Part X

RUDOLF CARNAP CENTENNIAL

The Unimportance of Semantics[1]

Richard Creath

Arizona State University

Our deepest commitments about history are reflected in how we break it down into periods. (Cf. Galison 1988) By drawing a break at a certain point we emphasize the novelty and importance of a new development. It is also how we contain and dismiss certain work as no longer relevant. Thus, in the history of physics we break the story with Newton, both to emphasize his roles in bringing previous developments to a close and in initiating new lines of work, and also to suggest that the ongoing practice of physics thereafter can appropriately in large measure ignore what preceeds Newton. Periodizing history is essential to understanding it, including when we periodize the work of a given writer. In philosophy, anyone who did not see a gulf between Kant's early work and his critical philosophy or between Wittgenstein's *Tractatus* and his *Philosophical Investigations* would be missing something enormously important. But periodization can also be dangerous in blinding us to the continuities between periods and in erroneously suggesting that it is safe to ignore what has come before. Nowhere is this more true than in standard treatments of the work of Rudolf Carnap.

Carnap's work is typically divided into four periods: There is the Carnap of the *Aufbau* (1928) which lasts until the early 1930s; there is the Carnap of syntax which lasts till the ink is dry on *The Logical Syntax of Language* (1934), say 1935; there is the semantical period which lasts till the mid- or late-1940s; and finally there is a period devoted to confirmation and probability theory and other broadly pragmatic matters in the philosophy of science. Some would add a Kantian or pre-critical period on the front; others would draw the lines in slightly different ways. But usually Carnap's work is thus drawn—and quartered.

Even Carnap encouraged this periodization; in fact, he appealed to it to avoid annoying questions about his earlier work. For example, in the late 1940s Carnap visited Minnesota. Wilfrid Sellars was at the time teaching a seminar on the *Aufbau* and so peppered Carnap with questions about it. Carnap couldn't escape; they were riding together in a car from the airport. When Carnap could contain his exasperation no further, he cut off discussion of the *Aufbau* by saying "But that book was written by my grandfather!" (Sellars 1975, p. 277) On the present occasion I have no wish to argue against periodization per se; it is essential to the historian's task. Moreover, I have no

wish to argue (my title notwithstanding) either that semantics is unimportant to us or that Carnap's work in his so-called semantical period is uninteresting or unimportant. Instead, what I shall urge is that there is no great cleavage either between Carnap's syntactical and semantical work or between his semantical and later work. Of course, there are differences, but they are not as important as the continuities. And we will mislead ourselves about all of it if we are guided by the standard periodization.

The first thing I want to do, however, is to review, perhaps a bit cynically, what I take to be the reasons or causes behind the standard periodization. Thereafter, I can review what is new and imporatant in the *Logical Syntax* that binds the rest of Carnap's work together and then use that to argue against the standard periodization more specifically.

It is easy to see why someone now would want there to be a wall after the *Logical Syntax*. After all, it says that all logic (and for that matter all philosophy) is syntax, and we know this to be false. In addition, it rejects a truth predicate and with it reference and designation, all of which we know to be central to our enterprise. Besides, it is so *hard*! It seems to have hundreds of pages of incredibly complicated English-free notation, all in defense of some thesis that we know to be wrong anyway.

By contrast, *Meaning and Necessity* (1947), which is emblematic of semantics, is so readable, so easy, and so accessible to anyone who has had standard contemporary graduate training in philosophy. We may quarrel with this or that claim in the book, but its view is still in the mainstream.

The argument for a cleavage between the semantics and the later work is similar in form. In the later period Carnap's work becomes wholly absorbed with philosophy of science and especially with probability and confirmation theory, a concern which seems absent in the semantical period. In this metaphysical age, worrying about the epistemology of science seems peripheral to the mainstream of philosophers. It is rather an odd taste to be indulged in members of the PSA, but not at all approved for New England Cartesians or for modal logicians on either coast. So the semantics seems relevant to contemporary concerns, but the later work does not. Moreover, we have it on excellent authority that Carnap's probability theory is wrong, and besides the probability books are so *hard*. Life is short and sweet, so we had better concentrate on the most promising stuff, namely the semantics.

All in all, then, the reasons for the standard periodization hinge on a determination to focus on that which seems accessible, relevant, and largely right to *us*. Insofar as this exemplifies a principle of charity it is not at all disreputable. I think, however, we should resist the urge to be thus charitable for two reasons: First, by looking at what we thought was wrong we might learn something. We might learn that it wasn't so wrong, or we might learn that scattered among the falsehoods were a lot of important truths. Second, we might come to understand quite differently and perhaps a bit better what already seemed familiar and right.

To make my case for a different periodization, or at least for less of a wall on either side of semantics, I need now to go back to the *Syntax* to see what was interesting and new about that. In fact I will spend a good deal of time on the development of the *Syntax*, but if we understand the importance of that clearly enough, the rest of my argument will fall neatly and fairly quickly into place.

To find out what was new in the *Syntax* we have to ask what Carnap was committed to just before he wrote that book. Well, his deepest commitment was to a thor-

oughgoing empiricism, which consisted of two parts. The first of these was a rejection of intuition. This supposed transempirical mode of knowing independent matters of fact was much loved by Platonic and Cartesian rationalists and apparently by Frege and Russell as well. The rejection of intuition is what the elimination of metaphysics is all about. The second part of Carnap's empiricism is the conviction that the meaning of a claim is somehow the mode of its verification. This link between meaning and knowing or justification derives more or less straightforwardly from Hume, but it was not dependent on any particular form of verification or testing. He could change his mind about how to test at the drop of a counterexample without giving up the crucial linkage to meaning. Whatever is not appropriately linked to experience is unintelligible. Metaphysics, thus, is not false, not unjustified, but utterly without cognitive meaning. Even so, the slogan that meaning is the mode of verification is at best only a strategy for a theory of meaningfulness and only hazily suggests a full fledged theory of meaning that would include synonymy, implication, and confirmation.

Now the severest problem of a traditional empiricism, such as Carnap's, is the question of what to do about mathematics and logic. (We might add epistemology to that list.) This is where logicism, which Carnap appropriated from Frege and Russell, comes in. If mathematics can be reduced to logic as logicism says, then the severest problem for empiricism is narrowed to what to do about logic. For this Carnap accepted Wittgenstein's doctrine in the *Tractatus* that logic is no news at all. Thus, empiricism is saved.

Carnap had a variety of other commitments before *Syntax* which should be briefly mentioned. He had always defended a kind of conventionalism, but on closer inspection this comes to nothing more than a Duhemian underdetermination thesis. He was also committed to something that might be called the possibility of alternative *Aufbau*s. Even before that book was published Carnap agreed that one could set up a constructional system in various ways. One could do it on an autopsychological basis, as he in fact did following the empiricist tradition and especially Russell. Or one could do it on a physical basis as Neurath had insisted. Now Carnap also seemed to think that some constructional systems were more "correct" than others, but what the possibility or the unequal correctness of the alternatives came to was not very well worked out.

A third early commitment beyond empiricism was to a philosophy of geometry according to which alternative mathematical geometries are really differing implicit definitions of the terms they contain. Thus, they do not disagree. This very early belief (It is expressed in Carnap's disertation.) undoubtedly derives from Hilbert, but it was also reinforced by Carnap's association with Schlick. If Quine is right that there is no fathoming the subdoctoral mind (Quine in Dreben 1990), then there is no hope of finding out what prompted Carnap to accept this in the first place. Finally, Carnap is committed to a full scale fallibilism. Not only are theories uncertain, but so too is the observational basis on which they rest. This idea is not yet there in the *Aufbau*, but it pre-dates the *Syntax*.

So much for background. When Carnap sat down to write what was to become *The Logical Syntax of Language* he most certainly did not have the whole actual outcome in mind. In fact, all he intended to say was that one could indeed describe the logical form of a language and do so within that language itself. That one can talk about logical form is directly contrary to Wittgenstein's claim that logical form could be shown but not said, and Carnap proposed to accomplish it via Godel's technique of arithmetization. That one could talk about logical form within that language was very important to Carnap, von Neumann, Neurath, and others apparently because it was

confusedly connected with the question of the unity of the language of science. (Contrary to Carnap's first impression, separating the object and metalanguages would appear to be no more insidious than type theory.) In order for a language to be able to describe itself that language has to be fairly weak. Stronger languages, including those in which classical mathematics could be expressed, must be ruled out. So there was to be no discussion or defense of these stronger languages, no principle of tolerance, and no discussion of general syntax. If Carnap had left Syntax at this point it would have been rather tame stuff.

In the process of writing *Syntax*, however, Carnap came to see that the forms of a variety of stronger languages could be described, albeit in a metalanguage stronger than the object languages themselves. Even more importantly he saw that by transfinite means (essentially by allowing an omega rule) the incompleteness established by Gödel of any language sufficiently strong to express classical mathematics could in important respects be repaired. Given the utility of these stronger languages and the metamathematical means to deal with them, such stronger languages could no longer be dismissed. This discovery was as electrifying to Carnap as the discovery that there are non-Euclidian systems was to geometers in the 19th century. (And for similar reasons.)

In order to cope with the discovery, Carnap made use of two old commitments from the pre-*Syntax* days. First, he used the idea that philosophic issues or doctrines can be absorbed into matters of logical form. The claim was originally Wittgenstein's, but he was concerned with a single language. The point still applies when we have a variety of languages. Importantly, among the philosophic commitments embedded in a language are the epistemic ones. I shall return to this later in greater detail. Given that an epistemology is embedded in each of the languages, there can be even in principle no non-question-begging epistemic grounds for preferring one language or logic or philosophy over another. Second among the pre-Syntax commitments to be used, Hilbert's implicit definition approach to geometry was waiting in the wings. Now, Carnap could generalize it. Alternative sets of logical rules could be thought of as implicit definitions of the philosophic terms they contain. Alternative philosophic presuppositions are not in conflict; they are just different ways of speaking. Like any theory of implicit definition, Carnap's theory of meaning here (insofar as we can call it that) is both *functionalist* and *holist*. It is functionalist because it specifies a system of relations that the words must bear to one another without saying more concretely what will do the job. It is holist because it is the totality of rules that defines each term. If one were going to use the word 'meaning', the meaning of a term would be its function within the whole system of rules.

Because the alternative sets of logical rules are thought of as definitions we get a thoroughgoing conventionalism with respect to philosophy and certain basic parts of science. This is encapsulated in the Principle of Tolerance. And the conventionalism we get is vastly more powerful than the Duhemian underdetermination thesis that had gone before. Underdetermination, remember, imagines that questions of what counts as evidence and what logical relation theory must bear to evidence are *settled* in advance. It then notices that, given plausible answers to those questions, for any amount of evidence, more than one theory will bear the appropriate relation to it. Carnap's new conventionalism, by contrast, ultimately says that what counts as evidence and what the appropriate logical relations are (even what the logical consequence relation itself is) *are all up for grabs too*. Carnap's is a very radical view.

By making it a *linguistic* conventionalism Carnap avoids the result that anything goes. What is conventional is meaning. The word 'unicorn' considered merely as a noise has no meaning. But we can go on to make it meaningful by specifying linguis-

tic conventions in any way we choose. In these conventions are embedded epistemic standards. If the conventions are chosen in one way it will be contingently correct to say 'There are unicorns' and chosen in another way (i.e., in a way that gives 'unicorn' a different meaning) it will be contingently correct to say 'There are no unicorns'. Once the meanings of the various words have been fixed, however, the logical and epistemological standards have likewise been fixed by being embedded in the conventions that gave the words meaning. What we get is not "ways of world making" but "ways of word making".

Carnap's conventionalism is tempered in another way, too, by his pragmatism. There may be no non-question-begging epistemic grounds for choosing among the alternative languages (logics, philosophies), but some languages are more convenient than others. Inconsistent languages are pragmatic disasters, and so are languages without inductive rules. It is not necessary to establish that a language is maximally or even minimally convenient before using it, but philosophic discussion (where it is not wholly misguided) must be pragmatic. Qua pure logicians our job is merely to trace out the consequences of this or that convention. This is an engineering conception of philosophy. Of course, we may make proposals and defend them as useful, but here we go beyond pure philosophy and enter the empirical. Carnap's pragmatism is encouraged but not contained in his association with the Bauhaus school of artists and architects. This association has recently been illuminatingly explored by Peter Galison. (1990) Carnap's pragmatism was likewise encouraged but not contained in Neurath's attempts at social engineering and by political and social changes within Europe more generally. The contrast with the Platonic ideal of philosophy, or for that matter with Kant's, couldn't be greater. The development of Carnap's radical conventionalism and pragmatism really is a watershed and really does begin a new period in his philosophy.

Before proceeding to his later work, however, I want to explore the *Syntax* still further. The first thing to do it to look at his pre-*Syntax* views to see how much they changed, and among these the place to begin is with logicism. Under the new conventionalism one no longer has to reduce mathematics to logic in order to resolve the epistemic problems of empiricism. Mathematical axioms can be treated as implicit definitions quite directly. Mathematics would then be true in virtue of meaning and hence by convention even without any reduction to logic. Such a reduction is still possible and desirable. Any reduction is an economy and thus pragmatically attractive. This is like reducing the number of axioms in propositional logic; it is nice but hardly earthshattering. In the (very weak) sense of thinking that the reduction is both possible and desriable Carnap is still a logicist, but this is logicism virtually in name only. In fact it had been absorbed into formalism. The reduction no longer carries with it any special epistemic benefits. Both logic and mathematics can be conventional or analytic with or without the reduction.

So what happens to the rest of Carnap's pre-*Syntax* views? As expected, he remains an empiricist, but perhaps surprisingly, empiricism itself becomes a convention, albeit one for which there are powerful pragmatic reasons. (Carnap 1936-37, p. 33) His anti-metaphysical stance, that is his rejection of intuition, is retained and systematized. The most basic ontological commitments are matters of convention. Carnap also gives the appearance of being a nominalist, especially in the last section of the book. But this section seems to have been written early, probably before his conventionalist breakthrough. In any case, whatever the appearances, Carnap is a neutralist, even a noncognitivist, about basic ontological claims. Outside the language there is nothing to say; inside a language those questions have been trivially settled. The nominalist appearance is given by the fact that the language that Carnap prefers and would

propose is a nominalist one, but that is hardly ontological commitment. Even Carnap's verificationism (better called confirmationism) is retained and deepened. He now has more nearly a full theory of meaning, and by identifying the epistemic rules as implicit definitions of the terms they contain, he is able to give some substance to what had been only a slogan: that meaning is the mode of verification.

A variety of other pre-*Syntax* views should be mentioned as well. His Duhemian conventionalism (the underdetermination thesis) is retained, but it pales beside his radical new conventionalism. There is still the possibility of alternative *Aufbaus*, but now this can be given a systematic account, not a mere suggestion. Gone, however, is the idea that one of these constructional systems is more correct, though some may be more convenient. The early Hilbertian philosophy of pure geometry is obviously generalized and moved to center stage. Finally, the fallibilism is still there, but it, too, is now a convention. Like empiricism itself, though, it is a convention for which there are powerful pragmatic reasons.

The actual text of *The Logical Syntax* proceeds first by example. It takes a weak language and then a stronger language and shows how to describe their logical forms, presumably on the grounds that showing is easier than saying how to do this. The last part of the book is a discussion of the philosophic import of syntax, but between the examples and the finale is a discussion of general syntax which is the real heart of the book. Here Carnap's primitive terms are 'is a sentence' and 'is a direct consequence of'. The first of these exhausts what we call syntax. Plainly, Carnap means to go beyond that. Not only is the logical consequence relation itself semantical, as we use the term, but so are truth tables, interpretation, and analyticity, all of which Carnap discusses. The treatment especially of the last of these is surprisingly close to a full semantical account. No doubt Carnap is still wrong in thinking that all philosophy is syntax, even in his broader sense, but he is not nearly as wrong as we might have thought given our use of the word.

All of this raises the question of why Carnap rejected the concept of truth. There is a rumor afoot, propagated by Hartry Field, that it was because truth did not admit of physicalist defintion. (Field 1972) This cannot be right about Carnap. Field need not worry, though, because the historical question does not bear directly on Field's own program. Carnap does discuss truth in *Logical Syntax*, and what he says is very odd. Most of the discussion concerns the semantical paradoxes, as though he were worried that any concept of truth were unavoidably inconsistent. That would be respectable but still a mistake. But Carnap goes on to show just how to avoid the contradiction, namely by formulating the truth predicate in a metalanguage distinct from the language to which that predicate applies. So why doesn't Carnap accept this? Well, it might have been because he still wanted to do the logic within the language it described. But he doesn't say this. And it would be a rather weak reason. And more importantly, he has plainly renounced this want in the rest of the book. What he does say is that this approach would not yield a genuine syntax: *"For truth and falsehood are not proper syntactical properties;* whether a sentence is true or false cannot generally be seen by its design, that is to say, by the kinds and serial order of its symbols."* (Carnap, 1937, p.216) What kind of reason is this?! Of course truth is not syntactical in this sense, but the question is why philosophy should be restricted to syntax in so narrow a way. Coffa interprets the argument as verificationism, but it is not even that. In technical terms this is just plain 'goofy'. It is as though 'and' is not a logical term on the ground that it is not a purely logical matter whether birds sing *and* Caesar marched. Or that 'two' is not properly definable in logic because it is not a purely logical matter whether there are two toads in Transylvania.

The argument against truth is so bad that it is plausible to assume that Carnap was antecedently prejudiced against the concept of truth. If so, he might have thought that his cavalier attitude about it in *Syntax* was harmless. Certainly Carnap was so predisposed, for under the pernicious influence of Neurath truth would have been called "metaphysical" and "absolutist". It was metaphysical because its acceptance somehow committed one to a domain of Russellian facts or Kantian things-in-themselves. It was absolutist because it was somehow confused with certainty, which in non-analytic cases Carnap's and Neurath's fallibilism forbids. This hypothesis about the underlying causes of the rejection of truth is confirmed when Carnap finally accepts the notion soon after *Syntax*. He does not say: now I see that truth is physicalistically definable. Instead, he says in effect: now I see that truth and confirmation must be distinguished and also that truth is not metaphysically loaded. (Carnap 1936)

What is sad about the whole episode is not only that truth is in fact entirely compatible with the conventionalism and pragmatism of *Logical Syntax*. Rather, it is that the background prejudices against truth actually *fly in the face* of the central lessons of that book, namely, its epistemic conventionalism and it ontological neutrality. Obviously, these are hard lessons to learn and ones which even Carnap had not fully absorbed.

It may be a blunder to identify truth with certainty, but it is no mistake at all to recognize that the enterprise of *Logical Syntax* is open to an epistemic interpretation. Carnap did not care for the word 'epistemology' because he thought it to have been preempted by psychologists and by philosophers practicing the work that Frege dismissed as psychologism. But that need not mislead us. What Carnap is investigating is the pure structure of epistemology. His most basic relation, that of direct consequence, is after all the relation that reasons bear to that which they immediately justify. If you want to find out what some foreign speaker means by some term, go find out what arguments the speaker accepts. (Carnap 1950b, p.37) Something is conventional just in case it could have been otherwise, and there is no epistemic reason for choosing among the alternatives. Carnap emphasizes the centrality of analyticity, but something is analytic just in case its justification can be traced back to conventions and nothing more. Thus, to be analytic is to have a special epistemic status. Analyticity is no mere substitute for truth within logic and mathematics, a substitute which is needed when one lacks a concept of truth but which is obsolete when one has a real truth concept. In effect, the analytic is the epistemically conventional. By seeing meaning as provided by implicit definitions and these as exhibiting the epistemic structure of the language, Carnap's verificationism is built in at the very foundation. The epistemic dimension of all this never changed. Later, when he addressed the issue of what we could believe about theoretical entities, it boiled down for him to the question of whether we should adopt by convention a rule of inference that would justify theoretical claims on observational evidence. He himself was willing to adopt such a convention, but instrumentalists were not. (Realists on the other hand often spoke as though the inference rule had been ordered by God, and there was nothing left for human convention to decide.) In any case, my point is not about scientific realism, but rather merely to illustrate that Carnap's notion of logic, from *Syntax* onward, is broad enough to include what we call epistemology. Certainly Carnap makes quite a point of calling his enterprise the logic of science.

If we count *The Logical Syntax of Language* as fundamentally epistemic, as we should, then it may seem that there are two overwhelming ommisions in the book. There is only the most rudimentary discussion of induction and confirmation, and there is almost nothing said of observation. Perhaps these omissions can be forgiven in a work devoted primarily to classical logic and mathematics. But still we should want more. As far as induction is concerned, it seems that Carnap did not know what to say at this point.

What he does say is sadly deductivist. What is required is that his most basic relation, that of direct consequence, be generalized in a natural way to include partial implication. This would then be an account of inductive inference, of confirmation, and of logical probability. Indeed, all of Carnap's discussions of probability and later philosophy of science can be thought of as attempts to carry out this very program. Whatever the success of Carnap's theory of logical probability it must be seen as continuous with the program of Syntax and in fact as trying to develop a proposal for a workable convention, perhaps one that would be an explication of our usual conventions.

As far as observation is concerned the story is a bit more complicated. Carnap did talk about this in "On Protocol Sentences" (1932), published while he was writing Syntax and in "Testability and Meaning" (1936-37) published just after. What he had to say was important, perhaps even on the right track. But not only do we recognize it as inadequate, Carnap did too. Unfortunately, in the nearly forty years remaining to him he did not see how to develop these ideas further in a satisfying way. In any case from the early 1930s Carnap is a conventionalist about observation as well. The protocol sentences and reports are not themselves conventions, but rather what we take as a protocol is conventional. Empirical psychology will help with the pragmatic question of how to revise or formulate the observation language, but there is no convention independent fact of the matter about whether protocols will concern sensory experiences, or physical objects, or both. Carnap hoped that the observable features of things could be marked by a special vocabulary and hence that observationally justified beliefs could be picked out syntactically. Then the fact that protocols need not be justified by inferring them from other beliefs might somehow be marked via the direct consequence relation. We know that this won't work and that observation is a vastly more complicated affair than just a special vocabulary. Carnap knew it too, but he did not know just how to improve the account. Moreover, he was more interested in saving both observation and theory while damning metaphysics than in exploring the limits or nature of observation. Though he hadn't yet figured out how he would carry it off, Carnap is quite explicit about being a fallibilist even about observation reports. Now I think that something along the lines that Carnap wanted (but never found) can be devised. This, however, is neither the time nor the place. What we can say now is that the conventionalist aspects of Carnap's approach to observation have for the most part been neither appreciated nor explored. We can also say, despite the omissions on observation and induction, that Carnap is giving us in Syntax the structure of an epistemology, or at least trying to do so.

Now it may seem odd in a paper nominally devoted to semantics that so far I have talked almost exclusively about the so-called syntax period. Of course, my thesis is that by misunderstanding Syntax we are led to exaggerate the differences between semantics and the work before or after and also to misunderstand Carnap's semantics itself. A correct understanding here will show Carnap's last four decades are, if not a seamless fabric, then at least a more or less continuous development. Carnap is not lurching from one misguided enthusiasm to another. Rather he has one broadly consistent leading idea, which demands our attention and which is too little understood.

With a clearer picture of Syntax in mind we can now address the supposed break between Syntax and semantics. As we saw there is a lot of what we call semantics in Syntax. It is in the consequence relation, in the truth tables, in the work on interpretation, and especially clearly in the discussion of analyticity. Of course, a concept of truth is officially rejected in Syntax, but when Carnap finally does accept truth, this is fully consistent with his conventionalist program. The confusions that had prevented the acceptance of truth are avoided not by abandoning that program but by carrying it through. (The conventionalism by itself will guarantee that the language is ontologi-

cally neutral. It will also guarantee that the protocols can have any desired degree of justification; if, as Carnap thinks, it is not handy to let them be certain, then don't. If truth can be defined in the way that *Syntax* outlines or that Tarski shows, then truth is a completely separate matter.) The move to semantics does not change the content of Carnap's conventionalism, but it does change the form. Now Carnap speaks of truth, reference, designation, and the like, and shows how such notions are interdefinable. The theory of truth and reference amounts to an implicit definition in the metalanguage not to a physicalist reduction. That Carnap now talks cheerfully "of" propositions, properties, meanings, etc. is taken by some to show that he has given up his old nominalism and has become a Platonist. This is twice wrong. He wasn't a nominalist before, and he isn't a Platonist now. Instead he remains a metaphysical non-cognitivist, and this is founded on his ongoing conventionalism. He doesn't have to repeat himself. After all, he thinks he is in the friendly and thoroughly pragmatic U.S. and that all this can be taken for granted.

To see that his conventionalist epistemological theme is sustained, let us very quickly review the major writings of the semantical period. In "Truth and Confirmation" (1936) Carnap admits, indeed insists, that the confusion of truth and certainty is just a mistake. There is certainly no repudiation of his conventionalism. The first book where he is working out his semantical views is *Foundations of Logic and Mathematics.* (1939) It title notwithstanding this is largely about the interpretation of science. He reiterates and defends his conventionalism for logic (no doubt in response to Quine's "Truth by Convention" (Quine 1936)) and reaffirms that his logic is a logic of science. The books *Introduction to Semantics* (1940) and *Formalization of Logic* (1943) can be considered as a pair. *Formalization* was written first and contains a result sufficiently dramatic that Carnap decided to preceed it with *Introduction to Semantics* both to prepare the reader for *Formalization* and as a textbook on semantics. What is so surprising? It is that logic too is open to non-standard interpretations. This arises out of his functionalist approach to definition; if logic proceeded by latching onto Platonic (convention independent) entities it is unlikely that this problem would ever have come up. Even *Introduction to Semantics* is at great pains to stress its continuity with what has gone before.

Meaning and Necessity is the book that we now tend to think of when we think of Carnap's semantics, no doubt because it is so delightfully readable. On this topic it is interesting to note that Church complained that the book was mere informal prolegomena and that publication should await the development of a strictly formal system. (In other words, don't publish until it has been made totally unreadable.) In any case the book arose out of the Quine-Carnap correspondence, that is, it was prompted by Quine's worries about meaning and analyticity. I have already argued that analyticity is at bottom an epistemic notion. At this point in the debate, however, Quine had not yet brought forward his alternative theory of knowledge, and Carnap was still reluctant to use the word 'epistemology'. So Carnap did not emphasize this aspect, even though it is there. Instead he concentrated on presenting clarification and technical improvement. His method of intension and extension, as Carnap was quick to agree, is really a method of intension. (The intensions do all the work.) But on closer inspection it turns out that expressions have the same intension if and only if they are alike in point of epistemic functioning. There are also non-essential changes in the presentation of analyticity; the definitions are now given in terms of state descriptions. These changes are the direct products of his emerging theory of inductive confirmation, work on which is occuring simultaneously. Finally, even the theory of modality that is given in the book is designed to make it empiricistically acceptable by making it a linguistic, i.e., conventional, affair.

The last major publication of the so-called semantical period is "Empiricism, Semantics, and Ontology" (1950a). This is basically a reiteration of his epistemic conventionalism and pragmatism and the ontological non-cognitivism that follows from it. The tone of the paper is very much: I cannot believe I need to repeat this stuff; I've been saying it all along. And indeed he had.

We are now in a position to evaluate the periodization of Carnap's work that puts a sharp break between *Syntax* and semantics. The case for the break is not very convincing. The radical conventionalism and pragmatism that was the main message of *Syntax* is still there. It may be altered in form, but not in substance. The ontological neutrality is still there, and the epistemic interpretation which makes sense of *Syntax* is still every bit as illuminating as before. In the end, Carnap's logic is still a logic of science. If our concerns are no longer epistemological, then so much the worse for us. As historians we should avoid a periodization which imposes our limitations on Carnap. I do not deny that there are changes over time in Carnaps's work. Certainly his program broadened. Certainly he emphasized, as every scholar does, what was new rather than old. Certainly the move from Prague to Chicago, and with it the change of context and critics, altered how he chose to present his ideas. But just as certainly there is no break in Carnap's fundamental conventionalism.

As for the supposed break between semantics and the work on probability and philosophy of science, very little needs to be said that has not already been covered. The probability work, though it is presented as describing a purely logical relation, is of obvious epistemic import. It is essentially an attempt to carry out the generalization of the direct consequence relation that we earlier described as the unfinished business of *Syntax*. Even the accounts of meaning now offered are overtly epistemological. Although I haven't the room to demonstrate this here, when we come to see the probability as an attempt to formulate conventions, the whole set of which give the meaning for the terms of the language, then many of the criticisms of *Probability* (1950b) can be blunted. If the epistemic reading of *Syntax* is acceptable then *Syntax* and the late work on probability and philosophy of science are of a piece. If the program of *Syntax* is continued in both semantics and probability, then it is unlikely that there is a break between the latter two. It is even hard to specify just when the break is supposed to have occurred. The probability work began well before *Meaning and Necessity* was published, and indeed it is reflected in the text of that work as well. In fact, Carnap lists *Logical Foundations of Probability* (1950b) as Volume Four of his Studies in Semantics. I think he knew what he was doing.

What then shall we make of all of this? Certainly, we are entitled to conclude that the standard periodization of Carnap's work with which we began is at best an exaggeration. It seems to me, however, that the moral goes far deeper than this. The legend that Carnap's thought made a radical shift in the mid-1930s is all that has licensed us in isolating and ignoring *The Logical Syntax of Language*. But what is really radical and well worth studying in Carnap's work is precisely the epistemic conventionalism and pragmatism that he announced there. It is also what is constant throughout the rest of his work. Once we see this, we have a whole new way of approaching his semantics and especially the topic of analyticity. Analyticity becomes an epistemic notion, and this fact can be used to respond to the criticisms of Quine among others. The work on probability will likewise have to be reevaluated, keeping in mind that conventionalism and a functionalist approach to meaning are being presupposed. If this is done, it seems likely that at least some of the objections to Carnap's probability theory can be answered.

How we periodize our history (and Carnap's) matters. But getting the historical record straight is only secondary. What is primarily at stake here is how we can learn from the past and how we can set that to work in our ongoing philosophy. Carnap's conventionalism and pragmatism is a rich and powerful and largely neglected tool to be used by us—now. It is the future that matters most about the past. And by reexploring our past we can hope to shape that which is to come.

Notes

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