

Rationalist Elements of Twentieth-Century Analytic Philosophy

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The history of the analytic tradition in twentieth-century philosophy has often been recounted as the story of a failed empiricism, but actually it is methods tracing back to the modern tradition of rationalism that have most enduringly determined its practice and continue to define it today. The variety of analytic, explanatory, and interpretive methods that have made up the analytic tradition have shared a central and abiding concern with the investigation of the logical and conceptual structure of language as a means of understanding the metaphysical structure of the world. Historically, this concern descends directly from Leibnizian rationalism, although the program it suggests was articulated and developed, much more fully than Leibniz himself could have imagined, through the new tools of logical analysis developed by Russell, Wittgenstein, and the philosophers of the Vienna Circle at the beginning of the twentieth century.

In this chapter, I survey rationalist elements in the articulation and development of analytic philosophy. I argue that the significance of these elements has been underappreciated in historical retrospection, and that their identification can give us a new source of insight into the character of the analytic tradition as a whole. This is so, not only because rationalist ideas played a decisive and under-appreciated role in the *origins* of analytic philosophy, but also because essentially rationalist methods have continued to support the practice of analytic philosophy throughout its development, giving it, far more than the empiricist goals that these methods have sometimes served, the specific unity of a tradition grounded throughout its history in a particular conception of the nature of philosophical inquiry.

Although the explicit repudiation of various forms and assumptions of empiricism has been a central theme of the tradition since the 1950s, the rationalist elements of analytic philosophy have seldom been subject to critical scrutiny either from within or without the tradition. Partly because of this lack of scrutiny, the rationalist elements of the project of analytic philosophy have continued to exert a decisive influence on its results, long after its most ambitious empiricist claims were repudiated and purged. By identifying the rationalist elements in the development of analytic philosophy, indeed, we can begin to correct a standard view of this development that misportrays the character of its deepest theoretical motivations. On this standard view, the history of analytic philosophy so far has been a two-stage affair, consisting first in the articulation of an ambitious program of foundationalist epistemological analysis by Russell,

Wittgenstein, and the philosophers of the Vienna Circle, and second in the more critical phase begun by the historically decisive repudiation of that program by Quine, Sellars, and late Wittgenstein. Because the successful arguments of the postpositivist repudiators mostly attacked the foundationalist notion of an uninterpreted "given" element in experience at the basis of knowledge – a notion central to empiricism both in its early modern and contemporary forms – the standard interpretation has usually seen the positive project to which they responded as a variety of empiricism, essentially a linguistically inflected descendent of the empiricist epistemology of Locke, Berkeley, and Hume. But, I argue here, the project of Russell, Wittgenstein, and the Vienna Circle was as much rationalist as empiricist, and actually derived from rationalism rather than empiricism its most innovative claims and enduring methods. Appreciation of these elements yields a substantially different picture of the large-scale history of the analytic tradition, a picture that reveals rather than conceals the methodological continuity of the tradition through both its positivist and postpositivist phases. On the improved view, the mid-century critique of the original project embodied not so much a decisive repudiation as a relatively superficial amendment of its most significant methodological assumptions, and the contemporary philosophers who celebrate the critique actually carry further the most significant elements of the project they claim to replace.

I

It is well known that what would become the analytic tradition began with Russell and Moore's rejection of the then-dominant philosophy of Hegelian idealism and their subsequent development of an anti-idealist program of linguistic or logical analysis as the basis of a fundamentally new kind of philosophy. The new program drew its central inspiration from the logical concepts and symbolism that had been developed over the second half of the nineteenth century, and its first applications were applications of these new logical tools to derive epistemological and metaphysical results at variance with the idealist picture. Over the first decade of the twentieth century, Russell began to articulate an atomist ontology, according to which the world is composed of logically distinct and separable items which Russell called propositions. Whereas the idealists had argued for the existence and ultimate unity of an absolute reality, to which all propositions can only approach imperfectly, Russell's atomism insisted that individual propositions about particular things and properties can have *complete* truth despite concerning only part of the universe.

Despite the terminology, Russell did not initially conceive of propositions as linguistic entities; but his application of the new logic developed by Frege to the problem of the logical foundation of mathematics soon led him in the direction of an increasingly linguistic program of analysis. Initially, the logical analysis of a proposition had simply been the elucidation of its metaphysical component structure; but drawing on Frege's innovations and suggestions, Russell soon saw that logical analysis, if seen as *linguistic* analysis, could have substantial metaphysical consequences as well. Ordinary language, Frege had suggested, often has a superficial grammatical form that hides its deep logical or conceptual structure, leading us in philosophy to propound distinctions

where there are none and to misunderstand the real conditions for the meaningfulness of our sentences. Logical analysis, then, has the task of revealing the genuine, underlying logical form of propositions, over against our tendency to misunderstand it. Thus, for instance, the Russellian theory of descriptions showed that sentences apparently naming fictional or non-existent objects – for instance, “the current king of France” – could be analyzed as involving concealed definite descriptions, and thereby shown not to call for metaphysically puzzling “non-existent entities.” The linguistic analysis shows that logic allows a sparser and more austere metaphysics than had previously been thought, paving the way for the replacement or elimination of many or most of the profligate and problematic entities demanded by traditional philosophical systems.

The linguistic analysis program thereby defined had straightforward epistemological consequences as well. Essential to epistemological analysis, according to Russell, was the idea of logical construction: given a set of simple elements or objects at the basis of knowledge, more complicated objects of knowledge could be analyzed as constructions definable in terms of the simple objects and their logical combinations. Given the theory of descriptions and other analytical innovations, it was reasonable to suppose, the concepts and entities of scientific knowledge could be revealed as logical constructions from the simple elements of experience, what Russell called sense data. This constructional project could, Russell supposed, show the genuine epistemological status of scientific knowledge claims by isolating the portion of their meaning that traced to direct empirical knowledge of sense data, what Russell called “knowledge by acquaintance.”¹ A completed logical analysis of a knowledge claim could thus distinguish its empirical from its logical components, separating the elements of its structure that are actually given in immediate experience from those superadded by linguistic categories and concepts. In this way, the logical analysis of a knowledge claim shows its real empirical content by identifying the simple experiences which would verify it, the experiences which an investigator must have in order to assert the claim’s truth. From this root in the practice of logical analysis grew the doctrine of verificationism, according to which the meaning of any empirically meaningful proposition is the method of experientially verifying it, and the decisive suggestion, already implicit in Russell’s method of analysis, that the doctrine could be used to purge science of metaphysical claims unconnected to any possibility of verification.

By around 1914, then, Russell’s rejection of idealism had led to a recognizably empiricist program of epistemological analysis; but it is noteworthy that much earlier in his development, Russell had originally developed the central idea behind this program – that insights from logic could be used to elucidate the metaphysical structure of the world – under the determinative influence of the rationalist Leibniz. Russell’s book on Leibniz, written following a series of lectures he delivered in 1900, was his first primarily philosophical work. Its central interpretive claim – that Leibniz had derived most of his metaphysics from the logical claim that all propositions have, essentially, a subject-predicate form – stood as a model for the kind of logically based metaphysical analysis that Russell had begun to think he himself could provide, by applying a new logical theory of relations that went substantially beyond the subject-predicate logic of Leibniz’s day. Thus, although Russell’s interpretation criticized Leibniz for the inadequacy of his particular logical assumptions, he took the

logical determination of Leibniz's metaphysics as a methodological model for his own developing conception of philosophy as analysis. He began his exposition of Leibniz's philosophy with a declaration of his allegiance to this conception:

That all sound philosophy should begin with an analysis of propositions, is a truth too evident, perhaps, to demand a proof. That Leibniz's philosophy began with such an analysis, is less evident, but seems no less true. (Russell 1992: 8)

Leibniz's example would soon inspire Russell in the invention of a style of analysis that has characterized analytic philosophy throughout its development, whereby formal analysis of the logical structure of language yields philosophically significant insight into the metaphysical structure of reality.

To understand Russell's developing conception of analysis, though, it is helpful to examine in detail its roots in his critique of Leibniz's metaphysics. According to Russell, the most significant failing of Leibniz's metaphysics, and the one that led most directly to the contradictions of his system, was its failure to account for the nature of relations. Historically, it is significant (though hardly surprising) that Russell located Leibniz's largest failing here, for it was on its handling of the nature of relations that Russell would soon most directly criticize the dominant idealist tradition. Doubtless, he already saw substantial continuities between Leibniz's rationalist metaphysics and the holistic metaphysics of Bradley and McTaggart's idealism, and indeed he already saw both as arising from a widely shared but ultimately incorrect logical assumption.² The assumption was that of the subject-predicate form of all propositions; beginning with it, Russell averred in the *Leibniz* book, could only issue in a theory of relations that construes them as ultimately unreal, as both Leibniz and the metaphysics of idealism were inclined to do (Russell 1992: sect. 10). For the underlying assumption of the subject-predicate form of all propositions led Leibniz to suppose that the entire truth of an apparently relational proposition (such as "the oak is taller than the elm" or "seven is greater than five") must consist in its attribution of a predicate to a particular subject, rather than in its referring to an actually existing relation. This, in turn, led directly to the doctrine of substances as sempiternally existing bearers of properties, complete in that each substance reflects within itself each of what would otherwise be called its relations to other substances (Russell 1992: sects. 8, 10). This much Russell saw as common ground for both Leibniz and the metaphysics of absolute idealism, which formulated the same conclusion as the doctrine of the "internality" of all relations. With the doctrine of substance in place, it was simply the further assumption of a plurality of substances, which Leibniz made but the absolute idealists did not, that marked his doctrine off from theirs and produced its particular contradictions:

Thus Leibniz is forced, in order to maintain the subject-predicate doctrine, to the Kantian theory that relations, though veritable, are the work of the mind:

In the belief that propositions must, in the last analysis, have a subject and a predicate, Leibniz does not differ either from his predecessors or from his successors. Any philosophy which uses either substance or the Absolute will be found, on inspection, to depend upon this belief. Kant's belief in an unknowable thing-in-itself was largely due to the same theory. It cannot be denied, therefore, that the doctrine is important. Philosophers have

differed, not so much in respect of belief in its truth, as in respect of their consistency in carrying it out. In this latter respect, Leibniz deserves credit. But his assumption of a plurality of substances made the denial of relations particularly difficult, and involved him in all the paradoxes of the preestablished harmony. (Russell 1992: 15)

Sharing with Leibniz the assumption of the subject-predicate form of logic and accordingly arriving at essentially the same doctrine of substance, the idealists diverged from him, according to Russell, only in that they thought there could be only one substance, a unified, all-encompassing absolute; whereas Leibniz's belief in the plurality of substance, given the shared assumption, led him instead to the doctrine of monads and to its most problematic implication, the theory of the preestablished harmony. In the rest of the book, Russell diagnosed the implausibilities of Leibniz's theories of continuity, number, space, and time. In each case, he thought, the contradictions and paradoxes of Leibniz's theory arose directly from his denial of real relations. Ultimately, Russell argued, Leibniz's assumption of the reality of the external world produced, when combined with the denial of real relations, a central inconsistency that vitiated the whole philosophy of monadism. The idealists, by contrast, maintained the same denial of the reality of relations but denied the existence of a mind-independent reality, producing a system that, for all its other failings, was at least a consistent whole.

Since Russell thought that Leibniz's central failing traced to the logical assumption of subject-predicate form, it is not surprising that he recommended its replacement with a substantially different picture of the logical form of the proposition. On the suggested picture, the proposition consists of both simple objects and metaphysically real relations in articulated combination; the subject-predicate form is to be understood as a special case of relational form, rather than the converse (Russell 1992: 15). Russell did not yet have the logical tools necessary to make this suggestion rigorous; he would encounter Peano's axiomatization of arithmetic, which derived from Frege's new logic and nineteenth-century developments in what would become set theory, only months after the Leibniz book. But already he insisted that only a genuinely relational logic could give an adequate characterization of the structure of mathematical propositions, for instance propositions asserting equality, inequality, and number. The new logical methods of Frege and Peano would soon lead Russell, in fact, to envision the possibility of reducing mathematics completely to logic and set theory by showing the entities and operations of mathematics to be logical constructions from sets.

But the most important and enduring result of Russell's early encounter with Leibniz was not the reduction of mathematics that Russell undertook in *The Principles of Mathematics* and *Principia Mathematica*, but rather the conception of philosophical method that he drew from Leibniz's system. On this conception of philosophical method, logic is not just a special theory of the structure of thought or a symbolic system for the rigorization of proofs and chains of reasoning, but a substantial source of philosophical insight in its own right. The underlying logical structure that characterizes meaningful language has immediate metaphysical and ontological implications; for this reason, the logical analysis of propositions – which Russell saw as the obvious beginning of philosophical theory – can be expected to solve traditional philosophical problems and elucidate the metaphysical structure of the world. Russell sought to make explicit

in his own philosophy what had been only implicit in Leibniz's, the straightforward derivation of claims about the large-scale metaphysical structure of the world from an understanding of the logical structure of the proposition. In so doing, he defined an essentially rationalist method of analysis that would characterize analytic philosophy through the next several decades of its development.

II

Russell's early analysis of Leibniz played a decisive role, therefore, in suggesting a philosophical method whereby analysis of the logical structure of language would yield decisive results in epistemology and metaphysics. But it was Russell's student Wittgenstein who would present the method in its purest form, in the terse and precisely written *Tractatus Logico-Philosophicus*. In the *Tractatus*, Wittgenstein sought to fix the bounds of meaningful language by elucidating the nature of the logical conditions for its possibility. At the center of its account of meaning is the idea of a kind of structure – what Wittgenstein called “logical form” – that is shared between meaningful propositions and the worldly states of affairs they are about (*Tractatus* 2.18, 2.2). According to the *Tractatus*' “picture theory” of meaning, a sentence pictures a fact or state of affairs by mirroring its form; names in the sentence correspond to objects in the world, and the formal or structural relations among names in the written or spoken sentence mirror the relations that the objects stand in to compose a fact (3, 3.14, 3.21). By sharing logical form with an actual or possible state of affairs, then, each logically well-articulated sentence has a particular, determinate meaning; and this suggests that the *analysis* of a meaningful sentence in ordinary language, by showing their actual logical form, can display its actual meaning by showing which fact it corresponds to. Writing an ordinary language sentence in a perspicuous, logical notation shows the actual structure in virtue of which it has meaning, over against the superficial form given it by the grammar of a particular language (3.25, 3.323–3.325). This, in turn, distinguishes those ordinary language sentences which have a genuine meaning from those which do not; and the standard statements of traditional philosophical problems, Wittgenstein thought, could now be exposed as meaningless, artifacts of the misunderstanding of the logic of our language that arises when we take its overt grammar, rather than its deep logical structure, to sort sense from nonsense.

His articulation of the picture theory led Wittgenstein to argue for a metaphysics according to which the world is composed of the totality of actually obtaining facts within the “logical space” of all possible states of affairs (1–1.13). He understood the facts themselves as objects standing in relations, complexes whose logical structure would be mirrored by the relational structure of names in sentences about them (2.0121). Accordingly, he argued for the existence of a class of logically simple and eternally existing particular objects whose possibilities of combination into states of affairs made for all actual and possible states of affairs (2.0123, 2.02, 2.0271, 2.03). The argument for this, moving from the formal requirements for the possibility of meaning to a concrete and general metaphysical result, exhibits particularly clearly the formal method of argument that Russell had developed under the influence of Leibniz.

The core of the argument is given at *Tractatus* 2.021 and the following remarks:

- 2.021 Objects make up the substance of the world. That is why they cannot be composite.
- 2.0211 If the world had no substance, then whether a proposition had sense would depend on whether another proposition was true.
- 2.0212 In that case we could not sketch out any picture of the world (true or false).

The implication of 2.0212 expresses a demand that Wittgenstein consistently places on the theory of meaning he develops in the *Tractatus*: that it explain the possibility of a proposition's having meaning or sense, its possibility of saying something that is true or false (see also 3.23 and the remarks that follow it). The demand is the basis for much of the *Tractatus*' analysis of meaning, and it allows for a familiar type of transcendental argument which Wittgenstein relies on a great deal to derive semantic as well as metaphysical and ontological conclusions. The argument typically begins with the claim that the possibility of meaningful language demands that certain general logical conditions be satisfied, both by our linguistic systems and by the worldly objects and states of affairs to which they refer. Since meaningful language is possible, we can conclude that these conditions are indeed satisfied. This kind of argument allows the derivation of the shared structure of language and the world simply from reasoning about the preconditions for the possibility and determinacy of sense. The argument for the existence of simples exhibits this structure particularly clearly. It has the form of a two-stage *modus tollens*: if the substance of the world were not simple, non-composite objects, then whether a proposition had sense would depend on whether another proposition were true. But in that case, propositions would not, in general, have any determinate sense at all, and the linguistic drawing of a true or false picture of the world would be impossible. Drawing such a picture is, however, possible; so (contraposing twice) we must conclude that the world is, indeed, composed of simple objects.

The argument, thus reconstructed, has two steps, each of which depends on Wittgenstein's particular understanding of the nature of logical analysis and each of which involves moving from claims about the logical structure of meaningful language to the logical structure of the world.³ A fully analyzed sentence contains only names, organized in various logical relations; given this, the argument for simples concerns the relationship of these names to the entities to which they refer (3.2–3.202). It claims that they cannot refer to entities that are composite; the logical names revealed by a completed analysis must refer to entities that are mereologically simple. For if such a name referred to a composite, then a proposition involving the name could be false in either of two ways. It could be false because what it claims of the composite is false, or it could be false because the composite fails to exist (that is, because the simpler entities which would make it up, were the proposition true, fail to be arranged in the right way or at all). If the proposition were false in the second way, then its falsity would amount to the falsity of a second, simpler proposition – the one asserting the existence of the composite. So if the possibility of falsity of the second type could not be ruled out, then the truth of even a completely analyzed proposition might depend on the truth of a logically simpler proposition; there would be no requirement or expectation that the complete logical analysis of a proposition would exhibit the conditions for its truth.

If the world were not composed of simple objects, then there would be no general expectation that logical analysis of propositions into simple names and their logical analysis could clarify the structure of propositions. Wittgenstein's argument for simples, however, goes further than simply insisting on the possibility of instructive analysis; for it claims that, if the world were not composed of simples, not only logical analysis but also sense would be impossible. We have seen already that the denial of atomism makes the sense of even completely analyzed propositions dependent on the truth of other propositions. But why should this dependence, if it obtained, vitiate the possibility of any proposition's having sense at all? The reason for the additional requirement traces to Wittgenstein's additional claims, elsewhere in the *Tractatus*, about the nature of meaning and the determinacy of sense. For a proposition to have meaning, he argues, is for it to show how things are if it is true; and a meaningful proposition must be able to show this *no matter how* the world actually is. A meaningful proposition must be true or false in any possibility whatsoever; but if its having sense depended on the obtaining of contingent facts, then there would be some possible situations – the situations in which those facts did not obtain – in which it was neither true nor false (because senseless). In particular, in the second situation considered in the last paragraph, a logically simple proposition would lack sense if the composite to which one of its simple names referred failed to exist; the sense of such a proposition would then depend on the truth of another proposition, which is only contingent. Thus, the requirement that sense be determinate across all possible situations itself demands that logically simple names not refer to complexes. They must, instead, refer to simple objects which are not made up of other objects. Moreover, the simple objects must be sempiternal and changeless; for only in this way can the determinacy of sense, across all possible situations and at all times, be ensured.

Considered as an instructive example of one of the argumentative methods that defined analytic philosophy at its origin, Wittgenstein's argument for the existence of simples is noteworthy in several respects. In its style and conclusion it resembles quite closely the flawed argument for monadism that Russell found in Leibniz; the difference is that Wittgenstein's argument, unlike Leibniz's (as Russell reconstructs it), departs not from the logical assumption of subject-predicate form but from that of relationally structured language with a logical form capable of mirroring the logical and relational structure of entities in the world. Because of his avoidance of the assumption of subject-predicate form, Wittgenstein's argument need not conclude, as Leibniz's had to, that all relations are internal to atoms; and because of this, Wittgenstein's argument avoids, as well, the obscurities of the doctrine of preestablished harmony. But the simples demanded by Wittgenstein's argument resemble Leibniz's monads in being simple, eternal, and necessary constituents of the world; and Wittgenstein's recognition of the kinship between his simples and those required by early modern rationalist systems is shown by his retention of the term "substance" to describe them. And most significantly, the method of argument that Wittgenstein employs to establish the metaphysical existence of simples is essentially the same one that Russell found in Leibniz and that he himself adopted in his own ontological and epistemological theory. The method begins, as we have seen, with the elucidation of logical requirements for the possibility of a proposition's meaningfulness; in this case, the requirement is that the sense of a meaningful proposition must be determinate across all possible worlds and at all times.

It then derives from these logical requirements for the possibility of sense, general metaphysical claims about the structure of the world and its constituents, claims which must hold true if the logical requirements are to be fulfilled. In this way, insight into the logical structure of language, when conjoined with reasoning about the logical preconditions for the possibility of meaning, issues in substantial ontological conclusions that are authorized by nothing more controversial or demanding than logic itself. The method of logical or conceptual analysis, although it operates purely on linguistic material, can accordingly yield substantial and general philosophical results with logical necessity and certainty. The conundrums and perplexities of traditional philosophical problems can be shown to result from their misunderstanding of the underlying logic of language, and the new methods of logic allow their swift replacement.

In view of the subsequent history of analytic philosophy and its usual interpretation, it is particularly significant that Wittgenstein's argument makes no mention of an empirical or experiential basis for meaningful propositions or knowledge claims. It is no part of Wittgenstein's concern to argue that the simples which he shows to exist are simple elements of experience or sense data, and no part of his argument depends on the suggestion that they are. Indeed, Wittgenstein in the *Tractatus* is generally unconcerned with epistemology; it is likely that, at this stage at least, he thought epistemology akin to psychology in being irrelevant to logical analysis.⁴ The simples for which Wittgenstein argues are necessary for the meaningfulness of any proposition, but it is notorious that he gives no general characterization of their nature. In this quietism about the nature of simples Wittgenstein certainly diverged from Russell, who consistently held, during and after the period of his greatest contact with Wittgenstein, that at least some simples are sense data, and may have believed that properties and logical objects are also simples. The doctrine of sense data, we have seen, came to play an important role in Russell's hopes for an epistemologically illuminating reconstruction of scientific knowledge claims. But the structure of Wittgenstein's argument shows that the atomism that Russell and Wittgenstein shared does not at all depend on assumptions about the nature of experience or its relation to knowledge, and that it can be established by the purely logical method of reasoning that Russell himself recommended and that Wittgenstein applied. The method of logical analysis itself, though it could be applied to epistemology given the assumption that at least some simples are sense data, does not demand any particular epistemological claim or reasoning in order to yield substantial metaphysical conclusions about the structure of the world. In the context of the influential project of the *Tractatus*, then, Wittgenstein's argument shows clearly that the epistemological commitments of the method of logical analysis are by no means as deep as has usually been thought. The method itself has no need for such commitments in order to secure metaphysical insight; and the empiricist assumption of the reducibility of all knowledge to propositions concerning immediate experience is, accordingly, no essential part of its proper concern.

III

In the late 1920s and early 1930s, the philosophers of the Vienna Circle sought to develop Russell's constructional method, in conjunction with the analytical practices

developed by Frege and Wittgenstein, into a far-ranging program of "scientific philosophy" that put reconstructive epistemology at the center of its concerns. With the epistemological structure of scientific knowledge clarified through the new logical tools now available, they reasoned, traditional philosophical confusions and problems could be eliminated in favor of a new method whose logical basis would put it on the secure path of an apodictic science. The program of the Vienna Circle has often, subsequently, been understood as a foundationalist empiricism; for the reconstructive epistemologies initially propounded by its most prominent members, Schlick and Carnap, placed subjective, elementary experiences at the epistemological basis of scientific knowledge, and sought the reduction of the meaning of scientific propositions to their basis in experience. But actually this element of foundationalist empiricism was the first element of the Circle's program to be abandoned, and its repudiation in the early 1930s left in place the significant rationalist elements that had informed the program from its beginning. In the Circle's protocol sentence debate of 1932-5, the sociologist Neurath successfully challenged Schlick and Carnap's assumption of a basis of scientific claims in immediate, subjective experience, eventually convincing Carnap of the universality of a "physical language" concerning only public, objective entities and events, and of the necessity that the epistemologically basic sentences of science be expressible in this language. After the protocol sentence debate, analytic philosophers would increasingly reject the Circle's foundationalist project and its empiricist hope of finding a basis for knowledge in immediate experience. But the essentially rationalist conception of philosophical method that the Circle developed from the suggestions of Russell and Wittgenstein would remain characteristic of the projects of analytic philosophy long after this historically decisive rejection.

An essentially rationalist understanding of philosophical method is already prominent in Carnap's first masterpiece, the influential *Der Logische Aufbau der Welt*. Written from 1922 to 1925, just before the beginning of Carnap's involvement with the Circle, the *Aufbau* embodies a particularly clear and historically significant development of the project of scientific philosophy that initially united the Circle. Its aim is to show the possibility of a clarificatory epistemology of scientific knowledge that reveals all scientific claims and concepts as logical constructions from simpler, epistemologically more fundamental entities, and indeed to actually begin this constructional project by showing how objective claims about entities and events in space and time can be constructed from a basis of immediate, elementary experiences (*Aufbau*, sects. 1, 2, 67, 78). Because the logical constructions that Carnap carries out in the *Aufbau* take immediately given elementary experiences as their basis, attempting to show the ultimate reducibility of all scientific claims to claims involving only such experiences and a single, basic relation of similarity among them, the *Aufbau* has often been interpreted as suggesting a foundationalist empiricism. But more recently, commentators have begun to question this usual way of interpreting the *Aufbau*, emphasizing the Kantian and rationalist ideas that actually influenced Carnap's project more deeply and enduringly (see, especially, Friedman 1987, 1999). The construction of objective claims from a basis in immediate, subjective experience, these commentators have pointed out, was intended by Carnap as only one possible example of the more general program of construction theory that it is the main goal of the *Aufbau* to defend; in fact, Carnap explicitly suggests the possibility of other, non-experiential bases for a

reconstruction of scientific knowledge, including the physicalist basis that he would later endorse (*Aufbau*, sects. 59, 62).

To understand Carnap's project, it is also important to note what he took to be its most significant logical innovation: the development of a theory of relations that made possible the definition of all scientific concepts and objects from a stock of basic objects and a single, fundamental relation among them. Given Frege's logic of relations, Carnap reasoned, scientific claims could be understood as *structural definite descriptions*, purely relational statements whose terms are "implicitly defined" by their place in the total relational web of scientific knowledge, rather than ostensively or by example (*Aufbau*, sects. 71-3). The method of implicit definition that Carnap employed had originally been discovered by Hilbert in his influential axiomatization of geometry (Hilbert 1962). Rather than defining the basic terms of geometry (such as "point," "line," and "plane") by reference to actual examples of drawn figures, Hilbert's system begins with a set of axioms asserting the holding of various relations among the bearers of these basic terms. In this way, the basic terms are implicitly defined simply as the bearers of all the relations asserted by the axioms. The resulting system yields all the theorems of geometry by structural means alone, without ever having to refer to an actual figure or perception. Similarly, Carnap reasoned, constructional theory could "structuralize" the terms and concepts of science by defining them in terms of their relational positions within the total web of knowledge. Within the context of the particular version of constructional theory that he worked out in the *Aufbau*, indeed, Carnap considered the possibility of structuralization essential to showing how claims about immediate, subjective experience could provide the basis for the objective propositions of science:

Now, the fundamental thesis of construction theory (cf. sect. 4), which we will attempt to demonstrate in the following investigation, asserts that fundamentally there is only one object domain and that each scientific statement is about the objects in this domain. Thus, it becomes unnecessary to indicate for each statement the object domain, and the result is that *each scientific statement can in principle be so transformed that it is nothing but a structure statement*. But the transformation is not only possible, it is imperative. For science wants to speak about what is objective, and whatever does not belong to the structure but to the material (i.e., anything that can be pointed out in a concrete ostensive definition) is, in the final analysis, subjective. One can easily see that physics is almost altogether desubjectivized, since almost all physical concepts have been transformed into purely structural concepts . . . From the point of view of construction theory, this state of affairs is to be described in the following way. The series of experiences is different for each subject. If we want to achieve, in spite of this, agreement in the names for the entities which are constructed on the basis of these experiences, then this cannot be done by reference to the completely divergent content, but only through the formal description of the structure of these entities. (*Aufbau*, sect. 16)

Immediate experiences and their relations are ultimately, Carnap thought, subjective in character; if they were to provide the basis of objective scientific knowledge, they could only do so insofar as all scientific knowledge claims are structuralized relational descriptions. Structuralization was the essential precondition, not only for the intersubjective intelligibility of scientific claims, but even for their meaningfulness; for only structural or structuralizable propositions could express claims with the generality

characteristic of scientific propositions. The relations in virtue of which scientific terms are implicitly defined could themselves, Carnap thought, be reduced to purely logical ones, together with the single, extensionally given relation of similarity among elementary experiences; accordingly, the reduction of objective scientific claims to the basis in immediate experience would not be a straightforward reduction of objects to objects, but a logical, definitional reduction of relations to relations.

Carnap perceived that the relational theory developed in the *Aufbau* and its method of using logical means to structuralize factual propositions were already anticipated by modern rationalism:

The fundamental concepts of the theory of relations are found as far back as Leibniz' ideas of a *mathesis universalis* and of an *ars combinatoria*. The application of the theory of relations to the formulation of a constructional system is closely related to Leibniz' idea of a *characteristica universalis* and of a *scientia generalis*. (*Aufbau*, sect. 3)

The idea of a *mathesis universalis* or "universal character" to which Carnap alludes figures in some of Leibniz's earliest writings, in which he suggests the possibility of developing a universal language by associating characteristic numbers with the simple notions that are the basis for all linguistic terms and categories. The development of such a language, Leibniz thought, could vastly improve human reasoning by giving it a unified mathematical calculus by means of which all arguments and conclusions could be evaluated:

Once the characteristic numbers of most notions are determined, the human race will have a new kind of tool, a tool that will increase the power of the mind much more than optical lenses helped our eyes, a tool that will be as far superior to microscopes or telescopes as reason is to vision. The compass never provided navigators with anything more useful than what this North Star would give us for swimming the sea of experiments . . . Moreover, who could doubt that reasoning will finally be correct, when it is everywhere as clear and certain as arithmetic has been up until now. (Leibniz 1989: 8)

With the development of the universal characteristic, Leibniz argued, both empirical and *a priori* reasoning could proceed according to a method whose results would be as certain and indisputable as the results of mathematics. Of course, it was just this kind of universal method of reasoning which analytic philosophers beginning with Frege saw in the new logic he had developed. Given the new logic, the method of logical analysis, akin to Leibniz's proposed method of identifying the simplest notions from which all others are constructed, could put reasoning in mathematics and science alike on a secure path of certainty. But the most significant implication of Leibniz's idea for Carnap's project was its suggestion of a universal logical form shared by all significant, objective propositions, the characterization of which would show the real content of any such proposition over against our superficial tendency to misunderstand it. Just as Leibniz had thought that the content of any proposition could be expressed by the association of characteristic numbers with its simple notions, Carnap's structuralism held that the content of any objective proposition amounts to its place in a system of relations ultimately reducible to the simple structural relations of logic.

And as for Leibniz, the essential precondition of this reduction was a logical understanding of the nature of linguistic meaning, an understanding that would allow logical analysis to clarify the meaning of scientific and ordinary propositions alike by resolving them into their logical components. For Carnap, Leibniz's suggestion of a universal characteristic was, doubtless, centuries ahead of its time; accordingly, it was little surprise that Leibniz lacked the logical details necessary to develop it into a usable method. But with the new logical tools available to him and the structuralism about meaning that they suggested, Carnap now thought he could implement the very project that had inspired Leibniz two and a half centuries earlier.

In the early 1930s, discussion in the Vienna Circle's weekly meetings turned to the question of the logical status of the basic observation statements or "protocol sentences" thought to comprise the empirical foundation of science. Despite substantially sharing Carnap's structuralist view of the nature of objective meaning, Neurath attacked Carnap's assumption that the protocol sentences must be records of immediate, private, subjective experience (Neurath 1932, 1934). Neurath argued that all meaningful scientific propositions, including those that are most empirically fundamental, must be expressible in the single, unified language of physics. The doctrine of protocol sentences as experiential reports that Carnap and Schlick shared, Neurath complained, could give no account of the truth of such sentences. For according to the doctrine, protocol sentences must be true in virtue of their correspondence with private, ineffable experience; but Carnap and Schlick could give no account of the relation of comparison between experience and language that would be necessary to explain this. According to Neurath's physicalism, by contrast, protocol sentences are not subjective, first-personal reports of immediate experience, but rather perfectly objective reports of an observer's having made a particular observation, recording, or measurement at a particular time. Nowhere in scientific reasoning is there any need for comparison of linguistic with extra-linguistic or subjective items; the truth of objective claims is to be evaluated only in terms of their rational relations to other objective claims, including the physicalistically reconstructed protocol sentences.

By 1932, Neurath had convinced Carnap to repudiate his former view in favor of a version of the physicalist view of protocol sentences, on the ground that only the universality of physicalist language could ensure the unity of scientific knowledge as a single, comprehensive framework (Carnap 1934a, 1987). Carnap's conversion to physicalism demanded that he abandon any hope of the sort of epistemological construction of scientific objectivity from the subjectivity of immediate experience that he had sketched in the *Aufbau*; but it is significant that he nevertheless still envisioned a successor project of analysis that continues in the vein of the *Aufbau*'s structuralist theory of meaning. Carnap outlined the successor project in *The Logical Syntax of Language*, written in 1934. The project of *Syntax* departed from the notion, which Carnap derived from Tarski and Godel's work on the metalogical representation of logical symbolism, that the formal or logical structure of a particular, conventionally structured language could be represented within that language itself. Given this possibility, Carnap thought, the logical rules of scientific language could be treated as purely conventional stipulations, allowing for an unending variety of possible languages for science, among which only pragmatic considerations should decide. The role of philosophical analysis, then, was to clarify the conventional logical structure of the language

scientists use and to facilitate the articulation of new languages that might be better able to satisfy natural explanatory demands.

Carnap now rejected, therefore, his earlier project of explaining the logical structure of (what he had taken to be) the *single* language of science, and along with this he rejected the epistemological project of defining the empirical basis of that language. But even within the context of his newly anti-empiricist conventionalism, Carnap's new view of logical analysis preserved the structuralist account of meaning that had provided the basis of the *Aufbau* program. As on the earlier program, the content of a proposition can be identified with its place in the total relational pattern of inferences that characterizes the logic of the language. Though Carnap now thought of this relational pattern as established by conventional stipulations, he continued to hold that the analysis of a proposition displays its formal or structural character, and that a complete analysis of a proposition results in its complete structuralization. The idea of the universality of logical structure that Carnap had drawn from Leibniz's suggestion of the universal characteristic continued to support his structuralist theory of meaning, and the doctrine of physicalism that Carnap drew from Neurath added to this support by establishing the possibility of a language whose purely structural characterizations could unify science into a single, comprehensive framework of unified explanation.

Neurath's historically decisive attack on the *Aufbau* project, then, had the effect of thoroughly and permanently repudiating its empiricist epistemic foundationalism; but it left wholly intact the rationalist motivation of Carnap's understanding of analysis and the structuralist theory of meaning that supported it. In its criticism of empiricist foundationalism, in fact, Neurath's attack significantly anticipated, both in general and in detail, the Quinean, Sellarsian, and Wittgensteinian criticisms of the Vienna Circle's project that would characterize mid-century analytic philosophy and seemingly usher in a new, postpositivist phase of the tradition. But like these mid-century critiques, Neurath's criticism of the empiricist *claims* of Carnap and Schlick's project left largely in place the originally definitive investigative *methods* of analytic philosophy, methods that, as we have seen, developed primarily from rationalist roots. We have seen that, despite his later development of the empiricist doctrine of sense data, it was the rationalist influence of Leibniz that first suggested to Russell his conception of philosophical analysis, and we have seen that Wittgenstein's understanding of the nature of analysis, and the doctrine of meaning that it suggested, contained no admixture of empiricism at all. Carnap's structuralist theory of meaning preserved and extended the methodological assumptions that Wittgenstein and Russell had shared, according to which the meaning of a proposition is shown by an analysis of its underlying logical form. Long after the mid-century purging of the empiricist elements of analytical epistemology, versions of this conception of philosophical insight would continue to characterize the aims and constrain the results of the various investigative projects grouped under the heading of "analytic philosophy."

IV

It is usual to see the history of analytic philosophy in the twentieth century as having consisted of two distinct but internally interrelated historical phases. The first phase,

according to the usual picture, was characterized by the formulation of a strong and ambitious program of epistemologically foundationalist analysis, by means of which scientific and ordinary propositions would be analyzed cleanly into two components, one empirical and experiential and the other conceptual. The project would thereby reveal the empirical foundations of knowledge in the immediacy of uninterpreted experience; and the conceptual component of knowledge could then be treated as purely a matter of conventional stipulations and patterns of linguistic use. According to the usual picture, the second phase of analytic philosophy began with the decisive repudiation by Quine, Sellars, and Wittgenstein of this original project. Quine's influential "Two Dogmas of Empiricism" showed the untenability of the distinction; presupposed by the proponents of the original project, between analytic truths, true in virtue of concepts and logic alone, and synthetic ones, true in virtue of experience. At about the same time, Sellars' manifesto "Empiricism and the Philosophy of Mind" polemicized against the conception of experience as representing a "Given," uninterpreted contribution to knowledge that had been basic to hopes for foundationalist epistemology; and Wittgenstein's complicated and elusive *Philosophical Investigations* seemed to show the possibility of an alternative account of linguistic meaning as linguistic use that owed nothing to the verificationism of analytic philosophy's first phase. These three prominent critiques, along with less prominent ones that anticipated or imitated them, are often seen as marking a decisive change in the methods and practices of analytic philosophy.

The standard picture has well served the purposes of retrospective accounting for analytic theorists concerned to portray their own projects as radical breaks with the legacy of the Vienna Circle; but actually it is a poor fit to the historical record, if that record is considered from a position of philosophical sensitivity to the deep methodological characteristics and tendencies of the analytic tradition. Appreciation of the rationalist origins of the methods of analysis that defined the tradition can help us to remedy the usual picture, checking its generalizations by situating it in a larger and more instructive philosophical context. For like Neurath's original criticism of Carnap's epistemic foundationalism, the mid-century critiques of what was supposed to be the univocal project of existing analytic philosophy almost universally focused on the specifically *empiricist* elements of that project. They issued in a historically decisive repudiation of those elements, effectively ending philosophers' hopes of using the method of analysis to produce an epistemological reconstruction of the relationship of experience to knowledge. But because they focused on the empiricist applications rather than the rationalist sources of the method of analysis, they left largely unscathed the methodological and semantic assumptions that had continuously determined the scope and character of analytic projects. As a result, a basically rationalist understanding of the logical nature of philosophical insight and a correlative structuralism about meaning remained the background of projects in analytic philosophy *even when* these projects seemed to wholly replace their analytical antecedents and *even when* philosophers impressed with the success of the mid-century critiques became reluctant to characterize their practice as anything like "logical analysis." Instead of developing into a farther-ranging critique of the fundamental methodological assumptions of analytic philosophy, the mid-century critiques led to an increasing reluctance on the part of analytic philosophers to discuss the methodological background of their practice. With

the rationalist determinants of the methodology of analytic philosophy, early and late, clearly in view, historical retrospection can begin to remedy this reluctance, equipping analytic philosophers with a fuller understanding of the philosophical bases and implications of their own practice.

To understand the enduring methodological determinants of the practice of analytic philosophy in greater detail, it is helpful to see specifically how one of the most important mid-century critiques of the original analytical projects of Russell, Wittgenstein, and Carnap actually preserved the most important theoretical motivations of these projects even as it appeared thoroughly to repudiate them. In "Two Dogmas of Empiricism," Quine construed Carnap's *Aufbau* as exemplifying a logically inflected empiricism, and argued that this empiricism depended on two unsupported dogmas. The first, and more historically significant, was the dogma of the analytic/synthetic distinction, which distinguishes analytic propositions true "in virtue of meanings" alone from synthetic propositions grounded, at least in part, in matters of empirical fact. Quine objected that there is no tolerably clear or univocal criterion of analyticity, and accordingly that scientific propositions cannot be sorted by analysis, as the logical empiricists had supposed, into separable empirical and conceptual components. The second dogma that Quine held to have been essential to Carnap's empiricism was the dogma of reductionism, or "the belief that each meaningful statement is equivalent to some logical construct upon terms which refer to immediate experience" (Quine 1951: 20). The two dogmas were intimately related, Quine thought, in that empiricism could only construe synthetic statements as those true in virtue of their confirmatory experiences; thus, the attack on the analytic/synthetic distinction sufficed, if successful, to demolish reductionism and its empiricist constructional project. But as we saw in the last section, Carnap had already abandoned the empiricist project and the dogma that Quine called reductionism two decades earlier, under the pressure of Neurath's physicalism. Though based on the rejection of the analytic/synthetic distinction rather than the assumption of physicalism, Quine's attack on Carnap's supposed empiricism focused on the very same doctrine of reducibility to experience that Neurath had criticized in his own attack two decades earlier. In so doing, it stopped short of questioning the elements of Carnap's program that had been most important, even at the time of the *Aufbau*, to Carnap himself: the theory of relational definite descriptions and the structuralist conception of meaning that he had defended as an offspring of the Leibnizian idea of the universality of logic.

But it is Quine's positive suggestion of a reconstructed theory of knowledge, purged of the two dogmas, that exhibits most clearly the continued influence of the rationalist methodology of the project common to Russell, Wittgenstein, and Carnap on Quine's own understanding of philosophical method. When he first introduces his suggestion for a replacement to reductionism, in fact, Quine explicitly refers to the physicalism that Carnap had first suggested in the *Aufbau* as a possible alternative to empiricist reduction and later endorsed under the influence of Neurath:

The dogma of reductionism survives in the supposition that each statement, taken in isolation from its fellows, can admit of confirmation or information at all. My counter-suggestion, issuing essentially from Carnap's doctrine of the physical world in the *Aufbau*.

is that our statements about the external world face the tribunal of sense experience not individually but only as a corporate body. (Quine 1951: 38)

Quine's positive suggestion for a reconstructed theory of knowledge, further elaborated in the final section of "Two Dogmas," would prove immensely influential for the development of postwar analytic semantics and epistemology. On the suggestion, the totality of knowledge has the structure, not of a founded edifice, but of a rationally interconnected web. Experience influences the shape of the web overall, but only by impinging upon it at its outer boundaries; given any new experience or experimental result, there is always a variety of possible ways in which the total web can be reshaped to accommodate it. The dichotomy between analytic and synthetic truths is replaced by a more gradual and variegated continuum between propositions that are relatively closer to empirical confirmation, and hence more likely to be revised given a recalcitrant experience, and those that are farther away and less likely to be revised; but there is no proposition that is totally immune from possible revision under the constraint of experience.

Quine's holistic picture of empirical confirmation, therefore, suggested to him the untenability of any foundationalist program of analysis designed to analyze scientific propositions into the separate empirical and conceptual components of their meaning. But although he would not endorse foundationalist programs of analysis, Quine's own semantic holism was derived not so much from the rejection of Carnap's deeper methodological and semantic assumptions as from the inheritance of them. Like Carnap, Quine understands the semantic content of a proposition as a matter of its place in a comprehensive, rationally interconnected web. As for Carnap (and Russell and Wittgenstein before him), this structuralism about meaning also suggests a program of philosophical investigation on which an understanding of the logical structure or form of propositions allows the clarification of their meaning for metaphysical and epistemological purposes. Over the years succeeding "Two Dogmas," Quine would develop the picture of knowledge first sketched there into a spare ontology derived from reflection on the metaphysical implications of first-order logic and a "naturalized" epistemology that followed Neurath in treating the philosophical theory of knowledge as a straightforward component of natural science rather than a tribunal for it.

Throughout the development of his philosophical method, though, Quine retained a basic structuralism about meaning and continued to look to the structure of logic as the main source of philosophical insight. Quine (1960) suggested that the imagined scenario of "radical translation" could clarify the large-scale logical structure of language. In radical translation, an interpreter attempts to understand the language of a foreign nation or tribe, given only the gestures and reports of its members. Reflection on the variety and structure of the interpretations possible, Quine reasoned, would show us how to understand the logical categories and distinctions present in our own language; the thought experiment yielded, in fact, several surprising semantic results, including the result that the intentional language with which we ordinarily describe mental states and propositional attitudes could be eliminated without violence to our ability to state the facts about the world. Both in its sources and its results, then, the thought experiment of radical translation figured as a fundamental component of a

view of philosophical method on which understanding of the large-scale structure of language yields substantial metaphysical results. In the extended applications of the radical translation scenario that have since been developed and defended by Quine's followers Davidson and Dennett, much the same conception of philosophical method – a conception of logically and semantically based insight into the structure of the world that Davidson has described as “metaphysics in the mirror of meaning” – has continued to the present day.

Nor was Quine's new method, and the methods that his students derived from it, atypical in its retention of the originally rationalist idea of using reflection on the logical structure of meaningful language to secure philosophical insight. By the 1960s, most analytic philosophers had realized the untenability of the atomism of the classical style of analysis, which had sought to analyze propositions *individually*; instead, they turned to practices of analysis and investigation aimed at clarifying the semantic structure of the language as a whole, in its pragmatic context of its embedding in our ordinary concerns and practices. Though the practitioners of “ordinary language philosophy” and “descriptive metaphysics” often characterized the semantic and pragmatic interrelations among linguistic propositions as matters of “grammar” rather than logic, the underlying picture of content as the position of a proposition in a structural, rationally articulated web of linguistic relations remained much the same. In the 1970s and 1980s, under the influence of Quine's naturalistic picture of philosophy, these practices of explicitly linguistic and conceptual analysis would largely cede to more scientifically minded metaphysical projects; but even these projects continued to look to logic as the essential source of philosophical insight, continuing to derive from reflection on the logical structure of scientific explanation claims about the metaphysical structure of the world.

With the rationalist influences on the enduring method of analytic philosophy clearly understood, we can begin to understand the methodological continuity of the tradition as a whole, allowing a deeper, more comprehensive, and more philosophically suggestive view of its history. For decades, the picture of analytic philosophy that sees the repudiation of empiricism as the central event of its history has rendered inaccessible any clear understanding of the rationalist conception of analytic practice that determined its origin and have characterized it in all of its forms. The standard picture has even convinced some leading historians of the analytic tradition that it no longer *has* any particular method or anything more than sociological unity.⁵ Appreciation of the rationalist elements of analytic philosophy, however, allows us to identify the basic rationalist faith that has sustained the tradition at *each* of its moments and in *all* of its most significant theoretical ambitions. After more than a hundred years of the practice of analytic philosophy, the interpretive task of understanding this practice by situating it with respect to its philosophical antecedents and anticipating its possible philosophical descendents has scarcely begun. The identification of the determinative rationalist influences on the methods of analytic philosophy, I have argued, provides an important first step towards the completion of this task, suggesting the existence of a fundamental and philosophically significant set of methodological assumptions at its core. But the further development of methodological reflection on the history and legacy of analytic philosophy can, no doubt, hardly avoid involving historical interpretation in deeper and more radical reflections.

Notes

- 1 Russell had not always held that only sense data can be known by acquaintance; indeed, the earlier form of his logical atomism had construed Platonic universals and the so-called "logical constants" – the real-world representatives of the logical operations of negation, disjunction, and conjunction – as possible objects of acquaintance.
- 2 For a trenchant and detailed account (which I partly follow here) of Russell's reaction to Leibniz against the backdrop of his rejection of absolute idealism, see Hylton (1990).
- 3 My account of the argument partially follows the reconstruction given by Anscombe (1959: 48–9).
- 4 This is suggested by *Tractatus* 4.1121; additionally, it was essentially on this basis that Wittgenstein convinced Russell to abandon work on a projected *Theory of Knowledge*.
- 5 This is the view, for instance, of Rorty (1979), who derives it directly from his celebration of the Quinean repudiation of the analytic/synthetic distinction:

If there are no intuitions into which to resolve concepts (in the manner of the *Aufbau*), nor any internal relations among concepts to make possible "grammatical discoveries" (in the manner of "Oxford philosophy"), then indeed it is hard to imagine what an "analysis" might be. Wisely, few analytic philosophers any longer try to explain what it is to offer an analysis . . . The present lack of metaphilosophical reflection within the analytic movement is, I think, symptomatic of the sociological fact that analytic philosophy is now, in several countries, the entrenched school of thought. Thus in these countries anything done by philosophers who employ a certain style, or mention certain topics, counts (*ex officiis suis*, so to speak) as continuing the work begun by Russell and Carnap. Once a radical movement takes over the establishment against which it revolted, there is less need for methodological self-consciousness, self-criticism, or a sense of location in dialectical space or historical time.

I do not think that there any longer exists anything identifiable as "analytic philosophy" except in some such stylistic or sociological way. (Rorty 1979: 172)

If the present analysis is correct, of course, Rorty's account, over-impressed with the importance of the Quinean critique, simply misses the methodological unity that continues to underlie the "stylistic" and "sociological" unity of the tradition; and the kind of methodological reflection for which Rorty sees no need could actually bring the tradition to a new level and kind of philosophical self-understanding.

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