# Seminar 3
# The Mixed Legacy of the *Aufbau*

Carnap's conception of multiple noncompeting unifications of science depended on the idea that unification was to be achieved by reductive definitions. Thinking that verification of theoretical claims must *logically entail* observational claims, he demanded that theoretical vocabulary be observationally definable. Because he wrongly thought that without definitions theories we know to be testable wouldn't be, he believed that there must be definitions. But principles connecting theory to data don't have to be definitions, a priori truths, or even universally quantified biconditionals; they can be just more theory. Carnap didn't realize this in 1928.

This caused problems. Consider color. One's perception of red things might be generally reliable, and so lead to knowledge, even if exceptions sometimes occur—in which what looks red isn't, or vice versa. This suggests that we don't need universally generalized biconditionals. One can see why by considering a Williamsonian conception of knowledge. Let p be a true physical-object statement I believe on the basis of certain sense experience. Perhaps there is a true, exceptionless universal generalization UG that connects statements about my sense experience with physical-object statements like p. But UG may be a mere accidental generalization that doesn't support counterfactuals. If so, then although p may be true and believed by me, it might also be true that I could easily have been in my present state of accepting p, even though p was false – in which case I wouldn't know p, even though p and other physical-object statements I take myself to know are Carnap-reducible to statements about my sense experiences. *Thus, even a successful Carnapian "reduction" might not explicate my knowledge.* A second possibility is that p might be true, and my knowledge of it safe, even though there are no Carnapian definitions that "reduce" p to claims about my sensory states. Since genuine knowledge doesn't require Carnapian reductions, the fact that I do have knowledge of physical objects doesn't show that a reduction to the claims about sensory experience is possible. These possibilities undermine the idea that Carnapian reductions must be possible, and that when they are, they will explain our knowledge.

Next consider Carnap's three imagined reductions of the psychological to the physical mentioned in the *Aufbau.* Each starts with unobservable physical entities posited by theories thought to provide the best explanation of everyday facts we know. Since the objects to which the reduction aims to reduce everything else are less securely and extensively known than are the familiar things which are to be reduced, one can't argue that reductions must be possible because otherwise our knowledge of the base wouldn't provide the justification we know we have for our knowledge of the objects to be reduced. In these cases, our knowledge of the reductive base doesn't provide our justification for our nontheoretical knowledge. Rather, our knowledge of the base depends on our knowledge of the familiar. Thus, one can't argue that Carnapian reducibility of the familiar to the theoretical must be possible, because if it weren't we wouldn't know the familiar.

Since Carnap knew this, his justification for the claim that everything must be reducible to the physically fundamental was, I suspect, that the physically fundamental is *explanatorily* fundamental. He was convinced that all psychological facts supervene on and are intimately explainable by physical facts, which in turn supervene on and are explainable by the most fundamental physical facts. He also was convinced that all things are complicated arrangements of the most fundamental physical things, and all properties are physical properties of varying degrees of complexity. Carnap's priority in these physical reductions isn't evidential; it is *explanatory*, and hence, covertly,

counterfactual. Does this give us reason to believe that such a reduction must. *must* be possible. Not without a demonstration that facts of type A can't explain facts of type B unless the things of type B are "definable" in terms of the primitive properties and relations applying to things of type A. We may also wonder whether, if such a reduction were possible, it would serve a theoretically important purpose. Perhaps it would. But that doesn't mean that what Carnap called a reduction in the *Aufbau* would do so. The role in Carnapian reductions of true, but not necessarily known or counterfactual-supporting, universally quantified biconditionals, suggests that it might not.

I now return to the autopsychological reduction, to which Carnap gave pride of place because reason of its presumed epistemic primacy as the basis of all knowledge. He assigned it this priority because he thought, (i) that an agent's cognition, and knowledge, of physical objects presupposes the agent's cognition, and knowledge, of the agent's private sensory experiences, and (ii) that an agent's cognition, and knowledge, of the agent's private sensory experiences is direct and unmediated, and so does not presuppose cognition, or knowledge, of physical objects. The task of the autopsychological reduction is to show how it is possible for an agent to use knowledge of the phenomenal properties of the agent's sensory experience to derive knowledge of physical objects in the agent's environment, of other physical objects and other agents, and, ultimately, of whatever can be studied scientifically. This was the promise enunciated in section 2 of the *Aufbau.*

> Even though the subjective origin of all knowledge lies in the contents of experience and their connections, it is still possible, as the constructional system will show, to advance to an intersubjective, objective world, which can be conceptually comprehended and which is identical for all believers.

The starting points for Carnap's reduction are fleeting sensory gestalts called *elementary experiences,* which include everything momentarily seen, heard, touched, tasted, or smelled, bound together in a perceptual whole. Distinct elementary experiences are said to be related by a primitive relation of *remembered similarity*, which is used to generate (i) quality classes —e.g., of experiences each of which involves seeing a colored spot in a certain part of the visual field—(ii) sense classes corresponding to the different sensory modalities, including classes containing all and only those with visual parts, those with auditory parts, etc., and (iii) classes corresponding to different phenomenal qualities, including those involving color sensations based on the five dimensions of hue, brightness, saturation, and two-dimensional location in the visual field. Finally, an intersubjective public space is supposed to be constructed—a space consisting of different points at which properties including colors are located. Eventually, the construction is supposed to include physical objects and other agents, with their own experiences. The crucial requirement is that the construction must yield propositional contents that can be apprehended, believed, and known by all. Somehow these *objective* contents must be abstracted from the *subjective* contents of different agents. The challenge was to explain how this can be done by defining all concepts needed to reconstruct our common knowledge from primitive properties of private sensory inputs of each individual.

> If the basis of this construction is autopsychological, then the danger of subjectivism seems to arise. Thus, we are confronted with the problem of how we can achieve objectivity of knowledge with such a system form…[B]y objectivity is sometimes meant independence from the judging subject. It is precisely the inter-subjectivity which is an essential feature of "reality"; it serves to distinguish reality from dream and deception. Thus, especially for scientific knowledge, intersubjectivity is one of the most important requirements. *Our problem is how science can arrive at intersubjectively valid assertions if all its objects are to be constructed from the standpoint of the individual subject, that is, if in the final analysis all statements of science have as their object only relations between "my" experiences. Since the*

> *stream of experience is different for each person, how can there be even one statement of science which is objective in this sense (i.e. which holds for every individual, even though he starts from his own individual stream of experience)?* The solution to this problem lies in the fact that, even though the *material* of the individual streams of experience is completely different, or rather altogether *incomparable*, since a comparison of two sensations or two feelings of different subjects, so far as their immediately given qualities are concerned, is *absurd*, certain *structural properties* are analogous for all streams of experience. Now if science is to be objective, then it must restrict itself to statements about such structural properties. (pp. 106-7)

The problem is starkly put. The phenomenal content of my sensory experience is private to me. Suppose I have visual experience of a circular red dot against a white background. Imagine that, in speaking to myself, I use the words 'red', 'white', and 'circular' to designate phenomenal properties of my experience. Carnap seems to suggest that the proposition I express using (1) is something I could know to be true, even though that knowledge couldn't be shared by anyone else, and so would be purely subjective.

1. I see (visualize) a circular red dot against a white background.

In what sense can't my seeming knowledge be shared? Assume no one can know the properties of my sense data (even if I try to tell them). Then no one else can know that I, SS, am having an experience with the phenomenal content reported. What about my use of (2)?

2. Someone is seeing (visualizing) a circular red dot against a white background.

It seems that I could *know* the proposition I use sentence (2). Could anyone else? They could know this very proposition, if like me, they use words like 'red', 'white', and 'circular' to designate phenomenal properties of their visual experience, and their visual experiences have the same phenomenal properties as mine. Nothing we have said so far rules this out. What is ruled out is that either of us *knows* that we that we *both* know it.

> Carnap might have had something stronger in mind. He says that "the material of the individual streams of experience is completely different, or rather altogether *incomparable,* since a comparison of two sensations or two feelings of different subjects, so far as their immediately given qualities are concerned, is *absurd*." If comparing the phenomenal qualities of private experiences of different subjects is absurd, perhaps *the claim that these qualities are the same* is also absurd. If so, we get the result that no *two* agents know any *one* proposition about a phenomenal property of private experiences and that such common knowledge is impossible. Why might one take the claim that there is such common knowledge to be absurd or impossible? Perhaps because one thinks the claim that there is such common knowledge is *meaningless.* If so, one can say more. If it is *meaningless* to claim that the phenomenal properties of private visual experiences of Agent 1 are the same as the phenomenal properties of such experiences of Agent 2, then, surely, (3) is meaningless, in which case it is tempting to suppose that at least one of its conjuncts must also be meaningless.

3. P is a phenomenal property of some private visual experiences of A1 and P is also a phenomenal property of some private visual experiences of A2.

Since surely one conjunct is meaningless iff the other is too, this is tantamount to the claim that there are no phenomenal properties, and hence no knowledge, whether shared or not, of propositions involving such properties. Although I don't think Carnap accepted this conclusion in the *Aufbau,* it is unclear how he would have blocked it.

However, it is clear how he proposed to solve the problem of achieving objective—

i.e., sharable and known to be sharable—knowledge. He must, he thought, eliminate subjective content from what is known by abstracting away from all "material content" so as to arrive at knowledge of *purely structural propositions*. He announces this goal in section 16.

> [E]ach scientific statement can in principle be transformed into a statement which contains only structural properties and the indication of one or more object domains. Now, the fundamental thesis of construction theory…asserts that fundamentally there is only one object domain and that each scientific statement is about the objects in this domain. Thus…*each scientific statement can in principle be so transformed that it is nothing but a structure statement*. But this transformation is not only possible, it is imperative. *For science wants to speak about what is objective, and whatever does not belong to structure…is, in this analysis, subjective*… [T]his 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 [phenomenal] content, but only through the formal description of the structure of these entities. However, it is still a problem how, through the application of uniform construction rules, entities result which have a structure which is the same for all subjects, even though they are based on such immensely different series of experiences. This is the problem of inter-subjective reality.

Achieving intersubjective objectivity is the unbearable burden of the autopsychological reduction. It will not do to replace one-place phenomenal properties with n-place phenomenal relations—as if that would render propositions structural, and so objective. Rather, *all phenomenal properties and relations* must, somehow, be defined away. But that is impossible. In the *autopsychological* reduction, the only properties and relations—apart from purely logical ones—that remain after the reduction of the physical and the general psychological to the autopsychological are properties and relations applying exclusively and transparently to private experiences of one agent. But for Carnap, there can be no objective (sharable and known to be sharable) knowledge of these.

Although the problem seems obvious, the complexity of Carnap's constructions obscures the difficulty by all but hiding it under a mass of detail. He defines the visual sense as the sense class members of which include experiences the qualities of which involve five dimensions. This may seem like a purely structural characterization that applies to all agents equally—and hence to be a proper subject of objective, but it isn't. Suppose parallel definitions can be given for all normally sighted subjects. For the definitions to work, the visual experiences of an agent must include those the qualities of which involve three dimensions—hue, saturation, and brightness (of properties of private experiences)—plus the two dimensions required for location in the visual field. But if, as Carnap insists, it is absurd to compare the phenomenal *red* of my experience with that of yours, then it is no less absurd to compare the phenomenal hue, saturation, or brightness of one of my experiences with those of yours. So, if the absurdity of the former makes propositions about phenomenal red incapable of being objectively known, then the absurdity of the latter makes propositions about phenomenal hue, saturation, and brightness incapable of being objectively known.

If none of these are objects of genuinely objective knowledge, then the objectivity of Carnap's concept *visual experience* is suspect. There is nothing magic about the number five. We have no reason to think it is impossible for an agent with no visual experiences to have other perceptual experiences involving qualities with exactly five dimensions. It is true that Carnap doesn't require his "definitions" to be necessary truths, and so is indifferent to the idea that possible agents might have nonvisual experiences with exactly five dimensions. But this misses two points. First, *we know that we have visual experiences*, as opposed to simply having experiences involving qualities with five dimensions. That too should be objective knowledge, which ought to, but can't, be

captured by the autopsychological reduction. Second, Carnap's definition of *dimensions of a sense class* makes use of the primitive 2-place relation on private experiences of *recollected similarity.* But just as I can't compare my experienced phenomenal colors with those of others, so I can't compare the *recollected similarity* relation on my experiences with corresponding relations on the experiences of others. Since the notion *dimensions of a sense class* is, for Carnap, definable from *recollected similarity*, I can no more compare the number of dimensions inherent in qualities of my visual experience with the number of those inherent in my neighbor's experience, than I can compare Carnapian *material qualities* of two streams of private experiences. Hence, his strategy of using structure to secure objectivity was bound to fail.

It was bound to fail, if Carnap's *purely structural statement* presupposed the primitive relation *recollected similarity*. Surprisingly, Carnap recognized this. In section 153, he proposes eliminating even that dependence.

> Every constructional system rests upon basic relations which are introduced as undefined basic concepts. Thus all constructed objects are complexes of the basic relations. *All statements that occur in the constructional system are statements about nothing but the basic relation* … However, this characteristic of the statements of a constructional system is not in harmony with the earlier thesis that statements of science must be purely structural… A purely structural statement must contain only *logical symbols*; in it must occur no undefined basic concepts from any empirical domain. Thus, after the constructional system has carried the formalization of scientific statements to the point where they are merely statements about a few…[or, in the case of the autopsychological reduction only one] basic relations the problem arises whether it is possible to complete the formalization by *eliminating from the statements of science those basic relations* as the last nonlogical objects.

This is incoherent. If the resulting statements of the system are purely logical, they have no empirical content. Scientific knowledge be rendered objective, but obliterated.

Nothing in the *Aufbau* is more stunning than Carnap's failure to see this. Part of the problem may have been the dizzying abstraction with which he pursued the project. Even so, it is not easy to explain how he overlooked the fundamental point. The crucial sections of the *Aufbau* in which he pulls the wool over his own eyes are 153–55. The best summary of this material that I know of is given by Michael Friedman. It begins as follows.

> How is it possible to eliminate even the primitive nonlogical concepts from a constructional system? The method that suggests itself to Carnap is again the method of purely structural definite description…In Carnap's system, for example, we make essential use of the (putative) fact that there is one and only one sense modality based on Rs [recollected similarity] that is exactly five-dimensional…We could define Rs, for example, as the *unique* basic relation such that there is one and only one sense modality based on it having exactly five dimensions…But…the *existence* claim implicit in our definition…will be a logico-mathematical truth [it will be a logical truth that there is at least one R such that something with exactly five formal features of a certain structural sort is definable from R], and the *uniqueness* claim [that there is only one such R] will, in general, be a logico-mathematical falsehood.

As Friedman points out, Carnap notices this problem and attempts a fix.

> Carnap responds then precisely by restricting the range of our variable [over relations]: we are not to consider all relations—which, as mere mathematical sets of pairs, may be "arbitrary unconnected pair lists"—but we are to restrict ourselves to "experienceable, 'natural' relations", or what Carnap calls "founded" relations (section 154). Carnap next makes the extraordinary suggestion that this notion of *foundedness* may itself be considered a basic concept of logic (154), and he completes the "elimination of the basic

> relation" thusly ( 155): *Rs* is the unique *founded* relation satisfying the chosen empirical conditions (section 155)!

This is no fix. Either (i) Carnap has traded one supposedly objectivity-blocking autopsychological primitive relation applying to private experiences for another, or (ii) he has destroyed the autopsychological reduction by introducing an empirical primitive it can't accommodate, or (iii) he has employed a genuine concept of logic, in which case he has drained his unification of science of all empirical content.

Carnap's failure was not due to lack of ingenuity. The basic problem he set for himself is unsolvable—namely, to explain how it is possible for our sharable, and known to be sharable, common knowledge of an intersubjectively available world to arise from a purely subjective starting point. The problem is unsolvable because the central idea driving the autopsychological reduction is false. *Our real starting point is not purely subjective*. We don't cognize physical objects by cognizing private sensory experience. Although empirical knowledge requires one to *have* sensory experiences, it doesn't require one to *cognize* one's experiences (or any purely private entities they may involve). One doesn't have to *perceive* the epistemically private, to *think about* the epistemically private, to *predicate* properties of it, or to *know* truths about it in order to have beliefs about, and knowledge of, the intersubjectively available world. When this mistake is eliminated, one is not driven to the incredible conclusion that objective—sharable and known to be sharable—knowledge of the world is possible only for purely structural propositions.

On the contrary, if one gives up the autopsychological reduction in favor of a physicalistic reduction, the propositions that can be objectively known by different people can include familiar, nonstructural, intersubjectively available, physical-object contents. In short Carnap's worst problems arose from his phenomenalism. He wasn't an epistemic foundationalist who was driven by the need for empirical certainties. But he was a psychological phenomenalist whose methodologically solipsistic starting point generated a pseudo-problem, to which his structuralist thesis seemed to be the only possible solution.

Carnap's confusions concerning objectivity are the most glaring problems for the autopsychological reduction, but they aren't the only ones. The reduction also founders on a flawed account of *the self*. When I talk of "myself," what the word picks out is just me, not any part of me, or any entity distinct from but related to me. The word "myself" does that, but it's not clear what the two words "my self" do. In philosophy they tend to be used when discussing facts about what I am experiencing, which I know in a private way I don't know other things. Thus, "the self" is often conceived as the private thinking and experiencing thing. What is that? Some say it is a Cartesian substance, some that it is a Kantian "unity of apperception," and some say it is a "Humean collection of experiences." The *Aufbau* doesn't say any of these things. But it isn't easy to pin down what exactly it does say.

> Carnap calls the autopsychological reduction solipsistic, because its base elements are private experiences of a single agent. But he insists that the resulting construction doesn't say that there is only a single agent, or that the experiences constituting "the given," which are the basis of the reduction, presuppose the existence of any agent at all.
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> The autopsychological basis is also called solipsistic. We do not thereby subscribe to the solipsistic view that only one subject and its experiences are real, while other subjects are nonreal. The differentiation between real and nonreal objects does not stand at the beginning of a constructional system. As far as the basis is concerned, we do not make a distinction between experiences which subsequent constructions allow us to differentiate into

> perceptions, hallucinations, dreams, etc…The basis could also be described as *the given,* but we must realize that this does not presuppose somebody or something to whom the given is given. (Section 64)
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> The expressions "autopsychological basis" and "methodological solipsism" are not to be interpreted as if we wanted to separate, to begin with, the "ipse", or the "self", from the other subjects, or as if we wanted to single out one of the empirical subjects and declare it to be the epistemological subject. At the outset [i.e., at the base level of the reduction], we can speak neither of other subjects nor of the self. Both of them are constructed simultaneously at a higher level…In our system form [the autopsychological reduction] the basic elements are to be called experiences of the self *after* the construction has been carried out. … [T]he characterizations of the basic elements…as "autopsychological", i.e. as "psychological" and as "mine", becomes meaningful only after the domains of the nonpsychological (to begin with, the physical) and of the "you" have been constructed … Before the formation of the system, the basis is neutral in any system form; that is, in itself, it is neither psychological nor physical." (Section 64)
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> *Egocentricity is not an original property of the basic elements* of the given [i.e., they are not so characterized at the lowest level]. To say that an experience is egocentric does not make sense until we speak of the experiences of others which are constructed from "my" experiences. We must even deny the presence of any kind of duality in the basic experience, as it is often assumed (for example, as "correlation between object and subject" or otherwise). (Section 64)

Here, we are told that the base elements of the autopsychological reduction include experiences but no experiencers. This doesn't mean that the experiences aren't experiences of a single agent; in fact, they are so characterized at higher levels of the reduction. It does mean that the experiences—out of which everything is "defined"—are conceptually prior to any thinker or experiencer who has them. I believe this is incoherent. Just as it is incoherent to suppose one could conceive of running without conceiving of a runner – i.e. one who runs -- so it is incoherent to suppose one could conceive of perceiving or thinking without conceiving one who perceives or thinks. The key Carnapian primitive is *recollected similarity,* which relates pairs of experiences. What is it for *experience 1* to bear this relation to *experience 2*? Carnap tells us in section 78: it is for the former, which occurred in the past, *to be remembered as similar to* the latter, which currently occurs. *To be remembered by whom?* Carnap's characterization presupposes some agent A who *remembers* having experience 1 and finds it similar to experience 2. Individual *experiences*—which are the only elements at the base level—don't *remember* anything, nor do pairs of them come to the shared conclusion that they are similar. Since no agents are recognized at this level, Carnap's relation, *recollected similarity,* is incoherent. Hence, the autopsychological reduction can't get off the ground.

A different problem arises when we consider not simply the base level, but the imagined unification of all objective knowledge that is supposed to be achieved by the reduction as a whole. Remember, the unification resulting from "reducing" all claims about the physical and the heteropsychological to the autopsychological is supposed not to compete with the purely physical reductions. Those reductions envision an exceptionless correlation of mental events or states with physical events or states (e.g., neurological events or states). To simplify, the physicalistic reduction allows us to truly say that all sensations are nothing but brain states, while the autopsychological reduction allows us to say that all brain states are nothing but sensations. Carnap's simultaneous embrace of these claims stems from his view that the unifications resulting from the two reductions represent the world as being in precisely the same state. I have suggested that the best explanation for this is one that reconstructs his position as adopting a version of holistic verificationism. On this view, the content of an individual claim—e.g., that all sensations are brain processes or that all brain processes are sensations—is, roughly,

what it contributes to the content of the overall theory of the world which it is a part. The two claims are compatible, and even complementary, if the two unifications make the same observational predictions and the two claims make comparable contributions to the two unified theories of which they are parts.

Now back to the self. Imagine I wake up in the dark unable to move, after being drugged. My only sensations are of a tiny point of light and a faint sound of music. Although I can think, I don't what has happened. In this pseudo-Cartesian situation I might know little more than that *I have thoughts and experiences,* and so, *I exist.* What is it that I know? Not simply that there are thoughts and experiences, or even thoughts and experiences of a certain type. That could be true even if the propositions I, in fact, know were false. For the same reason, what I know is not simply that someone is having thoughts and experiences. Suppose further, with Carnap, that materialism is correct and that, like every other human being, I am nothing more than a complex physical system. Then, in knowing that I exist, *I know, of a certain human, which is nothing more than a physical system, that it exists.* Still, I may not know that anything human or even physical exists. Moreover, what I know is different from what you would know, if you were in an identical situation.

How, in light of this, could Carnap's autopsychological theory of the world possibly capture my knowledge of my own existence and sensations? It could do so only if (i) it were capable of specifying what uniquely distinguishes me from all other agents and (ii) that information were extractable from the contributions my knowledge of myself makes to the observational predictions of the total theory. Since Carnap's autopsychological reduction doesn't satisfy these conditions, it can't capture the most elementary knowledge we have of ourselves.

I conclude that autopsychological reduction was a disaster. To salvage something from it, one must eliminate both (a) private experiences as items knowledge of which ground all other knowledge and (b) *definitional reduction* of higher to lower domains as the form of a system of unified science. Doing both has allowed more recent philosophers to focus on specifying what scientific theories are, what their intersubjective observational evidence consists in, and what, if anything, beyond equivalence of observational predictions is required in order for different theories to represent the world as being in the same state. It has also allowed them to pose answers to sophisticated questions regarding justification for accepting scientific theories, as well as for believing, or knowing, them to be true. The abandonment of *definitional reduction* as the means by which theoretical claims must be related to evidence has also reduced the motivation for supposing that there must be a way of unifying all of science into a single hierarchical system. Finally, the recognition that much of one's knowledge is irreducibly singular has made it less plausible to expect genuinely scientific knowledge to encompass all objective knowledge.

These limitations are foreign to Carnap. In sections 179 and 180, he articulates his vaulting conception of the aims of science and the scope of scientific knowledge.

> The aim of science consists in finding and ordering the true statements about the objects of cognition (not all true statements … we do not undertake to discuss the teleological problem

Here he suggests that with one possible exception—teleological truths—the task of science is to discover all truths about "objects of cognition." Since those are presumably *things we can think about,* the domain of science includes all truths. Two pages later he adds:

> *Science, the system of conceptual knowledge, has no limits.*…When we say that scientific knowledge is not limited, we mean: *there is no question whose answer is in principle unattainable in science*…It is occasionally said that the answer to some questions cannot be

conceptualized; that it cannot be formulated. But in such a case, the question itself could not have been formulated.

Two issues remain: *What is it for a scientific question to be answered?* and *Are their nonscientific questions that might have true, and perhaps knowable answers?* Carnap addresses the first as follows.

> Now, if it is the case that a genuine question is posed, what are the possibilities of giving an answer?...[A] statement is given; it is expressed through conceptual symbols in formally permissible combination. Now, in principle, every legitimate concept of science has a definite place in the constructional system…*We now replace the sign for each of these concepts as it occurs in the given sentence by the expression which defines it in its constructional definition*, and we carry out, step by step, further substitutions of constructional definitions …[E]ventually, the sentence will have a form in which…it contains only signs for basic relations [recollected similarity]…[*W*]*e presuppose that it is in principle possible to recognize whether or not a given basic relation holds between two given elementary experiences.* Now, the state of affairs in question is composed of nothing but such individual relation extension statements [about recollected similarity], where the number of elements [experiences] which are connected through the basic relation…is finite. From this it follows that it is in principle possible to ascertain in a finite number of steps whether or not the state of affairs in question obtains and hence that the posed question can be answered. (pp. 291-2)

Here Carnap presupposes the definitional reducibility to subjective experiences of the autopsychological construction. Thus, he thinks, *All scientific questions can be answered, because all meaningful scientific statements are, in principle, conclusively verifiable, and so capable of being known to be true, or false.* Here, in 1928, we already have the signature claim of logical empiricism. The only remaining issue is whether there are genuinely meaningful nonscientific questions the answers to which can be verified and hence known.

Carnap immediately takes this up in section 181.

> [C]onceptual knowledge does not meet any limitations in its own field; nevertheless, it is an open question whether it is perhaps possible to gain insights in a manner which lies outside *conceptual knowledge* and which is inaccessible to *conceptual thinking*… Unquestionably, there are phenomena of faith, religious and otherwise, and of intuition; they play an important role, not only for practical life, but also for cognition. Moreover, it can be admitted that, in these phenomena, somehow something is "grasped," but this figurative expression should *not lead to the assumption that knowledge is gained*…What is gained is a certain *attitude*, a certain psychological state, which, under certain circumstances, can indeed be favorable for obtaining certain insights. *Knowledge, however, can be present only when we designate and formulate, when a statement is rendered in words or other signs.* Admittedly the above-mentioned states put us occasionally in a position of asserting a statement or ascertaining it truth. *But it is only this articulable, and hence conceptual, ascertainment which is knowledge.* (pp. 292-3)

We have already been told that all conceptual knowledge falls within the domain of science. It is here suggested that there is no knowledge outside this domain, and that what falls outside that domain isn't stateable in words or symbols. In the next paragraph Carnap characterizes the nonconceptual deliverances of faith or intuition as *ineffable,* paraphrasing the *Tractatus*: "For, we cannot speak of question and answer if we are concerned with the ineffable." All this suggests that for Carnap, at the end of the *Aufbau,* the domain of science encompasses all knowledge and all truths. Since no stateable question or statement falls outside that domain, every truth-apt—i.e., cognitively meaningful—sentence is either conclusively verifiable or conclusively falsifiable, and so capable of being known to be true or known to be false. This is classical logical

empiricism of the sort espoused at about the same time by Schlick, under the influence of the *Tractatus*.