

**SEAN MORRIS:**

**Quine, New Foundations, and the Philosophy of Set Theory**

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Even if we disregard for a moment the usual series of companions (where *all* the achievements and fields of interests of the respected scholars are discussed), W. V. O. achieved much and broad attention from philosophers and historians. He was usually discussed as an epistemologist, a philosopher of language and of science, and as a logician. What got less attention is Quine as a *philosopher of mathematics* in general and as a *philosopher of set theory* in particular. Sean Morris' recent book, with its laconic, but unambiguous title, *Quine, New Foundations, and the Philosophy of Set Theory*, aims to change the game and rehabilitate Quine as a philosopher of set theory. With a similarly laconic and spoiled claim: Morris succeeds.

The book is masterly structured: it has mathematical parts (understandable for the laymen as well), historical parts (introducing the heroes of the story, with some of their context and background), and philosophical ones (producing original and suggestive arguments in contemporary debates). Morris also formulated some sharp theses as well; he shows that the fact there is one overwhelming set theory in textbooks is the result of certain historical events and not of necessity; that Quine saw very well this situation and his own set theory presented itself as an important and legitimate alternative; that Quine's philosophy of set theory is an accurate exemplification of his general philosophy. Let's take these ideas in order.

When Georg Cantor formulated set theory in the nineteenth century, it was the expression of a simple, but appealing idea, namely that every predicate has an extension and this extension determines the set. Thus the objects falling under the concept of spoon accounts for the set of spoons. Simple as it is, Cantor was able to perform a detailed and captivating mathematical work on numbers and especially on the various infinities (much of the core of Cantor's ideas are presented by Morris in an easily approachable manner). Nonetheless, just within a few decades, Bertrand Russell has shown that though the mathematical apparatus of sets are of utmost importance for mathematics, logic, and thus also for philosophy, something is wrong. According to Russell, if we take the set-determining idea unrestrictedly, we run into serious troubles; if every predicate has an extension and thus determines a set, then comes Russell's paradox. "If [the set of all non-self-membered sets] is a member of itself, then it is not a member of itself; and if it is not a member of itself, then it is a member of itself – hence a contradiction" (p. 2).

This paradox caused a major disruption both in the philosophy of mathematics in general and in the philosophy of set theory in particular. Something had to be done. Russell famously worked out his type theory where he could provide a solution. Thus a certain class (or set)  $x$  has only members which are at a lower level; hence one cannot formulate such sets that contain themselves as well; so no paradox. Though Russell's way of resolution gained a certain reputation (many philosophers, among others, Frank Ramsey and Quine himself worked on its simplification and further development), other players gained a foothold on the field. Ernst Zermelo, with his conception of set theory (later elaborated by Fraenkel, thus the name, Zermelo-Fraenkel (ZF) set theory), found another way to overcome the initial difficulties prompted by Cantor's, usually called, naive conception of sets. ZF says that sets are just collections that are formed out of their members through such an iterative process that is encoded in the axioms of the theory. By means of rigorous axiomatization (see especially Chapter 6), ZF avoids the dangerous Russell paradox.

This line of history might be seen as a way of forging the perfect and only set theory that captures the essence of sets. But Morris shows that the systematization, that is, the history of set theory "has largely been, and remains, a battle of competing intuitions about what sets are like" (p. 40). Most argumentations of the abovementioned scholars came down to such patterns that focused on two things: (1) avoiding the paradox encapsulated in the naive theory by saving as much of the original mathematical strength of set theory as possible (as Morris says, "including enough of Cantor's original theory to serve as a foundation for mathematics", p. 51); (2) harmonizing the new theory with one's own further commitments. Morris calls this approach "set theory as explication" (p. 1), since what matters are certain pragmatic criteria to achieve a well-determined goal; the quest of ultimate foundations of set theory, the unrevealing of sets' essence was not on the table. "We have here just a dispute of intuitions over what sets are like" (p. 46).

Quine arrived into this web of argumentation in the early 1930s when he tried to simplify Russell's and A. N. Whitehead's enormous *Principia Mathematica*. His attention quickly turned towards set theory and he started to publish important papers in the mid-1930s that dealt with related issues. By 1937, his land-marking article about "New Foundations for Mathematical Logic" has appeared with Quine's own way of overcoming the Russell paradox, and thus a wholly new set theory emerged. Leaving the details of Quine's theory behind (as they do not matter for us now and they are well-presented in Morris's book), what we shall see here is Quine's general methodology.

"While we find definite aspects of it in the work of Georg Cantor, Bertrand Russell, and Ernst Zermelo," claims Morris (p. 85), "Quine was really the first to fully

develop this conception as an explicit philosophical approach to set theory.” Quine’s task was simplification and clarification of our conceptual toolkit that included the apparatus of mathematics and set theory as well. He provided reasons and values to favor his own version of set theory, just like all the other major figures in the history did. One of the main results of Morris is that he has shown quite convincingly that although many have criticized Quine for deviating much from the set theory of ZF and thus prompted an alternative and undesirable account of set theory, his views were as legitimate and mathematically motivated as others. By asking how Quine’s own conception was expelled from the canon of set theories, Morris argues that it was due to the (both popularizing and scholarly) works of George Boolos whose arguments in favor of the iterative (that is, of the ZF) conception gained the support of many leading philosophers of mathematics. But the choice and preference of the ZF theory document a new trend towards the subject, namely what Morris called “philosophy as conceptual analysis which aims to discover a single correct notion of set”.

In fact, Morris claims that those values that are attributed to ZF by Boolos are not at all that convincing, and the theory occupies actually not that outstanding position as much of the literature conceives it. Although the author does not show that Quine’s theory would be any better (though there are some hints of Morris’s preferences), he plausibly argues that one shall at least consider it as a viable alternative. Nor the present situation (ZF’s alleged overwhelming merits), nor the history of set theory forces us to accept any theory (not especially ZF) as the ultimate theory that captures the alleged essence of sets. Rather, both history, and contemporary philosophical situation point towards “set theory as explication”.

During his career as a philosopher, however, Quine never aimed at anything like that of a “single correct” result or idea. “Quine approaches set theory as an explorative project much like the rest of science” (p. 65). While philosophers do not have any advanced super-knowledge above the sciences and about their foundations, they can provide conceptual clarifications and simplifications. This is what we see in Quine’s major work, *Word and Object*, regarding epistemology, language, science, and their complex interaction, and in fact, Quine’s big book on *Set Theory and Its Logic* (from 1963) “stands alongside *Word and Object* as one of his greatest philosophical achievements” (p. 186); this is a highly exciting, though controversial and unfortunately somehow a bit underdeveloped idea of Morris.

What may prompt the reader further as a bit of tension here is the following idea. According to Quine’s naturalism, the measure of all things is science (taken broadly), thus the task of philosophers might be no more (and no less) than conceptual clarifications and not to set directions and foundation for the sciences. Nonetheless, what we see here in the field of set theory (and thus in mathematics) is somehow the contrary. Quine

provides “new foundations”, reorganizes a whole field, and disregards previous results, based on his own (overall and holistic) commitments. Does he supersede his own naturalism here? Not necessarily, one could argue, since set theory is much like logic in being a tool, thus apt for reorganization and external simplification (though Quine thought that redefining logical operations we do not get a new logic, but simply leave behind logic, that is, it was not at all obvious for Quine that we can engineer alternative logics).

On the other hand, set theory seems to be a well-defined terrain of theoretical science as well, thus it is at least questionable that how deeply Quine can get into the field with his revisions. Though Morris provides many philosophical ideas and arguments in his book (especially in the sections about the relation of Quine to Carnap), the reader is still left a bit unsettled about the measure of the mathematical and the philosophical parts of his monograph. (Unfortunately, for example, Morris notes only in a footnote on page 105 that although Quine’s sometimes miniature, sometimes too abstract conceptual alterations might seem to be, if not unphilosophical, but still philosophically insignificant for many, in fact, “[f]or Quine, they are central to his philosophical endeavor, and this is very telling about his aims in the philosophy of set theory and in philosophy generally.”)

The edition is of the usually high quality from Cambridge University Press, it has almost no typos, and the cover fits the new trend in Quine scholarship (that is, it has a nice, previously unpublished photo of Quine). Morris’s book fills thus some gaps in our knowledge about and understanding of Quine’s philosophy in general and his philosophy of mathematics in particular. The author contributes many important insights to the literature and familiarizes the reader with an important aspect of Quine’s career. In fact, given the number of books and articles Quine devoted to logic, mathematics, and set theory, the dominance of *Word and Object* as the defining book from and about Quine is highly questioned. New foundations for a new Quine started to emerge.

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