Willard Van Orman Quine's Philosophical Development in the 1930s and 1940s

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1 The History of Analytic Philosophy and the Early Quine's Place within It

Willard Van Orman Quine (1908–2000), pioneer of mathematical logic, champion of naturalism in the philosophy of science and epistemology, atheist, materialist, unifier of an austere physicalism with the truth of logic and mathematics, globetrotter, polyglot, Harvard stalwart and celebrated naval officer, was both an establishment figure and a free-thinking radical. Quine's life began shortly after the emergence of analytic philosophy. He was soon to become one of its towering figures. Taught by A. N. Whitehead, interlocutor to Rudolf Carnap, Alfred Tarski, and Ruth Barcan Marcus, teacher of Donald Davidson and David Lewis, Quine was on the scene of the development of modern set theory, logical positivism, modal logic, truth-conditional semantics, and the metaphysics of possible worlds. Hardly a significant new movement in analytic philosophy passed him by. Yet Quine's relationship to many of these movements is surprisingly ill-understood. Everyone knows that the logical positivists, including Quine's mentor, Carnap, sought to place truth and meaning on a proper scientific footing by countenancing only *a priori* analytic and *a posteriori* empirically testable statements as properly significant. Quine, initially a devoted Carnap acolyte, soon developed reservations about the dichotomy between analytic truth by definition and empirically testable synthetic truth. All scientific truths, he famously argued in "Two Dogmas of Empiricism" (Quine 1951), rely upon both at once, and both are revisable under sufficient theoretical pressure. Quine's rejection of the analytic–synthetic distinction was once viewed as revolutionizing the philosophy of science and logic. But, strangely, these days Quine himself is commonly portrayed as a flat-footed positivist, a deflationist, a behaviorist, an anti-metaphysician, whose

objections to modal logic turn on superficial scope errors.[1] He has been the victim of his own success, his smooth prose distilled into catchy slogans – "the web of belief," "the myth of the museum," "to be is to be the value of a variable," "no entity without identity," "gavagai!" – liable to be misunderstood out of context. A highly original thinker who set himself against common analytic ways of speaking and thinking, Quine is easily misread because his oeuvre is vast, systematic, and largely unconstrained by many of the conceptual categories laid down by other analytic philosophers. To remedy misconceptions about him caused by out-of-context readings of his work, we must consider Quine's writings and influences from an historical point of view, extending the boundaries of the history of analytic philosophy to include the mid to late decades of the twentieth century.

Most research on analytic philosophy to date has concentrated on the early period, nearly all of it centered around Frege, Russell, and Wittgenstein, occasionally including Carnap and the Vienna Circle. Recently, some historians have ventured into scholarly work on Quine, especially on the early evolution of his position on analyticity (e.g. Creath 1990a, Ben-Menahem 2005, Mancosu 2005, Hylton 2007, Ebbs 2011). Quine's previously unpublished lectures and records of his conversations with Tarski and Carnap, revealing the development of his views in the 1940s, have begun to come out posthumously (Quine 2008a, 2008b, Frost-Arnold 2013). But one significant text has remained entirely unexplored. No one to date has paid any heed to Quine's fourth book on logic and its philosophy, a book written with great urgency as he prepared to bid farewell to logic and philosophy while readying himself for war in 1942, a book that in a letter to Carnap he presented as a major turning-point (Quine 1990b, 299).

How did it come about that none of those meticulous Quine scholars have cited, or even read, this book? Because Quine wrote it in Portuguese, under the title *O Sentido da Nova Lógica*, during a visiting professorship at the Free School of Sociology and Politics of São Paulo. Anglophone philosophers have so far neglected it because they could not read it. An English translation never appeared, apart from a few sections translated by Quine himself, published in the *Journal of Philosophy* in 1943 as "Notes on Existence and Necessity" (Quine 1943). Although generations of Brazilian logicians grew up with *O Sentido da Nova Lógica* (da Costa 1997, 688), and Mario Bunge translated the book into Spanish (Quine 1958), Quine modestly declined to translate it into English, claiming that the insights it contained had been

[1] For such portrayals of Quine, see for instance Price 2009, 325–326, Shaffer 2009, 348–361, Tahko 2011, 28. For rebuttals of these, see Janssen-Lauret 2015, 151–154 and Janssen-Lauret 2017, 250–255.

supplanted by later, better worked-out versions (Quine 1997, 8). For contemporary philosophers and historians of analytic philosophy, by contrast, such gradual shifts and their contribution to the development of Quine's mature views are part of the fascination the book holds. A full English translation of it is now finally seeing the light of day. Walter Carnielli, William Pickering, and I have jointly translated the book, which appears in this volume under the title *The Significance of the New Logic*. In this accompanying essay I will draw out the main philosophical contributions Quine made in the book, placing them in their historical context and relating them to Quine's overall philosophical development during the period.

The 1930s and 1940s were a time of great intellectual upheaval in the field of logic and its philosophy. What Quine calls "the new logic" in the title of this book – modern mathematical logic rather than the old Aristotelian paradigm – was gaining momentum throughout Europe and the United States, being put to use in a variety of different ways by analytic philosophers, mathematical logicians, pragmatists, logical positivists, and the Polish School in their attempts to make sense of contemporary developments in science and mathematics. Among the applications Quine mentions in the Introduction to this book are transfinite mathematics, the logicist project, the incompleteness of arithmetic, proof theory, solutions to the set-theoretic and semantic paradoxes, formal theories of truth, and new approaches to ontology. Quine had come to Brazil to introduce these methods and their applications to philosophers and scientists there, for many of whom this was entirely new territory.

Although written as a logic textbook, *The Significance of the New Logic* also contains intriguing philosophical material. It is known, for example, for the first appearances of Quine's doctrine of pure vs. impure designation – including his famous example of the impurely designative occurrence of "Giorgione" in "Giorgione is so-called because of his size" – which he excerpted for "Notes on Existence and Necessity," and of the virtual theory of classes, to which he was later to give a key role in *Philosophy of Logic* (Quine 1970) and *Set Theory and Its Logic* (1963). Much of the emerging historical literature on Quine concentrates on the evolution of the young Quine's semantic holism, his opposition to the analytic-synthetic distinction, and his philosophical relationship with Carnap. Several careful historical-philosophical works chart Quine's development from his earliest worries about analyticity in the 1930s, via the influence of Tarski in the 1940s, to his mature "Two Dogmas" view of 1951 (Creath 1990a, Hylton 2001, Ben-Menahem 2005, Mancosu 2008, Frost-Arnold 2011). Analyticity and Quine's rejection of conventionalism about meaning are among the key themes discussed in this book. Quine clearly

considered *The Significance of the New Logic*'s sections on meaning and analyticity to be of consequence, since he selected them for publication in "Notes on Existence and Necessity." The ideas expressed in them also led to an intense exchange of letters between him and Carnap on their semantic differences over the course of 1943 (Creath 1990a, 295–377).

But, I will argue, this book is driven just as much by the philosophy of logic and ontology. These too were major motivating factors for the early Quine, although they have thus far not received as much attention in the historical literature. Much of the content of *The Significance of the New Logic* is best understood by considering Quine as part of a broader historical narrative, which I lay out in section 2; a précis of the main philosophical moves of the book follows in section 3. Quine is presented as an interlocutor not only to Carnap but also to Tarski, to Frege, to Quine's Ph.D. supervisor Whitehead, and to Whitehead's co-author Russell. Their three-volume magnum opus *Principia Mathematica*, inspired by Frege's new mathematical logic and his logicist thesis that mathematics was reducible to logic, had been the subject of Quine's 1932 Ph.D. thesis and of his first book based on that thesis (Quine 1934a). He began to appreciate Frege, whose work was difficult to get hold of in the United States at the time, a few years later. Unlike Carnap, these early analytic philosophers held that, in addition to epistemology and the analysis of language, metaphysical questions about existence and the nature of things were central to philosophy, too. The early Quine, I show, had much in common with Carnap, but not anti-metaphysics. Young Quine inclined, as Tarski had done, toward the modest metaphysics of nominalism, holding out hope for a unified science with a modest, concrete ontology (section 4). In this book Quine also made refinements to, and developed further arguments for, his own ontological views – including his four-dimensionalism – and his theory of ontological commitment (section 5). The crucial work on analyticity, modality, and impure designation familiar from "Notes on Existence and Necessity" is considered in its original Portuguese framing, and revealed to be entwined with Quine's commitment to extensionalism, and his desire to avoid abstract posits such as propositions and modal concepts (section 6). Lastly, I explore how his nominalistic leanings informed his philosophy of logic and mathematics (section 7).

2 The Historical Story: The Early Quine and the Period Leading up to *The Significance of the New Logic*

A deep admiration of *Principia Mathematica* had originally brought Quine to Harvard to work on a Ph.D. with Whitehead. Unfortunately, Whitehead had lost interest in mathematical logic some years before, when he had begun to devote himself to making sense of Einstein's general relativity by way of an involved and idiosyncratic event ontology. The more metaphysically cautious Quine concentrated on purging the *Principia* system of use–mention confusions. He completed his Ph.D. on that topic, under Whitehead's rather lax supervision, in just two years. At the suggestion of Feigl, Quine then secured a postdoctoral grant to travel to the European continent, in search of more like-minded spirits: the philosophers and logicians of the Vienna Circle and Polish School, but most of all Carnap.

Carnap's philosophy was driven first and foremost by a quest to make sense, in a scientifically respectable way, of truth, meaning, and justification as used in the empirical sciences, and in logic and mathematics. In addition, it was driven by anti-metaphysical attitudes. Opposition to metaphysics was common among Carnap's colleagues of the Vienna Circle and the Polish School. It was motivated to an extent by justified fears among those left-leaning intellectuals about metaphysics in the neo-Thomist, Heideggerian, and Hegelian styles finding their way into and fuelling the rise of fascist ideologies on the European continent (Uebel 2016, § 2.3). Carnap also thought of anti-metaphysics as an outgrowth of his semantic and epistemological project, his appeal to mathematical axioms as playing the role of implicit definitions of mathematical terms (Creath 1990b, 5–6). Quine had fallen under Carnap's spell because of his semantics and epistemology. He admired Carnap's attempts to put logic and mathematics on a naturalistically solid footing. He was less taken with Carnap's anti-metaphysical attitudes, which he came to reject some time before he had articulated well-developed objections to Carnap's position on analyticity. Quine shared Carnap's pragmatist sympathies and was not drawn to traditional metaphysics of the Platonist, neo-Aristotelian, or Hegelian kind. Yet he took existence questions arising from science and mathematics seriously. He did not consider them to be rendered meaningless or obsolete by Carnap's program. In this respect he resembled Frege, Russell, and Whitehead, as well as American pragmatists such as Peirce and James, not Carnap. Perhaps Quine had failed to develop an anti-metaphysical streak in part because the metaphysics of his culture of origin was much more sober and naturalistic than that of the cultures surrounding Carnap. Whitehead's event-ontology, James's empiricist anomalous monism, and Russell's project of logical construction, although not entirely

Quine's style, were all informed by those philosophers' respect for empiricism and science. Unlike Carnap, Quine did not have cause to associate metaphysics with dangerous political authoritarianism. He always favored a modest, empirically informed ontology.

In July 1934, some months before delivering the Carnap lectures (1990a [1934]) that he was later to call "abjectly sequacious" (Quine 1991, 266), Quine published his third journal article. It was his first publication on a topic other than mathematical logic. Its title was "Ontological Remarks on the Propositional Calculus," and its aim was to undermine what he describes as Frege's and Wittgenstein's views that sentences are the names of special logical posits, such as propositions or truth values. In 1936, in "Truth by Convention," he first published some of his reservations about analyticity. But those reservations were still fairly mild, elaborating on a suggestion made in the first Carnap lecture that it is easy to add further truths to the category of analytic stipulations (Creath 1990b, 30–31, Ben-Menahem 2005, 252–255). It would take him more than ten years to come to an alternative account of meaning, truth, and justification. As we will see in section 6, by the time of *The Significance of the New Logic* Quine, though expressing some hesitation, continued to draw on the notion of analyticity (see pp. 89–93 below). By contrast, Quine's account of ontology evolved far less hesitatingly, and more quickly. His theory of ontological commitment was almost fully formed by 1939. Two papers dating to that year express a version very close to the mature theory – except for some modifications which this book sheds light on, discussed in section 5. While certain expressions designate objects – these papers say – others, the syncategoremata, are meaningful without designating. If existentially generalizing on some expression is truth-preserving, that indicates that the expression designates an entity. In this way we can dispel apparent difficulties about nonexistence claims lacking subject matter, and meaningfully compare the advantages of nominalistic vs. realistic languages (Quine 1939a, Quine 1966 [1939]). The earlier of the two 1939 papers was not published until 1966, the *Erkenntnis/Journal of Unified Science* volume it was due to appear in having been derailed by the Second World War.

The Nazi occupation that precipitated that war proved catastrophic for Quine's friends, the members of the Polish School and the Vienna Circle. Many of them were Jewish, or left-wing and politically active. Those who could fled to the United States or the United Kingdom. Several of those who could not were murdered by the Nazis, such as the logicians Janina Hosiasson, Adolf Lindenbaum, Moses Presburger, and Mordechaj Wajsberg. The Polish logicians had made a significant impression on Quine. Tarski's name occurs frequently in *The Significance of the New Logic.* Łukasiewicz is also cited in its

short bibliography. Another small sign of Polish influence is Quine's use of Kotarbinski's term "gnoseology" (meaning "theory of knowledge"; see the title of Kotarbinski 1966 [1929])[2] to rebut Carnap's conventionalism (see p. 14 below).

Quine had looked on in horror as Hitler occupied more and more of Europe in the late 1930s. He regularly voiced his worries about their European friends in letters to Carnap, who had already emigrated to the United States in 1935 (Quine 1990b, 260–268). Tarski, who was Jewish, arrived in 1939. He held a temporary position at Harvard for some time, partly thanks to Quine's efforts (Quine 1990b, 268). There he discussed logic, meaning, truth, and mathematical finitism with Quine and Carnap in 1940–41. Carnap's shorthand transcripts of their conversations have recently been deciphered, translated, and published (Frost-Arnold 2013). Tarski maintained – with Quine, against Carnap – that some scientifically respectable sense could be made of the old nominalism–Platonism debate (see also Quine 1990b, 295). A truly nominalistic mathematics, not invoking abstract numbers, sets, or expression types, might have to be finitist if there is a finite number of physical things in the universe, which Tarski thought might be the case (Carnap 2013 [1940–41], 153). It follows that certain statements generally held to express analytic mathematical truths, such as those expressing the existence of infinite sets or series, turn out not to be analytic after all. Discussing these ideas with Tarski may well have sparked or encouraged Quine's idea that it is possible not only to add extra analytic stipulations to our theories as he had maintained in 1936 but also to subtract some of them (Mancosu 2005, Frost-Arnold 2013, 84–87). By the early 1940s Quine had not yet completely given up on analyticity; it would take him another ten years to express in print the view that any stipulation is potentially revisable.

As the war raged on in 1941 and 1942, Quine was left with little time for philosophical research (Quine 1996, Preface). Having felt duty-bound to help defeat the Nazis, he had signed up for a technical assignment in the US Navy. His time was wholly taken up by a combination of teaching and preparing for his war work, until he was offered, and accepted, a three-month visiting professorship in São Paulo. A keen amateur linguist already proficient in French and German, Quine had picked up some conversational Portuguese while on sabbatical in the Azores in 1938. He was allowed to defer his commission as a naval officer, and flew to Brazil in May 1942. First, he delivered a lecture, "Os Estados Unidos e o Ressurgimento da Lógica," whose translation appears alongside the book in this volume, to the União Cultural Brasil–Estados Unidos. But his primary task was a Portuguese-

[2] Thanks to Thomas Uebel for bringing this point and Kotarbinski's book to my attention.

language lecture course aiming to introduce the new logic to Brazil, both its technical advances on the old Aristotelian logic and its potential for scientific and philosophical applications. The philosophy he had lacked the time to work on began once again to fall into place. He received significant help with the Portuguese from his Brazilian assistant, Vicente Ferreira da Silva, whose book on mathematical logic (Ferreira da Silva 1940) he had previously reviewed, and who later became a well-known existentialist (Quine 1997, 6). With Ferreira da Silva's help, Quine began to prepare the lectures for publication in book form. He did so partly because he was keen to publish the new material and to leave a legacy in Brazil, but also because the war had made him fear for the future of the Western world. His three-month appointment and the looming Navy commission left Quine pressed for time. He wrote all night. He lived off deep-fried street food. With days to spare, he finished correcting the proofs for *O Sentido da Nova Lógica* (Quine 1997, 7). Quine's usually consummate attention to detail could not quite withstand the pressure and the sleep deprivation; the book contains some misprints and typographical errors, indicated here in editorial footnotes and corrected in the text. There also appear to be some philosophical loose ends, half-finished trains of thought never quite completed, or picked up in a modified form several years after the war, when Quine's thinking had to an extent shifted. After completing the book, his technical work in the Navy took up nearly all of his time and attention until the war ended. Quine worked, with dedicated groups of mathematicians and cryptanalysts, on translating and analysing intercepted submarine communications – apparently quite successfully, as he was highly commended by his admiral (Lodge, Leary, and Quine 2015, 42).

Meanwhile the publication process of *O Sentido da Nova Lógica* dragged on, much to Quine's annoyance. It was held up by bureaucratic interference, the non-existence of Portuguese-speaking mathematical logicians to serve as plausible manuscript referees, and typesetting troubles. The first edition was finally published in 1944, on the rather brittle paper that resulted from shortages during the Second World War. Copies are now very rare. A second edition followed in 1996, with a new preface by Quine, and a third edition in 2016 (Quine 1996, Quine 2016). Our translation is based on the first edition.

3 *The Significance of the New Logic*: The Book and Its Content

What Quine called "the new logic" was indeed rather new in 1942. Kurt Gödel's incompleteness proof, published in 1931, was only eleven years old.

One year earlier, Susan Stebbing had published the first accessible book on contemporary logic and its philosophy (Stebbing 1930). Tarski's work on truth dated from 1933, but that was the Polish version; Quine and Carnap, who spoke German but no Polish, had had to wait for the German translation of 1935. In his Introduction to this book, Quine described the new logic as a response to Cantor's advances in transfinite arithmetic (see pp. 10–11 below) and to Russell's paradox and the related semantic paradoxes (12–13). The need for a new philosophy of logic had also become apparent. While we might previously have tried to identify logical (and mathematical) truth with provability, Gödel's incompleteness result made that identification impossible (17). Quine proposed instead a conception of logic as a universal science, one compatible with any area of enquiry. Such a universal science would treat all subject matters, and all objects, equally.

The Significance of the New Logic has some areas of overlap with Quine's introductory logic textbook *Elementary Logic* (Quine 1941) and with his expansive and technical *Mathematical Logic* (1940). Like *Elementary Logic* and *Mathematical Logic*, it takes as a point of departure a tripartite division of logic into the theory of composition (sentential logic), the theory of quantification (which, together with sentential logic, yields predicate logic), and the theory of classes. *The Significance of the New Logic* is more ambitious in scope and subject matter than *Elementary Logic*, which only covers the theories of composition and quantification. But it differs from *Mathematical Logic* in being aimed at a non-expert audience. Convinced of the new logic's potential for revolutionizing science and mathematics, Quine took on the task of introducing analytic philosophy neophytes not only to recent advances in philosophical thinking about identity, existence, meaning, modality, and description but also to the theory of classes.

The book's philosophical remarks on statements, in Chapter I which focuses on the theory of composition, have much in common with those in *Elementary Logic.* In both books Quine took statements, the substituends for the *p*s and *q*s of sentential logic, to be declarative sentences with timeless verbs and without indexicals, articulating a sort of precursor of his later account of eternal sentences (Quine 1941, 6, §§ 36, 40, and see p. 19 below). In both books he appealed to pragmatic reasons to explain away apparent paradoxes of the material conditional, a strategy we now associate with the later works of Grice. Quine was an early adopter of this style of argument in *Elementary Logic*, although the argument in *The Significance of the New Logic* is worked out in more detail:

> In practice we do not utter conditionals when the truth values of their components are already known. But this does not stop us from identifying 'if p then q' with '~ (p • ~ q)', because it is equally obvious that in practice we would not use a compound of the form '~ (p • ~ q)', any more than 'if p then q', when we already know what the truth values of the components are . . . we could provide more information in less space by only affirming 'q' or denying 'p'.
>
> *(see p. 32 below; cf. Quine 1941, 21)*

In both books he proposed to read 'or' as inclusive, but in this book he adds some further arguments for that conclusion. They include one natural-language case due to Tarski (see pp. 30–31 below), and further appeals to pragmatics:

> consider the expression '$x \leqq y$' . . . '$x < y$' and '$x = y$' are in themselves mutually exclusive, or incompatible . . . '~ (x < y • x = y)' [is] added to the statement ['~ (~ x < y • ~ x = y)'] with the inclusive sense to produce a statement with the exclusive sense. But this additional conjunct is a known truth (given any x and y) that we can therefore freely insert or omit. To omit it is not to deny it; we never say everything that we know.
>
> *(see pp. 29–30 below)*

Quine's philosophical reflections on quantification theory in Chapter II do not go far beyond those of *Elementary Logic*, apart from a practical application to insurance calculations also discussed in his "Relations and Reason" (Quine 1939b). New material on the philosophical applications of quantification appears in Chapter III, including several forerunners of arguments made famous by "On What There Is" (Quine 1948). The technical treatment of predicate logic in this book resembles *Mathematical Logic* more than *Elementary Logic*, using truth-table techniques for sentential logic and matrices for quantification theory.

The Significance of the New Logic deploys a simplified version of the symbolism of *Principia Mathematica*, with parentheses to avoid ambiguity, a single (universal) quantifier, and two primitive sentence connectives – the tilde for denial, and the *Principia* dot '•' for conjunction. (Apparently unknown to Brazilian typesetters, the *Principia* dot comes out looking rather square and elongated in the first edition and has transmogrified into an underscore by the second.) All the other operators of predicate logic are defined in terms of those three primitives; the primitive of membership is added in Chapter IV. This system is austere, just one step removed from the simplest possible system, with just one primitive each for the theories of composition, quantification, and classes – that is, the Sheffer stroke, universal quantifier, and membership sign respectively. Quine impressed upon the reader how much can be proved within this tiny, yet powerful, symbolism: in particular, the