range of issues, from Kant's general theory of the mathematical method to his specific views of arithmetic, geometry and algebra; some of the papers further examined the connection between Kant's thoughts about

https://doi.org/10.1017/S1369415423000031 Published online by Cambridge University Press

mathematics and his theories of space, time, intuition, concepts, transcendental idealism and empirical realism. The collection delineated a set of interpretive debates that attracted a new generation of scholars to a fertile area of historical and philosophical scholarship.

Since then, the field has developed in many exciting directions. The classic Hintikka–Parsons debate on the nature and role of Kantian intuition influenced subsequent scholars to use the 'logical/phenomenological' distinction as a useful framework for their own ideas, and fairly narrow questions about intuition widened to include a variety of related interpretive issues that bear on Kant's general understanding of mathematical cognition. Michael Friedman has continuously refined and developed his interpretation of Kant's philosophy of mathematics since his original article on Kant's theory of geometry, and has mentored an entire cohort of younger scholars inspired and challenged by his ideas. And all of the other contributors to the original volume were instrumental in advancing the field via their own continued research and their tutelage of younger scholars interested in Kant's philosophy of mathematics.

In 2020, nearly thirty years after the original volume, Carl Posy and Ofra Rechter published the first volume of a projected two-volume collection, again titled *Kant's Philosophy of Mathematics*. The collection also succeeds a conference, which brought many of the original contributors together with a new generation of scholars in Jerusalem in 2009. The first volume of the new collection, subtitled *The Critical Philosophy and its Roots*, will be discussed here; the second volume, subtitled *Reception and Influence,* is forthcoming.

The volume is divided into four parts, each part comprising three chapters. 'Roots' addresses Kant's pre-critical philosophy of mathematics; 'Method and Logic' collects essays on inference, the logic of intuition and meta-mathematical questions; 'Space and Geometry' and 'Arithmetic and Number' take up issues in Kant's theory of geometry and arithmetic, respectively. There is perhaps less thematic coherence in each of the first two parts than in each of the latter two, but the four parts do mark a natural division among the topics that have interested scholars in the wake of the original volume. In what follows, I provide a brief description of each contribution, followed by a concluding remark about the whole.

Relating to part I, Kant and his contemporary Moses Mendelssohn famously competed for an essay prize sponsored by the Berlin Academy on the topic of whether the mathematical method can be used in philosophy; Mendelssohn won and Kant took honourable mention. Katherine Dunlop explores 'Kant and Mendelssohn on the Use of Signs in Mathematics', arguing for a kind of formalist understanding of Kant's pre-critical philosophy of arithmetic, and showing how Mendelssohn's own view of the subject and method of mathematics compares to Kant's. Dunlop's contribution brings out the nuances of the two competing views, and uses Mendelssohn's view to good effect in understanding Kant's. Along the way, Dunlop provides a useful discussion of Kant on the arbitrariness of mathematical concepts.

In his 'Kant on Mathematics and the Metaphysics of Corporeal Nature: The Role of the Infinitesimal', Daniel Warren performs an acute analysis of Kant's position on the infinite divisibility of space and matter, from the pre-critical essay *Physical Monadology* to the critical *Metaphysical Foundations of Natural Science*. He shows that at both stages Kant distinguishes material from spatial adjacency, and then carefully spells out how,

https://doi.org/10.1017/S1369415423000031 Published online by Cambridge University Press

for Kant, the idea of the infinitesimally small enables the mathematical representation of physical contact.

In his 'Of Griffins and Horses: Mathematics, Metaphysics, and Kant's Critical Turn', Carl Posy identifies and aims to solve 'the riddle' of Kant's critical turn in a chapter whose prose is both spirited and technically precise. Posy claims that key doctrines expressed in Kant's critical works are to be found in his pre-critical works, thus undermining Kant's own account that he has changed his view, and presenting interpreters with a riddle. He solves the alleged riddle by invoking contemporary semantics to illuminate Kant's critical reconciliation of mathematics and transcendental philosophy, a reconciliation unavailable using the Leibnizian resources of the pre-critical philosophy.

Turning to part II, in his chapter on the theory of mathematics, Jaakko Hintikka doubles down on his well-known and much-discussed 'logical' interpretation, the source of his classic debate with Charles Parsons. In the course of his defence, he claims to make 'nonsense of much of recent discussions of Kant's theory of mathematics and of the role of intuition there'. This result is overstated; Hintikkas's discussion would have benefited from a more productive engagement with the recent literature. However, it is interesting to witness Hintikka revisit his influential interpretation.

Mirella Capozzi's chapter 'Singular Terms and Intuitions in Kant' offers a 'reappraisal' (and rejection) of Hintikka and Thompson's views on singular terms and intuitions. This chapter is among the most clear and insightful of the volume, bringing together many texts in an especially enlightening way. Capozzi analyses the gap between intuitions and concepts and explores the role that intuitions play in the formation of concepts, ultimately offering an historically rich account of singular concepts and the objectivity of intuitions. Unfortunately, Kant's philosophy of mathematics is not addressed until the final paragraph; this is a disappointment given the relevance of these results to an interpretation of mathematical concept construction.

Desmond Hogan has the ambitious goal, in his 'Kant and the character of mathematical inference', of resolving 'longstanding textual and conceptual puzzles' about Kant's view of the syntheticity of mathematics. He analyses a series of interpretations that lead to very different accounts of Kant's view of mathematical proof and of the role of intuition in mathematical reasoning, arguing that the key to Kant's real view lies in seeing Crusius as his primary intellectual target. Along the way, Hogan offers an especially helpful discussion of Kant's notion of 'intuitive containment'. Hogan's rewarding chapter manages to be a paradigm example of carefully contextual history of philosophy while also bearing on problems in analytic philosophy that transcend Kant's philosophy of mathematics.

Moving to part III, Jeremy Heis's 'Kant on Parallel Lines: Definitions, Postulates, and Axioms' is a strikingly original take on Kant's own original reflections on parallel lines. He shows that Kant's theory of mathematical definitions led him to reject extant definitions of parallel lines. Moreover, on the basis of what he argues is Kant's systematic distinction between axioms and postulates, as well as Kant's engagement with the mathematics of his time, Heis claims that Kant would have considered Euclid's notorious 'parallel postulate' an axiom, distinct from practical and indemonstrable propositions such as Euclid's postulates 1, 2 and 3. Heis's argument gives us new insight into the early evolution of philosophical debates about the parallel postulate, and thus illuminates an historical episode that was at the origin of a revolution in formal mathematics and logic.

Gordon Brittan's 'Continuity, Constructibility, and Intuitivity' is a breezy but trenchant exploration of how these three notions cohere in Kant's theory of mathematics. Along the way, Brittan gives helpful overviews of interpretations offered by Russell, Friedman and Posy in order to situate his own remarks in contrast to theirs.

Michael Friedman tackles §26 of the B-Deduction in his 'Space and Geometry in the B Deduction' and adds another dimension to the rich interpretation of Kant's theory of geometry that he has been building across multiple books and essays. Here he begins by offering a reading of the notorious footnote at B160n., attributing the possibility of constructions in geometrical space to the unity of metaphysical space, and moves from there to an explication of Kant's main argument in §26. Friedman's interpretation of this small section of the *Critique* radiates to all corners of Kant's critical thought, illuminating the essential role that the transcendental unity of apperception plays in the mathematical representation of the structures of space and of time.

Turning, finally, to the contributions that make up part IV, Daniel Sutherland's chapter, 'Kant's Philosophy of Arithmetic: An Outline of a New Approach', is a *précis* of a project that will interpret Kant on arithmetical cognition from a non-traditional vantage. From Sutherland's perspective, traditional debates over the role of intuition in arithmetic reasoning threaten to obscure key issues about Kant's conception of number, including whether Kant's was a cardinal or ordinal conception, or both. This chapter functions in part as an extended abstract for work that Sutherland published in his 'Kant's Conception of Number' (Sutherland 2017).

Emily Carson's 'Arithmetic and the Conditions of Possible Experience' is a complex and philosophically rich exploration of the relation between Kant's account of arithmetic and the suppositions of his transcendental philosophy. On Carson's view, Kant makes arguments in support of the conditions of possible experience that serve also to justify conditions on the possibility of mathematics, even though these arguments do not rely on mathematical evidence. In this chapter, she explains how Kant provides a metaphysical grounding for arithmetic by offering a unifying account of the comments on number that Kant makes through disparate parts of his project, including the Aesthetic, the Deduction, the Schematism, the Principles and the Discipline. Carson has unearthed a distinctive and compelling feature of Kant's transcendental philosophy, and the precision of her thought and writing brings the difficult topic into clear focus. Her chapter engages productively with other interpretations, and she is masterful at situating Kant's philosophy of mathematics in the broader context of his transcendental philosophy.

'Kant on "Number"', by William Tait, is perhaps the most provocative chapter in the collection. Tait's main claim is that when Kant speaks of the 'arithmetic' of 'numbers', he means to refer to operations on the positive real numbers. Here Tait diverges from a robust interpretive tradition that understands Kant to be referring to whole numbers. In defending his view, Tait offers up a fascinating set of reflections on a large variety of related topics, which include pure intuition and the generality of geometric reasoning, number(ing) as a schema, construction and existence claims in Euclid and Hilbert, and eighteenth-century number theory. He marshals a considerable number of texts and historical figures to make his case. The breadth of Tait's observations, together with his interpretive provocations, make this a stimulating chapter with which to engage.

This volume, especially when paired with the original, is an invaluable overview of the state of the field. Posy and Rechter have convened the most exciting authors on Kant's philosophy of mathematics for their two-volume project, and every contribution here enlightens. In many places in the book, the authors feel to be in conversation, even when they are not directly supporting or opposing each other's positions. Many of the chapters intersect in captivating ways: Capozzi with Hintikka, Heis with Friedman, Sutherland with Tait, Carson with Dunlop, Friedman and Sutherland.

The progression from the original volume to the current work shows that in the past three decades scholarly evidence of Kant's philosophy of mathematics has become more inclusive of Kant's writing beyond the first *Critique*, and scholars themselves have become more sensitive to the historical context of Kant's thought. The introduction to the volume, written by the editors, is itself a very clear and useful overview of the whole field. Students and scholars alike will be enormously grateful for this resource.

Lisa Shabel
The Ohio State University
Email: shabel.1@osu.edu

References

Posy, Carl (ed.) (1992) *Kant's Philosophy of Mathematics: Modern Essays*. Dordrecht: Springer.
Sutherland, Daniel (2017) 'Kant's Conception of Number'. *Philosophical Review*, 126(2), 147–90.