Mid-Century American Philosophy

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Mid-Century American Philosophy

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1 Introduction: American Philosophy and the Origins of the Analytic Movement

Analytic philosophy reached the American continent in the 1930s as members of the logical positivist movement, many of whom were Jewish, or left-wing and politically active, fled the Nazis, according to the conventional historical narrative (e.g. Beaney 2013: 15). The mid-twentieth century was a time of upheaval for analytic philosophy, a time during which it broadened and expanded from a more reductive, atomist and logicist project, driven largely by formal and philosophical logic, to one more open to holism and paying closer attention to ordinary language and its analysis. Several of the major changes which distinguish the mid-analytic period from the early analytic period famously had American origins. I will discuss three vital ones: the debate on the analytic-synthetic distinction which culminated in W.V. Quine's celebrated rejection of it in his 'Two Dogmas of Empiricism', the question of ontology, and the rise of modal logic and modality in philosophy. Philosophy of science also flourished in the U.S. as a result of the work of European refugees such as Rudolf Carnap and Carl Hempel, alongside non-immigrant Americans like Nelson Goodman and Quine (also see Werndl, this volume, and Lutz, this volume). The growth of holism within analytic philosophy derived in part from this surge in philosophy of science and in part from the ordinary-language philosophy and late Wittgensteinianism which flourished primarily in the U.K. (see Marion, this volume).

Certainly the conventional narrative is correct that many central and eastern European emigrés were influential in shaping these new directions within analytic philosophy. Carnap, who came to the U.S. in 1935, was the central foil to the first two—analyticity and ontology—and a contributor to the third (modality). Alfred Tarski, who had been at a conference in the U.S. when the Nazis invaded Poland, and stayed at Harvard for a few years before moving to Berkeley, played a key role in the first development, and held views on the second and third which influenced W.V. Quine.[1]

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[1]Tragically, the brilliant Polish logician Janina Hosiasson-Lindenbaum who, like Tarski, was Jewish, was booked on the same ship as Tarski to attend the same conference, but her visa was denied. She wrote 'On Confirmation' (Hosiasson-Lindenbaum 1940), the first solution to the Raven Paradox, from exile in Vilnius,

But the conventional narrative is also a little oversimplified. It tends to leave out of account several female contributors to analytic philosophy. This applies even to those who fit the narrative, such as the logical positivist Else Frenkel-Brunswik, who was associated with the Vienna Circle. Having fled Austria for the U.S. in 1938, she co-wrote the germinal text *The Authoritarian Personality* (Adorno, Frenkel-Brunswik, et al 1950), and argued for the interpretation of psychoanalytic theory in terms of Carnapian dispositional statements (Frenkel-Brunswik 1954; also see Borchers 2003, Janssen-Lauret 2022b: 129-130).

In assuming that analytic philosophy came to the U.S. with the logical positivist refugees, themselves influenced by Wittgenstein, the conventional narrative also appears to rest on a view of analytic philosophy as an endeavour born to the three 'founding fathers' G.E. Moore, Bertrand Russell, and Ludwig Wittgenstein in Cambridge, inspired by the 'grandfather' figure Gottlob Frege, and continued by these men's followers. Such a view is quite explicitly expressed by Beaney (2013: 13-15) and Soames (2003: xiii). It is more inclusive than a view of analytic philosophy as a British or Anglophone phenomenon, which marginalizes the European contributors, as restricted to the analysis of language, which primarily describes ordinary language, late Wittgensteinianism, and inferentialism, or as merely critical philosophy, which excludes analytic system-builders like Russell, Quine, A.N. Whitehead, Dorothy Emmet, and Mary Midgley.[2] But it implies that there were no women among the early analytic philosophers unless they were followers of the 'fathers', thus overlooking women like Constance Jones, who proposed the sense-reference distinction before Frege (Jones 1890; Janssen-Lauret forthcoming-c). And it overlooks the other American branches of the analytic family. Pragmatists and pragmatism-adjacent philosophers have influenced analytic philosophy from the beginning, such as William James, C.S. Peirce, and Victoria Welby (Misak 2016), Christine Ladd-Franklin (Uckelman 2021, Janssen-Lauret forthcoming-a), and arguably W.E.B. Dubois (Spencer 2020). The verification theory of meaning, for example, was not brought to the U.S. by the logical positivists, but dates back to Peirce (Quine 1951: 35). The U.S. was home to a movement called 'speculative philosophy' (de Laguna 1951), which originally set itself against analytic philosophy but many of whose themes are congenial to middle and later analytic philosophy. And C.I. Lewis and Ruth Barcan, both Americans, published systems of modal logic before Carnap did.

As a result, I prefer a broader narrative of what analytic philosophy is than the conventional one. 'Analytic philosophy' resists neat and tidy definition, and there is no brief collection of necessary and sufficient principles for who counts as an analytic philosopher or an ancestor of analytic philosophy. But it can be characterised as a varied movement with

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where she was later cruelly murdered by the Nazis. For more on Hosiasson-Lindenbaum, see Janssen-Lauret 2022b: 132-134, Sznajder 2022, and Pettigrew, this volume.

[2]The view that analytic philosophy consists in the analysis of language was influentially expressed in the Introduction of Dummett 1973. Sluga (1975) famously criticised the conception of analytic philosophy as Anglophone or Anglo-American philosophy. The view of analytic philosophy as restricted to merely critical philosophy is defended by Katzav and Vaesen 2017 and rebutted in Janssen-Lauret forthcoming-b.

a variety of strands—logical atomist, pragmatist, anti-idealist, logical positivist, ordinary language, Quinean, etcetera—each with its more central and more peripheral figures.

2   Analyticity and Its Discontents

An analytic truth is supposed to be a truth made true by meaning alone, not by anything empirical. Locke and Hume thought that there were such truths: they distinguished between truths which expressed matters of fact and those which expressed only 'relations of ideas'. Kant called a truth 'analytic' when 'the predicate B belongs to the subject A as something that is (covertly) contained in this concept A', and synthetic when B 'lies entirely outside' A (Kant 1787: B10). The dissolution of this Kantian view drove the development of some central currents within analytic philosophy. First, Kant's 'containment' metaphor was overly limited, because it does not account for all logical truths, even those of sentential logic. From the truth of 'p', it follows that 'p or q' is also true. But in no reasonable sense is 'or q' contained in 'p' (Haack 1977: 12). Second, Kant thought that mathematical truths, even simple arithmetical ones like '5+7 = 12' were not analytic. Kant categorised these as 'synthetic a priori' truths: like truths about causation, perception, space and time, or metaphysics, these, he argued, were true independently of experience, but not because of meaning alone. They required a 'synthesis' of components being put together by the mind.

Yet new developments in mathematics from the late nineteenth century onwards, known as the revolution in rigour, cast doubt on the assumption that mathematical statements can be divided into true and false based on the contributions of human minds. Previously, mathematicians had built up their theories by beginning with axioms which seemed intuitively or self-evidently true independently of experience. But coherent proof systems began to be found which lacked some such intuitive axioms. Non-Euclidean geometries gave up the axiom that parallel lines never meet, and soon even found application in Einstein's theory of relativity. Cantor's theory of transfinite numbers, as well as set theory, introduced proof systems which implied the unintuitive claim that there are higher and lower levels of infinity. They distinguished the type of infinity where we start with one unit (a natural number, for example), and carry on adding units without end, from the type of infinity displayed by the real numbers, or points on a line, where in between any two of them there is another, such that they do not form a list, not even an infinite list. Dedekind defined an infinite set as a collection which has a proper part the same size as it, in defiance of the intuition that wholes are always greater in size than their proper parts. As intuition proved such an unreliable guide for exploring new realms like the infinite or non-Euclidean geometry, mathematicians and logicians had to turn to, as Quine was later to write, 'blind navigation, relying on nothing but the rigorous rules of valid deduction, and accepting the consequences' (Quine 1944: 10).

Having had to fall back on provability in this way, several distinct but interconnected

movements of logicians attempted to reduce more of human knowledge to the provable. Impressed with the new proof theories which apparently needed no synthetic input from the human mind, they tended to identify the provable with the analytic a priori. One such movement was the logicism of Frege and of Russell and Whitehead (also see Ebert and Rossberg, this volume, and Linnebo, this volume). Logicists set out to reduce all of mathematics, or at least arithmetic, to logic, where logic was taken to include the theory of truth functions, the theory of quantification, and set theory. A distinct but related movement, often inspired by Moore, aimed to show that central philosophical truths which Kant had designated as either synthetic or unknowable–truths about perception, causation, mind and body–were in fact analytic, as revealed by painstaking 'conceptual analysis'. As the new proof systems concerning non-Euclidean geometry and higher infinities also had applications in the new Einsteinian physics, the idea gained momentum that much, or even all, of science and philosophy could be reduced to a combination of a priori analytic conventions, a posteriori observations, and their logical consequences. Carnap's *Aufbau*, a book whose title translates into English as 'the logical construction/structure of the world', became a foundational text for the Vienna Circle because it worked out such a view in careful detail. The *Aufbau* aimed to find a justification for our tendency to believe in an external, objective world even though our basis for that belief rests only on our internal, subjective experiences. Carnap argued that we could find warrant for belief in an objective external reality by appealing to structural similarities between different people's streams of experience. We can formulate a system which constructs objective reality out of our observations, he argued, because 'science is essentially concerned with structure' (Carnap 1928: §66). Analytic conventions–logical truths and logical inference rules, mathematical truths, definitions, hypotheses, and the structural-descriptive connections between observations–were central to this structure. The *Aufbau* inspired the logical positivist view that to place truth and meaning on a proper scientific footing, we ought to countenance only a priori analytic and a posteriori empirically testable statements as properly significant. Statements about the outside world were supposed to be analysed into the experiences out of which they were systematically constructed. Experiential tests confirm or disconfirm such statements. Statements which were neither analytic nor verifiable with reference to experience were nonsensical.

Criticisms of the analytic-synthetic distinction in the Americas date back at least to Grace and Theodore de Laguna, who argued that Kant's analytic-synthetic distinction could not stand because it ultimately rested on an undefended assumption that analysis into component predicates terminates in simples (1910: 68-74).[3] But it was engagement with logicism and logical positivism, especially Carnap's work, which sparked the well-known sustained and systematic attack on the analytic-synthetic distinction that convinced many analytic philosophers to abandon the distinction from the 1950s onwards. Although Quine's 'Two Dogmas' generally gets all the credit for this development, other participants

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[3]For a different interpretation of this work and its significance, see Katzav 2022.

such as Alfred Tarski, Morton White, and Nelson Goodman also played key roles.

One effect of the increased stress on provability over intuitions of self-evidence following the revolution in rigour was the project of trying to identify logical (and, for logicists, mathematical) truth with provability. But Gödel's incompleteness theorems made that identification impossible. Gödel proved that any system strong enough to express arithmetic will contain some statements which cannot be proved in that system (Gödel 1931).[4] The development of logicism also stood in the way of regarding mathematical truth as mere provability, because it made claims about the size of the universe. Frege's original logicism appeared elegant, simple, and intuitive, but turned out to demonstrate the unreliability of intuition, because it was inconsistent. Frege's system purported to prove all arithmetical truths using only the austere resources of second-order polyadic (that is, multiple-quantifier) logic plus a theory of classes, which says that for any specified condition a corresponding class exists. On such a theory some classes are members of themselves, such as the class of all classes, though most are not; for example, the class of all humans is non-self-membered. Frege's system turned out to be internally contradictory. It was stymied by Russell's paradox: the class of all non-self-membered things both is and is not a member of itself. Conditions determining what it takes to be a class, set, or collection had to be restricted somehow, so that self-membered collections were ruled out. The logicism of *Principia Mathematica* combined second-order polyadic logic with a theory of types. Every object belongs to only one type, beginning with type 0, comprising ordinary individuals, which are never self-membered because they are not collections and have no members. Type 1 consists of collections only of type 0 individuals, so that type 1 collections are also never self-membered, and so on up. With these resources, *Principia* reduced arithmetic to logic. But among the axioms it needed in order to do so was the Axiom of Infinity. That axiom states that there are infinitely many things.

Among Tarski's points of departure when coming to question the analytic-synthetic distinction was his belief that the Axiom of Infinity is not a logical truth. The Axiom of Infinity is not a logical truth because it can be coherently denied: it is not analytically false to say that there aren't infinitely many things, but only finitely many things in the world. Indeed Tarski positively thought this denial might be true. Tarski adhered to nominalism, the view that there are no abstract objects such as numbers, sets, or types, and physicalism, the view that there are only physical things (on Polish philosophers and nominalism, also see Brożek, this volume). If there are only finitely many physical things in the world, and no non-physical or abstract things, then mathematical statements expressing the existence of infinite sets or series, turn out not to be analytic truths.

Tarski, as a Jewish refugee from Nazi-occupied Poland, had secured a temporary post at Harvard with the help of Quine, who had visited Poland alongside Vienna and Prague on a postdoctoral grant in 1932-33. Quine's mentor Carnap had already moved to the U.S. in

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[4]For an accessible introduction to Gödel's incompleteness results, see Nagel and Newman 2012. For further applications of incompleteness in the history of analytic philosophy, also see the chapters by Linnebo, Pettigrew, and Richardson in this volume.

1935. At Harvard, Tarski, Quine, and Carnap met regularly to discuss mathematics, logic, and their philosophy, and Carnap kept detailed notes (Carnap 2013 [1940-41]; Tarski's point above about the Axiom of Infinity appears on p. 157).

Quine had already expressed, in his 'Truth by Convention', some tentative objections to Carnap's use of analyticity (Quine 1936). But those objections were rather modest, suggesting that there is no obvious stopping point for adding further sentences to the class of analytic conventions. For example, the truth 'the Manchester philosophy PhD students' office has a portrait of Susan Stebbing on the wall' could be taken as a synthetic truth, a discovery of a feature of the office or the portrait, but it could equally well be taken as an analytic convention: a kind of definition of what 'the Manchester philosophy PhD students' office' means. Tarski's view that mathematics might be finitist if there are finitely many physical things (Carnap 2013 [1940-41]: 153) may have given Quine the thought that we can not only add further truths to the list of analytic conventions, but also subtract from it: the alleged mathematical truth that there are infinitely many things was arguably not an analytic truth after all.[5]

At the time, in 1941, Quine had been inclined to agree with Tarski, but was still considering different solutions. Carnap, in his notes, wrote that Quine entertained the idea that non-finitistic mathematics might stand to finitistic mathematics as observation sentences stand to theoretical physics (Carnap 2013 [1940-41]: 150). It would take Quine another ten years to publish a total rejection of the distinction between the analytic and the synthetic. During the early forties, Quine still toyed with the idea of making analyticity work. In 1942, having spent the preceding months preparing to join a cryptanalyst division of the U.S. Navy, he travelled to Brazil to take up a short visiting post. During this period Quine, who enjoyed learning languages, wrote a logic book in Portuguese (Quine 2018 [1944]) in which he considered the view that 'the meaning of an expression is the class of all the expressions synonymous with it' while synonymity itself 'calls for a definition or a criterion in psychological and linguistic terms' (Quine 2018 [1944]: 89). Generations of Brazilians were raised on Quine's book, including the famous logician Newton da Costa (da Costa 1997). The book was also translated into Spanish by Mario Bunge, a pivotal Argentinian logician and philosopher of science who wrote the first analytic philosophy book in the region (Bunge 1959). The growth of analytic philosophy and formal logic in Latin America largely took off a little later than the mid-century period which I discuss here, but was very significant, especially for the development of paraconsistent logics (for more information see Peres 2018, Dalva Secco & Alvarez Lisboa 2022).

Also in the early 1940s, C.H. Langford penned a critique of Moore-style 'conceptual analysis' which would inspire others to overthrow the analytic-synthetic dichotomy. Langford framed the problem as a 'paradox of analysis'. Does a truth to be analysed have the same meaning as the statement which provides its analysis? If they do have the same

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[5]For more on the development of Quine's views on the analytic-synthetic distinction, see Creath 1990b, pp. 30-31; Ben-Menahem 2005, pp. 252-255, Mancosu 2005, Frost-Arnold 2013 pp. 84-87, Janssen-Lauret 2018.

meaning, then analysis is a trivial project, which tells you no more than the original truth did. But if they do not have the same meaning, the analysis is false (Langford 1942).[6] White who, like Quine, had honed his scepticism about the analytic-synthetic distinction in discussions with Tarski, expressed dissatisfaction with several available solutions which posited abstract (that is, non-spatio-temporal, non-causal) objects. Since Frege's work on sense and reference (Frege 1892), some philosophers had thought of meanings as self-standing objective entities, distinct from words or mental states: abstract propositions and abstract modes of presentation which are really out there. Our minds have access to these entities, according to those who believe in them, but do not create or contain them. One issue with such entities is that their relationship to our minds is mysterious, and that it appears extravagant to posit a huge array of abstract meanings, especially for those with nominalist leanings, such as Tarski, Goodman, Barcan, and the early Quine. Another issue, which White concentrated on, is that if there is some sense in which the truth to be analysed and its analysis have different meanings, then there should be even more such entities than at first we thought. There aren't just the kind of meanings which account for them having the same meaning (in one sense), but even more fine-grained meanings such that they also have different meanings, in another sense (White 1948).

Nelson Goodman, too, whose entering wedge into the debate had been a deep engagement with Carnap's *Aufbau*, worried about having to posit arrays of finely-grained meanings. Goodman worried that to speak of one term 'having the same meaning as' another is plagued by a lack of clarity. He considered a range of hypotheses as to what might constitute sameness of meaning and wrote them all off as unclear or unverifiable. Sameness of meaning cannot mean that both expressions stand for the same abstract object, because our epistemic access to abstract objects is so mysterious that we cannot verify when a term stands for an abstract object. Nor can it mean (as Locke and Hume thought) standing for the same mental image, because many terms do not have a clear mental image associated with it, and mental images associated with a given term can vary wildly among persons. It cannot mean that one term could not possibly, or conceivably, apply to anything unless the term with the same meaning also applied to it, because we have no clear criterion for possibility which does not involve conceivability, and conceivability itself is too close to the vagueness associated with mental images. So, Goodman concluded, differentiation of meanings would have to rely on extensions: collections of things to which the term applies. But in that case any two terms referring to nothing, like 'unicorn' and 'centaur', would mean the same. We could try to distinguish meanings by appealing to the differences between unicorn-descriptions and centaur-descriptions. Yet this leads to the view that no two expressions have the same meaning, because bachelor-descriptions differ from unmarried-man-descriptions. So there is no sameness, but only likeness, of meaning (Goodman 1948). Goodman, Quine, and White engaged in correspondence about the topic

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[6]In my 2022c, I argue that Stebbing had already provided a solution to this paradox 10 years before Langford formulated it. But her solution did preserve a role for sameness of meaning between expressions, so did not solve the problems raised by Goodman and White.

the results of which were summarised by White (White 1950).[7]

According to Quine's mature view, expressed in 'Two Dogmas of Empiricism', it is not ultimately defensible to divide truths up into conventional analytic truths and empirically testable synthetic truths, because scientific and ordinary-language truths always rely on both convention and observation at the same time. All truths are true both because of what words mean and because of the way the world is. We may think that we can introduce stipulations which are true by definition, and to a certain extent we can, where we introduce by definition a new abbreviation, to be used only in a limited formal language (Quine 1951: 26). But where we construct scientific or mathematical theories aimed at truly describing the world, word meaning must always combine with agreement with reality. 'Cleopatra ruled Egypt' would have been false if she had not done so, but would also have been false if 'ruled' had instead meant 'ate'. Where our theory does not agree with reality, we often revise or withdraw our empirical hypotheses. But sometimes we revise our conventions. The logicists revised Frege's theory of classes to arrive at a consistent theory. Tarski sought to revise Russell and Whitehead's type theory to dispense with the supposedly analytic truth that there are infinitely many things, because he thought it was false. Under sufficient theoretical pressure, it is not only purportedly synthetic statements which can be revised, but also purportedly analytic ones, which suggests that they are not really made true by meaning alone. Meaning is holistic: no truth is true by meaning alone or incapable of being revised. The meaning of each statement derives in part from interrelations with other statements of that theory.

Carnap's *Aufbau* had presupposed that we can confirm or disconfirm individual statements by appeal to the experiences out of which the statements are logical constructions. Indeed, the logical positivists had enthusiastically embraced the originally Peircean view that the meaning of a statement is its method of verification, that is, empirically confirming or disconfirming it. This view persisted in Carnap's later works, after he had relinquished the *Aufbau*'s assumption that all claims about the external world must be translatable into statements about individual experience. According to Quine, this did not go far enough. Meaning holism, he argued, shows that the verification theory of meaning must be given up. In any of its forms it rests on a division of truths into the analytic and the synthetic. Verifiability with reference to experience presupposes that each statement has an analytic component–its logical form, definitions of its terms, etcetera–and an empirical component, which describes experience or observations. The analytic component is verified no matter what, being true because of meaning alone, so it remains for us to determine the empirical component and test it against experience. In analytic truths, the empirical component is empty, so the whole statement is confirmed no matter what. But, argued Quine, we cannot dissect our individual statements into a conventional component and an empirical component. The meaning of each statement derives in part from interrelations with other

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[7]For a detailed account of the above debate including interesting quotations from White's and Goodman's letters, see Cohnitz and Rossberg 2006: 66-74, as well as White 1999.

statements of that theory. We do not test the truth of statements in isolation from each other; in case of disconfirmation, we always have the option of revising not that particular statement, but our conventions instead. As Quine put it, 'our statements about the external world face the tribunal of sense experience not individually but only as a corporate body' (Quine 1951: 38). So meaning holism goes hand in hand with epistemic holism: what we confirm or disconfirm is not an individual statement, but a whole theory.

3   Ontology and Meta-Ontology

Einsteinian physics, set theory, logicism, and other novel theoretical developments in the sciences brought new existence questions to the fore. Ontology is the branch of philosophy which investigates questions about what there is (or what exists; I will use 'what there is' and 'what exists' interchangeably). Logicism assumed that numbers existed, but were reducible to a new, somewhat unfamiliar kind of entity, namely sets. But nominalists such as Tarski, as well as Goodman and the early Quine (Goodman & Quine 1947), and Barcan[8] (Barcan Marcus 1961, Barcan Marcus 1978), attempted to make do without numbers and sets. Tarski's motivation had been physicalism: he believed that only physical things exist, hence no numbers. General relativity appeals in its overall description of the world not to space and time separately, but to one new, unintuitive entity: space-time, with time as the fourth dimension. Quine took this to imply that we have good reason to believe in '[t]he four-dimensional spatio-temporal view of nature' (Quine 1939a, p. 701). He made use of such four-dimensionalism to formulate a view on what physical objects are, writing of Alexander the Great's horse, 'Bucephalus is an extended portion of the spatio-temporal world [with] a spatial extension of several hectoliters and a temporal one of several years' (Quine 1944: 159). The success of behaviour-based methods in biology and psychology led some philosophers to hypothesise that existence claims about psychological entities and states could be explained away in terms which appealed only to physical, outwardly observable behaviours (Hempel 1949). Quine, we saw above, toyed with the idea that psychology could tell us what sorts of things meanings were, thus obviating the need for abstract meaning entities like propositions.

These ontological investigations carried further questions in their wake. If a logicist can reduce all arithmetical statements to statements about set theory, has he thereby shown that there are numbers, or that numbers are a kind of set? When a nominalist proposes that there are no numbers, sets, or other abstract objects, what arguments must she offer to win a debate with him concerning the existence or non-existence of numbers or sets? Do we have good reason to believe in a four-dimensional space-time because general relativity

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[8]Ruth Barcan published her early papers on modal logic as 'Ruth Barcan', but, as she recounted later, when she submitted her next manucript to the *Journal of Symbolic Logic*, 'Church [the editor] informed me testily that he had learned I was married and must heretofore use my 'legal' name' (Barcan Marcus 2010: 82). She therefore appended her husband's surname, 'Marcus'. Out of respect for Barcan's preference I will call her either 'Barcan' or 'Barcan Marcus', not just 'Marcus'.

appeals to it? What justifies the claim that there are only physical objects? If we can say all there is to say about psychology using only the language of behaviour, does it follow that we have explained minds away? These are questions belonging to the branch of philosophy now often called 'meta-ontology'. Quine referred to these as questions of ontological commitment (Quine 1939, Quine 1948): under what circumstances is someone committed to affirming an existence claim?

Asking questions about how to settle an ontological dispute, or under what conditions someone has good reason to believe in the existence of some entity, presupposes that existence questions are good questions to begin with. This presupposition is itself disputable. On the picture which the logical positivists brought to American shores, existence questions are not answerable, because existence claims are not ultimately proper, meaningful statements. The logical positivists sought to place truth and meaning on a proper scientific footing by allowing only a priori analytic and a posteriori empirically testable statements as significant, and by construing sentence meaning as verifiability. They famously concluded that the statements of traditional metaphysics, such as those about God, freedom, essences, and the like, were not scientifically verifiable and were therefore meaningless pseudo-statements. Although Carnap's *Aufbau* was a major inspiration for verificationism, and is usually taken to be an anti-metaphysical text, some argue that there is some modest metaphysics in the *Aufbau*, that it does not write off all claims about the nature and existence of things as pseudo-statements (MacBride 2021). The later Carnap, by contrast, consigned all existence statements either to the category of analytic consequences of a framework or to the category of the meaningless. At this point, Carnap felt that there was no one privileged language or logic, but that all consistent systems with reasonable expressive power have their uses, and we ought to embrace an attitude of 'Tolerance' towards them all. For each such system, once we know what its terms, predicates, and logical rules are, we know what existence claims follow logically from it. Take the theory of propositions: according to Carnap, it analytically entails that there are propositions (Carnap 1950: 26-27). But whether, for example, the theory of propositions is preferable to the nominalist views of Barcan Marcus, who rejected propositions, is a pseudo-question given the Principle of Tolerance: preferable by whose standards? Whether there *really* are abstract propositions, as Frege thought, or only concrete (that is, spatiotemporal or causally efficacious) individuals, as Barcan Marcus thought, then becomes a pseudo-question, too. We cannot answer questions about what there *really* is, because we need a language to do so, all languages make different existential claims, and no language is objectively preferable.

The logical positivists' anti-metaphysical attitudes may in part have had political roots. As they were largely left-leaning, and many of them were Jewish, they were understandably wary of neo-Thomist essentialism, right-wing Hegelianism, and Heideggerianism, some branches of which were associated with, or informed, fascist ideology (Uebel 2016 §2.3; Janssen-Lauret 2018, Spencer 2020). Yet several sympathetic critics of Carnap pointed out that it is possible to oppose essentialism and Hegelianism without denouncing all existence questions as senseless. Susan Stebbing defended the possibility of a modest, empiricist kind

of metaphysical analysis against Carnap (Stebbing 1933, see also Janssen-Lauret 2022b). In 1941, Quine and Tarski, both of whom opposed essentialist and Hegelian metaphysics, also differed with Carnap, maintaining that the debate between nominalists and believers in numbers was a scientifically viable question, not a meaningless one (Carnap 2013 [1940-41]: 153). Quine had held this view for some years before. In 1939, he had written that nominalism would be vindicated just in case 'it is possible to set up a nominalistic language in which all of natural science can be expressed' (1939a, p. 708).

Tarski, whose work was mostly mathematical, did not say much about ontological commitment in his published papers. Both Quine and Ruth Barcan Marcus, by contrast, presented sophisticated, worked-out accounts of what it takes to have good reason to believe in an entity. Quine's criterion of ontological commitment is very well-known; Barcan Marcus's equally interesting one is only just beginning to be appreciated.[9] Quine and Barcan Marcus held similar, though non-identical, positions on what exists. Both were suspicious of appeals to propositions, properties, and other abstract objects. The young Quine had taken Tarski's finitist nominalism very seriously. Barcan Marcus continued to do so well into the 1970s, after Quine had come to the view that real numbers exist, because modern physics unavoidably appeals to real numbers just as it appeals to four-dimensional space-time.

Despite these similarities in their own ontologies, Quine and Barcan Marcus took different lines with respect to ontological commitment. They agreed with each other, and disagreed with Carnap, in considering existence questions genuine questions, their answers neither trivial nor meaningless. They opposed Carnap's Principle of Tolerance.[10] They also agreed that in order to attribute existential commitments to someone, her discourse needs to be systematised to some degree. Because we can make non-existence claims— 'there is no phlogiston', 'unicorns do not exist'—clearly not every word or language form comes with commitment to an entity. Still, some language forms do, otherwise we could not attribute an ontology to anyone. Quine and Barcan Marcus differed over what kinds of language forms commit us to an existence claim.

Quine famously summed up his theory of ontological commitment in slogan form as 'to be is to be the value of a variable' (Quine 1939, Quine 1948). A variable is the 'x' in the context, 'there is an x such that ...' or, formally, '$\exists x(...\ x\ ...)$'. But some further systematisation of discourse now proves necessary. Not every ordinary-language 'there is' comes with an entity attached. After all, we can coherently say 'there is a rise in inflation' or 'there is a mass migration between that country and the neighbouring country because there is a disparity in GDP between them' without being immediately committed to the existence of inflation, a rise, a migration, or a disparity. (Inflation is just prices going up,

[9]See Janssen-Lauret 2016 and Schipper 2022 for different developments of it.

[10]In Quine's case, he and Carnap both recognised that this was because of his opposition to the analytic-synthetic dichotomy: 'Quine does not acknowledge the distinction which I emphasize above, because according to his general conception there are no sharp boundary lines between logical and factual truth, between questions of meaning and questions of fact'(Carnap 1950: 32 n.2).

and a migration is just people moving; neither is obviously an entity.) To believe in an entity, we ought to have a good theoretical reason: we start believing in some new entity—a Higgs boson, a new species, dark matter—because we need to believe in it to explain everything there is to explain, or we disbelieve in some entity because our theory gets by equally well without appeal to such an entity. Hence Quine's view that we should believe in space-time, because our current best physics appeals to it, but we need not believe in the higher flights of set theory.

When we propose a true, exhaustive description of the world we are rationally compelled to believe in the objects mentioned by that theory. The values of our 'x'es and 'y's play an indispensable explanatory role, otherwise our theory would get by without speaking of them. Quine ensured that this condition is met by requiring that theories are rendered in a formal language, where all logical consequences are clearly apparent. His choice of formal language was first-order logic without individual constants. We have reason to believe something exists just in case our best theory contains a description which conveys its explanatory role. We do not have reason to believe in two things with the exact same explanatory role: if x already fills that role, and y answers to all and only the same descriptions, then y is explanatorily inert. As a result Quine's formal language of choice has a relation of indiscernibility in place of identity.

Barcan Marcus, by contrast, thought that we have reason to include something in our ontology whenever we are able to refer to it directly. Barcan Marcus was the first exponent in the analytic tradition of the position, now popular but then revolutionary, that proper names are not equivalent to descriptions. Their meanings are just their bearers. Quine had thought that we do not have direct perception of objects. Rather, our observations give us reason to believe in bodies which cause our sensory states, bodies whose explanatory role we describe. By contrast, Barcan Marcus held that our minds can reach out and grasp concrete individuals (that is, spatiotemporal objects which can be causes and effects) in an unmediated way. Once we have achieved such acquaintance with an individual, we may assign it a name, which Barcan Marcus called a 'tag' (Barcan Marcus 1978). The tag is directly referential: it does not describe.'This tag, a proper name, has no meaning. It simply tags' (Barcan Marcus 1961: 310). So we can refer to objects without needing to describe them. This implies that on Barcan Marcus' view, unlike Quine's, we may have reason to believe in two objects which answer to all and only the same descriptions. Barcan Marcus felt the need for a formal language which has not just a relation of indiscernibility, but also one of identity. She chose first- or second-order modal logic with individual constants and an identity predicate as her formal language for ontological enquiry. We may sum up Barcan Marcus's criterion of ontological commitment in a slogan to rival Quine's: 'to be is to be the referent of a tag' (Janssen-Lauret 2015 §5).

On Barcan Marcus' view, the archetypal way of coming to know an object is by observing it. Upon observing it, we name it. Of course, in many cases we know of objects by testimony, reports of someone else's observations of concrete objects. (Barcan Marcus' strong nominalism implied that unless an object is concrete, our minds cannot grasp it at

all. So we have no reason to believe in any but concrete objects.) It may seem natural to the reader that both proper names and variables bound by existential quantifiers come with ontological commitments.[11] But Barcan Marcus did not think so. For her, the only language form which comes with an entity attached is the kind with a directly referential function, whose whole point is simply to stand for something. All other language forms lack this referential functions: they are mere manners of speaking. Quine had held that predicates, sentence connectives like 'and' and 'not', and propositional discourse are among the kinds of language forms which do not carry commitment to any entity. Barcan Marcus put quantifiers in the same category. '$\exists x(Fx)$', according to her, does not mean 'there is an F' or 'an F exists'. Rather, '$\exists x$' and '$\forall x$' are linguistic devices for speaking with generality.

Barcan Marcus' substitutional theory of quantification explained how quantifiers could be used to generalise without having to speak of entities. She interpreted '$\exists x$' and '$\forall x$' not as meaning 'exists' and 'all', but as non-temporal 'sometimes' or 'in some cases' or 'it is sometimes the case that' and as non-temporal 'always', 'in all cases', or 'it is always the case that', respectively (Barcan Marcus 1961: 319–21). Variables need not have values. They need only be capable of having a term of the appropriate sort substituted for them. So '$\exists x(Fx)$' reduces to 'Fa or Fb or Fc ...' listing all individual constants 'a, b, c, ...', and '$\forall x(Fx)$' to 'Fa and Fb and Fc ...' listing all individual constants 'a, b, c, ...'. An advantage of this account of quantification, Barcan Marcus thought, is that we can use quantifiers as devices of generalisation in contexts where we do not want to be committed to entities. She suggested, for example, that nominalists like her who did not believe in propositions may use sentential quantification, which treats sentences as the terms substituted for sentence variables: ' "(p) (pv-p)" need not be paraphrased as "Any proposition bears the excluded middle relation to its negation" ' (Barcan Marcus 1978: 360).

Quine had attempted to do away with individual constants by converting them into descriptions, such as 'the socratiser' for 'Socrates'. Barcan Marcus was unimpressed. 'The socratiser' is supposed to mean 'the individual who answers to all and only the same descriptions as Socrates'. But what is that to mean unless someone or something has first been named 'Socrates'? 'Such devices do not *eliminate* the name; they recycle it' (Barcan Marcus 1993: 211, her emphasis).

Another Quinean objection to Barcan Marcus' substitutional quantifier has more force, especially for those not already committed to a strong nominalism. On her substitutional interpretation, quantified phrases reduce to conjunctive or disjunctive lists of atomic sub-stitution instances. But lists of names or other substitution instances can at most aspire to the more limited kind of infinity, the kind had by the natural numbers: denumerable infinity. It follows that Barcan Marcus can have ontological commitments to at most as many things as there are natural numbers, no more. It is impossible to assign names to each of a collection greater than that. Yet there might be reason to believe in collections of a higher, non-denumerable infinity. We may believe in all the real numbers, or view

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[11]Russell may have held such a view, and I defend a version of it in Janssen-Lauret 2016.

space-time as having a structure such that in between any two points on a line, there is another one, such that they cannot form a list. As a nominalist, Barcan Marcus herself was content to rule out such ontological commitments (Barcan Marcus 1978: 124).

4   The Rise of Modal Logic

Modal logics are logics which allow us to draw inferences from sentences which include words like 'must' and 'may', 'ought' and 'can', 'necessarily' and 'possibly'. The arrival on the scene of modal logics, especially quantified modal logics which allowed sentences to combine modal operators and quantifiers, permitting constructions such as 'there is something which is possibly human', revolutionised analytic philosophy. Philosophers of previous eras had often been interested in modal questions, like 'Is Socrates necessarily human?' and 'Does God exist necessarily?'. A 'modal' became known as an expression which qualifies the truth of a judgement. These included the alethic modalities 'necessarily' and 'possibly', the deontic modalities 'obligatory' and 'permitted', and epistemic modalities like 'it is known that' and 'for all that we know'. 'Must' and 'may' are, in ordinary English, ambiguous, able to mean any of the above depending on context. Formally, modern modal logics generally symbolise the 'must' operators as '$\Box$' and the 'may' operators as '$\Diamond$'.

With the advent of modern mathematical logic and its uses in formulating scientific and philosophical statements, the impression grew that a properly empiricist philosophy deals in unqualified truth only. Analytic philosophers tended towards focusing on extensions— collections of things which are a certain way—rather than intensions—collections of things intended by the thinker, or things which might possibly be a certain way. We contend with things as they are, not as they may or must be. Besides, alethic modality in particular was associated with essentialist discourse which had, for many early analytic philosophers, uncomfortable political or religious connotations. Quine, Tarski, Goodman, and the early Carnap were extensionalist radicals, adhering to Tarski's principle that 'two concepts with different intensions but identical extensions are logically indistinguishable' (Tarski 1935: 387). Analytic philosophy appeared to be heading down a firmly anti-modal path. Quine asserted that logics which allowed a modal operator to be written after a quantifier, as in '$\exists x \Diamond (Hx)$', could not be devised as they could not possibly make any sense.

Ruth Barcan's first publications boldly set out a quantified modal logic one of whose main axioms had the general form '$\Diamond \exists x (Fx) \to \exists x \Diamond (Fx)$' (Barcan 1946, Barcan 1947). Although the interpretation of this formula, the Barcan Formula, is disputed (e.g. Williamson 2013: ch.2; Janssen-Lauret 2022a: 362-364, 374-376), in ordinary English, we might read it as 'if it is possible that something is F, then something is possibly F'.[12] Barcan's system allowed for modal operators to occur after the quantifier, and yet constituted a coherent proof theory. Quine, among the foremost logicians of his generation, had to eat his words

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[12]Barcan's own version is strictly speaking not a formula at all, but an axiom schema. I've slightly simplified the formalism to make it accessible.

in his not unfavourable reviews of the papers of this 24-year-old female graduate student (Quine 1946, Quine 1947b).

Soon after the publication of Barcan's articles, Carnap, having been led away from the straight and narrow path of radical extensionalism, published his own quantified modal logic (Carnap 1947). Quine had known it was coming for some years. It had been Quine's old foe, the Principle of Tolerance, which had proved Carnap's siren call towards intensional languages. Quine had not been as polite about Carnap's modal logic as he was about Barcan's. Having learnt from Hempel that Carnap had turned intensionalist, he fired off an ill-advised letter to his mentor which read, 'your principle of tolerance may finally lead you even to tolerate Hitler' (Quine 1990: 241). Some years later, when Quine met Carnap in Harvard to discuss the manuscript of *Meaning and Necessity*, Quine wrote that they 'never got past the second page' (Lambert 2001: 276).

It has become common to reassign credit for the first symbolic quantified modal logic either to Carnap (1947) or to Kripke (1963), who put forward an interpretation of quantified modal logic which interpreted 'necessarily' as meaning 'it is true in all possible worlds that', reviving a suggestion of Leibniz's. Arguments in favour of assigning credit to one of these men instead of to Barcan include Carnap's having started work on his modal logic before Barcan started working on hers (Hochberg 2002: 288), and Kripke's possible-world semantics being preferable to Barcan's system (Ballarin §3.1-2). Others argue that the credit must go to Barcan, because she published her quantified modal logic first (Williamson 2013: 31, Connell and Janssen-Lauret 2022: 202) and because Barcan's system has its advantages over Kripke's, a fact which Quine came to appreciate (Janssen-Lauret 2022a).

Barcan's papers which set out her quantified modal logic are densely formal. Here I will give only a very brief accessible sketch (for a more detailed ordinary-language gloss, see Janssen-Lauret 2022a: 362-366). Barcan borrowed the sentential fragment of modal logic, the part of the system which allows us to prefix a modal operator on a whole sentence ('possibly, p'/'$\Diamond p$') from C.I. Lewis (1918). Barcan added to Lewis's proof systems S2 and S4 rules and axioms for first- and second-order quantification (that is, quantification into both name position and predicate position) and an axiom schema for combining quantification with modal operators, the Barcan Formula mentioned above, in the form,

$$\Diamond \exists x \text{ A } \prec \exists x \Diamond \text{ A.}^{13}$$

With these resources Barcan proved more than 80 theorems in her (1946), most of them quantificational. Her first paper consisted almost entirely of proofs, and contains no discussion of the philosophy of modality. What's more, Barcan here said nothing about how these proofs apply to the world. In particular, she did not present a possible-world interpretation of her system. Proofs, as we have seen, can proceed by deriving theorems from axioms in steps licensed by the inference rules. To do this we need not think about whether the

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[13]The ⊰ operator was introduced by C.I. Lewis. 'p ⊰ q' means the same as '$\Box p \rightarrow q$', namely, 'necessarily, if p then q'.

theorems have applications—for example, it can be disputed whether the higher infinities have application to the world—or whether they are intuitively true.

In Barcan's second paper, she set out to prove 'the identity of individuals' (Barcan 1947). Unlike her later works, here she did not make use of proper names or the relation of identity proper, but variables and indiscernibility. Taking the identity relation, I, to be the set of all pairs $\langle \alpha_1, \alpha_2 \rangle$ such that necessarily, for any property, if α_1 has it then α_2 has it, she proved that in second-order quantified S4, the I-relation is necessarily equivalent to the I_m-relation, which is the set of all pairs $\langle \alpha_1, \alpha_2 \rangle$ such that for any property, if α_1 has it then α_2 has it. It follows that if α_1 and α_2 have all and only the same properties—that is, they are indiscernible—then they are necessarily indiscernible. A plainer ordinary-language gloss has it that statements of identity (strictly speaking, indiscernibility) are never contingently true. If true, they are necessary.

Why was Quine more open to Barcan's modal logic than to Carnap's? Because Quine's arguments against his system did not work against hers. In the early 1940s, Quine had considered the option that 'the result of applying "necessarily" to a statement is true if, and only if, the original statement is analytic' (Quine 1944: 89). That is, a statement might be taken as necessary because it is true in virtue of meaning alone. But if this is so, we cannot have constructions of the form 'there is someone who is necessarily human'—which Quine called 'quantifying in' the sentence governed by the modal operator—because a human does not have truth-by-meaning-alone properties. Such properties belong to expressions if they belong to anything. But Barcan's system had no interpretation—on purpose, I conjecture, to evade that objection of Quine's (Janssen-Lauret 2022a: 361). There is historical evidence that in the mid-1940s, she already held a version of her name-based meta-ontology (Janssen-Lauret 2022a: 365, 369). She said nothing about meaning properties of any sort. Like the early exponents of transfinite numbers and set theory, she purported only to navigate blindly using a coherent proof theory. Quine allowed that this could be done.

Quine's subsequent attack pushed the line that if Barcan were to give an interpretation for her modal logic, it would have to rely on abstract objects or merely possible objects (Quine 1947a). This had been his main objection to Carnap's modal logic, which had contingent identity rather than necessary identity. According to Carnap, we must appeal to abstract concepts to distinguish the 'morning star'-meaning from the 'evening star'-meaning in the identity statement 'the morning star is the evening star', which is contingent, unlike 'the morning star is the morning star', which is analytic. Quine had not been sent the last page of Barcan's 1947 at this point, and therefore did not realise that Barcan's system had necessary identity. Since Quine's main problem with abstract modal objects was that they were incompatible with physicalism, he had similar worries about possible worlds. Quine also maintained that modal logics must talk about peculiar entities like 'the possible fat man in that doorway', and could not say anything principled about whether that man was identical to the possible bald man in that doorway (Quine 1948). Quine considered this to be unclear and ontologically profligate.

Barcan's answers to these challenges were much more congenial to Quine than Carnap's. Carnap, who did not find existence questions to be legitimate, saw no problem with speaking as though there are abstract concepts and did not mind ontological profligacy. Barcan, like the early Quine naturalistically inclined, did share his worries in principle, but explained that her system did not have the features Quine found problematic.

Barcan explained that she was neither committed to Carnap's view that 'the morning star is the evening star' is a contingent identity nor to the implausible claim that it is, like 'the morning star is the morning star', analytic. This is because the ordinary English sentence 'the morning star is the evening star' is ambiguous. It could be read as an identity statement, where the 'is' stands for identity, and 'the morning star' and 'the evening star' function as proper names. On that view, it says of one individual (the planet Venus) that it is identical with itself, using two different names for it. Alternatively, it could be read as a contingent statement, because we can coherently say, 'the star first seen in the evening might have been different from the star first seen in the morning' (Barcan Marcus 1961: 311). But read like that, the 'is' in 'the morning star is the evening star' is not the 'is' of identity. And 'the morning star' and 'the evening star', in that case, function not as proper names, but as descriptions attributing the properties of being the star first seen in the morning and the star first seen in the evening respectively. Descriptions, as Quine himself had made clear, set out in language some conditions which the object described answers to. Two objects may well coincidentally answer to the same description, which makes the case very different from identity. If 'the morning star' and 'the evening star' are read as descriptions in this way, the relation that holds between them is therefore weaker than identity. Identity cannot hold coincidentally (Barcan Marcus 1961: 310).

In 1961, two years before Kripke, Barcan already provided a semantic interpretation for her system. But it did not rely on possible worlds or abstract objects. Barcan proposed that the domain of the actual world would do for interpreting sentences governed by modal operators. The Barcan Formula should therefore not be read as 'if in some possible world something is F, then in the actual world something is possibly F', because that would commit her to other worlds and merely possible objects. Rather, Barcan proposed to read it as, 'if it is possible that something is F, then something is possibly F'. She intended her modal logic as a vehicle for talking counterfactually about actual individuals: that is, to speak of them not as they are but as they might have been. According to Barcan, such discourse is an important feature of empirical theories. Modal logic helps us make clear what a theorist does when she observed an individual, names it and considers how it might have looked or behaved differently. As a result, Barcan concluded, 'there are no specifically intensional objects' (1961: 320-321). By Quine's lights, this made her modal system preferable to Kripke's, due to its ontological parsimony.

In the later analytic period, during the 1970s-90s, Quine and Barcan Marcus also had a fruitful exchange over the question whether essential properties are posited by modal systems and which versions of anti-essentialism are viable (Janssen-Lauret 2022a: 378-380).

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5 Conclusion

The development of analytic philosophy around the mid-point of the twentieth century owed much to movements which originated or grew to fruition in the Americas. I have discussed the overthrow of the analytic-synthetic distinction, the growth of sophisticated theories concerning the circumstances in which we have good reason to believe in the existence of an entity, and the arrival on the scene of quantified modal logics, which proved so popular among middle and later analytic philosophers. Other branches of formal logic, as well as philosophy of science, also thrived in the Americas, including Latin America. Reflecting on these developments also makes apparent the virtues of a broad and inclusive narrative of the history of analytic philosophy. According to conventional narratives, analytic philosophy began in Cambridge with the three 'founding fathers', and was introduced to Vienna by followers of Wittgenstein, who in turn brought it to the Americas when they fled the Nazi occupation of much of the European continent. Such narratives rightly emphasize the important role of Jewish and anti-fascist European immigrants in shaping American philosophy. Yet they do not leave enough room for acknowledging the role of other North and Latin American analytic philosophers and those who influenced analytic philosophy, especially those marginalised due to their ethnicity or gender, such as Ladd-Franklin, Dubois, de Laguna, Bunge, Arruda, Goodman, and Barcan Marcus. Ruth Barcan Marcus in particular, as the first person to publish on symbolic quantified modal logics and the necessity of identity within such logics, is revealed by more inclusive narratives to be one of the central figures of mid-century analytic philosophy.

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