Reviews

RUSSELL'S LOGICISM THROUGH KANTIAN SPECTACLES

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Anssi Korhonen. *Logic as Universal Science: Russell's Early Logicism and Its Philosophical Context*. (History of Analytic Philosophy series) Basingstoke, UK, and New York: Palgrave Macmillan, 2013. Pp. x + 277. ISBN: 978-0-230-57700-8. £55; US$85.

This new contribution to Palgrave Macmillan's popular *History of Analytical Philosophy* series (edited by Michael Beaney) aims to outline the distinguishing philosophical outlook of Bertrand Russell's early logicist period, exemplified most notably by Russell's classic *The Principles of Mathematics* of 1903. The key themes of the book are Russell's views in mathematical methodology and mathematical ontology, the universal applicability and nature of logic, and the relationship of logical and mathematical knowledge to the distinction between form and content in ontology and semantics. Throughout, Russell's views are contrasted with the views of Kant and like-minded philosophers, who in many ways dominated the philosophical landscape prior to the emergence of analytic philosophy.

The first chapter, "Russell's Early Logicism: What Was It About?", aims to differentiate how Russell understood his logicist project from the rather different aims of other philosophers with whom Russell is often lumped: Frege and logical empiricists such as A. J. Ayer and the members of the Vienna Circle. Korhonen notes aptly that while these thinkers were all in some sense logicists, their logicist aims were quite different: "there were in fact as many logicisms as there were logicists" (p. 21). In contrast to others, it was not principally important for Russell that mathematics be shown to be analytic. Russell gave different accounts of analyticity in different places. When employing a purely Kantian notion of analyticity on which analytic truths must be non-informative, Russell concluded that mathematics and logic were *both* synthetic à priori. When operating instead with a more Fregean notion of

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analyticity, on which all of modern logic counts as analytic, Russell claimed instead that mathematics is analytic. It was important for Russell that the "logic" to which mathematics could be shown to be reduced was the sophisticated and rich symbolic logic developed only at the end of the nineteenth century, not the more sterile syllogistic logics that had come before. Korhonen sees Russell's project as a natural outgrowth in the increase in *rigour* brought about in nineteenth-century mathematics by its expansion into such areas as non-Euclidean geometry, and the increased interest in foundational aspects of other areas, such as real analysis. According to Korhonen, the importance of this increase in rigour in mathematics was not exclusively epistemological, but semantic, in that it made it easier to see how best to define certain mathematical concepts, allowing for the first time the definitions in terms of logical constants given by Russell.

The relationship between Russell's philosophy of mathematics and Kant's looms large in the next two chapters. Chapter 2 delves into the Kantian and Russellian notions of mathematical methodology. Korhonen stresses an often overlooked similarity between Russell and Kant: both believed that the forms of judgment and reasoning used in traditional logic were inadequate to capture the semantic content and distinctive reasoning patterns necessary for mathematics. Citing, for example, the need for "construction postulates" in Euclidean geometry, Kant came to adopt what Korhonen dubs a "construction semantics": the distinctive meaning or semantic content of mathematical concepts derives from the constructibility of instances of such concepts in pure intuition. Russell's criticism of Kant's philosophy of mathematics is often portrayed merely as the observation that more recent researches have shown that spatial diagrams are not necessary in mathematical proof. As Korhonen interprets Kant, however, mathematics requires an appeal to intuition not just in reasoning but for the very meaningfulness of its concepts. However, by sketching the development of Russell's understanding of mathematical notions from his pre-logicist intuitionist period until his embrace of contemporary logic through the Peanist school, Korhonen argues that Russell's criticism runs deeper. Russell believed that the source of the distinctive content of mathematical concepts and judgments could be sought in our grasp of logic, which early Russell himself took to be synthetic à priori. A more general comparison of their respective views of the synthetic à priori is taken up in the third chapter. It can roughly be seen as a kind of defence of Kant against Russellian criticisms. On the Kantian picture, a judgment is synthetic à priori when its truth is required by the conditions of our possible experience. Korhonen interprets Russell and other commentators as holding that this commits Kant to the view that the kind of necessity synthetic à priori judgments enjoy is a merely relative necessity. Rather than being true in all logically possible worlds, they are true in those worlds in which certain kinds of

cognitions and experiences occur, much like "physically necessary" propositions are those true in all those worlds in which the actual laws of nature obtain. Korhonen argues that this conception of modality is alien to the Kantian project, and that for Kant, one cannot think of there being a larger "space of possibilities" in which what is synthetic à priori does not hold. Instead, the very conceivability of the content of the judgments in question requires the presupposition of these truths. As a contribution to Kant interpretation, Korhonen's thesis here seems plausible; unfortunately I think the chapter sheds little light on Russell's positive views.

In Chapter 4, "Russell's Ontological Logic", Korhonen explores early Russell's notion of a proposition considered as a mind-independent complex object. In the early parts of the chapter, he considers Russell's undifferentiated notion of *term*, i.e., Russell's contention that every entity whatever is capable of occurring in a proposition as a logical subject. Only certain entities—concepts (predicates and relations)—are capable of occurring in a proposition in a relating or predicating way, whereas all entities may occur as subject on Russell's early views. Thus, the relating relation of Love that Russell believes provides the unity of the proposition *Socrates loves Plato* is the same as that which occurs in a non-relating way in *Love is a virtue*. Because the difference between a relating relation and one that does not relate is not the relation itself (we have the same entity in each), Russell once wrote that the difference must be one of "external relations". Korhonen suggests that this commits Russell to the view that it is not in fact Love itself that is responsible for the unity of the former proposition, but these external relations. However, Korhonen never provides much of an explanation of the difference between internal and external relations, and without further elaboration, I found Korhonen's charge that there is a problem here too thin to be convincing. Korhonen then sketches early Russell's views on propositional functions and formal implication. This material is mostly well done, with the exception that Korhonen misleadingly suggests that the notion of propositional function is one Russell inherited from Peano. In fact, Russell himself invented the notion as a *corrective* to a *failure* on the part of Peano and others of the period to distinguish clearly between propositions and propositional functions (*PoM*, §13; Peano's own failure to distinguish them is clear in a quotation Korhonen himself includes on p. 129). In the later parts of the chapter, Korhonen sketches Russell's views that *logic* can be considered a branch of science, aiming to uncover truths of the highest generality concerning certain fundamental relations between propositions. Quite adeptly, however, Korhonen counters the view that this commits Russell to rejecting all kinds of meta-logical or formal semantic research, as has been alleged by such commentators as Dreben and van

Heijenoort. Following Landini,[1] Korhonen notes that one can distinguish the science of logic from the study of logical theories or logical calculi. The consideration of, for example, a different semantic interpretation of a certain formula in a logical calculus in which it comes out false does not require one to reject the truth of the general proposition the formula is usually meant to represent.

The final chapter, "Russell and the Bolzanian Conception of Logic", is the longest and in many ways the most interesting. Korhonen argues there that Russell rejected the Kantian conception of logic as being formal in the sense of lacking content, and adopted something more like a Bolzanian conception of logic on which the form/content distinction is not fully absolute. For early Russell, a logical truth is supposed to be absolutely or fully general, and not about this or that thing, property or relation. However, given Russell's understanding of the variable as unrestricted, even *x's being human implies, for all x, x's being mortal* is, in the relevant sense, about absolutely everything; yet this is not a proposition of logic. This leads Russell to claim that propositions of logic must contain *only* variables and logical constants such as class-membership and implication. However, early Russell was unable to provide a very useful account of what differentiates logical constants from others. Logic is a science not different from other sciences, has true propositions as its goal, and has a subject matter: the concepts the logical constants represent. While discussing Russell's views on inference, Korhonen seems to me to misunderstand Russell's attitude about the relationship between material and formal implication (implication for all values of a variable). Russell maintains that an inference of the form $A \supset B$, A, therefore B, is useful or practical when $A \supset B$ is an instance of a formal implication known to be true. Otherwise, $A \supset B$ could only known to be true on the grounds that A is false (in which case the minor premiss would be unavailable) or that B is true (in which case the conclusion is already known). Korhonen seems to infer from this that Russell thinks that the inference from $A \supset B$ and A to B is necessarily *mediated* by a formal implication, such as the following: for every p and q, p's implying that p implies q implies that q. I do not see why Korhonen draws this conclusion, and overall I find this discussion too brief to be helpful. He does, however, defend Russell against the oft-given charge that he conflated inference rules and axioms by calling both "primitive propositions". Korhonen cites (pp. 206–8) Russell's discussion of Lewis Carroll's puzzle about inference in §§38–45 of the *Principles* as evidence against this. In the later parts of the chapter, Korhonen describes what he sees as Russell's moving away from the Bolzanian conception of logic in later years, after giving up on propositions as objective entities and rejecting the view that logical constants represent genuine

[1] Gregory Landini, *Russell's Hidden Substitutional Theory*, pp. 30–41.

entities of the world. While later Russell seems to retain certain features of his early views—for example, that all genuine entities are alike as possible logical subjects in ascriptions or predications—the schematic notion of form or structure required for the Bolzanian conception of logic is unavailable when facts replace propositions as the centrepiece of Russell's metaphysics. Moreover, Russell came to believe that a statement can be true, and contain nothing but variables and logical constants, and yet not be logically true or logically necessary.

Overall, my evaluation of this book is mixed. The brief foray into later developments in Russell's thought at the end of the final chapter is welcome, but too brief. Russell's philosophical career was long and far reaching, and it is inevitable that a scholarly treatment will cover some portions better than others. Nevertheless, there are several other places where at least a brief discussion of changes to Russell's views would have added significantly to Korhonen's discussion. For example, in Chapter 4, Korhonen presents difficulties as he sees them with Russell's account of propositions, but only in Chapter 5 does he discuss Russell's abandonment of propositions with the introduction of his multiple relations theory of judgment, and nowhere does Korhonen discuss the transition between these views. This leaves the reader in the dark as to whether or not the kinds of difficulties discussed by Korhonen in Chapter 4 were responsible for Russell's change of mindset. It also seems odd, given Korhonen's discussion in the early parts of Chapter 5 of whether or not Russell had a positive account of the nature of logical constants, that Korhonen never discusses in detail Russell's 1911 attempt to provide a definition of a logical constant (see *Papers* 6: 35–7). These are only examples. Some books concerned with the philosophy of logic and mathematics make the mistake of using too much formal symbolism at the expense of informal explanation. Korhonen's book, if anything, makes the opposite mistake. There are almost no symbols in the book, and most discussions are left at a high level of generality. All of Korhonen's discussions would have benefitted from more explicit examples, from deductions of mathematical results to exemplify differences in attitude between Russell and Kant about mathematical methodology, to formulas written with only logical constants and variables to demonstrate the strengths and weaknesses of the Bolzanian conception of logic. Given this, it is somewhat surprising, however, that many if not most of Korhonen's main interpretive positions are plausible. Certain of Korhonen's insights, such as the semantic importance of logical rigour, the synthetic apriority of logic itself for early Russell, the compatibility of Russell's universalism with logical metatheory, and so on, make the book a worthwhile read for those of us interested in Russell's technical philosophy. The book's attractions are also likely to be strong for those interested in a comparison between Kant's views on logic and the philosophy of mathematics and those prevalent in analytic philosophy,

since Kant features so prominently (and sympathetically) in Korhonen's study.

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ACCIDENTAL NUCLEAR WAR AND RUSSELL'S "EARLY WARNING"

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Eric Schlosser. *Command and Control: Nuclear Weapons, the Damascus Accident and the Illusion of Safety*. New York: Penguin P.; London: Allen Lane, 2013. Pp. xxiii + 632. ISBN: 978-1594202278. US$36; CDN$38; £25.

Eric Schlosser has given us a very important and much needed look at the history of US nuclear weapons safety. The book is well researched and, despite its subtitle, is more than a history of nuclear weapons safety. In the course of developing his thesis that nuclear weapons have been—and continue to be—a shockingly dangerous part of the post-WWII world, we get not only a tutorial on nuclear weapons and delivery systems, but a fascinating and eye-opening account of the dynamic of the nuclear arms race, replete with inter-service rivalries, ideological fanaticism, and the struggle for civilian control. It was this dynamic which gave us obscenely bloated nuclear arsenals and a military leadership that too often favoured weapons reliability over safety.

The story is cogently covered in the course of recounting in considerable detail what has to be one of the most frightening of US nuclear weapons accidents (and there were hundreds[1])—viz. the 18 September 1980 accident in

[1] A Sandia Laboratory study found at least 1,200 "serious" accidents involving nuclear weapons between 1950 and 1968. The most serious are called "broken arrows" in Defense Department parlance. These include unauthorized launch, release of a